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**AEROSPACE MEDICINE**

**EN ROUTE CARE AND AEROMEDICAL  
EVACUATION MEDICAL OPERATIONS**

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This instruction implements Department of the Air Force Policy Directive (DAFPD) 48-1, *Aerospace & Operational Medicine Enterprise (AOME)*; supports DAFPD 10-29, *Worldwide Aeromedical Evacuation Operations*; and establishes, defines, and implements standards of care in the Air Force (AF) Aeromedical Evacuation (AE) System. This publication applies to all military and civilian personnel of the Regular Air Force, Air Force Reserve, and Air National Guard. This publication does not apply to the United States Space Force. This Instruction requires the collection and or maintenance of information protected by the Privacy Act of 1974 authorized by Department of Defense (DoD) Instruction (DoDI) 6025.18, *Health Insurance Portability and Accountability Act (HIPAA) Privacy Rule Compliance In DoD Health Care Programs*, and DoDI 8580.02, *Security of Individually Identifiable Health Information in DoD Health Care Programs*. The applicable SORN [F044 F SG E, Electronic Medical Records System] is available at: <http://dpclo.defense.gov/Privacy/SORNs.aspx>. Ensure all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Instruction (AFI) 33-322, *Records Management and Information Governance Program*, and disposed of in accordance with the Air Force Records Disposition Schedule located in the Air Force Records Management System. Refer recommended changes and questions about this publication to the OPR using the AF Form 847, *Recommendation for Change of Publication*; route AF Forms 847 from the field through the appropriate functional chain of command. This publication may be supplemented at any level, but all supplements are routed to the OPR of this publication for coordination prior to certification and approval. The authorities to waive wing/unit level requirements in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. Reference DAFI 33-360,

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## ***SUMMARY OF CHANGES***

This document has been substantially revised and needs to be completely reviewed. Major changes include updating: validating flight surgeon responsibilities throughout, patient regulating in [chapter 3](#); nursing considerations in [chapter 8](#); patient safety program in [chapter 9](#); and medical logistics in [chapter 12](#). Significant USTRANSCOM information was removed and the user is referred to USTRANSCOM guidelines.

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## Chapter 1

### PROGRAM OVERVIEW

**1.1. Mission Description.** AE includes all elements of medical care, support, treatment, staging and transport, from the point at which a request for movement has been received, through the final destination for definitive care. AE provides time-sensitive movement of casualties to and between medical treatment facilities (MTFs), using USAF and/or contracted aircraft with medical aircrew trained explicitly for the mission. AE forces can operate as far forward as aircraft are able to conduct air operations, across the full range of military operations, and in all operating environments. Specialty medical teams may be assigned to work with the AE aircrew to support patients requiring more intensive patient care. The AE system is a subset of the overall patient movement system. Patient movement begins as soon as a patient receives care, which may be at point of injury. Patient staging has several connotations and denotes all patient staging missions, in garrison and expeditionary. The ERPS is a specific, Unit Type Code (UTC) staging facility. The En Route Patient Staging System (ERPSS) denotes the global system. There are also facilities that may not have a designated ERPS UTC, in which patient staging also occurs. Patient staging provides medical personnel and equipment necessary for 24-hour patient staging operations, patient transportation to/from aircraft, and administrative processes for tracking patients transiting the AE system worldwide.

**1.2. Purpose.** This AFI provides clinical information and guidelines to promote safe and effective en route care for DoD beneficiaries and other authorized, or designated patients. Care is provided by en route care personnel in the patient staging and inflight environment. Information in this AFI provides guidance for patient airlift operations, but is not intended to be used as a substitute for sound clinical judgment.

### 1.3. Scope.

1.3.1. Staging facilities facilitate any necessary inpatient medical-surgical care. The supporting MTF with required capability cares for critically ill or inpatient mental health patients or on a short-term basis by an En Route Critical Care (ERCC) team (e.g., critical care air transport team [CCATT]; burn team; neonatal intensive care team) at the staging facility for patients awaiting airlift. ERCC system encompasses several critical care teams (e.g., burn, neonatal, lung, pediatric, trauma). Provisions are secured to address support services and additional clinical care required by patients in the staging facility due to patient condition changes, or mission delays/cancellations. The primary supporting MTF generally provides all clinical, surgical, and ancillary support required for patients in the staging facility regardless of size.

1.3.2. Aeromedical Evacuation Crew Members (AECM). AECMs provide specialized inpatient medical-surgical care capability with basic life support (BLS) and advanced cardiac life support (ACLS) resuscitative capability while contacting the mission Command and Control (C2) for further medical direction. During mission execution, AECM's clinical practice is under the medical direction of the validating flight surgeon (VFS). Mission requirements drive the use of specialty augmented medical teams and medical attendants (MA). **Note:** To preserve life, limb, or eyesight, in an emergency, when no physician is present or cannot be contacted, AECMs and/or medical personnel follow guidance outlined

within this instruction. The AECM notifies the appropriate Patient Movement Requirements Center (PMRC) of any treatment performed outside a patient's written orders as soon as operationally feasible.

1.3.3. Medical personnel in the AE system provide care based upon their specialty, scope of practice, specific core competencies, level of knowledge, training, and skills.

#### **1.4. Standards.**

1.4.1. Standards of Care (SOC): The AE and patient staging environments present the health care provider with unique challenges. The stresses of flight are considered in patient preparation. The SOC in the air are adapted to the aircraft's capabilities and limitations, and the in-flight environment. Refer to DAFPD 46-1, *Nursing Services*.

1.4.2. Standards of Performance: The standards of professional performance are the expected level of function based on education, level of experience and criteria of the current position requirements. The baseline clinical standards of care are inpatient medical-surgical care. Air Mobility Command (AMC) Command Surgeon (SG) has adopted Clinical Skills Plus (formally known as Mosby Online), Lippincott, Air and Surface Transport Nurses Association (ASTNA) standards of professional performance (when operationally feasible) and the National Registry for Emergency Medical Technicians. Refer to AFI 46-101, *Nursing Services and Operations*.

1.4.3. Standards of Practice: Standards of practice focus on the medical personnel and their competency, experience, and education. The primary goal of the AE system is to meet the perceived, actual, or potential health needs of the patient, while maintaining the continuum of care. Refer to DAFPD 46-1

1.4.4. Aeromedical Evacuation Clinical Protocols. AE clinical protocols (AECPP) are evidence based clinical protocols that provide standard orders in specific clinical scenarios. AECPPs are located on the AMC/SG Sharepoint and the electronic flight bag.

## Chapter 2

### OPERATIONAL AND ADMINISTRATIVE ROLES AND RESPONSIBILITIES

**2.1. United States Transportation Command.** Is the DoD single manager for implementing policy and standardizing procedures and automated information system requirements for global patient movement (PM); provides global PM in coordination with the geographic combatant commanders (GCC) through the Defense Transportation System and in accordance with DoD Instruction (DoDI) 6000.11, *Patient Movement (PM)*.

2.1.1. United States Transportation Command, Command Surgeon (TCSG) orchestrates strategic, operational, and tactical guidance on patient movement; guides unity of effort, total interoperability and standardization between PMRCs to ensure optimal fusion of expediency and patient safety across the patient movement system. Provides clinical and administrative support to PMRCs during peacetime and contingency operations and maintains trained patient movement joint service enablers in accordance with DoDI 6000.11 and USTRANSCOM guidance.

2.1.2. PMRCs clinically and administratively validate patient movement requests (PMRs) through the TRANSCOM Regulating and Command and Control Evacuation System (TRAC2ES) in accordance with DoDI 6000.11. Once validated, a requirement for PM passes to the respective transportation operations center (maritime, air) or agency to identify appropriate transportation based on available resources and clinical requirements.

2.1.3. The AE patient safety program (AE PSP) is a subset of the TCSG Patient Movement Patient Safety (PMPS) program just as AE is a subset of patient movement (PM). The AE PSP supports Air Mobility Command's core mission of AE. It also supports and is aligned under the TCSG mission as the DoD single-manager for global PM. The USTRANSCOM Command Surgeon reports patient safety data directly to the Defense Health Agency.

**2.2. Air Force Surgeon General (AF/SG).** AF/SG is primarily responsible for developing and coordinating health care policy for the Air Force Medical Service (AFMS). The AF/SG is also responsible for coordinating and aligning health care programs and services to integrate with other Services' medical departments and the Office of the Assistant Secretary of Defense for Health Affairs. The AF/SG is also responsible for developing operational medical capabilities to support the warfighter and for the delivery of operational clinical services under the operational control of the combatant commands for the en route care system.

**2.3. Air Mobility Command.** AMC serves as the lead major command (MAJCOM) for AE. As outlined in DAFPD 10-21, *Rapid Global Mobility*, AMC coordinates with the other commands (e.g., AF Reserve Command {AFRC} and Air National Guard {ANG}) involved in air mobility operations, to include AE, and manages those processes designated to enable the interoperability of air mobility forces regardless of the command. AMC maintains clear, detailed, and accountable standards in this mission area to ensure efficient employment and interoperability. AMC works with MAJCOMs to ensure appropriate forces are organized, trained, and equipped to perform the AE mission across the full spectrum of operations to meet global AE requirements. All AE forces comply with lead MAJCOM readiness standards addressing operational and clinical requirements. Aeromedical Evacuation policies and procedures are fully

coordinated through AMC and supporting MAJCOMs to ensure needs are identified and policies and procedures are thoroughly formulated.

2.3.1. AMC Command Surgeon (AMC/SG). Serves as the AE program medical director, responsible for the overall supervision, safety, and quality of medical care provided worldwide by the AE system, En Route Critical Care (ERCC), and patient staging personnel. AMC/SG establishes clinical practice standards and clinical training requirements. AMC/SG collaborates with AMC Directorate of Operations (AMC/A3) to ensure medical/clinical operations and aircrew operations are fully integrated.

2.3.1.1. AMC En Route Medical Care Division (AMC/SGK). Represents the AMC/SG regarding AE clinical programs and activities. Serves as a clinical advisor to all AMC, ANG, and AF Reserve (AFR) AE/patient movement units. Establishes and maintains clinical policy and procedures for AE and the clinical standardization and training of medical personnel assigned to AE/patient movement duties. Responsible for and manages the AE Patient Safety and ERCC team programs. SGK provides necessary clinical inputs to include special interest items, allowance standards substitutions, and crew complement to AMC/A3 to ensure current medical/clinical operations are incorporated into operational processes. Maintains oversight and guidance of the medical/clinical operations of AE and ensures integration with global patient movement processes in the 4X (medical and health services) publications series.

2.3.1.1.1. Guides clinical operations through release of clinical information impacting AE through the use of policies, clinical operations patient safety alert (COPSA), guidance memorandums, and emergency care research institute notifications. Notifications are sent to the applicable leadership for dissemination. COPSAs are maintained on the electronic flight book (EFB), the medical read file for patient staging personnel and AMC/A3 and AMC/SG site (reference [Attachment 2, A2.1.1](#)).

2.3.1.1.2. Manages the AE COPSAs to facilitate the timely communication of AE-focused clinical information and lessons learned from AMC/SG to the global AE community. The COPSA carries the same weight as the flight crew information file (FCIF). The operational and medical unit commanders ensures widest dissemination and implementation of applicable recommendations. AECMs and other ERCC personnel read and follow the recommendations contained in the COPSAs.

2.3.1.1.3. Defines the requirements for the clinical training levels identified in AFMAN 11-2AEV1, *Aircrew Standardization/Evaluation Program*.

2.3.1.1.4. Creates standardized clinical scenarios to support specialized inpatient medical surgical care capabilities.

2.3.1.1.5. Provides clinical scenarios for MAJCOM and Joint Staff directed exercises.

2.3.1.1.6. Orchestrates clinical planning for Humanitarian Assistance and Disaster Response activities.

2.3.1.1.7. Collaborates on medical equipment requirements for developmental and commercial-off-the-shelf items that supports the MAJCOM Safe-to-Fly program.

- 2.3.1.1.8. Provides clinical consultant services to AMC Medical Support Division (SGS) for medical information systems (e.g., electronic health record) for en route care.
- 2.3.1.1.9. Collaborates with AMC Modernization and Research Division (SGR) on clinical equipment, research gaps and modernization of the current AE portfolio.
- 2.3.1.2. AMC Medical and Aeromedical Evacuation, Readiness and Plans Division (AMC/SGX). Oversees policy, guidance, strategic resource planning, mission capability reporting and expeditionary operations. Develops and monitors Theater Aeromedical Evacuation System (TAES) ground support UTCs in the Aeromedical Evacuation and Patient Staging Course.
- 2.3.1.2.1. Supervises Manpower and Equipment Force Packaging System (MEFPAK) Responsible Agency (MRA) duties covering en route medical care, AFMS-owned AE UTCs, and war reserve materiel (WRM) assets. Establishes policies, directives, and procedures for the medical readiness programs at subordinate units. Develops requirements for research and development of medical equipment proposed for and used in the AE. Directs AMC medical operations, deployments, contingency, disaster planning, and use of command medical assets in exercises.
- 2.3.1.2.2. AMC/SGXM is the patient movement item (PMI) program execution office and is responsible for administering the PMI program. Responsible for AMC medical readiness and liaison with the MTFs, MAJCOMs, AFMS, combatant command (CCMD), and partner agencies. Global Force Functional Area Manager for AE Support UTCs (e.g., CCATT, ERPSS), and recommends sourcing solutions to the TCSG to meet Combatant Commander (CCDR) requests for forces. Training waiver authority for MEFPAK training requirements as described in AFI 41-106, *Air Force Medical Readiness Program*.
- 2.3.1.2.3. Assists in the development of component-level war planning and AE staging planning support for TCSG in support of Combatant Command (CCMD) Operational Plans (OPLANS) and Concept Plans (CONPLANS) under the authority of Joint Strategic Capabilities Plan planning tasks. Identifies AFMS-owned AE capabilities based on available resources. Manages the Safe-to-Fly program for AE equipment to be used on Air Force fixed and rotary wing aircraft.
- 2.3.1.3. AMC Aerospace Medicine Division (AMC/SGP). Advises and assists the AMC/SG in the interpretation and implementation of the AMC aerospace medicine program and operational medical policies. Serves as waiver authority for aeromedical flight physical standards in AMC and coordinates aeromedical waivers for those cases requiring specialist review. Member of AMC threat working group. Assesses medical threats for worldwide deployment locations and provides risk assessments for the AMC Threat Working Group. Develops policy for public health infection and communicable disease control for AE operations.
- 2.3.1.4. AMC Medical Support Division (AMC/SGS). Develops, coordinates, and advocates AMC/SG inputs into the AFMS strategic resourcing process including Medical Planning and Programming Guidance and Program Objective Memorandum. Develops and executes annual budget for directorate operations MEFPAK mission. Provides

budget analyst function for global AE financial transactions including funding worldwide patient movements on military aircraft and civilian air ambulances. Also collaborates with TCSG to process civilian insurance reimbursements to the government for beneficiary patient travel. Advises the AMC/SG on establishing policy and guidance for the development and deployment of command-unique medical data and communication systems. Provides installation, operations, security training, and maintenance services for the AF en route electronic health record (EHR). Provides consultant services to field activities for medical information systems. Manages technology and processes for the AE EHR Program, including resourcing and device technology evolution. Validates and processes military personnel appropriation (MPA) man-day requests using the current using the Manpower MPA Man-day Management System (M4S) for ANG and AFR medical personnel to support AMC/RegAF requirements.

2.3.1.5. AMC Modernization and Research Division (AMC/SGR). Develops, maintains, advances, and pursues funding for the AMC medical modernization portfolio. Leads AE research and development efforts across the AFMS. Articulates research needs and capability gaps with internal and external research partners, defines and articulates the process for users to submit research and technology solutions, and accurately categorizes initiatives with distinction between knowledge enhancement and technology development. Identifies gaps in doctrine, organization, training, materiel, leadership, and education, personnel, and facilities. Leads development activities of the EHR.

2.3.2. AMC Directorate of Operations (AMC/A3). Defines roles and responsibilities of the A3 in the AE system.

2.3.2.1. AMC Deputy Director, AE Operations. Senior AE authority to Directorate of Operations and provides executive oversight for global Total Force AE operations. Directs efforts to include AE funding, manning, training, and strategic direction for AMC/A3 assigned divisions and AE squadrons. Interfaces with joint, North Atlantic Treaty Organization (NATO), and coalition forces to develop worldwide AE doctrine and policy. Provides AE expertise to Headquarters United States Air Force, MAJCOMs, and Numbered Air Force (NAF). Co-chair of the AE Board.

2.3.2.2. AMC Aeromedical Evacuation Operations Branch. Provides policy, procedures, and concepts of operations for all Aeromedical Evacuation Squadrons (AES). Develops ground operations training programs, standards, and inspection guidelines for global AE. Interfaces with joint, special operations, NATO, and coalition policy makers to standardize AE operations worldwide. Serves as the Global Force Functional Area Manager for AE (non AFMS) UTCs and recommends sourcing solutions to the joint force provider to meet CDR requests for forces. Identifies AE unit capabilities based on available resources (active duty, AFR, and ANG). Appointed by the AMC/A3 as the program element monitor for Program Element: 41133F – Aeromedical Evacuation. Coordinates with AMC/SG for funding and associated medical resource letter equipment laydown for AE squadrons. Implements changes to the medical resource letter for personnel UTCs assigned to AE squadrons. Establishes doctrine and policy to support AE operations, in coordination with AMC/SG and owning MAJCOM/A3s. Establishes and disseminates operational training and assessment policy. Advocates to obtain and allocate resources for AE equipment and training. Executes AE Lead Command operational functions.

2.3.2.3. AMC Aeromedical Evacuation Standardization and Evaluation (AMC/A3VM). Implements and manages AE specific issues for the flight manuals and technical order program for various Air Force weapon systems. Provides standardized operating guidance for aircrews to ensure publications are readily available to meet all aircrew and mission requirements. Observes operational missions and performs No-Notice flight evaluations to provide feedback on the health of the AE system. Maintains current, universal qualification status in respective crew position to fulfill MAJCOM job responsibilities, administers required evaluations, and provides competent and current expertise on respective aircraft and aircrew-related issues. Develops and authors master question file for each crew position for in-unit closed book testing in accordance with AFI 11-202V2, *Aircrew Standardization and Evaluation Program*. Coordinates with AMC/SG on development of new aeromedical evacuation equipment, assesses operational risk for use on AMC aircraft, and provides recommendations for medical equipment air worthiness testing. Provides guidance on medical equipment to aeromedical evacuation crewmembers. Approves waivers for non-certified/non-standard medical equipment required for patient moves.

2.3.2.4. AMC Aeromedical Evacuation Training and Operations (AMC/A3TM). Establishes policies and procedures for AECM aircrew operational training and operations. This includes the preparation and update of AMC training publications, qualification programs, and continuation training. Training includes both peacetime and wartime requirements and ensures a global approach and interoperability with the worldwide AE system to include high consequence infectious disease transport capabilities. Formulates and interprets policy and procedures for AE units which cannot be addressed at the local wing level. Participates in Unit Effectiveness Inspections to validate Wing compliance with training programs. Participates in frequent AE flights performing training and basic crewmember duties. Provides functional expertise to aeromedical evacuation units. Represents the AMC/A3TM Division Chief regarding AE training policy. Coordinates war readiness training and equipment issues with AMC Medical Equipment Force Packaging (AMC/SGXM/SGXO) and coordinates clinical training requirements with AMC/SGK.

2.3.2.5. AMC Joint Exercises (AMC/A3Y). Focal point for command support and participation in joint and national exercises and provides foundational exercise inputs, establishes the framework for leadership decisions on the Mobility Air Force's Exercise Weight of Effort, and validates unique exercise plans and orders for exercise during the year. Exercises include, but are not limited to, ULTIMATE FOCUS (headquarter crisis battle staff function), ULTIMATE REACH (strategic airdrop), and Theater AE system exercises at the Joint Readiness Training Center.

2.3.3. The AMC Component-MAJCOM includes its commander, AMC/CC, identified staff, the 618th Air and Space Operations Center, and all assigned forces. A3X, A5X and the Air Operations Center (AOC), support the AMC/CC through the full range of air mobility operations at the operational and tactical levels in world-wide operations.

2.3.3.1. AMC A3X and A5X branches function as the execution and contingency planners, of the AMC Component MAJCOM; they are also the AF component within AMC which executes Commander United States Transportation Command (USTRANSCOM/CC) assigned missions. A3X and A5X plan, coordinates and direct AE

execution for real-world and exercise requirements and coordinate laydown of AE forces. A3X and A5X develops component-level war planning and AE planning support for USTRANSCOM in support of CCMD OPLANS and CONPLANS under the authority of Joint Strategic Capabilities Plan planning tasks. A3X and A5X collaborate with USTRANSCOM and AMC to identify AE capabilities based on available assets. A3X and A5X collaborate with PACAF and USAFE A3 for AE forces to coordinate AE support for real world and AMC-sponsored exercise requirements and OPLAN/CONPLAN support.

2.3.3.2. The AMC/CC retains responsibility as Commander of Air Force Forces (COMAFFOR). The COMAFFOR delegates operational control to AMC/DA3 and tactical control to 618 Air and Space Operations Center/CC of the AMC forces and Air Reserve Component (ARC) forces available for allocation and execution.

2.3.3.3. 618th Air and Space Operations Center. The 618 Air and Space Operations Center is the planning, tasking, executing, and assessing agency for USTRANSCOM validated patient movement requirements. The 618 Air and Space Operations Center provides centralized C2 of all AMC air mobility operations around the globe and acts as the single point of contact for AMC operations. A critical enabling feature of 618 Air and Space Operations Center is its robust C2 system, which allows 618 Air and Space Operations Center to schedule, task, manage, coordinate, control, and execute air mobility missions globally.

**2.4. Pacific Air Forces Command Surgeon (PACAF/SG).** PACAF/SG is the theater Air Component Surgeon for United States Indo-Pacific Command (USINDOPACOM) and has clinical oversight of the AE mission for the USINDOPACOM theater to include US Forces Korea and US Forces Japan.

**2.5. United States Air Forces Europe-Air Forces Africa Command (USAFE-AFAFRICA/SG).** USAFE-AFAFRICA/SG is the theater Air Component Surgeon for United States European Command (USEUCOM) and United States African Command (USAFRICOM) and has clinical oversight of the AE mission for the European and African theaters.

**2.6. Wing Commander.** (or the individual performing the functions of a wing commander equivalent). Exercises command over AE units and personnel in their wing. Establishes AE goals and programs within the wing in support of the wing's objectives. Establishes plans, policies, and procedures necessary to the proper conduct of wing affairs especially those which facilitate the Medical Group (MDG), AES, and Patient Staging operations within the Wing. Wing Commander ensures the safety of personnel and equipment to include those en route care assets deployed to the Wing, through an active and aggressive safety education and inspection program.

2.6.1. Operations Group Commander (OG/CC). The primary mission of the operations group (OG) is to manage flying operations within the assigned wing. AESs are assigned to the OG. The OG typically has an AE Standardization and Evaluation (Stan/Eval) function as well as an operations support squadron to provide flying support to AES's in areas of airfield operations, aircrew training, weather, intelligence, host aviation resource management and current operations.

2.6.2. Aeromedical Evacuation Squadron (AES). Plans, directs, organizes, coordinates, and evaluates all activities in support of AE training/operational missions and the TAES. AES



Commander advises the OG/CC on major policies and procedures affecting AE and the TAES. Provides guidance and direction to the DO, chief nurse executive, superintendent, and ensures all flights function optimally including operations, operations support, training, clinical management as well as stan/eval and the commander's support staff. AES/CCs incorporate clinical information released by AMC/SG into a medical read file which is maintained in FCIF Volume I - Part B in accordance with AFI 11-202V2\_AMCSUP, *Aircrew Standardization and Evaluation Program*; AECMs reviews and initials the medical read file as outlined in the unit Go/No Go process. AES/CCs maintain unit readiness in accordance with AFMAN 10-2909, *Aeromedical Evacuation (AE) Equipment Standards*.

2.6.3. MDG. Provides outpatient and/or inpatient medical care to DoD beneficiaries. Provides medical support to the AE system for patient staging and/or unscheduled remain overnight (RON) missions. Maintains unit readiness in accordance with AFI 41-106 and postures Air Force UTC in support of the DoD medical mission.

2.6.4. Staging facility aeromedical staging squadrons. Provides coordination, communication, and transportation 24/7 to support medical care of patients transiting the aeromedical evacuation system. Ensures patients are medically prepared for flight. The peacetime mission is to conduct a comprehensive training program to maximize wartime readiness.

2.6.5. Chief Nurse Executive (CNE). Patient staging, AE squadron, or expeditionary AE flight designate a CNE in accordance with AFI 46-101.

2.6.5.1. The CNE administers, directs, and evaluates nursing service activities. Evaluates the quality of nursing care provided to AE patients in accordance with AFI 44-119, *Medical Quality Operations* and implements programs to improve patient care delivery and organizational efficiency. Performs roles and responsibilities and functions in accordance with AFI 46-101. The CNE advises the commander on nursing matters and clinical care and quality in AE and/or patient staging settings.

2.6.5.2. The CNE coordinates clinical training required by AFIs and clinical management and staff development programs to promote nursing practice proficiency. Nursing personnel are required to have sufficient professional skill to provide the required medical support consistent with patient numbers, classification, and condition as determined by the CNE. The CNE establishes clinical training levels in accordance with AFMAN 11-2AEV1.

2.6.5.3. The CNE in an AE squadron or expeditionary AE flight reduces or increases the crew complement based on operational risk management (ORM) and patient acuity in accordance with AFMAN 11-2AEV3, *Aeromedical Evacuation Operations Procedures*. in accordance with AFPAM 10-1403; *Air Mobility Planning Factors*, for contingency planning only, the patient/crew ratio should be no greater than 10:1 (10 patients to each AECM). The medical crew director (MCD) and charge medical technician are counted as AECMs.

**2.7. Flight Surgeon.** The flight surgeon is responsible for continued medical treatment of AE patients to include reassessment and clearance of patients prior to loading patients on an AE mission. In contingencies, the ERPS flight surgeon serves as an AE consultant and triage officer. If needed, the flight surgeon serves as medical provider for medical personnel and aircrew. Due

to the joint operational nature of contingencies, the flight surgeon may be placed in a role of educator for other physicians attempting to utilize the AE system.

**2.8. Patient Staging and En Route Patient Stage.** ERPS provides support and continuity of medical care for patient movement and serves as an integral link in the global PM system. The ERPS, regardless of facility size, provides medical personnel and equipment necessary for 24-hour patient staging operations, patient transportation to/from aircraft, and administrative processes for tracking patients transiting the AE system worldwide. It is designed for short-term inpatient medical-surgical nursing care and limited emergent intervention (reference [Chapter 5](#) and ERPS Tactics, Techniques, and Procedures [TTP] 3.42.57, *En Route Patient Staging System*). The USTRANSCOM Patient Movement Requirements Center (TPMRC) or applicable C2 agency, coordinates the ground transportation of the ERCC patient and team. The AE Operations Team (AEOT) and ERPSS collaborates with the TPMRC to ensure the ERCC team is recovered and returned to either the AEOT or lodging as required.

2.8.1. ERPSS-10 (FFEPS) is deployed in accordance with AFTTP 3-42.57. **Note:** If the ERPSS-10 is tasked, the AE Communications Team (FFQCR) UTC is tasked to provide manpower for communication operations.

2.8.2. The ERPSS-provider (FFPPS), ERPSS-50 (FFFPS) and ERPSS-100 (FFPSS) are deployed in accordance with AFTTP 3-42.57.

2.8.3. Guidance on administrative control for AFR and ANG personnel is provided in Air Force Doctrine, Volume 1 and AFI 38-101, *Manpower and Organization*.

## **2.9. Contingency Operations.**

2.9.1. Air Operations Center (AOC). The AOC provides operational-level command and control of air, space, and cyberspace operations (reference AFI 13-1AOCV3, *Operational Procedures-Air Operations Center*).

2.9.2. Air Mobility Division (AMD). The AMD is a division within AOC. The AMD chief and personnel plan, coordinate, task and execute the air mobility mission in support of the AOC air, space, and cyberspace operation planning and execution processes. The AMD consists of four teams: airlift control team, air refueling control team, air mobility control team and aeromedical evacuation control team. The Aeromedical Evacuation Control Team (AECT). The AECT is responsible for operational planning, scheduling, and execution of intra-theater AE missions. The AECT advises and briefs the AMD chief and Director of Mobility Forces (DIRMOBFOR) on AE issues. The AECT provides command and control of all theater assigned/attached AE units/operations within the specified area of responsibility (AOR)/joint operations area (JOA) and assists with inter-theater AE operations arriving, departing, or transiting the AOR/JOA. The AECT receives validated patient movement requirements from the PMRC supporting the AOR/JOA. This could be the TPMRC-America's (A); TPMRC-East (E) TPMRC-West (W) or joint patient movement requirements center (JPMRC). The AECT TAES manager coordinates with operational AE planners and theater medical planners to develop plans and strategies to determine appropriate force lay-down of AE ground forces and AE crews in support of joint patient movement operations. The AECT maintains secure and non-secure communications with all AE elements, PMRCs, operational AE planners, theater medical planners and the deployment distribution operations center (DDOC). The AECT coordinates closely with the Personnel Recovery Command

Center and joint personnel recovery center to establish/develop integrated AE support following Personnel Recovery operations. The AECT integrates its activities with the air refueling control team, air mobility control team, airlift control team, and specialty/support functions to the maximum extent possible to support the total air mobility effort.

2.9.3. Director of Mobility Forces (DIRMOBFOR). The DIRMOBFOR is responsible for integrating the total air mobility effort for the COMAFFOR or Joint Forces Air Component Commander and, in this capacity, provides guidance to the Air Mobility Division to execute the air mobility mission.

2.9.4. Joint Patient Movement Requirement Center (JPMRC.). The joint activity established to coordinate the joint patient movement requirements function for a joint task force operation within a unified command area of responsibility. It coordinates with the theater patient movement requirement center for intra-theater patient movement and the TPMRC-A for inter-theater patient movement.

## **2.10. AE Squadron UTC Structure.**

2.10.1. AE Command Squadron (AECS) (FFQCC). In a contingency, the AECS provides C2 of assigned AE Forces in accordance with AFTTP 3-42.52, *Aeromedical Evacuation Command Squadron* (FFQCC). The AECS can deploy in advance of other AE UTCs to establish the support required for AE forces and establishment of a theater aeromedical evacuation system. The AECS advises the Wing and OG/CCs, as well as other appropriate personnel/agencies on AE Concept of Operations (CONOPS), doctrine, capabilities, and requirements. This UTC provides procedural guidance, technical guidance, and management oversight for assigned, attached, and transiting AE elements.

2.10.2. AE Liaison Team (AELT) (FFQLL). The Air Force AELT provides support between the forward user and the AE system in the form of operational and clinical interface. This interface may occur at locations without other AF personnel such as far forward bases and onboard ship. An AELT may be geographically separated from other AF assets.

2.10.2.1. The flight nurse (FN) provides clinical expertise to facilitate clinical support for administrative, aircraft specific requirements, equipment requirements and clinical implications of altitude and stresses of flight. The FN assists the medical units in preparing AE patients for flight.

2.10.2.2. The Medical Service Corps officer works with the medical unit to move patients to the correct staging location in a timely manner. The Medical Service Corps officer coordinates with airlift operations centers and support functions to complete all AE flight requirements prior to departure. The administrative officer duties are in accordance with AFTTP 3-42.53, *Aeromedical Evacuation Operations Team* (FFQNT) and *AEOT Manpower Augmentation Team* (FFQCM).

2.10.3. Aeromedical Evacuation Crew (FFQDE). A basic AE crew consists of two FNs and three aeromedical evacuation technicians (AET) trained to provide in-flight inpatient medical-surgical level care during air transport using medical equipment certified for use by airworthiness testing standards in accordance with AFTTP 3-42.5, *Aeromedical Evacuation*. Crewmembers are knowledgeable about the stresses of flight, aerospace physiology on patients, basic trauma skills and patient safety. AECMs are experts on the interface between aircraft systems and medical equipment to meet clinical care requirements. AECMs also

ensure medical mission management, aircraft safety, configuration, and integration of medical equipment with aircraft systems. AE crews have limited diagnostic capabilities and rely on aircraft communications system to contact C2 and the governing PMRC as needed.

2.10.4. AE Operations Team (AEOT) FFQNT. Provides operations and mission management support to airfields supporting AE. Provides supervision and crew management for all assigned or transiting AE crews and ERCC teams in accordance with AFTTP 3-42.53. Manages launch and recovery of missions, interfaces with flight line support agencies, assists with configuration of aircraft for AE missions, and oversees flight line activities for patient loading and unloading. Supports AE and ERCC team equipment and resupply. Coordinates AE crew and ERCC team requirements for life support, billeting, food service, transportation, finance, and administrative needs (when ERCC teams are attached to the AES). May be augmented with an AEOT Augmentation Team (FFQCM).

2.10.5. Aeromedical Evacuation Communications Team (FFQCR). Provides communications capability to any AE UTC when mission requirements dictate, and other forms of communications are considered unavailable. Deploys from home station with communications security for secure communications capability. AE communications equipment is organic to AE equipment UTCs and is not a stand-alone communications UTC.

## **2.11. Force Protection.**

2.11.1. Civil Engineering (CE) has the primary responsibility to provide facility hardening for the staging/AES facility and ancillary structures associated with it (e.g., logistics storage, laundry, latrines, anti-hijacking areas, patient leisure areas).

2.11.2. In accordance with AFH 10-222V1, *Civil Engineer Bare Base Development*; AFH 10-222V10, *Civil Engineer Camouflage, Concealment, and Deception Measures* and AFH 10-222V14, *Civil Engineering Guide To Fighting Positions, Shelters, Obstacles And Revetments*. CE provides hardening for AE and ERPS. In the event CE does not provide support, staging/AE personnel harden (e.g., sandbag) their own facilities.

2.11.3. The senior officer of ERPS or AE establishes weapons plans, policies, procedures, and processes upon arrival. Weapons are defined as any device which may be used to inflict injury or death, to include, but not limited to, firearms, explosives, ammunition, knives (including multi-purpose tools), etc. Weapons handling and storage procedures include:

2.11.3.1. Ensuring the proper control of weapons when temporarily stored in the facility.

2.11.3.2. Outlining the proper storage and distribution procedures for weapons that are ERPS/AE assets. Establish a secure site for ERPS/AE defensive weapons and ammunition.

2.11.3.3. Establishing clear policies defining personnel authorized to carry weapons: Members of security forces or Military Police performing official duties are authorized to carry a firearm while in the ERPS/AE facility. The ERPS/AE senior officer or Wing/CC may issue written authorization to other individuals with specific mission requirements to carry weapons into the ERPS/AES in accordance with the Laws of Armed Conflict, the Geneva Conventions, and AFI 31-117, *Arming and Use of Force by Air Force Personnel*.

2.11.3.4. Determining and establishing a secure weapons storage area and activity log. Ensure persons unauthorized to carry firearms or other weapons in the ERPS/AES facility are identified and disarmed.

2.11.3.5. Positioning of the clearing barrel. Refer to AFMAN 31-129, *USAF Small Arms and Light Weapons Handling Procedures*.

2.11.3.6. Weapons are identified and inventoried using AF Form 1297, *Temporary Issue Receipt*.

2.11.3.7. Establishing and managing the disposal of collected weapons and ammunition with security forces and/or armory.

2.11.4. Temporary storing of weapons for redeploying staging/AE personnel includes:

2.11.4.1. Securing and reclaiming weapons to and from security forces.

2.11.4.2. Securing weapons in approved travel case or storage area.

2.11.5. Patient Staging and AE personnel may be tasked with post-attack reconnaissance under the direction of explosive ordnance disposal.

2.11.6. Policy and guidance for entry control points are established to include entry, exit and firearm management. Entry control point policy include; personnel identification, passwords, and protective barriers.

### Chapter 3

#### REQUESTING AE PATIENT MOVEMENT THROUGH PMRC

**3.1. Patient Movement Considerations.** Weather, maintenance problems, availability of aircraft, crew duty day limitations, en route stops, and diversions may cause delays, cancellations, or denials to requests for AE patient movement. Secondly, patients should not experience any degradation in the delivery of a required level of care as a patient moves through different phases of patient movement, e.g., ground to air to ground.

3.1.1. The flight surgeon and/or the referring privileged provider, in conjunction with the PMRC works to mitigate any issues resulting from degradation in the level of care. An accepting privileged provider and available bed is verified for all non-contingency patients prior to PMR submission.

3.1.2. If a non-contingency inpatient is transiting a Continental United States (CONUS) patient staging facility without the required clinical capability, an interim RON accepting privileged provider at a local hospital will be arranged by the referring privileged provider and documented in the PMR. **(T-0). Note:** The PMRC provides guidance in situations when contingency patients also require an accepting privileged provider.

**3.2. Requesting AE for Patients.** The referring privileged provider assesses risks associated with patient movement and determines the need for evacuation. The requesting provider obtains an accepting provider at the receiving facility. The in-flight environment and the physiological stresses of flight described in [Chapter 7](#) can impair the ability to assess and deliver care while airborne. The referring privileged provider consults the governing PMRC to consider standards for aeromedical movement of patients, flight safety and operational constraints of the current operational environment. Consultation between the referring privileged provider and the PMRC is essential to mitigating these risks. Transport can be executed by USAF and or contracted aircraft. The request for PM begins with the initiation of a PMR by the referring privileged provider. Patient eligibility for movement is in accordance with DoDI 6000.11.

3.2.1. PMRs and AF Form 3899s, *Aeromedical Evaluation Patient Record*, are generated at the referring MTF by entering patient information into TRAC2ES. The AF Form 3899 has the referring privileged provider's signature and orders for AE (ground transport, staging, in-flight, and remain-overnight phases). The AF Form 3899 is the authorizing document for in-flight care, as well as part of the patient's permanent medical record.

3.2.2. Referring Privileged Provider. The referring privileged provider initiates a medical referral and clinical assessment, much like they do when requesting medical consultation. The VFS reviews this information, makes adjustments and interventions, then oversees the movement of the patient from one location to the next. Both providers have significant clinical input into the patients' care and outcome.

3.2.2.1. The referring privileged provider is responsible for finding an accepting privileged provider at the destination facility, if applicable. The PMRC verifies an accepting privileged provider, once obtained by referring privileged provider.

3.2.2.2. The referring privileged provider stabilizes patients entering the regulated patient movement system as much as the situation and resources allowed include, but are

not limited to securing airway, controlling hemorrhage(s), treating shock and stabilizing fractures.

3.2.2.3. The referring privileged provider is responsible for completing transfer orders on the AF Form 3899 for all URGENT (“U”), PRIORITY (“P”) and ROUTINE (“R”) patients.

3.2.2.3.1. This order includes the phone number, service, and name of the accepting provider (e.g., Transfer to Dr. X, General Surgery) as applicable.

3.2.2.3.2. Hand-written orders and patient information are required to be written legibly so accurate patient information is relayed.

3.2.2.3.3. After consulting with the governing PMRC and the VFS, the referring privileged provider consider the adverse effects of stresses of flight when writing orders.

3.2.2.3.4. The referring privileged provider signs all orders for AE.

3.2.2.3.5. All special diets are ordered by the referring privileged provider and documented on the EHR or AF Form 3899.

3.2.2.3.6. The referring privileged provider is responsible for writing or dictating a transfer summary whenever a patient is being transported in the AE system.

3.2.2.3.7. The referring privileged provider provides key information, including pending labs, x-rays, consults and the status of the patient and their anticipated needs.

3.2.2.3.8. The referring privileged provider outlines recurring assessment requirements.

3.2.2.3.9. The referring privileged provider in collaboration with the VFS orders any O2 requirements needed during flight.

3.2.2.3.10. The referring privileged provider in collaboration with the VFS provides appropriate documentation requesting use of Vacuum Spine Board (VSB) or a NATO litter with a cervical collar and may have an ERCC team assigned to the patient.

3.2.2.3.11. The referring privileged provider always uses a cervical collar (C-Collar), in conjunction with the VSB, if C-Spine injury is suspected.

3.2.2.3.12. The referring privileged provider will include the burn criteria as defined by American Burn Association (ABA) (<http://www.ameriburn.org>) described in **Attachment 10** and will follow **Chapter 8** for prompt consultation with a burn surgeon and transport to a burn center. **(T-0)**.

**3.3. Local Flight Surgeon.** The flight surgeon is the local authority for determining whether patients are physiologically ready for air transport. The flight surgeon or privileged provider in consultation with the VFS, clears AE patients for flight. The flight surgeon in collaboration with the VFS, may also determine if a patient’s category should change and adjust AE clinical care as indicated to safely transport patient.

3.3.1. Patients in RON status remain under the care of the local FS, unless transferred to other privileged providers for specialty or higher-level care.

3.3.2. The flight surgeon reevaluates each RON patient for continuation in the AE system, including those that are transferred. This clearance to fly (proceed) is documented on the EHR or AF Form 3899.

3.3.3. If transferred, the local MTF flight surgeon assesses whether the patient's condition warrants removal from AE until further stabilized for movement.

3.3.4. When no FS is available, the privileged provider, identified by the commander, at the RON location is responsible for the RON patients and is responsible for the above duties. Approval for the RON with no FS is confirmed with the PMRC before the patient departs the sending facility.

### 3.4. Submitting a PMR for Validation and Movement.

3.4.1. Submit a PMR as soon as the need for movement is determined. The patient movement process begins when the referring MTF electronically submits the PMR to the PMRC through TRAC2ES. If the MTF does not have access to TRAC2ES, call the PMRC for assistance in obtaining access and/or submitting the PMR. The PMR contains fields for clinical data and administrative data.

3.4.2. The PMR accurately reflects the patient's current condition and medical equipment/durable supply requirements. The PMR also provides a succinct care summary to ensure the receiving MTF is prepared and capable for assuming care of the patient upon arrival. Significant changes in the patient's condition require updates to the PMR. Submitting thorough clinical and administrative information shortens the validation process. The PMR content contains the following information (reference [Table 3.1](#)) and is consistent with documentation contained within the patient's medical record.

3.4.3. For ROUTINE Precedence moves, if patient is going to a civilian facility, a TRICARE Authorization number is needed for care prior to PMR validation. Additionally, if patient is moved by civilian ambulance on either end of the move, a TRICARE authorization number for ground transportation is needed prior to PMR validation. For URGENT or PRIORITY moves, authorizations can be acquired at a later time.

3.4.4. Required information and documentation (e.g., scanned copies of passports, contractor letters of authorization) vary by patient situation and theater of operation. Contact your servicing PMRC for detailed guidance.

**Table 3.1. Minimum Requirements to Enter a Patient Movement Request.**

Information	Notes
Diagnosis	
Reason for Movement	
Concise and accurate medical history	Include any procedures/treatments specifically addressed in this document, related to patient diagnosis (e.g., chest X-ray results at least 24 hours post chest tube removal).
Date and time of last relevant surgery	Absolute dates and times are used (e.g., 3 Aug 14); not relative dates/times (e.g., 3 days ago).
Privileged provider's orders	



Plan of care	
Current Vital Signs (VS)	Vitals are documented in the PMR within 72 hours prior to validation for all routine in-patients. All URGENT (U) and PRIORITY (P) patients VS are documented in the PMR within 12 hours prior to validation.
Significant lab values	Current hemoglobin and hematocrit (H&H) for all trauma, post-arrests, and post-operative patients. If ventilated, arterial blood gas results within 12 hours of validation are documented.
Oxygen (O2) requirements	A pulse oximeter is available on board AE aircraft, but referring privileged providers are required to recognize these devices can give erroneously higher readings under certain physiologic conditions (e.g., carbon monoxide poisoning, dehydration, anemia, impaired peripheral circulation, and high or low cardiac output states). <b>Note:</b> A cabin altitude restriction is sometimes required in addition to supplemental oxygen therapy.
Documentation for regional and epidural pain management infusions	Infusion documentation includes the medication, dosage, drug concentration, location, rate of infusion, pump type, and the service that is overseeing the infusion. Document pain score. Include pain medication for break-through pain.
	Notification to the VFS of any infusion line is required prior to clearing the patient for flight.
	Be aware of the action and side effects of patient specific medications prior to starting care and prior to departure.
	During the placement of the epidural catheter if “loss of resistance technique with air” has been used, or a “wet tap” occurs, the patient is held a minimum of 24 hours prior to planned AE mission to decrease the possibility of complications.
All current medications with dose, frequency, and route	A physician orders and/or reviews all pain medication loading dose(s), PCA bolus dose amount, lock-out interval, basal flow (continuous) rate, breakthrough pain orders, continuous peripheral IV infusion or saline lock, and over-sedation protocol on the EHR or AF Form 3899.
Self-medicating patients	Confirm the self-administering medication (SAM) is clearly indicated in the orders and the “SAM” box is marked on the EHR or AF Form 3899.
Nutritional status/diet orders	

Ambulatory status and/or physical limitations	
Travel limitations	Stops, RONS, cabin altitude restriction.
Patient equipment	External fixators, epidural pain pumps, cardiac monitors, chest tube drainage systems, pulse oximeters, wheelchair to include dimensions, crutches.
Request for MA or NMA or specialty medical teams	When patient needs exceed the capabilities of the aeromedical evacuation crew or NMA. A complete discussion of NMAs & MAs can be found in <b>paragraph 6.5.</b>

### 3.5. Determining Movement Precedence.

3.5.1. Precedence determines how quickly the patient is moved by the patient movement system. Precedence is determined by the clinical requirement for saving life, limb, or eyesight and is consistent with the delivery date to the destination medical facility. The movement precedence is determined through consultation between the referring and accepting privileged provider. The VFS and the PMRC make the final determination on the precedence. **Note:** During contingency operations, additional information may be required as determined by the PMRC. Generally, patients may be regulated to the closest uniformed services treatment facility having the medical capability to care for the patient.

3.5.2. Precedence categories are URGENT (“U”), PRIORITY (“P”) and ROUTINE (“R”). All “U” or “P” requests are approved in accordance with PMRC guidelines.

3.5.2.1. If a request for “U” or “P” movement is not validated and the referring privileged provider does not concur with the decisions, he/she can request a review by TCSG, the appropriate theater command surgeon, or designated representative.

3.5.2.2. Report “U” and “P” patients directly to the PMRC with the help of the AE clerk or patient administration personnel. “U” or “P” patients require direct communication between the referring, accepting privileged providers and VFS.

3.5.2.3. “U” Precedence (stabilizing vs unstable) requires immediate PM to save life, limb, eyesight, or prevent serious complications of injury or existing medical condition. Immediate action is taken to obtain suitable transportation to meet patient requirements. Timeline for movement is as soon as possible and validated by supporting PMRC VFS.

3.5.2.4. “P” Precedence (stabilizing vs stabilized) requires expedient PM and prompt medical intervention when care is unavailable locally and medical condition could deteriorate; PM is required sooner than the next scheduled channel AE mission. Timeline for movement is defined by the competent medical authority and validated by the supporting PMRC VFS.

3.5.2.5. “R” Precedence (stabilized vs stable) requires timely PM, can tolerate longer periods except when clinical requirements/or status change warrants higher movement precedence. Timeline for movement is defined by competent medical authority and validated by the supporting PMRC VFS.

#### 3.5.2.6. Response Time.

3.5.2.6.1. Many factors influence response time for “U” and “P” movements. Validation of the PMR by the PMRC is required before airlift is allocated. The PMRC provides the validated PMR to the appropriate C2 agency to procure airlift.

3.5.2.6.2. The 618 Air and Space Operations Center/AMD/AECT considers all airlift sources to include commercial air ambulances. The PMRC considers alternative sources of patient movement or transport if airlift response time does not meet the patient’s clinical needs.

### 3.6. Special Category Patients.

3.6.1. Special patients can be designated by the AECM, Patient Movement Clinical Coordinators (PMCCs), VFS or responsible physician and are coordinated through the PMRC.

3.6.2. Indicate a patient is a special category patient in the TRAC2ES PMR if the patient is of command interest, any patient O-6 or higher (active or retired), E-9 depending on position (command), foreign national, secretarial designee, or any other high visibility patient movement.

### 3.7. Determining Patient Classification.

3.7.1. Classification are assigned by a referring privileged provider in coordination with the PMRC and designates the patient status, based on diagnosis and ability to self-help in an emergency. The AECM may assign a higher (upgrade) classification, e.g., 2B to 2A if the patient’s condition warrants.

3.7.1.1. A patient’s classification will not be downgraded without the approval of the VFS (e.g., 1A to 1C). **(T-0)**. Patient status changes can and do occur after the initial reporting of patient movement requests. All medical personnel are required to continuously re-assess and document patient status changes and ensure updated information is communicated to the PMRC.

3.7.1.2. The AECM notifies C2 who then contacts the governing PMRC of any change in patient status or classification as soon as possible. Complete DD Form 2852, *Patient Movement Event/Near Miss Report* or Joint Patient Safety Reporting (JPSR) worksheet, and update AF Form 3829, *Summary of Patients Evacuated by Air*. The DD Form 2852/JPSR Worksheet is protected from disclosure under Department of Defense Instruction 6025.18, *Health Insurance Portability and Accountability Act (HIPAA) Privacy Rule Compliance in DoD Health Care Programs*; and DoDI 6025.13, *Medical Quality Assurance (MQA) and Clinical Quality Management in the Military Health System*.

3.7.2. Patient classifications (reference [Table 3.2](#)).

3.7.2.1. Patients are classified according to the severity of symptoms.

3.7.2.2. 1A and 1B patients will have standing and/or as needed (PRN) medication orders for agitation/anxiety/sleep. **(T-0)**.

3.7.2.3. 1A – Severe. Psychiatric litter inpatient requiring the use of restraining apparatus, sedation, close monitoring and are required to have a MA.

- 3.7.2.3.1. Patients who require restraints have them applied prior to boarding the aircraft, are sedated for flight, and require close monitoring.
- 3.7.2.3.2. Restraints are four-point restraints. Patients are continually monitored throughout the flight with line of sight at all times while in the AE system. Monitor the respiratory status of sedated patients (to include pulse oximeter) at regular intervals and observe for signs of over-sedation.
- 3.7.2.3.3. The referring physician, PMRC, MA, or AECM may determine the patient's behavior is too high risk to flight safety, thus requiring further stabilization.
- 3.7.2.3.4. The patient is stabilized prior to AE movement with appropriate psychiatric medications that effectively control symptoms of extreme agitation and/or anxiety.
- 3.7.2.3.5. If the patient requires an MA, the MA is the same gender, preferably of equal or higher rank if operationally feasible.
- 3.7.2.3.6. Patients only RON at a bedded MTF.
- 3.7.2.3.7. Patients travel in hospital garments, pajamas, or physical training (PT) gear. All strings, laces, and belts are removed from the PT gear.
- 3.7.2.4. 1B – Intermediate. Psychiatric litter inpatient of intermediate severity.
  - 3.7.2.4.1. Patients should be transported on a litter. In coordination with the AECM, these patients may be allowed to sit up for comfort under close observation.
  - 3.7.2.4.2. Psychiatric patients may require tranquilizing or sedating medications to prevent harm to self, aircrew members, or the aircraft. These patients require a restraint order for applying restraints or have restraints immediately available at the litter. Once available restraints are applied to the patient, the AECM contacts the VFS for an applied restraint order.
  - 3.7.2.4.3. Do not seat near exits, flight deck or where emergency equipment (e.g., oxygen, crash axes, or emergency O2 shut off valve) is kept. **Note:** Inform all aircrew members of the patient's location.
  - 3.7.2.4.4. Patients should travel in hospital garments, pajamas, or physical training (PT) gear. All strings, laces, and belts are removed from the PT gear.
  - 3.7.2.4.5. Patients only RON at a bedded MTF.
- 3.7.2.5. 1C – Ambulatory psychiatric inpatient of moderate severity and may require an attendant for movement.
  - 3.7.2.5.1. May be dressed in civilian or military clothing.
  - 3.7.2.5.2. Do not seat near exits, flight deck or where emergency equipment (e.g., oxygen, crash axes, or emergency O2 shut off valve) is kept.
  - 3.7.2.5.3. Patients do not self-medicate or carry their own medication.
  - 3.7.2.5.4. Patients only RON at a bedded MTF.
- 3.7.2.6. 3C - Inpatient ambulatory, drug, or alcohol (substance) abuse patient going for inpatient treatment.

3.7.2.6.1. Individuals who have recent drug or alcohol consumption may exhibit signs or symptoms of withdrawal (reference [paragraph 8.20.13](#)).

3.7.2.6.2. Patient may sit next to exits and O2 shut off valves, if determined to be competent by a FN.

3.7.2.6.3. Patients may RON at an ERPS if determined by the FS and the senior nurse at the ERPS to be stable and safe.

3.7.2.7. 5B - Outpatient ambulatory, drug, or alcohol (substance) abuse, going for treatment. **Note:** Patients may RON at an ERPS if determined by the FS and senior nurse at the ERPS to be stable and safe.

3.7.2.8. 5C - Psychiatric outpatient going for treatment or evaluation. **Note:** Patients may RON at an ERPS if determined by the FS and senior nurse at the ERPS to be stable and safe.

**Table 3.2. Patient Classification.**

<b>CLASS 1</b>	<b>Neuropsychiatric Patients</b>
1A	Severe Psychiatric Litter Patients. Psychiatric patient requiring the use of a restraining apparatus, sedation, and close supervision at all times (reference <a href="#">paragraph 3.7.2.3</a> ).
1B	Psychiatric Litter Patients of Intermediate Severity. Psychiatric patients may require tranquilizing or sedating medications to prevent harm to self, aircrew members, or the aircraft. These patients have a restraint order for applied restraints or restraints immediately available at the litter. Once available restraints are applied to the patient, the AECM contacts the validating flight surgeon for an applied restraint order (reference <a href="#">paragraph 3.7.2.4</a> ).
1C	Psychiatric Ambulatory Patients of Moderate Severity. Psychiatric patients who are cooperative and who have proved reliable under observation. May or may not require an attendant for movement (reference <a href="#">paragraph 3.7.2.5</a> ).
<b>CLASS 2</b>	<b>Inpatient Litter Patients (Other than Psych)</b>
2A	Immobile Litter Patients. Patients unable to move about on their own volition under any circumstances and requires assistance with egress.
2B	Mobile Litter Patients. Patients able to move about on their own volition in an emergency. Able to sit in a seat if desired.
<b>CLASS 3</b>	<b>Inpatient Ambulatory Patients (Other than Psych)</b>
3A	Ambulatory patients, non-psychiatric and non-substance abuse, going for treatment or evaluation, requiring care en route.
3B	Recovered ambulatory patient returning to home station.
3C	Ambulatory, drug, or alcohol (substance) abuse, going for inpatient treatment.
<b>CLASS 4</b>	<b>Infant Category</b>
4A	Infant under 3 years. of age, occupying an aircraft seat, going for treatment.

4B	Infant under 3 years. of age, occupying a seat and returning from treatment.
4C	Infant requiring an approved air worthy incubator.
4D	Infant under 3 years of age, occupying a litter.
4E	Outpatient under 3 years of age.
<b>CLASS 5</b>	<b>Outpatient Category</b>
5A	Ambulatory outpatient, non-psychiatric, non-substance abuse, going for treatment.
5B	Ambulatory outpatient, drug, or alcohol (substance) abuse, going for treatment (reference <b>paragraph 3.7.2.7.</b> ).
5C	Psychiatric outpatient going for treatment (reference <b>paragraph 3.7.2.8.</b> ).
5D	Outpatient on litter for comfort, going for treatment.
5E	Returning outpatient, on litter for comfort.
5F	Returning outpatient, returning to duty.
<b>CLASS 6</b>	<b>Attendant Category</b>
6A	MA: Physician/Nurse/Tech required for specific medical needs based on the patient's condition and treatments required in flight.
6B	NMA: family/unit member for the purpose of providing assistance on an AE mission in accordance with DoDI 6000.11 (reference <b>paragraph 6.5.</b> ).

### 3.8. PMR Validation and Acceptance for Flight.

3.8.1. When the PMR is submitted with required information and all approvals are completed, a PMCC or VFS clinically validates, as appropriate. The Patient Movement Operations Officer (PMOO) administratively validates the PMR. The airlift C2 agency, after receiving a validated PMR, selects the most advantageous mission for the patient and notifies the PMRC of the mission, who then notifies the facilities and ground transportation agencies. The Patient Movement Operations Officer (PMOO) builds the mission in TRAC2ES as required and the Duty Controllers makes appropriate notifications to originating and destination facilities prior to the mission and during execution.

3.8.1.1. If the patient requires total care or continuous observation, a MA from the originating medical facility or staging unit may be required to accompany the patient.

3.8.1.2. The PMRC coordinates any requirement for a specialty team or MA made by the referring privileged provider, in coordination with the VFS.

3.8.2. The validation process includes confirming the patient is medically cleared for flight and this movement is appropriate when all circumstances are considered. Circumstances include, but are not limited to information identified in **paragraph 3.5** as well as:

3.8.2.1. Availability of adequate care in the local economy.

3.8.2.2. Patient transportation eligibility. Found in DoD 4515.13R *Air Transportation Eligibility* and DoDI 6000.11.

### 3.9. Patient Movement Operations.

3.9.1. There are Three TPMRCs (USTRANSCOM Patient Movement Requirements Centers). They are joint Units reporting directly to the TCSG and serve as DoD's manager for the development of policy and standardization of procedures and information support

systems for global patient movement. TPMRC-Americas covers North and South America and includes Alaska. TPMRC-East covers EUCOM, CENTCOM and AFRICOM theaters, and TPMRC-West covers INDOPACOM. The TPMRCs implement policy and standardization for the regulation, clinical standards, and safe movement of uniformed services and other authorized, or designated patients. They also orchestrate and maintain "global oversight" in coordination with the geographic combatant commanders and external intergovernmental organizations, as required and in accordance with USTRANSCOM guidance.

3.9.2. TPMRC-A. Located at Scott Air Force Base, IL and is responsible for patient movement within U.S. Northern Command (USNORTHCOM), from U.S. Southern Command (USSOUTHCOM), and from USNORTHCOM. TPMRC-A coordinates with Outside the Continental United States (OCONUS) CCMDs to receive PM inbound to USNORTHCOM. Contact Information: DSN: (312) 779-4200, commercial: (618) 229-4200; toll free: 1-800-303-9301.

3.9.3. TPMRC-E. Located at Ramstein AB, Germany, and is responsible for patient movement within and from USEUCOM, USAFRICOM, and United States Central Command (USCENTCOM) (when there is no JPMRC). Contact Information: DSN: (314) 480-8040/2264 or Civilian: 0049-6371-47-8040/2264.

3.9.4. TPMRC-W. Located at Joint Base Pearl Harbor-Hickam and is responsible for patient movement within and from United States Pacific Command (INDOPACOM). Contact information: DSN: (315) 448-1602/04/09 or commercial: (808) 448-1602/04/09.

### **3.10. Validating Flight Surgeon (VFS).**

3.10.1. The VFS is assigned to each PMRC and provides medical direction during transport for all patient types served by the PM system.

3.10.1.1. The VFS seeks prompt specialty or subspecialty consultation, as appropriate, when a patient's needs exceed their scope of practice. The VFS, working in concert with the PMRC PMCCs, identifies skill requirements to ensure appropriate level of care required for any patient movement. The VFS also assesses any infectious disease risk to decrease risk to other patients and crew members.

3.10.1.2. The VFS works with the referring and accepting privileged providers, as well as any ERCC team MA when planning and coordinating the patient's transfer. If there is a question as to the level of care required, the VFS works with the sending physician and ERCC team MA to make a determination.

3.10.2. The VFS ensures compliance with applicable accepted practice standards for air and ground patient movement.

3.10.3. Medical direction is transferred from the VFS to a privileged provider traveling with AE patients as a MA, an ERCC team physician or other specialty team.

3.10.4. AECMs transporting AE patients provide care in-flight under the medical direction of the VFS.

3.10.5. If the VFS and/or PMRC have a question regarding the AECMs' ability to care for a patient without a specialty care team or MA, the VFS and/or the PMRC contacts the CNE at the AES tasked with the mission to determine appropriate staffing levels for the mission.

### 3.11. TRAC2ES.

3.11.1. TRAC2ES is the Automated Information System supporting patient movement which links the originating and destination MTFs with medical transportation assets and C2 infrastructure to plan and manage PM, and to maintain continuous global awareness of the PM system. The user interface is an exclusively web-based application (T-Web), but a computer-based spreadsheet called a TRAC2ES unloadable Contingency Spreadsheet (TUCS) exists for users with sporadic or non-existent internet connectivity. The system is used by: PMRCs, fixed and deployed MTFs, PM C2 elements, and the headquarters of Joint Task Forces, combined task forces, and CCDRs. For the latest information regarding TRAC2ES, go to <https://trac2es.transport.mil> or email [trac2es@us.transcom.mil](mailto:trac2es@us.transcom.mil). Users may apply for new accounts by contacting the TRAC2ES Helpdesk at: [transcom.scott.tcj6.mbx.service-desk@mail.mil](mailto:transcom.scott.tcj6.mbx.service-desk@mail.mil). The help desk can provide forms and assist with guidance to register for a new account.

3.11.2. Refer to USTRANSCOM guidance for additional information.



## Chapter 4

### ORIGINATING AND DESTINATION FACILITY

**4.1. General Information.** Originating and destination facilities assume the responsibilities of patient staging in the absence of an ERPS. It is the responsibility of the originating facility to identify, create and submit a PMR and identify PMI, supplies and medications required to monitor and treat the patient throughout the AE system. MTF/CC coordinates with supporting patient staging facilities for PM operations requirements and procedures. AECMs are responsible to review the PMR to ascertain if the AE system is required to bring PMI with the mission (reference [chapter 5](#) for additional ERPS information and [chapter 6](#) for patient preparation).

#### 4.2. MTFs and ERPS responsibilities.

4.2.1. Monitor TRAC2ES daily to identify any inbound/outbound patients regulated to their facility.

4.2.2. Verify information on the mission manifest, including patient information, load data, special equipment requirements, meals, and AE mission information with appropriate agencies.

4.2.3. Update ITV events, and document in TRAC2ES, to assist with patient tracking and clinical updates.

4.2.4. Coordinate patient and mission changes with appropriate PMRC and C2 agencies.

4.2.5. If clinical/mission status changes occur, the MTF/ERPS provides an up-to-date copy of the PMRs and TRAC2ES mission manifest to the AE crew upon patient delivery.

**4.3. Theater Medical Data Store.** TMDS is a theater specific data repository for clinicians to gain patient's medical information. Medical records collected from Theater Medical Information Program - Joint (TMIP-J) applications flow into the databases and are accessible worldwide through TMDS.

**4.4. Travel Authorizations.** The originating facility provides a valid, funded travel order for all US Armed Forces and non-US Armed Forces patients and attendants (revenue reimbursable/pay patients).

4.4.1. Prepare the travel order or transportation authorization:

4.4.1.1. Include a complete billing address for non-US Armed Forces patients.

4.4.1.2. Attach the "Secretarial Designee" letter (if applicable) authorizing AE and specifying the reimbursable rate.

4.4.1.3. Send a copy of the travel order to the TCSG within five workdays after the patient leaves the facility to:

**Table 4.1. TCSG.**

TCSG
Third Party Collections 510 POW/MIA Dr, Building P40-E Room 217

Scott AFB, IL 62225
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4.4.2. Prevent patient movement delay by authorizing alternate methods of transportation for Armed Forces patients from the active component. Service policy/guidance directs the members' understanding of the need for personal funds; amount limit, and means of payment (e.g., Treasury checks, money order, and cash).

**4.5. Transportation.** In the absence of an ERPS, the originating facility are required to provide appropriate patient preparation, transport, medical escort and manpower to safely load patients and transfer the patients' and attendants' baggage, records, medical equipment, supplies, medications, and valuables on and off the evacuation asset. The ERPS capability coordinates this role if assigned/postured at the location.

4.5.1. Patients on approved litters are transferred and prepared according to patient preparation requirements. The originating facility ensures patients have flight approved equipment, appropriate clothing, and adequate levels of supplies, medications (reference [paragraph 8.22.5](#)) and appropriate nutrition. Patients arrive a minimum of one hour prior to scheduled take off (reference [Chapter 6](#)).

4.5.2. The originating and destination MTF/CC ensures the MTF has a process for:

4.5.2.1. Providing required MA to and from an evacuation asset.

4.5.2.2. Maintaining adequate communications with MTF personnel in case of an en route emergency.

4.5.2.3. Planning and coordinating to preclude mission and patient delays on the flight line.

4.5.3. MTF staff needs to plan for medication (e.g., pain, nausea, or anxiety) and oxygen administration requirements during transport between the flight line and MTF. **WARNING:** Maintain the level of clinical care throughout the duration of patient movement.

4.5.3.1. The MTF is responsible for providing an ACLS-credentialed staff to transport patients to and from the aircraft and the medical facility when patient condition dictates. If an ACLS-credentialed staff member is not available from the destination MTF, an ACLS-credentialed AECM obtains/maintains custody and care of patient to the destination MTF until appropriate transfer of care can be accomplished. The MTF ensures the AECMs are returned to aircraft.

4.5.3.2. For a critical care patient, the ERCC team maintains custody and care of the patient to and from the aircraft. The TPMRC or applicable C2 agency, coordinates the ground transportation of the ERCC patient and team. The AEOT and ERPSS collaborates with the TPMRC to ensure the ERCC team and equipment is recovered and returned to either the AEOT or lodging as required.

#### **4.6. Documentation and Transfer of Patient Records.**

4.6.1. The EHR is the primary source for patient documentation. In the event the EHR is unavailable, the AF Form 3899 series is utilized. If a patient arrives without EHR or an AF Form 3899 and arrives with any other medical documentation information, those documents are transcribed and attached onto an AF Form 3899 and become a permanent part of the patient's medical record.

4.6.2. The originating facility is responsible for patient documentation and transfer of comprehensive patient information. Originating MTFs initiates applicable paperwork in accordance with AFI 48-107V3; *En Route Care Documentation*, for the patients entering the AE system. (e.g., AF Form 3899 series, baggage/anti-hijacking forms, baggage tags).

4.6.3. All facilities protects and securely transports medical information to and from the evacuation asset in accordance with DoDM 6025.18, Implementation of the Health Insurance Portability and Accountability Act (HIPAA) Privacy Rule in DoD Health Care Programs, and DoDI 8580.02, Security of Individually Identifiable Health Information in DoDI Health Care Programs. **Note:** The destination facility is responsible for assuring all patient documentation is transferred and placed in the patient's permanent medical record.

**4.7. Mission Coordination.** The MTF coordinates mission requirements with appropriate personnel, such as patient census, launch and recovery times/staffing needs to include drivers or vehicles, appropriate clinical points of contact at other MTFs and supporting agencies.

**4.8. Accountability.** All healthcare workers ensure patient accountability is maintained. This can be maintained on Health Insurance Portability Accountability Act (HIPAA) compliant status boards and log sheets. TRAC2ES PM Automated Information System may be used for ITV.

**4.9. Entry Requirements.** Sending facility/patient staging units ensures patients and attendants meet passport, all visa, and immunization requirements of the country in which the receiving facility is located. It also ensures patients possess a military, dependent, civilian or contractor government identification (ID) card.

**4.10. Patient Safety Events/Near Miss Events.** The receiving facility ensures incidents or significant changes in patient status that occur within 24 hours of patient arrival are reported on a JPSR worksheet or DD Form 2852 (reference [Chapter 9](#)).

**4.11. RON Patients.** At a minimum, MTF commanders ensure their personnel complete the following tasks for all RON patients at or near their facility:

4.11.1. Medically evaluate each patient upon arrival and daily, or as medical condition requires.

4.11.2. Prepare patients both clinically (reference [Chapter 6](#)) and administratively for further PM.

4.11.3. Provide safekeeping of patient valuables.

4.11.4. Ensure patients have proper nutrition, bathroom facilities, and a place to sleep/stay.

**4.12. MTF Support Requirements for the Co-Located ERPS.**

4.12.1. The MTF provides the supported staging facility with medical, mental health, administrative, logistical, pharmaceutical, nutritional medicine, radiology, and other support services as needed. Unless otherwise designated, the Chief of Aerospace Medicine has oversight of clinical care functions.

4.12.2. The Chief of Medical Staff (SGH) at the MTF has a supporting responsibility for the ERPS. The SGH is a Medical Corps officer who directly reports to the MTF/CC. The SGH is responsible for oversight of clinical provider quality and scope of care; utilization of professional resources; policies supporting medical care; and appropriate credentialing, privileging, and peer review processes as outlined in AFI 44-119. If the ERPS is not co-

located with a MTF with a SGH available, a senior medical officer other than the Commander is appointed for the above responsibilities.

4.12.3. Chief Nurse (SGN) at the MTF has a supporting responsibility for the ERPS. The SGN is a Nurse Corps Developmental Team appointed senior nurse who reports directly to the MTF/CC. The SGN has the authority and responsibility for the delivery of nursing services. The SGN coordinates on all actions impacting nurses and maintains functional control of Air Force nursing service personnel; officers, enlisted, civilian, and contractors. The SGN plans, coordinates, and establishes practice and performance standards for all nursing personnel, ensures enlisted nursing personnel practice within the scope and to the full extent of their respective Career Field Education and Training Plan, and ensures peer review, currency and competency for nursing service personnel. If the ERPS is not co-located with a MTF with an SGN available, a senior nurse other than the commander is appointed for the responsibilities.

4.12.4. The supporting MTF provides medical materiel support for patients transiting the continuum of medical care. The MTF provides supplies, equipment, linen, medications, and custodial services and the subsequent accounting for such materiel in accordance with AFMAN 41-209, *Medical Logistics Support*.

4.12.5. The MTF Resource Management Office includes reports from the supported staging facility as part of the MTF reporting requirements. The MTF assists the staging facility with personnel, funding requests, requirements, and other services as needed.

4.12.6. The MTF supports network and terminal connectivity to TRAC2ES.

4.12.7. The MTF ensures the staging facility has enough physical space to accommodate patient loads, infection control processes, readiness requirements and AE mission or transportation surges.

4.12.8. The MTF Vehicle Control Officer (VCO)/Vehicle Control Non-Commissioned Officer (VCNCO) provides appropriate vehicles for transportation needs and serves as the liaison to the vehicle operations flight and the staging facility VCNCO.

4.12.9. The MTF provides Commander's Support Staff services in support of disciplinary actions, career training and leave monitoring.

4.12.10. The MTF provides personnel trained in patient loading as required.

4.12.11. Staging personnel provide nursing care for patients who have been transferred to the ERPS awaiting transportation. Patients on life support systems or cardiac monitors, as well as inpatient mental health patients are provided care in the adjacent MTF or local community medical facilities, as appropriate. In the event additional care/support is required for patients in the ERPS, the supporting MTF provides clinical/surgical interventions or other ancillary care as required. All patients are assessed to ensure the ERPS is capable of providing care as required.

4.12.12. Requirements to establish a patient staging facility include:

4.12.12.1. MTF Pharmacy support is available 24 hours/day either in-house or available within one hour as deemed appropriate for scope of care by the MTF commander.

- 4.12.12.2. Radiology support (including: Magnetic resonance imaging, computerized axial tomography scan and ultrasound) is available within one hour, 24 hours/day.
- 4.12.12.3. Mental health support is available within one hour, 24 hours/day. Mental health support is prepared to respond and assess/treat patients as needed.
- 4.12.12.4. Surgical support (to including anesthesia) is available within two hours, 24 hours/day. Surgical consultants are available within one hour, 24 hours/day.
- 4.12.12.5. Nutritional medicine support for ERPS is available 24/7. **Note:** This is a supporting MTF responsibility unless the staging facility has assigned nutritional medicine personnel.
- 4.12.12.6. Immediate/in house access to advanced life support services 24 hours/day.
- 4.12.12.7. Intensive Care Unit (ICU) support and critical care specialist is available 24 hours/day at either the military or civilian MTF.
- 4.12.12.8. Emergency medicine support is available 24 hours/day.
- 4.12.12.9. Ambulance support is available within 20 minutes, 24 hours/day.
- 4.12.12.10. Staff physician support is available 24 hours/day.
- 4.12.12.11. Laboratory services are available within one hour, 24 hours/day.

## Chapter 5

### EN ROUTE PATIENT STAGING SYSTEM (ERPSS)

#### 5.1. En Route Patient Stage (Facility).

5.1.1. The ERPSS facility is a key healthcare component of the AE system and provides temporary holding capability for patients transiting the system. While some ERPSS are located adjacent to a bedded facility, they are designed for short term complex medical-surgical nursing care and limited emergent intervention. Critically ill patients receive care at the nearest bedded MTF or by the CCATT while awaiting airlift. (T-1).

5.1.2. ERPSS facilities not co-located with a MTF need to identify their clinical capabilities to support en route patients and develop mitigation plans to ensure appropriate clinical care for patients which exceed the MTF/ERPSS capabilities. All staging facilities informs the TCSG of any change to their Scope of Care by sending an email to: [transcom.scott.tcsг.mbx.tcsг-director@mail.mil](mailto:transcom.scott.tcsг.mbx.tcsг-director@mail.mil).

#### 5.2. Roles and Responsibilities.

##### 5.2.1. Staging facility personnel:

5.2.1.1. Receive regulated/unregulated patients and provide continuing and supportive medical care.

5.2.1.2. Prepare and “clear patients for flight” to ensure suitability for movement under the guidance of the PMRC VFS (reference [Chapter 6](#)).

5.2.1.3. Brief patients and accomplish appropriate documentation and TRAC2ES inputs.

5.2.1.4. Provide ground transportation between the staging facility and the aircraft according to flight line safety rules and regulations.

5.2.1.5. Provide facility security for the protection of assets, personnel, and entry control.

5.2.2. The ERPS Officer in Charge (OIC), if not established as a Commander on G-Series orders through an OPORD or appointment by the supporting MTF, is the senior officer of the team assembled regardless of AF Specialty Code (AFSC).

5.2.3. MTF/CC coordinates with supporting patient staging facilities for PM operations requirements and procedures. The Medical Officer of the Day in the ERPS is responsible for patient care oversight.

##### 5.2.4. Flight Surgeon responsibilities:

5.2.4.1. The flight surgeon reviews the patient’s record, prescribed treatment, diet, and address any current medical complaints upon arrival with appropriate documentation on the patient’s EHR or AF Form 3899. The flight surgeon clears the patient for travel in the AE system and coordinates status changes with the appropriate PMRC.

5.2.4.1.1. A flight surgeon evaluates and documents the patient's condition upon arrival and every 24 hours.

5.2.4.1.2. The flight surgeon consults with medical specialists as needed and is available on a 24-hr basis.

5.2.4.2. Makes rounds with the staging nurse at a minimum every 24 hours and updates the EHR or AF Form 3899. In the event of a patient status change, report the change through ERPS facility leadership and/or PMRC for updating TRAC2ES.

5.2.4.3. The TRAC2ES classification of inpatient or outpatient status is only one of the initial data points used for determining the appropriate location for the patient to RON. This is a clinical decision by the FS in collaboration with the PMRC validating authority. The PMRC VFS may also be consulted for patients with complicated or unusual conditions or any time further expertise is required or desirable.

5.2.5. A Patient Safety Manager (PSM) is appointed by the ERPS Senior Nurse and is responsible for compliance with the policies (reference [chapter 9](#)).

5.2.6. The ERPS Administrator provides oversight to staging facility/ERPS Control Center of personnel, logistics, biomedical equipment repair, facility manager, security, transportation personnel and disaster response planning and coordination.

5.2.7. Pharmacy services are the responsibility of the supporting MTF unless pharmacy personnel are assigned to the staging facility.

### 5.3. Vehicles.

5.3.1. The tasking agency (MEFPAK, MAJCOM, CCMD) tasks the appropriate vehicle support, personnel, and equipment UTCs with the ERPS. Fixed staging facilities require adequate Ambulance/Ambulance Bus (AMBUS) assets assigned to support PM requirements.

5.3.2. The ERPSS-10 UTC deploys with two High Mobility Multipurpose Wheeled Vehicles (HMMWV) packed out with Allowance Standard 904F medical equipment in accordance with approved pack-out guidance. The ERPSS-10 is placed near the flight line to facilitate loading/unloading patients from the aircraft.

5.3.3. The ERPS OIC appoints a VCO/VCNCO in writing. The VCO/VCNCO manages the vehicles in accordance with AFI 24-301, *Ground Transportation*, AFI 24-302, *Vehicle Management*, and local directives.

5.3.3.1. The VCO/VCNCO ensures appropriate personnel are trained to operate assigned vehicles and verifies certification for flight line vehicle operations.

5.3.3.2. The VCO/VCNCO prepares and submits vehicle reports according to local directives.

### 5.4. Interface with MTFs/Other Agencies.

5.4.1. The leadership element of the ERPS (OIC, Senior FS, Administrator and CNE):

5.4.1.1. Coordinate with the supporting MTF to establish administrative, ancillary service, and clinical support requirements.

5.4.1.2. Establish communications with the appropriate PMRC.

5.4.1.3. Establish communications with all supported service tactical evacuation assets/units.

5.4.1.4. Establish communications with all MTFs moving patients to the ERPS to ensure transportation and continuity of patient care is maintained.

5.4.1.5. Establish communications with the base commander (deployed) and airfield manager.

5.4.1.6. Establish communication with the AE C2 assets at the ERPS location. The ERPS leadership team develops a relationship with the Air Terminal Operations Center, CE, communications, transportation, dining facilities, flight safety, fire, and force protection units. These units are notified of the presence of an ERPS facility on the base and the mission support requirements inherent in the patient movement system.

5.4.1.7. The ERPS control center communicates any changes to the patient manifest or patient condition directly with the ERPS OIC to ensure the most current medical information is available to the AE crew.

## **5.5. Training.**

5.5.1. AFI 41-106 is the governing AFI for ERPSS training, unit training, and deployment requirements. The staging mission is a unique role integral to the successful movement of patients. All personnel assigned to an ERPSS UTC attend the Aeromedical Evacuation and Patient Staging Course. The AFTTP 3.42.57 has additional home station training requirements.

5.5.2. UTCs pare and tailored to support expeditionary operations, require all personnel to perform a variety of functions outside of traditional AFSC responsibilities. Standardized training ensures mission success.

## **5.6. Expeditionary Medical Logistics.**

5.6.1. The ERPSS utilizes WRM supply and equipment assets that may be pre-positioned. Orders for medical materiel flow from the deployed unit through the MTF. The ERPSS-10 deploys with an initial seven-day supply and may use AF reachback support when a Theater Lead Agent for Medical Materiel (TLAMM) is unavailable. The ERPSS-50 and ERPSS-100 deploys with a 30-day supply of expendable items. Orders for ERPSS-50 and ERPSS-100 are passed to the supporting MTF or directly to the designated TLAMM.

5.6.2. Once the theater has sustained operations, the TLAMM system becomes the source for all joint medical supply needs. ERPS is supported by the base MTF.

## **5.7. ERPS Facility Administration.**

5.7.1. Maintain a comprehensive events log documenting activities, correspondence, communications, and facility issues. The events log provides historical documentation of all activities within the facility and can be used to verify activities, as well as actions taken by unit personnel. All reports are submitted through the C2 chain.

5.7.2. Maintain a status board displaying appropriate information, such as mission, estimated time of arrival, estimated time of departure, patient loads, and aircraft data.

5.7.3. Verify mission information including patient information, load data, special equipment requirements and aircraft information with appropriate agencies as directed by higher headquarters and local directives. Coordinate patient and mission changes with appropriate PMRC and C2 agency to ensure airlift and crews are appropriate for mission.



5.7.4. Coordinate mission requirements with appropriate personnel, such as census, launch and recovery times/staffing needs, to include drivers or vehicles, appropriate clinical points of contact at other MTFs and supporting agencies.

5.7.5. Establish procedures to ensure the privileged provider physician at the originating facility initiates appropriate documentation and signs the AF Form 3899, or AF approved electronic patient documentation, recommending movement of patients and attendants. The staging facility clinical staff, patient administration or medical regulating office provide appropriate documentation to meet mission requirements, such as PMRs, patient manifest, and patient baggage list. AF Form 3899, Standard Form 600 (SF 600), *Chronological Record of Medical Care* or equivalent form, is available for ongoing documentation of patient care. The flight surgeon clears the patient for movement and documents appropriately. Additionally, the ERPS ensures processes are coordinated with local security forces to store/dispose of weapons or ammunition which cannot be returned to the patient's unit liaison officer (LNO).

5.7.6. Ensure patient accountability is maintained at all times. Status boards or log sheets can be used to maintain patient accountability provided they are compliant with HIPAA and personnel are briefed on use, maintenance, and compliance issues.

5.7.7. Patient death in the ERPSS. If a patient death occurs in the ERPSS, the individual remains are transported to the sending or host MTF with all records and appropriate documentation, e.g., "Death Certificate". If at an ERPSS-10, individual remains are to be transported back to the providing user service facility.

**5.8. Mission Launch and Recovery.** Plans, policies, procedures, and processes are in place to include the following:

5.8.1. Management, control, and training of MAs.

5.8.1.1. Stresses of flight.

5.8.1.2. Billeting and recall.

5.8.1.3. Attendant responsibilities relating to patient care.

5.8.1.4. Inventory and management of special equipment.

5.8.1.5. Delivery and recovery of patient to and from aircraft.

5.8.1.6. Documentation of patient treatments/therapies includes medication, special diet, patient medical records, X-rays, SF 600, AF Form 3899, or equivalent form. This is the responsibility of the MA to report to the AECM.

5.8.1.7. Proper handling of litters, NATO carriers and attire.

5.8.2. Management of administrative processes including:

5.8.2.1. Reviews of AF Form 3899 and TRAC2ES PMR.

5.8.2.2. Preparation of baggage list provided by TRAC2ES and DD Form 600, *Patient's Baggage Tag*.

5.8.2.3. Anti-hijacking process and presentation (reference [paragraph 6.7](#)).

5.8.2.4. Vehicle control including drivers, configuration of AMBUSs, ambulance or opportune conveyance.

5.8.2.5. Flight line authorization, chocks, and approved communication devices.

5.8.2.6. Vehicle mechanical and security checks.

5.8.2.7. Flight line safety and security.

5.8.3. Management of all documentation including:

5.8.3.1. Providing AECMs notification of patient classification changes.

5.8.3.2. Completion of EHR or AF Form 3899.

5.8.3.3. Completion of AF Form 3838, *Do Not Resuscitate (DNR) Certification for Aeromedical Evacuation*, if required.

5.8.4. Ensuring adequate medication supply for patient.

5.8.5. Briefing of patients scheduled for departure to include:

5.8.5.1. Potential for unscheduled overnight stops.

5.8.5.2. Possession of authorized/unauthorized articles.

5.8.5.3. Use of restrooms.

5.8.5.4. Hand-carried luggage, X-rays, medical records, and medications.

5.8.5.5. Sequence and order of patient loading.

5.8.5.6. Procedure and patient requirements during transport to aircraft.

**5.9. Reports and Communication.** All reports are submitted in accordance with AFMAN 10-206, *Operational Reporting* (OPREP) and specific CCMD, Joint Task Force (JTF) and AFFOR guidance.

5.9.1. Expeditionary (deployed) units report in accordance with C2 guidance e.g., (Component NAF CCMD, Joint Task Force, MAJCOM). In-garrison medical units report in accordance with the Operations Event/Incident Report and AFI 41-106.

5.9.2. The Situation Report (SITREP) is completed by the deployed medical commander (senior officer) to provide daily medical input for inclusion in the deployed wings' SITREP. Any ERPS may be required to provide information for this report (reference AFMAN 10-206).

5.9.3. Intelligence reports, including medical intelligence, are forwarded through the medical group.

5.9.4. Communications/Computer Systems Support. The ERPS-50 and 100 UTCs deploy with radio equipment, organic to the equipment UTCs, to be operated by ERPSS personnel. The CCMD defines the appropriate encryption capability for the current AF model and type. Support for this radio system is required from base and/or expeditionary combat support communication resources for initial setup as well as ongoing support for telephone, local area network, and internet.

## Chapter 6

### PATIENT PREPARATION

#### 6.1. Overview of patient preparation.

6.1.1. Patient preparation is critical to ensure continuity of care and safe transport. A thorough review by the PMRC of patient condition and requirements is crucial. Coordinate with the MTF FS or the VFS to ensure the patient is cleared for AE. Patient preparation is completed by the sending facility and the staging personnel.

6.1.2. A hand-off tool assists in communication and serve as a checklist to assure correct documentation paperwork, supplies, equipment, meals, and x-rays accompany the patient. Obtain accepting physician name and contact information as required and arrange for any specialized AE prior to PM (reference [Attachment 6 and 8](#)).

6.1.3. All patients are prepared; including but is not limited to providing proper medications, equipment, supplies, briefings, and security measures. If a patient is improperly prepared for flight, AECMs may not have time to address the issue with originating MTF or staging facility prior to take off. On-the-spot ORM is accomplished and may include contacting the local facility, VFS, or C2 as appropriate. **Note:** All patient preparation shortfalls are documented and submitted on a JPSR worksheet or DD Form 2852. Inform C2 if equipment is not available for flight to meet patient requirements.

#### 6.2. Litters.

6.2.1. Litter patients and accompanying equipment will be delivered to the aircraft by the sending facility on litters approved for flight. (T-1). The USAF AE system does not replace litters and accompanying items in-turn.

6.2.2. Litters are prepared with:

6.2.2.1. Mattress.

6.2.2.2. Two blankets.

6.2.2.3. Two sheets.

6.2.2.4. One pillow and pillowcase.

6.2.2.5. Two litter straps.

6.2.2.6. Any additional items required for patient needs or weather.

6.2.2.7. During contingency operations, the minimum is a litter and two litter straps.

#### 6.3. Clothing the Patient.

6.3.1. The originating MTF ensures litter patients who do not wear hospital pajamas wear appropriate conservative seasonal attire and all patients require appropriate attire per patient classification outlined in [paragraph 3.7](#)

6.3.2. These clothing requirements do not apply during field maneuvers, field exercises, or other unusual circumstances.

**6.4. Equipment and Supplies.** Patient movement items. PMI remains with the patient to destination MTF, whether it is an intra or inter theater transfer. Receiving facilities/ERPS are responsible for ensuring PMIs continue with the patient for onward movement. Destination facilities are responsible for recycling PMI back into the PMI system. Only AE approved equipment is used. For non-standard/non-certified equipment, the sending facility begins the waiver process according to AFMAN 11-2AEV3, and AFMAN 10-2909.

**6.5. General considerations for attendants.**

6.5.1. MA and NMA's are regulated through the AE system to provide care or assistance to the patient en route. They are not intended to be used to augment staff or perform attendant duties at the destination facility. A competent medical authority may relieve attendants en route upon approval of a VFS. Military service members acting as attendants are expeditiously released upon arrival at the destination facility to return the capability to the sending command as soon as possible.

6.5.2. The attendant is prohibited from having knives or weapons unless attendant is a guard of a prisoner patient.

6.5.3. The attendant maintains line of sight with the patient at all times unless relieved by an AECM/ERPS/MTF staff.

6.5.4. At the originating facility, all attendants are provided with a duty responsibility handout along with verbal instructions (reference [Attachments 3-5](#)).

6.5.4.1. Recommend AECM carry copies of [Attachments 3-5](#), in the mission package. The AECM works closely with onboard MAs, special medical personnel/teams, NMA and the aircraft commander to ensure the safety of all patients, passengers and crew in addition to proper care for patients.

6.5.4.2. AE system is not responsible for returning attendants to their originating location. Originating locations place attendants on orders to ensure return through the passenger transportation system in accordance with DoDI 4515.13R.

6.5.5. The attending physician may authorize one (or more if necessary) adult attendant. The PMRC director is the approval authority. NMAs provide: moral/emotional support, assist with activities of daily living, coordinate breaks with the AECM/Staging Facility/MTF Staff and all other actions necessary for the patients' health and welfare.

6.5.5.1. Military NMA, e.g., battle buddy (reference [Attachment 5](#)).

6.5.5.2. Family/non-military NMA (reference DoDI 4515.13-R; DoDI 6000.11; and [Attachment 3](#)).

6.5.5.2.1. Additional family members may be authorized to accompany patient, as exception to policy, when necessary to patient's health and welfare after approval by commander, MTF director, and concurrence of director of applicable PMRC.

6.5.5.2.2. If an immediate family member is not available, another adult may accompany patient in NMA status on the determination of need and written justification. NMAs are issued appropriate travel orders authorizing same category of movement as patient.

- 6.5.5.2.3. Any family member not authorized travel, who chose to accompany the patient is responsible for all costs associated with travel and lodging. **Note:** The originating MTF clearly conveys this to the family and/or NMA prior to movement and a document a statement of understanding in the PM.
- 6.5.6. MAs are required for patients whose needs exceed the capabilities of the medical crew or who require special attention en route. The supporting PMRC identifies the requirement for a MA that possesses the appropriate skill level and coordinates with the referring MTF. The referring MTF will provide the required MAs, except during contingencies. **(T-0)**. In some instances, MAs may be additional AECMs with coordination of C2 and AES Chief Nurse. A Physician MA may be called upon to consult on other patients. For MAs responsibilities (reference [Attachment 4](#)).
- 6.5.6.1. Provide and coordinates patient care requirements with the AECM.
  - 6.5.6.2. Familiarize themselves with the patient and serve as the clinical authority for their patient's care.
  - 6.5.6.3. May, upon request, evaluate or help care for other patients on the AE flight as needed.
  - 6.5.6.4. Provide and document care including administering medications in-flight.
  - 6.5.6.5. Remain with the patient and coordinate breaks with the medical crew.
  - 6.5.6.6. At RON stops, MAs brief personnel providing direct patient care assigned to their patient(s) during rest periods and remain available for consultations.
  - 6.5.6.7. The MA either accompany the patient to the MTF or may be relieved by the same level care provider from the receiving MTF at the flight line.
  - 6.5.6.8. For all severe psychiatric patients (1A or 1B) requiring ongoing supervision, the MA or NMA is the same gender and preferably of equal or higher rank if operationally feasible.
  - 6.5.6.9. Attendants who have completed their attendant duties may return to their originating location as duty passengers through the normal duty passenger movement process in accordance with DoDI 4515.13R.

## **6.6. Baggage.**

- 6.6.1. Inform all patients and passengers regarding baggage restrictions and prohibitions, to include the current Federal Aviation Administration (FAA) provisions on liquids, and the general prohibition on bringing weapons and explosives onboard the aircraft.
- 6.6.2. Patients and passengers are authorized two pieces of checked baggage if space is available on the aircraft or transport platform. Checked baggage may not exceed 62 linear inches (length plus width plus height) or 70 pounds for each piece. Carry-on baggage fits under the seat and may not exceed 45 linear inches. Any duffel bag, sea bag, B-4 bag, flyers kit bag, or diver's traveling bag that exceeds 62 linear inches but does not exceed 100 pounds may be substituted for one of the checked baggage items. **Note:** This does not include A/B/C bags or Individual Battle Attire Equipment. Every effort is made to keep this equipment with the patient. If necessary, the A/B/C bags and excess gear may be moved as unaccompanied

baggage through travel management office (TMO) to home unit of record. For small aircraft such as the C-21, bags are limited to one small bag not to exceed 30lbs.

6.6.3. Patient's unit ships personal baggage in excess to the standard baggage allowance as unaccompanied baggage in accordance with applicable service directives.

6.6.4. The MTF is required to:

6.6.4.1. Attach DD Form 600, *Patient's Baggage Tag*, to each piece of patient baggage to be stowed. **Note:** Baggage information is loaded and updated into TRAC2ES.

6.6.4.2. Deliver the TRAC2ES baggage manifest or AF Form 3851, *Patient Baggage Data*, to the designated AE representative at the time of patient transport.

6.6.4.3. Place a copy of the temporary duty (TDY) travel order or travel authorization in each piece of stowed and hand-carried baggage.

6.6.5. Hand-carried bags. The patient may bring a small hand-carried bag for personal items for use during travel (including over-night stops). If a patient is self-medicating, the staging facility or AECM ensures the patient's medications are in his/her hand-carried baggage. Hand-carried bags is labeled with the patient's name and contact information but is not tagged with a DD Form 600.

6.6.5.1. All baggage is screened and anti-hijacked, including carry-on bags (reference [paragraph 6.7](#)).

6.6.5.2. Litter patient's small bags may be secured on the litter with the patient with the approval of the AECM.

6.6.5.3. Ambulatory patients or attendants carry-on baggage fit under the aircraft seat.

6.6.5.4. If a patient's baggage or valuables are lost and the MTF cannot determine exactly where and how the loss occurred, the MTF or agency follows the chain of custody, informs the appropriate C2 of the incident and includes enough information in the inquiry to allow the C2 to trace the items. **Exception:** These procedures do not apply to valuables the MTF/Originating facility has sent by registered mail.

6.6.6. Patient/attendants unaccompanied or untagged baggage is not transported onboard AE aircraft. Unaccompanied or untagged baggage is transferred to Travel Management Office (TMO) for disposition by the sending facility.

6.6.7. No show patients/attendants baggage is removed from the flight prior to departure.

## 6.7. Anti-hijacking.

6.7.1. Anti-hijacking procedures are conducted before departing for the flight line.

6.7.1.1. Conduct screening procedures in accordance with AFI 13-207-O, *Preventing and Resisting Aircraft Piracy (Hijacking)*, and FAA directives on all patients, MAs and NMAs, and /or baggage. Prepare the certificate for the AECM with names of the individuals searched and completion of anti-hijacking procedures. If a patient or attendant refuses to comply with the requirements, do not transport this individual to the aircraft.

6.7.1.2. Patient identification is conducted during anti-hijacking procedures (reference [paragraph 6.9](#)).

6.7.1.3. Inspect all hand-carried items.

6.7.1.4. Inspect patients and attendants either with a handheld or walk-through metal detector, x-ray machine or by a physical check.

6.7.1.5. Identify any patient or attendant showing suspicious behavior.

6.7.1.6. Honor requests for visual/physical inspection instead of using x-ray or metal detectors.

6.7.1.7. Conduct all screening procedures with the highest standard of military courtesy.

6.7.2. Follow OPORD during contingencies if Kevlar® helmet, flak vest and other protective gear is needed while performing anti-hijacking procedures. When possible, anti-hijacking is accomplished in an area away from the flight line.

6.7.3. Check each patient traveling to seek mental health treatment to ensure patient is not carrying objects that could inflict harm to self or others, to include weapons in checked luggage.

6.7.4. Use alternate anti-hijacking procedures for patients and passengers with implantable cardiac pacemakers and defibrillators. **WARNING:** Electromagnetic interference from handheld and stationary surveillance systems interferes with these medical devices. Changes in pacing rates, shock, and possible cardiac arrest may occur.

6.7.5. Notify the appropriate DoD law enforcement agencies if suspicious items are found. Unauthorized items are confiscated, returned to the unit LNO and documented on AF Form 1297. Unauthorized items in hand-carried luggage include firearms, ammunition, knives, etc. Weapons and ammunition, whenever possible, are given to the patient's unit LNO for storage and/or return to home station, with appropriate documentation in the Events Log or on an AF Form 1297. Firearms issued to individuals may be transported in checked luggage if declared and if no ammunition accompanies the weapon. The pilot in command (PIC) is the final authority for firearms on the aircraft.

6.7.6. Restrict inspected patients and attendants to a holding area. Re-screen individuals who leave the holding area.

6.7.7. This statement is accomplished in accordance with AFI 13-207-O and documented on the last page of the Patient Baggage Data (AF Form 3851): "Anti-Hijacking of all patients and bags completed in accordance with AFI 13-207-O." Followed by the printed name and signature of person performing the check.

6.7.8. Escort guards for prisoner patients are military NMA, and the same policies and procedures apply. An escort guard is required to ensure order and prisoner patient security (reference AFMAN 11-2AEV3 and AFI 11-202V3, *General Flight Rules*, AMC Supp). Guards accompany prisoner patients to their destination.

6.7.9. Classified materials held by official couriers are exempt from anti-hijacking procedures.

## 6.8. Valuables.

6.8.1. Patients are encouraged not to carry valuables (e.g., large amounts of cash, checks, and jewelry) while in the AE system.

6.8.2. The originating MTF conducts an inventory of all patient valuables:

6.8.2.1. For unconscious patients, the AF Form 1052, *Envelope/Record for Patients Storing Valuables*, is used to inventory their valuables and personal items.

6.8.2.2. Coordinate with the next-of-kin, if available, to take valuables belonging to unconscious or incompetent patients, who originate from military or other Government hospitals, or send the valuables by registered mail to the patient's destination facility.

6.8.2.3. If the patient has more than \$50 in cash, contact the Patient Administration section for assistance.

6.8.2.4. The originating MTF provides a container for each patient's valuables. Place a copy of their TDY orders in the bags and inside the container. The container is labeled showing patient's full name, grade, cite number, service, and originating and destination MTF.

6.8.3. The AECMs are not required to accept patient valuables unless the patient is physically present for the flight.

6.8.4. The entire processing of valuables is witnessed and attested to by a disinterested officer whenever possible.

## **6.9. Patient Identification.**

6.9.1. All patients and attendants including active component, dependents, retirees, and others require an identification (DoD identification card, passport, driver's license, Common Access Card), copy of their Travel Order (DD Form 1610, *Request and Authorization for TDY Travel of DoD Personnel* or equivalent), and patients and attendants require an ID wristband while in the AE system. **Note:** There may be times when patients/attendants arrive to aircraft without ID bands (civilian transport, MASCAL, etc.), if this happens, the AECM places an ID band on the patient.

6.9.1.1. The patient wristband includes patient's last name, first name, TRAC2ES cite number, date of birth, originating and destination MTF, rank, patient status and bar code. All attendants, both medical and non-medical, excluding specialty teams, are listed above the patient's name.

6.9.1.2. All patients with allergies have a separate band listing out specific allergies including medications, foods, and latex.

6.9.2. The attendant's wristband includes the word "ATTENDANT", TRAC2ES cite number and the patient's actual name. Specialty teams such as Critical Care Air Transport Team (CCATT) as discussed in AFI 48-107V2, *En Route Critical Care*, are not required to have an ID wristband.

## **6.10. Weapons.**

6.10.1. Patients travel without weapons. Notify aircrew if authorized weapons are carried onboard.

6.10.2. Weapons arriving at the aircraft with patients are cleared and returned to the patient's unit or secured by the loadmaster and turned over to the appropriate agency at the destination airfield.



**6.11. Nutrition and meals.** (reference AFI 48-116, *Food Safety Program* and AFMAN 44-144, *Nutritional Medicine*).

6.11.1. Patient care guidelines.

6.11.1.1. Assess and document nutritional status (intake patterns, appetite, ability to chew/swallow and digest), time of last meal, food allergies, and fluid intake.

6.11.1.2. Evaluate and document gastrointestinal (GI) status and/or symptoms, especially for patients receiving pain medication and patients in the PM system for more than 24 hours.

6.11.1.3. Assist patients with preparation, positioning and eating, as necessary. If not clinically contraindicated, elevate head or adjust them to an upright sitting position.

6.11.1.4. Check for food allergies, and verify diet order before administering patient meals, snacks, and beverages.

6.11.1.5. Provide fluids at least every two hours for those not on fluid restrictions.

6.11.1.6. Administer meals and snacks as close to normal mealtimes as possible. Special diets are served first. Times may be adjusted to the destination time zone if there are no contraindications.

6.11.1.7. Time between the evening and breakfast meals will not exceed 15 hours. **(T-3)**.

6.11.1.8. When operationally feasible, patients are fed prior to patient care hand-offs, ground/aircraft departure and arrival, and if delay in feeding is anticipated due to operational constraints.

6.11.1.9. Dietitians and/or diet therapy technicians may not be available to monitor all aspects of dietetic/nutritional support and food safety. In this instance, local nursing personnel, Public Health Officer (PHO), and/or flight surgeon to provide support, oversight, and meals.

6.11.1.10. Notify the supporting C2 of significant impact/delays due to inadequate dietetic support and/or food safety issues. Complete JPSR worksheet or DD Form 2852. Provide detailed information on AF Form 3829, if indicated.

6.11.2. Packing meals.

6.11.2.1. Keep the entire meal as small as possible due to limited storage space aboard the aircraft and other transportation assets.

6.11.2.2. Label the box containing the meal and snack with the following information; name, diet, station enplaned, preparation date, and time.

6.11.2.3. Pack diabetic snacks separately, sealed in a bag. These may be placed in the same box with the meal, however, clearly label these packages as snacks and indicate the time for consumption.

6.11.3. Planning en route meal requirements (reference [Table 6.1](#)).

6.11.3.1. Patient diet information can be obtained from TRAC2ES by pulling a Mission Manifest Report for the mission and then selecting the “Patient Special Diet Information” report which lists the number and type of meals required.

6.11.3.2. Originating MTF Patient administration desk (PAD)/AE Clerk ensures diet orders are recorded in the PMR through TRAC2ES in accordance with Theater OPORT and/or local directives.

6.11.3.3. Originating and/or en route joint Base Operating Support (BOS), contracting food services, flight kitchens, staging facilities and MTFs provide patient and attendant regular diets, snacks, beverages, and bulk food, and may fill special diet requirements under the direction of dietetic/nutritional medicine/nursing personnel.

6.11.3.4. Aircraft refrigerators/coolers may be used if available for patient nourishment items, with coordination and approval from the loadmaster/boom operator and/or PIC.

**Table 6.1. Planning Patient Meals and Snacks.**

<b>Flight Time</b>	<b>Refrigerator Available</b>	<b>No Refrigerator Available</b>
Less than 4 hours	Snacks and beverages (1) if not over mealtime Box lunch (2) or frozen entree meal and beverages (1)	Snacks and beverages are not over mealtime Box lunch (2) or MRE (3) and beverages
More than 8 hours	2 meals 1 box lunch (2) and 1 frozen meal and beverages (1)	2 meals 1 box lunch (2) and 1 MRE (3) and beverages (1)
	OR	OR
	2 frozen meals and beverages	1 MRE (3) and snacks and beverages (1)
Each additional 4 hours	Add additional frozen meal and beverages (1)	Add additional snacks and beverages (1)
<b>Notes:</b> 1. Shelf stable and does not require refrigeration. 2. Includes sandwiches. Considered “safe” to consume within 4 hours of issue from a food service facility if not stored in a refrigerator at or below 41° F. Avoid using mayonnaise. 3. Only when no other shelf-stable food is available. Do not use MRE heaters in-flight.		

6.11.3.5. Request infant/child meal food items by specifying the child’s age on the diet order request. Pediatric nutrition needs assessment/screening criteria includes an assessment of weight for age, weight loss, special dietary needs, food allergies, chronic illnesses, and nutrition education needs.

6.11.3.6. The originating, or en route privileged provider, writes diet orders including tube feedings on the EHR or AF Form 3899.

6.11.4. Total parenteral nutrition infusions may continue until complete then switch to 10% Dextrose in Water.

#### 6.11.5. Food safety.

6.11.5.1. At operationally feasible locations, potentially hazardous/non-shelf stable foods (meat, eggs, and milk products) are maintained either below 41° F or above 140° F in order to remain safe.

6.11.5.2. Use commercially prepared shelf-stable food available through local prime vendor source whenever possible. Meals Ready to Eat (MREs) are used if other shelf-stable food is unavailable.

6.11.5.3. Depending on the location, water and ice sources may not be adequate, so bottled water may be required. Follow commander's OPOD, CCMD's FHP guidance and/or local directives.

6.11.5.4. Staging facilities, ground transportation vehicles, and aircraft may lack adequate equipment to store food at safe temperatures.

6.11.5.5. Food-borne illnesses are a threat to the health of all personnel. Patients who are compromised have an increased risk of food-borne illness. Personal hygiene, food safety, and sanitation practices are critical for all personnel responsible for patient feeding. Follow safe food handling practices and limit access to food preparation areas. Personnel handling and preparing food items wash hands with soap and water or use hand sanitizer prior to contact with any food items. Patients are also instructed to wash their hands (reference [paragraph 8.25](#)).

6.11.5.6. After meals are consumed, and before leaving the patient care area, all nursing personnel check used box lunches/patient trays for possible contamination (e.g., syringes, wound dressings, body fluids) before disposal and/or cleaning.

#### 6.11.6. Insulated Containers/Coolers.

6.11.6.1. If operationally feasible and available, pack patient meals/special diets in insulated containers, with ice, and deliver to the patient departure point for loading onto the aircraft or transportation asset.

6.11.6.2. Unsealed food items, medications, and blood products are prohibited in food refrigerators and food items are not permitted in biomedical refrigerators.

6.11.6.3. Usually there is no temperature reading device or power associated with these units, and temperatures are not evenly distributed. Temperature ranges are 34° to 40° F for the food refrigerators.

6.11.6.4. Monitor ground UTC internal refrigerator temperatures at least three times a day with a refrigerator thermometer and record on a locally developed temperature chart.

6.11.6.5. Fleet services clean aircraft refrigerators used for patient food pre and post-mission.

#### 6.11.7. PMRC.

6.11.7.1. Provide diet information to the ERPS or the originating MTF.

6.11.7.2. Submit PM/AE diet orders and bulk food requirements to MTF dietetic/nutritional and/BOS food support personnel at locations without an ERPS.

6.11.7.3. Complete diet order request and fax diet orders to the appropriate MTF according to patient's special diet requirements identified in TRAC2ES.

6.11.8. ERPS or originating facility.

6.11.8.1. Each MTF/ERPS contacts their designated patient administration desk/AE clerk or AELT to coordinate ground and aircraft arrivals and departures for meal delivery.

6.11.8.2. If a staging facility is in place, the staging facility charge nurse ensures patient meals are ordered on AF Form 1094, *Diet Order*. If available, Nutritional Medicine coordinates patient feeding requirements with BOS elements. If there is not a staging facility, the AEOT Senior Nurse, or AECM, ensures patient meals are ordered.

6.11.8.3. Update TRAC2ES diet orders/requirements as required. In the event of altered transportation plans, the originating MTF or ERPS obtains adequate nutritional provisions for patients and provides 1-day tube feeding supply for intra-theater PM and three-day supply for inter-theater PM.

6.11.8.4. Submit diet and bulk food orders to dietetic/nutritional support personnel at least four hours before aircraft departure time or in accordance with local directives.

6.11.8.5. Deliver patient meals to patient care areas and aircraft in coordination with local Public Health Officer and/or FS if applicable.

6.11.8.6. Clean/disinfect refrigerators used to store patient nourishments after each use. Clean/disinfect insulated transportation containers/coolers and return to supporting food service agency (reference [paragraph 8.25](#)).

6.11.9. AECMs.

6.11.9.1. Check that meals are available and received.

6.11.9.2. Coordinate meal storage requirements and feeding times with PIC and/or loadmaster/boom operator.

**6.12. Patient Briefings.**

6.12.1. The sending facility, ERPS, and AE crews (AECMs reference AFMAN 11-2AEV3) ensure each patient/attendant receives an informational briefing explaining what the patient can expect during their flight. These briefings are customized for each theater of operations (e.g., USAFE, PACAF, CONUS) to provide essential information. Thorough preflight briefings completed prior to take off reduce stress (reference [Attachments 3, 4, & 5](#)). **Note:** This requirement may be impractical during contingency operations.

6.12.2. ERPS or Originating Facilities Briefings. Brief patients and attendants during routine operations on AE and staging policies and procedures to include the following:

6.12.2.1. Force protection issues.

6.12.2.2. Unauthorized items are confiscated.

6.12.2.3. Anti-hijacking requirements.

- 6.12.2.4. Route of evacuation, including the *estimated* time and the number of *planned* stops (when known). Notifying patients and attendants that the itinerary is subject to change.
- 6.12.2.5. Potential for unscheduled overnight stops.
- 6.12.2.6. Baggage limitation, including weight and size according to the baggage section, or exceptions, is annotated on the patients' travel orders.
- 6.12.2.7. Place a copy of the TDY travel order or travel authorization in each piece of stowed and hand-carried luggage.
- 6.12.2.8. The need for personal funds, medical supplies, medications, and appropriate dress.
- 6.12.2.9. U.S. Department of Agriculture and Customs inspections procedures.
- 6.12.2.10. Use of restrooms prior to departing for the flight line.
- 6.12.2.11. Do not place the following items in checked bags; x-rays, medical records, and medications (if authorized to "self-medicate"). These items are hand carried.
- 6.12.2.12. Procedures and patient requirements during transport to aircraft.

## Chapter 7

### FLIGHT PHYSIOLOGY AND STRESSES OF FLIGHT

**7.1. Flight Environment.** AE occurs in a physically constrained, relatively hypoxic, hypobaric, noisy, vibrating, unclean environment with wide temperature shifts differing significantly from the MTF. Physical stresses during flight affect not only every patient's physiology and psychology but can impair medical providers' abilities to assess and deliver care while airborne. Patients in the AE environment are susceptible to physiologic stresses encountered at altitude.

#### 7.2. Gas Laws.

7.2.1. Dalton's Law of partial pressure. Dalton's gas law states the total pressure of a mixture of gases is equal to the sum of the partial pressures of each gas within the mixture. Barometric/atmospheric pressure is the pressure exerted against an object by the atmosphere. Therefore, as altitude increases and barometric pressure decreases and there is a corresponding decrease in the partial pressure of inspired oxygen, even for patients on ventilators with 100% O<sub>2</sub>. Oxygen concentration remains 21% regardless of altitude. Barometric pressure multiplied by the concentration of gas is equal to the partial pressure of the gas. As altitude increases, the partial pressure of a gas decreases. The actual available oxygen decreases with altitude because oxygen molecules move farther apart, possibly resulting in hypoxia. As pressure decreases, O<sub>2</sub> has a harder time crossing into the blood stream, resulting in a decreased O<sub>2</sub> saturation (SpO<sub>2</sub>) of the blood. For example, at an altitude of 10,000 ft., partial pressure of oxygen in arterial blood (PaO<sub>2</sub>) would measure approximately 51 millimeters of Mercury (mmHg), yielding a SpO<sub>2</sub> of approximately 84% in a healthy individual.

7.2.2. Charles' Law: When the pressure is constant, the volume of gas is proportional to its temperature. Likewise, if volume remains constant, the pressure on the gas varies directly with temperature. During flight, temperature decreases an average of 3.5 Fahrenheit or 2 Celsius per 1000 ft., therefore, ambient temperature for an aircraft flying at 35,000 ft. can be expected to be near -57F. Such a reduction in temperature results in a significant drop in oxygen tank pressure if exposed; conversely oxygen tank pressure can be expected to rise with significant increases in ambient temperature.

7.2.3. Henry's Law: The principle of evolved gas disorders. The solubility of gases in liquids: The quantity of gas dissolved in 1 milliliter (ml) of a liquid is proportional to the partial pressure of gas in contact with the liquid. The weight of gas dissolved in a liquid is directly proportional to the weight of the gas above the liquid. An example is shaking a can of soda and opening it immediately. The balance of pressure is altered, releasing the bubbles of gas in the soda. During a rapid decompression, the same principle applies where nitrogen bubbles are released into the blood following the dramatic changes in aircraft pressurization. This relationship explains why dissolved nitrogen transitions to a gas phase in blood and tissues during decompressions.

7.2.4. Boyle's Law: The principle of gas expansion. Boyle's Law states at a constant temperature, the volume of gas is inversely proportional to the pressure. During ascent (decompression), gasses expand and during descent (recompression), gasses contract. For instance, a climb to flight level 180 from sea level (SL) results in a 50% reduction in total

barometric pressure accompanied by a 50% increase in gas volume. However, the constant pressure (47 millimeter of Mercury [mmHg]) of water vapor within the body contributes to physiological gasses expanding at a slightly greater rate than atmospheric gasses therefore resulting in a 50% increase in gas volume at 16,500 feet (1,500 feet lower than atmospheric gasses). One example is the volume of gas in a balloon expands at altitude.

7.2.5. Graham's Law: The law of gaseous diffusion. Gases flow from higher pressure (or concentration) to a region of lower pressure (or concentration). Simple diffusion or gas exchange at the cellular level is an example.

**7.3. Physiological Stressors of Flight.** The stressors of flight can be broadly categorized into two classes: those which can quickly incapacitate the patient and crew and those which can aggravate medical conditions. In certain age groups, (e.g., neonates) irritant stressors, such as extreme cold, can be life threatening. The patients' ability to withstand the physiologic effects of flight stressors vary depending upon their underlying disease processes and their age. Patients are exposed to barometric pressure changes, decreased partial pressure of oxygen, decreased humidity, temperature variations, high noise levels, vibration, travel fatigue and gravitational forces.

7.3.1. Barometric Pressure Changes (Boyle's Law). Gas volume changes are physiologically significant in AE. The mechanical effects of expansion and contraction can exert a differential pressure on the surrounding tissues, which can cause severe, potentially disabling pain and potential physical damage to tissues (e.g., ear, sinus, GI tract, and lungs). Air filled balloon devices (e.g., foleys, g-tubes) are usually be filled with normal saline (NS) by the originating MTF to avoid the repeated pressure exposure by expansion/contraction of the balloons during changes in altitude. Endotracheal tubes are filled with air and monitors by the CCATT team with a pressure manometer. Small pockets of air within fluid can cause damage to the trachea. AECMs ensure this precaution has been accomplished to prevent soft tissue damage and/or irritation.

7.3.1.1. A cabin de-pressurization may result in decompression sickness.

7.3.1.2. If a patient experiences adverse symptoms related to barometric pressure changes, the clinician documents the maximum cabin altitude at the time of the incident.

7.3.2. Decreased Partial Pressure of Oxygen (Dalton's Law). Dalton's Law more significantly affects patients with cardiac disease, pulmonary disease, anemia, trauma, and increased intracranial pressure. These patients may quickly experience vital end-organ dysfunction when exposed to altitude hypoxia and require supplemental oxygen therapy as ordered.

7.3.2.1. Increased oxygen or delivery pressures may be required when at altitude.

7.3.2.2. Follow the AE Clinical Protocol for Emergency Oxygen if supplemental oxygen is needed, call C2 and the PMRC to obtain an order as soon as possible and initiate a JPSR worksheet or DD Form 2852. If an ERCC team doctor is on board, they can write the order but also notify C2 and the VFS. **Note:** A pulse oximeter is available on board AE aircraft, but referring privileged providers recognizes these devices can give erroneously higher readings under certain physiologic conditions (e.g., carbon monoxide poisoning, dehydration, anemia, impaired peripheral circulation, and high or low cardiac output states). **Note:** A cabin altitude restriction is sometimes required in addition to

supplemental oxygen therapy (reference [Chapter 8](#) for cabin altitude restrictions) and AE Clinical Protocol – Emergency Oxygen.

7.3.3. Decreased Humidity. The partial pressure of water (e.g., humidity) of cabin air decreases as altitude increases. When air is cooled, it loses its ability to hold moisture. Air at altitude is cold, possessing little moisture (e.g., the higher the altitude, the colder and drier the air is). The fresh air supply is drawn into the aircraft cabin from a very dry atmosphere. Extended flying time magnifies the drying effects of exposure to altitude.

7.3.3.1. Cabin humidity can be less than three percent (3%) toward the end of a long mission. Resulting dehydration and thickened secretions can affect pulmonary patients. Use humidification bottles for all patients receiving oxygen to keep the secretions loose in the lower respiratory tract.

7.3.3.2. Patients with fluid balance problems, (e.g., patients with renal and cardiac diseases or respiratory compromise), are at significant risk and have strict intake and output (I&O) ordered (oral and/or IV). Plan to provide hydration to all patients as required.

7.3.3.3. Wounds requiring moist packing may dry out quickly during airlift. Treatment orders need to specify wound care objectives such as reinforcing dressings and providing additional solutions to the wound.

7.3.3.4. Nothing by mouth (NPO) patients require hydration status via intravenous fluids (IVF). Their IVF rates would need to be slightly increased, compared to usual MTF rates.

7.3.4. Temperature Variations. An increase in altitude results in a decrease in ambient temperature. Aircraft cabin temperature fluctuates considerably depending on the temperature outside the aircraft. Temperature fluctuations on the flight line and in the aircraft can be extreme.

7.3.4.1. Patients with burns/skin-damage, who are critically ill, sedated, mentally altered, elderly, or infants can succumb to hypothermic conditions that may often occur on military aircraft.

7.3.4.2. An air worthy certified incubator can be used to provide warmth for infants under 10 pounds.

7.3.4.3. Blankets are available in flight. Prior to the flight, the originating facility ensures the patients are prepared for temperature fluctuations in-flight.

7.3.4.4. When traveling at extreme temperatures, monitor portable oxygen source pressures.

7.3.5. High Noise Levels. Noise is a problem in all aircraft. To reduce gross weight and thus maximize fuel savings, military aircraft are not equipped with noise shielding materials found on modern civilian commercial aircraft.

7.3.5.1. Noise interferes with the ability of providers to assess vital signs (VS), auscultate, and communicate with patients including deescalating/monitoring psychiatric patients, and detecting equipment alarms while on board the aircraft.

7.3.5.2. Patients, passengers, crews, and attendants are provided hearing protection prior to flight. Alternate methods of communication may be required.



7.3.6. Vibration. When the human body is in direct contact with a source of vibration, mechanical energy is transferred, which is degraded into heat within those tissues that have dampening properties. The response to whole body vibration is an increase in muscle activity both to maintain posture and to reduce the resonant amplification of body structures. This is reflected in an increase in metabolic rate, a redistribution of blood flow with peripheral vasoconstriction, and increased oxygen requirements. The increase in metabolic rate during vibration is comparable to that seen in gentle exercise and respirations are increased to achieve the necessary elimination of increased carbon dioxide. Additionally, disturbances in visual acuity, speech, and fine-muscle coordination result from vibration exposure.

7.3.6.1. Vibration may cause increased pain for many patients. Orthopedic patients often benefit from pain medication administered during preflight before exposure to vibration. Additional padding/cushioning of stabilizing devices (e.g., casts, external fixators, braces) and supportive techniques can help relieve discomfort from vibration.

7.3.6.2. Equipment can be affected by vibration and settings require close monitoring.

7.3.6.3. Originating privileged providers order a pain control regime to include PRN orders.

7.3.7. Turbulence. Turbulence can be produced by high and low temperature changes in the outside air. Turbulence increases stress during flight by promoting fatigue and increasing susceptibility to motion sickness and disorientation.

7.3.7.1. Turbulence may easily overwhelm and incapacitate someone suffering from other medical conditions, (e.g., chemotherapy, pregnancy, or patients prone to motion sickness). PRN anti-emetic order is recommended. In the event nausea and vomiting are already present, medicate the patient prior to arrival at the aircraft and have PRN orders written.

7.3.7.2. All patients, equipment, and supplies are secured in accordance with AFMAN 11-2AEV3 and AFMAN 10-2909.

7.3.8. G-Forces. The effects of G-Forces involve an understanding of the concepts of exerted forces. Speed, velocity, weight, mass, and the laws of motion are among those considerations. Specific perils from the effects of G-Forces can include deterioration of vision and disturbances of consciousness related to high-performance aircraft. Newton's First Law of Motion states unless acted upon by a force, a body at rest remains at rest, and a body in motion moves at constant speed in a straight line.

7.3.8.1. Findings, such as increased intracranial pressure (ICP), pregnancy, unstable fractures and blood pooling are conditions to consider when examining effects of G-Forces in AE. To reduce the effects of G-forces, extra padding may be used on the abdomen and seat belt for small children, pregnant women, and patients with abdominal surgery.

7.3.8.2. Patients with head injuries may be loaded head forward and facing aft at the discretion of the VFS or ERCC team physician when applicable and after communication with the MCD.

7.3.9. Fatigue. All the stresses of flight induce fatigue to some degree and are an inherent stress in the AE environment. Erratic schedules, multiple platforms over several days,

hypoxic environment, noise, vibration, and imperfect environmental systems eventually take their toll.

7.3.9.1. Travel through multiple time zones may cause bodily circadian rhythm disruption or jet lag, also characterized by symptoms of fatigue and irritability. Order "litter for comfort" for patients who cannot tolerate prolonged sitting.

7.3.9.2. Consider the following human systems factors which may lead to stress/fatigue. The acronym DEATH may assist in remembering the factors.

7.3.9.2.1. **D** rugs. Use of over the counter (OTC) medications, misuse of prescription medications, and use of stimulants such as caffeine can cause insomnia, tremors, indigestion, and nervousness.

7.3.9.2.2. **E** xhaustion. Exhaustion can lead to judgment errors, limited response, falling asleep, channeled attention, and changes in circadian rhythm.

7.3.9.2.3. **A** lcohol. Using alcohol may cause histotoxic hypoxia, which is a deficiency of oxygen reaching the bodily tissues due to impairment of cellular respiration especially by a toxic agent such as alcohol. Histotoxic hypoxia affects efficiency of cells to utilize oxygen, interferes with metabolic activity, and can result in a hangover.

7.3.9.2.4. **T** obacco. Besides exposing the body to tar, nicotine and carcinogens, the average smoker normally has 5 to 10 % hemoglobin involved as carboxyhemoglobin. This results in hypemic hypoxia (reduces the oxygen carrying capacity of the blood) and lowers altitude tolerance. Flying at a cabin altitude of 10,000 ft. with 10% carboxyhemoglobin is physiologically equivalent to 15,000 ft.

7.3.9.2.5. **H** ypoglycemia. Poor dietary intake can cause nausea, headache, dizziness, and judgment errors.

## Chapter 8

### PATIENT CARE RESPONSIBILITIES

#### 8.1. Aeromedical Evacuation Clinical Protocols.

8.1.1. Standing orders are signed by En Route Care Medical Director in AMC/SGK.

8.1.2. Consult an ERCC team doctor in-flight, if available, for any clinical situations that may arise. Call C2 and the PMRC to obtain an order as soon as possible and initiate a JPSR worksheet or DD Form 2852.

8.1.3. Are maintained on the EFB and AMC/A3/SG site (reference [Attachment 2, A2.1.1](#)).

8.1.4. The AECP documents the use of AE Clinical Protocol in the EHR or AF Form 3899. All AECP documentation includes the statement “in accordance with AE Clinical Protocol - XXX”.

**8.2. Preflight Assessment and Report.** Patient acuity, mission requirements, and the environment determines how extensive this process is. Obtain as much history as possible from the patient, PMR, and patient records using the Identify, Situation, Background, Assessment, and Recommendation (I-SBAR) format found in [Attachment 7 & 8](#).

8.2.1. In the AE environment, the primary assessment skills are inspection and palpation. Primary and secondary trauma assessment skills are used to quickly identify and treat life-threatening conditions. **Note:** Auscultation is not reliable during in-flight assessments.

8.2.1.1. During flights shorter than 45 minutes, as appropriate and per diagnosis, clinicians assess for allergies, immediate patient concerns/interventions required, suicidal ideations/homicidal ideations, restraints or constrictive devices, VS, pain level, sedation score (reference [Table 8.10](#)), circulation, motor and sensory function. **Note:** Operational constraints may limit completion of these tasks.

8.2.1.2. Clinicians assess patients for abnormal respiratory findings to include respiratory adjuncts.

8.2.1.3. Clinicians assess patient’s ability or inability to self-medicate, and any other clinical findings suggesting a decreased sensorium and/or altered judgment.

8.2.2. Primary Survey. Accomplished when the patient is initially seen by medical personnel, such as at a first aid station, MTF, ERPS or at the flight line. Life threatening conditions are identified, and management begins. Ensure this is done prior to flight. Reassessment of circulation, airway, and breathing is ongoing.

8.2.2.1. Circulation.

8.2.2.2. Airway.

8.2.2.3. Breathing: Ventilation and oxygenation.

8.2.2.4. Disability: Brief neurologic examination to establish level of consciousness (LOC).

8.2.2.4.1. The following is a MNEMONIC for differentiating the causes and treatment coma/unresponsiveness:

8.2.2.4.2. U – Units of Insulin

8.2.2.4.3. N – Narcotics

8.2.2.4.4. C – Convulsions

8.2.2.4.5. O – Oxygen

8.2.2.4.6. N – Non-Organic

8.2.2.4.7. S – Stroke

8.2.2.4.8. C – Cocktails

8.2.2.4.9. I – Intracranial Pressure

8.2.2.4.10. O – Organism

8.2.2.4.11. U - Urea

8.2.2.4.12. S - Shock

8.2.2.5. Exposure/environment: If condition and situation warrants, completely undress the patient. Prevent hypothermia, if possible.

8.2.3. General appearance:

8.2.3.1. The patient's body position noting posture and any guarding or self-protection movements.

8.2.3.2. Observe for stiffness, rigidity, or flaccid muscles.

8.2.3.3. Observe unusual odors such as alcohol, gasoline, chemical, vomitus, urine, or feces.

8.2.4. Secondary survey. This assessment is a brief, systematic process to identify ALL injuries, obtain history and mechanism of injury as well as maintaining core body temperature, obtaining a complete set of VS, temperature, pulse oximetry, and the insertion of adjuncts such as a urinary catheter and nasogastric tube (NG), as required.

8.2.4.1. Full VS (blood pressure [BP], pulse, respirations, pulse oximetry, temperature), pain level, history, cardiac monitor, and pulse oximeter applied as necessary.

8.2.4.2. Give comfort measures (verbal reassurance, pain assessment, and pharmacologic/non pharmacologic).

8.2.4.3. History and head-toe assessment (if condition and situation warrants).

8.2.4.4. Include face, neck, chest, pelvis/abdomen, extremities.

8.2.4.5. Inspect back and posterior surfaces.

8.2.4.6. Reference American Heart Association (AHA) or equivalent, Trauma Nurse Core Course (TNCC) if available and current and DHA/J7 Education and Training guidelines.

8.2.5. Ongoing assessment/re-assessment. Reevaluate the patient noting, reporting, and documenting any changes in the patient's condition and responses to resuscitative efforts. Time, personnel, and environment determines this re-evaluation process.

### 8.3. General Nursing Care.

8.3.1. A plan of nursing care is developed or modified using the patient's chart and other information, to assure continuity of care. The patient is observed throughout all phases in the AE system. The appropriate level and type of medical and psychological care measures are rendered by AE, CCATT or ERPS personnel, as described in this chapter.

8.3.2. Maintain strict patient confidentiality (on a need-to-know basis), as related to HIPAA rules and regulations, in reviewing or releasing any medical information.

8.3.3. Patient comfort. If the ambient temperature exceeds a comfortable level, the AECM can speak with the PIC and or the Loadmaster/Boom Operator to correct the temperature. Whenever possible, to prevent hypothermia in critical care patients, temperature in the aircraft is kept warmer than normal.

8.3.3.1. Latrine facilities. Inform litter patients urinals, bedpans, and modesty curtains are available. Ensure patients have the opportunity to use the restroom before being transported to the aircraft and prior to critical phases of flight.

8.3.3.2. Oral hygiene. Dried secretions accumulated on the tongue and palate reduce oral sensitivity and promote bacterial growth. Mouth care, especially for debilitated patients, is essential because of the reduced humidity in the aircraft cabin. Comatose, paralyzed, and other patients at risk receive mouth care at least every two hours **Note:** When a toothbrush and toothpaste is contraindicated, disposable foam swabs are an acceptable substitution.

8.3.3.3. Position changes. Any position, even the most comfortable one, may have an adverse effect on a patient over time. A patient's movements may be limited by disease, injury, or helplessness. Position changes promote comfort and relaxation, prevent skin breakdown, and improve gastrointestinal and respiratory function. Position changes are completed at least every two hours.

8.3.4. Straps/stanchion arms can be adjusted two inches up or down to allow for position changes to reduce pressure points on litter patients. A blanket roll, lift sheets or backrest may also assist in shifting the patient's weight and keeping heels off the litter to relieve pressure.

8.3.5. Range of motion (ROM) exercises are utilized whenever possible.

8.3.6. The Braden Scale is used throughout the DoD Medical Service to identify patients at risk for developing skin breakdown or pressure ulcers. Factors predisposing a patient to develop pressure ulcers include decreased mobility, activity, and sensory perception; increased moisture, friction, and shear forces; and intrinsic factors influencing tissue tolerance associated with age, nutrition, and tissue perfusion. The Braden Scale uses these factors to provide a score 6-23. AECMs and ERPS staff are familiar with these scores for purposes of awareness and documentation during hand-offs from MTFs and the need for intervention to minimize pressure ulcer development or worsening during flight (reference [Attachment 9](#)).

8.3.7. Patient ambulation. Encourage ambulation every two hours to prevent venous thromboembolism (VTE) for patients whose condition allows. Ambulatory patients are encouraged to stand up and stretch to promote circulation to the extremities. Litter patients are ambulated, assisted to the lavatory and allowed to sit in a seat, if possible. Ensure

adequate pain control. Any complaints of calf tenderness or new posterior leg pain is evaluated for VTE pre/post transport (reference [paragraph 8.6](#)).

8.3.8. Reduce fatigue. All patients are susceptible to the effects of fatigue. Litter patients require special planning and care to reduce fatigue. **Note:** Nursing interventions counter these stresses of flight. Provide ear plugs, blankets, and pillows. Dimming the lights in-flight provides an atmosphere for sleep and relaxation. An uncomfortable position may hinder sleep more than the vibration and noise of the engines.

8.3.9. Skin care. Disposable washcloths are available and can be placed in a plastic bag, dampened with hot or cold water, and distributed to the patients. Antiseptic towelettes or liquid hand sanitizer are made available and offered before meals and after a patient uses a urinal, bedpan, or latrine.

8.3.10. Monitor I&O as condition warrants.

8.3.10.1. Intake: All those fluids entering the patient's body such as oral fluids, ice chips, parenteral, IVF, feeding tubes, irrigation, and blood transfusion.

8.3.10.2. Output: All fluid that leaves the client's body such as urine, diarrhea, vomiting, and drainage from all tubes and bleeding.

#### **8.4. Airway and Respiratory Management.**

8.4.1. Stresses of flight affecting airway and respiratory management.

8.4.1.1. Decreased partial pressure of oxygen: Exacerbates possible oxygenation deficiencies due to a compromised respiratory system and diminished ciliary action.

8.4.1.2. Barometric pressure changes: May cause spontaneous pneumothorax in a trauma patient with significant respiratory compromise. GI gas expansion may cause diaphragmatic crowding leading to lower tidal volumes.

8.4.1.3. Thermal: Both an increase or decrease in body temperature increases the metabolic rate and O<sub>2</sub> demand on the body (particularly true in ventilator dependent patients).

8.4.1.4. Decreased humidity: The effectiveness of ciliary action is decreased, resulting in thickened secretions.

8.4.1.5. Fatigue: Most patients with respiratory disorders are already fatigued from the added workload of breathing. The overall effect of the previously mentioned stresses of flight and the total length of time in the AE system may increase fatigue and exacerbate the patient's condition.

8.4.1.6. Gravitational Forces: The positive gravitational forces generated on takeoff/ascent may cause diaphragmatic crowding, fatigue, and exacerbate the patient's condition.

8.4.2. Assessment of respiratory status.

8.4.2.1. Determine the mechanism of injury or disease. Look, listen and feel for indicators requiring possible intervention. The flight environment may preclude auscultation. If appropriate, obtain a baseline oxygen saturation.

8.4.2.2. Assess and document the following as dictated by the patient's condition:

8.4.2.2.1. Respiratory rate, depth, symmetry, oxygen saturation and maximum cabin altitude.

8.4.2.2.2. Document if any of the following abnormal findings are present.

8.4.2.2.2.1. Any use of accessory muscles, intercostal and substernal retractions, stridor, nasal flaring, pursed-lip breathing, prolonged expiration, skin color and position of patient.

8.4.2.2.2.2. Tongue obstructing the airway in an unconscious victim.

8.4.2.2.2.3. Loose teeth and/or other foreign objects.

8.4.2.2.2.4. Facial and/or oral bleeding.

8.4.2.2.2.5. Facial fractures resulting in loss of maxillary and mandibular structural integrity.

8.4.2.2.2.6. Inhalation injury or nasal/mucosal charring.

8.4.2.2.2.7. Tracheal edema.

8.4.2.2.2.8. Hematomas, bruising, wounds, and crepitus of the neck and upper chest.

8.4.2.2.2.9. Position of trachea (midline or deviated).

8.4.2.2.3. Glasgow Coma Scale (GCS): A score of less than 8 may suggest concurrent findings of hypoxia and require intubation (reference [Table 8.1](#)).

**Table 8.1. Glasgow Coma Scale.**

<b>Adult</b>		<b>Child</b>	
<b>Eye Opening</b>			
No Response	1	None	1
Opens to Pain	2	Opens to Pain	2
Opens to Speech	3	Opens to Verbal	3
Opens Spontaneously	4	Opens Spontaneously	4
<b>Verbal Response</b>			
No Response	1	None	1
Incomprehensible	2	Moans to Pain	2
Inappropriate words	3	Persistent Cry to Pain	3
Confused	4	Inconsolable Cry to Pain	4
Oriented	5	Appropriate Words/Coos	5
<b>Motor Response</b>			
No Response	1	None	1
Extension to Pain	2	Extension to Pain	2
Flexion to Pain	3	Flexion to Pain	3
Withdraws to Pain	4	Withdraws to Pain	4
Localizes Pain	5	Localizes Pain	5

Obeys Command	6	Spontaneous Movement	6
Score interpretation: E+V+M= 9-13 Moderate Brain Injury 3-8 Sever Brain Injury <8 May suggest concurrent findings of hypoxia and require intubation			

8.4.2.2.4. Severe respiratory distress or status epilepticus may require sedation or paralyzing agents to secure airway. **Note:** The AE in-flight kit does not contain paralytic drugs.

#### 8.4.3. Preflight/in-flight considerations and care for respiratory patients.

8.4.3.1. Assure sufficient O<sub>2</sub> is available in all phases of transport (including portable for ground transport if required).

8.4.3.2. Maintain a patent airway with positioning, suctioning, and adequate humidified oxygen. **Note:** Administer oxygen for any signs of hypoxia and respiratory distress or significant change from original assessment.

8.4.3.3. Respiratory disease pathologies may require additional preflight evaluation and possible cabin altitude restriction. Some of the more common diagnoses include, but are not limited to:

8.4.3.3.1. Chronic obstructive pulmonary disease (COPD). COPD includes pulmonary emphysema, chronic bronchitis, and status asthmaticus.

8.4.3.3.2. Restrictive lung disease: Extensive pneumonic consolidation, aspiration pneumonia, pulmonary atelectasis and infarction, pulmonary contusions, acute respiratory distress syndrome (ARDS), pulmonary edema, and hemothorax and/or pneumothorax.

8.4.3.3.3. Any disease or physiological process dependent upon oxygen delivery such as extensive tumors, granulomatous processes, lymphatic spread of carcinoma, diffuse parenchymatous diseases, alveolar proteinosis, sarcoidosis, interstitial fibrosis, shock, cardiac disease, and traumatic brain injury (TBI).

8.4.3.4. Cabin altitude restriction and supplemental oxygen: The decision for cabin altitude restriction or supplemental oxygen is based on the individual patient needs, the VFS orders, and the following considerations:

8.4.3.4.1. Most AE aircraft (C-17 and KC-135) cruise with a cabin altitude of 6,000 – 8,000 ft. At a 7,000 ft. altitude, a healthy person's PaO<sub>2</sub> is 60 mmHg or about 90 percent saturation. Patients with a sea level PaO<sub>2</sub> below 60 mmHg (90 percent saturation) potentially have difficulty with hypoxic hypoxia while in-flight.

8.4.3.4.2. Patients with COPD are administered low flow oxygen therapy (1 to 2 liters per minute via nasal cannula [NC] or Venturi mask) to avoid suppression of their hypoxic drive. Closely monitor respiratory rate if receiving higher concentrations of O<sub>2</sub>. Request lower cabin altitude if unresponsive to high flow O<sub>2</sub> and operationally feasible. Complete a JPSR worksheet or DD Form 2852.



## 8.4.4. Urgent airway management.

## 8.4.4.1. Airway obstructed or partially obstructed:

8.4.4.1.1. Position patient to allow for maximum ventilation. Consider a backrest if not contraindicated.

8.4.4.1.2. Open and clear the airway (reference AHA or equivalent, TNCC if available, and DHA/J7 Education and Training guidelines).

8.4.4.1.3. Suctioning (do not invoke a gag reflex).

8.4.4.2. Advanced airway treatment/management: In general, advanced airway procedures such as oral/nasal intubation, cricothyrotomy, and tracheostomy procedures are not normally performed by AECMs. Specially trained healthcare professionals, working within their AFSC scope of practice, may perform those procedures. The benefits of the procedure outweighs the risks of not performing the procedure in the AE system. Any change in a patient's status is reported to C2 and PMRC for further guidance and a JPSR worksheet or DD Form 2852 is submitted.

## 8.4.5. General clinical guidelines for all respiratory patients.

8.4.5.1. O<sub>2</sub> delivery methods are outlined in [Table 8.2](#)

**Table 8.2. O<sub>2</sub> Delivery Methods.**

Reference AHA or equivalent, TNCC if available, and DHA/J7 Education and Training guidelines on practices and assessment skills.		
METHOD	Liters Per Minute (LPM)	O <sub>2</sub> %
NC Low flow-O <sub>2</sub> delivery mixes with ambient gas. Inspired O <sub>2</sub> concentration depends on the flow rate and the patient's tidal volume.	Increasing O <sub>2</sub> flow by 1 LPM increases inspired O <sub>2</sub> concentration by approximately 4%.	
	1	24
	2	28
	3	32
	4	36
	5	40
	6	44
Face Mask-Administer 6 to 10 LPM	10	60
Non-rebreather mask with O <sub>2</sub> reservoir (constant flow of O <sub>2</sub> enters the attached reservoir). Administer 10-15 LPM via a tight-fitting mask for patients who require a rapid clinical	10 -15 LPM	> 90%

effect/high-flow O <sub>2</sub> .  <b>Note:</b> Requires close monitoring for nausea and vomiting. Suction is readily available.		
Venturi Mask Use for patients who retain CO <sub>2</sub> . Initially use 24%, unless otherwise ordered, and observe for respiratory depression. <b>Note:</b> Not supplied in the AE IFK.	in accordance with manufacturer's guidelines.	24 28 35 40

8.4.5.2. In the most serious cases, give high flow O<sub>2</sub> @ 100% via non-rebreather mask or bag valve mask (BVM).

8.4.5.3. Deliver humidified O<sub>2</sub> whenever possible. Monitor sterile water levels in humidification bottles.

8.4.5.4. Monitor pulse oximetry (O<sub>2</sub> saturation) and titrate O<sub>2</sub> up or down accordingly to maintain at least 92% or as directed by VFS.

8.4.5.5. In patients with low hemoglobin states, supplemental O<sub>2</sub> is ordered by the VFS per [Table 8.3](#)

8.4.5.6. **Table 8.4** outlines the effect of altitude on delivered oxygen levels and converts what is required on the ground to what the increase requirements is at altitude.

**Table 8.3. Oxygen Requirements for Low Hemoglobin States.**

PATIENT'S CONDITION	IN-FLIGHT O <sub>2</sub> REQUIREMENTS
Chronic low hemoglobin states	
8.5 – 10 7.0 – 8.5 Below 7.0	PRN Oxygen Available Oxygen 2L for flight As directed by the VFS
Acute low hemoglobin states	
9.0 - 10.0 8.0 – 9.0 Below 8.0	Oxygen Available Oxygen 2L for flight As directed by the VFS

**Table 8.4. Conversion for In-flight Oxygen Administration.**

Altitude	Oxygen Percentage														
10,000	30	36	44	51	58	65	73	80	87	94	100				
9,000	29	35	42	49	56	63	70	77	84	91	98	100			
8,000	28	34	40	46	54	61	67	74	81	87	93	100			
7,000	27	32	39	45	52	58	65	71	78	84	91	97	100		
6,000	26	31	37	44	50	56	62	69	75	81	87	94	100		
5,000	25	30	36	42	48	54	60	66	72	78	84	90	96	100	
4,000	24	29	35	41	46	52	57	64	70	75	81	87	93	97	100
3,000	23	28	33	39	45	50	56	61	67	73	78	84	89	95	100
2,000	23	27	32	38	43	48	54	59	64	70	75	81	86	91	97
1,000	22	26	31	38	41	47	52	57	62	67	73	78	83	88	93
FiO <sub>2</sub>	21	25	30	35	40	45	50	55	60	65	70	75	80	85	90
<b>Desired Sea Level Equivalent Oxygen Percentage</b>															
<p>*Even though the delivered O<sub>2</sub> may be at 100%, the partial pressure of oxygen necessary to deliver 100% SLE cannot be obtained (ex: 100% O<sub>2</sub> @ 8,000 feet only provides 75% O<sub>2</sub>. EXAMPLE: A patient receiving a fraction of inspired oxygen (FiO<sub>2</sub>) of 30% while on the ground, who is flying at a cabin altitude of 8,000 feet, requires the FiO<sub>2</sub> increased to 40% to deliver the same partial pressure of oxygen as the patient was receiving on the ground (SLE).</p> <p>Desired % O<sub>2</sub> SLE cannot be obtained at these altitudes.</p>															

8.4.5.6.1. Monitor pulse oximetry (O<sub>2</sub> saturation) and titrate O<sub>2</sub> up or down accordingly or as ordered by the VFS.

8.4.5.6.2. These parameters are based on hemoglobin because hematocrit may be decreased or elevated in dehydration or fluid overload.

8.4.5.6.3. If not contraindicated, push oral fluids to prevent dehydration.

8.4.5.7. Pulmonary hygiene measures.

8.4.5.7.1. Assist into sitting position (if not contraindicated); position on a backrest (if available).

8.4.5.7.2. Turn, cough, and deep breathe every two hours, and note color, amount and consistency of secretions (e.g., soot, blood streaks, and clots).

8.4.5.7.3. Incentive spirometry if available every one to two hours while awake.

8.4.5.7.4. Use a pillow for abdominal/thoracic splinting when coughing.

8.4.5.7.5. If breathing is ineffective or absent reference AHA or equivalent, TNCC if available, and DHA/J7 Education and Training guidelines for actions.

#### 8.4.6. Hyperventilation.

8.4.6.1. An abnormal increase in the rate and depth of breathing. Although unrelated in cause, the symptoms of hyperventilation and hypoxia are similar and often result in confusion and inappropriate corrective procedures. Contributing factors can be related to psychological stress, medications, physiological changes, and stresses of flight.

##### 8.4.6.2. Treatment for hyperventilation:

8.4.6.2.1. At altitude, the treatment of hyperventilation and hypoxia for the AE patient is similar. Reference AE Clinical Protocol – Emergency Oxygen and encourage deep breathing (reference [Attachment 2, A2.1.1](#)).

8.4.6.2.2. When a patient is hyperventilating from anxiety, putting on a mask to administer oxygen may heighten anxiety.

8.4.6.2.3. Methods to reduce the patient's respiratory rate include counting to five slowly while exhaling, working with the patient to control inhalations and exhalations to only 10 times a minute. Give the patient a watch with a second hand, or a cell phone with a stopwatch, and instruct them to maintain a respiratory rate between 10 and 12 breaths per minute.

#### 8.4.7. Hypercapnia:

8.4.7.1. Refers to increased amounts of CO<sub>2</sub> in the blood. CO<sub>2</sub> accumulates in the blood due to poor alveolar ventilation. As the O<sub>2</sub> in the blood is lowered, the CO<sub>2</sub> is raised. Altitude can exacerbate hypercapnia. The increased CO<sub>2</sub> stimulates the respiratory center in the brain stem. Elevated CO<sub>2</sub> is a powerful vasodilator, producing both peripheral and cranial vasodilatation. Any condition causing poor alveolar ventilation can result in hypercapnia.

8.4.7.2. Signs/symptoms of hypercapnia: Headache, vertigo, hypertension. Late symptoms include hypotension, coma, and cardiac failure.

##### 8.4.7.3. Pathological states primarily producing hypercapnia:

8.4.7.3.1. Central nervous system. Pharmacological depression (barbiturates, narcotics, alcohol, and tranquilizers), cerebrovascular accident, meningitis and encephalitis, severe intracranial hypertension associated with trauma, and tumors.

8.4.7.3.2. Diseases of nerves and muscles: Guillain-Barre' syndrome, muscular dystrophy, myasthenia gravis, insecticide poisoning, tetanus, chronic progressive polyneuropathy, diphtheritic polyneuritis, iatrogenic hemidiaphragmatic paralysis from indwelling interscalene pain catheters, and poliomyelitis.

8.4.7.3.3. Diseases of the chest wall: Flail chest and kyphoscoliosis.

8.4.7.3.4. Metabolic diseases: Severe hypothyroidism, starvation, obesity, and electrolyte imbalance.

8.4.7.3.5. Pulmonary causes: Chronic obstructive pulmonary disease (emphysema and chronic bronchitis); acute obstructive disease; severe asthmatic disease; acute

bronchiolitis; mechanical obstruction such as blood, water, pus, pulmonary edema, massive parenchymal lung disease, restrictive disease of the pleura, severe pain or diaphragmatic embarrassment after surgery, mechanical obstruction of large airways, upper respiratory obstruction, abdominal compartment syndrome, and obstruction of trachea or large bronchi.

#### 8.4.8. Care/management of endotracheal tube and tracheostomy patients.

8.4.8.1. Care providers for patients requiring artificial airway management, carry extra airways with them.

8.4.8.2. Attach an approved end-tidal CO<sub>2</sub> monitoring device or an in-line CO<sub>2</sub> indicator to the endotracheal or tracheostomy tube.

8.4.8.3. The ERCC team may elect to fill endotracheal and tracheostomy tube cuffs with air and then attach to a cuff pressure monitor to minimize tissue trauma and the complications of re-intubation.

8.4.8.3.1. Cuff pressure is usually maintained between 15-20 cm, and is checked preflight, at cruise and hourly, on descent, and prior to deplaning. Document cuff pressures on patients' medical record.

8.4.8.3.2. If an ERCC team is unavailable and an endotracheal or tracheostomy tube cuff requires inflation for flight, ensure it is inflated with air. Use minimal occlusion volume/minimal leak technique to permit adequate ventilation and avoid tissue trauma. **WARNING:** Excessive pressure in the endotracheal or tracheostomy cuffs may decrease blood flow to tissue causing airway damage, while under inflation may permit air leak/ineffective ventilation and increased potential for aspiration of upper airway secretions.

8.4.8.4. Tracheostomy patients may require humidification during AE.

#### 8.4.9. Ventilator patients.

8.4.9.1. Only approved or waived ventilators are used for AE missions. AECMs are responsible for ensuring the ventilator interfaces with aircraft systems and a dedicated regulator/oxygen line is available to operate ventilators.

8.4.9.2. Assure adequate portable oxygen is available for all phases of transport including enplaning and deplaning.

8.4.9.3. Set up for ventilated patients:

8.4.9.3.1. During transport, an emergency oxygen line for any vented patient is attached to a personal bag valve mask (BVM.). The BVM is kept on the litter (normally under/behind backrest) connected to the oxygen unless using the oxygen line for an in-line respiratory treatment.

8.4.9.3.2. Cardiac monitor.

8.4.9.3.3. Pulse oximetry.

8.4.9.3.4. CO<sub>2</sub> monitor.

8.4.9.4. General nursing care for ventilated patients.

8.4.9.4.1. Ventilator-associated pneumonia (VAP) is any pneumonia occurring in the patient who is intubated or who was extubated within the past 48 hours. Follow the current clinical practice guidelines to prevent and mitigate VAP.

8.4.9.4.2. VS at least q 2 hours.

8.4.9.4.3. Oral care q 2 hours.

8.4.9.4.4. Nasogastric/oral gastric (NG/OG) tube inserted.

8.4.9.4.5. Raise head-of-bed 30 degrees, unless contraindicated.

8.4.9.4.6. Soft wrist restraints in place to prevent extubation or inadvertent removal of vital therapeutic devices.

8.4.9.4.6.1. Every 1-hour restraint assessment and circulation is documented.

8.4.9.4.6.2. Reevaluate the patient and ventilator settings at altitude, changes at altitude may require ventilator-setting adjustments.

8.4.9.4.6.3. Positive end-expiratory pressure (PEEP) settings typically remain constant at altitude.

8.4.9.4.7. Administer pain and sedation medication, as ordered, for patient comfort.

#### 8.4.10. Chest tubes.

8.4.10.1. Chest tubes may be left in position for AE. Either a chest drainage unit with an integral one-way valve (e.g., Atrium Express 4050) or a Heimlich ® valve will be in place prior to patient transfer to the flight line. **(T-0)**. The Heimlich valve may be utilized with a chest drainage system without a one-way valve system. Glass chest tube drainage bottles are not used in-flight. **WARNING:** Use of the Heimlich valve with the Atrium Express could cause great risk to a patient during rapid decompression because the Atrium Express has a built in Heimlich valve. The addition of another Heimlich valve causes dangerous negative pressure in the thoracic cavity during a rapid decompression. Do not obstruct the positive pressure relief valve. **Note:** Frequently check water seal drainage systems, which use fluid to establish suction, to ensure evaporation/changes in pressure does not reduce suction.

8.4.10.2. Chest drainage units listed in the current AE Equipment Compendium are approved for use in-flight; ensure familiarity with conditions for use. Other drainage units may be encountered in the AE system and may be acceptable if a one-way valve system is present, conditions for use in accordance with manufacturer guidelines are followed, and a waiver is obtained in accordance with AFMAN 10-2909 and AFMAN 11-2AEV3. A JPSR worksheet or DD Form 2852 is completed on all equipment requiring a waiver.

8.4.10.3. Patients may be airlifted 24 hours after chest tube removal.

8.4.10.3.1. A chest X-ray, anterior/posterior and lateral, with interpretation, is completed post chest tube removal and documented in the patient's medical records.

8.4.10.3.2. Patients post-chest tube removal, requiring AE before or within 24 hours are approved by the referring provider and the VFS.

8.4.10.3.3. Occlusive dressing is applied to the site where the chest tube was removed.

8.4.10.4. Preflight/in-flight considerations and care for chest tube patients.

8.4.10.4.1. Patient assessment includes: assessing breath sounds, VS with pulse oximetry, and inspection of the chest tube site to ensure intact dressing and connections for any leaks or kinks. Assess tidaling in the chest drainage device. In a patient with a pleural chest tube, tidaling is normal. Oscillations are more apparent when suction is momentarily turned off. If there is no tidaling, consider 1) an occlusion somewhere between the pleural cavity and the water seal, 2) a full expansion of the lung where suction has drawn the lung up against the holes in the chest tubes, or 3) PEEP, which can dampen oscillation. **WARNING:** Check chest tubing for occlusion and assess patient for bilateral rise and fall of chest wall.

8.4.10.4.2. Ensure all connections are taped, tubing is not looped or kinked or hanging below the drainage system.

8.4.10.4.3. Mark level of collection chamber and notify VFS if drainage is in excess of 100ml since leaving the ERPS or MTF.

8.4.10.4.4. Document presence or absence of an air leak in the water seal (bubbling indicates free air in the pleural cavity).

8.4.10.4.5. Do not allow the chest drainage system to be above the level of the chest.

8.4.10.4.6. Position patient mid-tier or above to facilitate drainage. Patients with chest tubes are not be floor-loaded.

8.4.10.4.7. The chest tube is only clamped if directed by a privileged provider. If directed by the privileged provider, a Kelly clamp accompanies the patient while in the AE system.

8.4.10.4.8. Maintain and document I&O on each leg of the mission in the EHR or the AF Form 3899E, *Patient Movement Intake/Output*, as required.

8.4.10.4.9. Check the suction control frequently and adjust the suction control to maintain the appropriate amount of suction according to the physician's order. If the chest drainage system uses water to maintain suction, adjust suction control for minimal bubbling according to manufacturer's recommendations. Ensure patient is utilizing an incentive spirometer (IS) and/or coughing and deep breathing every one to two hours while in-flight.

8.4.10.4.10. Move and drain chest drainage tubing hourly to facilitate flow and prevent clotting. **WARNING:** If clotting is suspected, do not milk or strip chest tubes; this has the potential to causes increased intra-pleural pressure. If you see visible clots, squeeze hand-over-hand along the tubing and release the tubing between squeezes to help move the clots in the drainage unit.

8.4.10.4.11. Unless contraindicated, position on a backrest for comfort.

8.4.10.4.12. Pain medication as required.

8.4.11. Pulmonary emergencies.

#### 8.4.11.1. Initial response to pulmonary emergencies.

8.4.11.1.1. Maintain the airway and assist breathing. Reference AHA or equivalent, TNCC if available, and DHA/J7 Education and Training guidelines.

8.4.11.1.2. Administer high flow O<sub>2</sub> to maintain pulse oximetry greater than 92% or as directed by VFS.

8.4.11.1.3. Establish IV access.

8.4.11.1.4. The AECM notifies C2 who then contacts the governing PMRC for guidance, possible cabin altitude restriction, and diversion to a MTF capable of handling the situation, as required.

#### 8.4.11.2. Asthma/COPD.

8.4.11.2.1. Assess signs and symptoms:

8.4.11.2.1.1. Tachypneic, labored respirations with increased effort on exhalation (prolonged).

8.4.11.2.1.2. Possible cough and dyspnea.

8.4.11.2.1.3. Signs of hypoxia (reference [Table 8.5](#)).

8.4.11.2.1.4. The presence of wheezing, difficulty speaking, and use of accessory muscles indicates an emergent situation.

8.4.11.2.2. Emergency treatment/management (reference AE Clinical Protocol - Emergency Oxygen).

8.4.11.2.3. Administer medication and oxygen as directed.

8.4.11.2.3.1. The goal of oxygen administration for a COPD patient is to maintain adequate arterial blood saturation with oxygen (SaO<sub>2</sub>) without worsening acidosis. **WARNING:** Patients with chronically elevated blood CO<sub>2</sub> levels may rely on relative hypoxia as a respiratory driver. Titrating O<sub>2</sub> outside ordered SpO<sub>2</sub> parameters may result in decreased respiratory drive. In a clinical emergency, high flow oxygen may be required. Patients receiving high flow O<sub>2</sub> require full time observation.

8.4.11.2.3.2. Encourage oral (PO) fluids or consider IV maintenance fluids, if not contraindicated.

#### 8.4.12. Tension pneumothorax.

8.4.12.1. Air enters the pleural space and is unable to escape. This may occur as a result of trauma, complication of medical treatment/procedure or spontaneously. Tension pneumothorax may also be due to a kinked or clotted chest tube. The involved lung collapses and the mediastinum shifts to the opposite side, compressing the contralateral lung. Venous return to the heart is decreased and cardiac output is dramatically reduced.

8.4.12.2. Tension pneumothorax signs and symptoms:

8.4.12.2.1. Hypoxia (reference [Table 8.5](#)).



- 8.4.12.2.2. Severe respiratory distress with dyspnea (air hunger and rapid respirations) and cyanosis.
- 8.4.12.2.3. Decreased or absent chest expansion on affected side.
- 8.4.12.2.4. Diminished or absent breath sounds on affected side.
- 8.4.12.2.5. Difficulty ventilating patient with endotracheal tube.
- 8.4.12.2.6. Presence of clots in the chest tube or Heimlich valve.
- 8.4.12.2.7. Hyper-resonance on percussion.
- 8.4.12.2.8. Subcutaneous emphysema.
- 8.4.12.2.9. Distended neck veins and hypotension.
- 8.4.12.2.10. Tracheal shift to unaffected side (late sign).
- 8.4.12.3. Tension pneumothorax treatment/management:
  - 8.4.12.3.1. If this is assessed and not previously treated preflight, the patient is not stable for flight.
  - 8.4.12.3.2. If chest tube is present:
    - 8.4.12.3.2.1. Assure the drainage system is operational.
    - 8.4.12.3.2.2. **WARNING** : If clotting is suspected, do not milk or strip chest tubes; this has the potential to causes increased intra-pleural pressure. If you see visible clots, squeeze hand-over-hand along the tubing and release the tubing between squeezes to help move the clots in the drainage unit.
  - 8.4.12.3.3. If a chest tube is not present, patent, or operable, a needle decompression (NDC) is performed immediately. The NDC is performed using the NDC kit or an alternative 14 or 10-Gauge, 3.25-inch needle (reference AHA or equivalent, TNCC if available).
    - 8.4.12.3.3.1. Continue to assess patient. Decompression may have to be repeated until a chest tube is inserted.
    - 8.4.12.3.3.2. Decrease the cabin altitude, if operationally feasible.
    - 8.4.12.3.3.3. The AECM notifies C2 who then contacts the governing PMRC for guidance and possible diversion to a MTF capable of handling the situation.
    - 8.4.12.3.3.4. Continue to closely monitor the pulse oximeter and patient for recurrence.
- 8.4.13. Open pneumothorax. Air enters the chest via an open wound; also known as a “sucking chest wound.”
  - 8.4.13.1. Signs and symptoms:
    - 8.4.13.1.1. Severe respiratory distress with dyspnea and cyanosis.
    - 8.4.13.1.2. Gurgling, sucking wound.
    - 8.4.13.1.3. Tachypnea and grunting.

#### 8.4.13.2. Treatment/management:

8.4.13.2.1. Treat by applying an occlusive dressing completely over the defect during expiration.

8.4.13.2.2. Allow the casualty to adopt the sitting position if breathing is more comfortable.

8.4.13.2.3. Monitor for possible development of subsequent tension pneumothorax.

8.4.13.2.4. If signs of a tension pneumothorax develop, REMOVE the occlusive dressing for a few seconds and allow the tension pneumothorax to decompress, then replace. If this does not resolve the issue, reference [paragraph 8.4.12.3](#)

#### 8.4.14. Massive hemothorax.

##### 8.4.14.1. Signs and symptoms:

8.4.14.1.1. Severe respiratory distress with dyspnea.

8.4.14.1.2. Signs of shock ([paragraph 8.8](#)), hypoxia ([paragraph 8.5](#)) and reference AE Clinical Protocol – Emergency Oxygen.

8.4.14.1.3. Breath sounds decreased or absent.

8.4.14.1.4. More than 100ml of blood loss per hour from chest tube.

8.4.14.1.5. Traumatic injury to the chest.

##### 8.4.14.2. Treatment/management.

8.4.14.2.1. Seek immediate assistance from a privileged provider/C2/PMRC for guidance and possible diversion to a MTF capable of handling the situation. Treat shock as appropriate.

8.4.14.2.2. Chest tube placement is required.

#### 8.4.15. Flail chest.

8.4.15.1. Multiple rib fractures resulting in loss of chest wall stability. Normal thoracic function and gas exchange are impaired. The underlying pulmonary contusion and splinting of the fracture pain leads to hypoventilation and hypoxia. The flailing segment moves inward during inspirations and outward during expiration. Severe muscle spasms may conceal the flailing segment.

##### 8.4.15.2. Signs and symptoms.

8.4.15.2.1. Respiratory distress with dyspnea, cyanosis, and hypoxia.

8.4.15.2.2. Paradoxical chest wall movement.

8.4.15.2.3. History of blunt trauma to the chest.

##### 8.4.15.3. Treatment/management.

8.4.15.3.1. Supplemental oxygen. Evaluate for elective intubation.

8.4.15.3.2. Adequate pain management (reference [paragraph 8.21](#)).

- 8.4.15.3.3. Position for comfort. **Note:** Place on affected side if in respiratory distress to improve oxygenation of unaffected lung.
- 8.4.15.3.4. Monitor IVF infusion to avoid fluid overload.
- 8.4.15.3.5. Pulmonary failure may require emergent intubation.
- 8.4.15.3.6. May require PEEP or Continuous Positive Airway Pressure.
- 8.4.16. ARDS.
  - 8.4.16.1. Lung injury with several causes and may be a complication of other diseases, injuries, volume overload, infection, toxic inhalation, massive transfusion, etc.
  - 8.4.16.2. ARDS results from a severe alteration in pulmonary vascular permeability, which leads to a change in lung structure and fluid shift to interstitial space (edema). Interferes with alveolar-capillary membrane affecting ventilation.
  - 8.4.16.3. Treatment/management.
    - 8.4.16.3.1. Supplemental oxygen/ventilator support.
    - 8.4.16.3.2. PEEP (if required).
    - 8.4.16.3.3. Monitor continuous pulse oximetry.
    - 8.4.16.3.4. Fluids are restricted unless shock is present.
    - 8.4.16.3.5. Turn patient every two hours unless contraindicated to promote postural drainage.

## 8.5. Hypoxia.

- 8.5.1. Hypoxia is a general term describing an oxygen deficiency in the tissues sufficient enough to cause impairment of function. Oxygen deficiency can result from various causes. AE patients are already in a compromised state, are at a higher risk and may experience signs of hypoxia faster than normal. Administer oxygen for any sign of hypoxia, respiratory distress, or significant change from original assessment. Base the treatment on underlying pathology, preflight VS and pulse oximetry.
- 8.5.2. Stages of altitude induced hypoxia.
  - 8.5.2.1. Indifferent stage: Starts at sea level and extends to 10,000 ft. The body reacts with a slight increase in heart rate and ventilation. Night vision begins to diminish at 5,000 ft.
  - 8.5.2.2. Compensatory stage: Extends from 10,000 ft. to 15,000 ft. The body attempts to protect itself against hypoxia by increasing BP, heart rate, and the rate and depth of respiration. Efficiency and performance of tasks requiring mental alertness becomes impaired.
  - 8.5.2.3. Disturbance stage: Extends from 15,000 ft. to 20,000 ft. Characterized by dizziness, sleepiness, tunnel vision, and cyanosis. Thinking becomes slowed and there is a loss of muscle coordination.
  - 8.5.2.4. Critical stage: Extends from 20,000 ft. to 30,000 ft. Marked mental confusion, incapacitation followed by unconsciousness.

### 8.5.3. Major causes of hypoxia in the AE environment:

8.5.3.1. High altitude: Altitude is the most common cause of in-flight hypoxia.

8.5.3.2. Hypoventilation: Hypoventilation is inadequate ventilation often caused by diseases outside the respiratory system and can exist when lung tissue is normal. Over-sedation is a common cause of hypoventilation.

8.5.3.3. Lung pathology: Conditions of the lungs producing arterial hypoxia in the presence of normal alveolar PaO<sub>2</sub> is termed “increased alveolar-arterial oxygen tension difference.” Three mechanisms contribute to this condition:

8.5.3.3.1. Diffusion defect: Interference with diffusion of oxygen from alveolar air into pulmonary blood results in lowered PaO<sub>2</sub>. This is seen in diffuse pulmonary infiltration, interstitial fibrosis, early edema, viral pneumonia, sarcoidosis, and anemia.

8.5.3.3.2. Abnormal perfusion-ventilation ratio: An important aspect of normal lung physiology is local/regional optimization of alveolar perfusion based on the ventilation of the alveolar-capillary units. In certain lung diseases there is a breakdown of this optimization with a resulting deterioration in gas exchange. This is seen in patients with pulmonary emphysema, status asthmaticus, pulmonary edema, pulmonary embolus, and chronic bronchitis.

8.5.3.3.3. Intrapulmonary shunts: When the ventilation/perfusion ratio is abnormal due to poor ventilation of the alveoli, the blood passes through the involved parts of the lung without the oxygen-carbon dioxide exchange occurring. For example, in lobar pneumonia, the blood passes directly from the pulmonary arterial circulatory system into the pulmonary venous system without a gas exchange.

### 8.5.4. Types of hypoxia:

8.5.4.1. Hypoxic hypoxia (altitude hypoxia): Caused by exposure to the airborne environment. Results in deficiency in alveolar oxygen exchange. A lower barometric pressure at altitude results in a decrease in alveolar PaO<sub>2</sub> and interferes with ventilation and perfusion. Any condition requiring oxygen at sea level is closely monitored at altitude.

#### 8.5.4.2. Altitude Blood Oxygen Saturation.

8.5.4.2.1. Sea level 98%.

8.5.4.2.2. 10,000 ft. 87%.

8.5.4.2.3. 22,000 ft. 60%.

8.5.4.3. Hypemic hypoxia: A reduction in the oxygen-carrying capacity of the blood caused by anemia, hemorrhage, hemoglobin (Hgb) abnormalities (e.g., sickle cell disease), medications (e.g., sulfanilamides, nitrites), or chemicals (e.g., cyanide, carbon monoxide). **WARNING:** Carbon monoxide has a 200 x greater affinity to bond to Hgb than oxygen. Pulse oximetry reading may not be accurate in carbon monoxide poisoning.

8.5.4.4. Histotoxic hypoxia: A deficiency of oxygen reaching the tissues due to impairment of cellular respiration especially by a toxic agent such as alcohol. Histotoxic hypoxia affects efficiency of cells to utilize oxygen, interfere with metabolic activity.

8.5.4.5. Stagnant hypoxia: A reduction in total cardiac output due to the pooling of blood and the reduced blood flow to the tissues. Interferes with the transportation phase of oxygen by reducing systemic blood flow. Causes include: Respiratory failure, continuous positive pressure, ventilation, positive end expiratory pressure (PEEP), cardiovascular and/or pulmonary embolus (blood clot or gas bubbles), shock, acceleration (G-Forces), extremes in environmental temperature, postural changes, tourniquets, arterial spasm, hyperventilation, and heart failure.

#### 8.5.5. Characteristics of hypoxia:

8.5.5.1. Generally, patients are not familiar with their personal symptoms of hypoxia, so AECMs are alert to all possible signs and symptoms patients may exhibit. Because AE patients are already in a compromised state, they usually experience the effects of hypoxia earlier than normal. Signs and symptoms are listed in [Table 8.5](#)

8.5.5.2. Cyanosis is a late sign of hypoxia because the oxygen saturation values are below 75% in persons with normal Hgb before it is detectable.

**Table 8.5. Signs and Symptoms of Hypoxia.**

Signs	Symptoms
Restlessness	Confusion
Slouching	Headache
Euphoria	Dizziness
Confusion	Euphoria
Stupor	Blurred Vision
Dyspnea	Tunnel Vision
Belligerence	Insomnia
Tachypnea	Hot and cold flashes
Hypertension	Tingling
Tachycardia	Numbness
Bradycardia	Nausea
Arrhythmias	Anger
Hypotension (late)	Tachypnea
Cyanosis (late)	Short of breath
Seizures (late)	Changing judgment or personality
Unconsciousness(late)	

8.5.6. Due to the relative hypoxic environment in AE aircraft, patients having diagnoses or conditions which compromise tissue oxygenation are considered for either oxygen supplementation or a cabin altitude restriction, or both. The attending physician, in consultation with the VFS, considers prescribing supplemental oxygen and/or cabin altitude

restriction and documents these orders in the patient movement request and the EHR or AF Form 3899.

8.5.7. Prevent hypoxia by encouraging deep breathing and ambulation, if appropriate. Evaluate potential causes of hypoxia: medications, underlying medical conditions, etc.

8.5.8. Treatment of hypoxia (reference AE Clinical Protocol – Emergency Oxygen).

8.5.8.1. Request lower cabin altitude if unresponsive to high flow O<sub>2</sub> and operationally feasible.

8.5.8.2. When administering O<sub>2</sub> to correct hypoxia, allow approximately three to five minutes to elapse for a more accurate pulse oximeter reading.

8.5.9. Documentation includes subjective and objective data for giving oxygen; VS, date, time and delivery method of administering the oxygen (e.g., non-rebreather mask at 15 LPM or nasal-cannula at 4 LPM), notification of a physician, and the outcome. The following statement is documented on the EHR or AF Form 3899: “Oxygen was administered in accordance with AE Clinical Protocol – Emergency Oxygen”. Completion of a JPSR worksheet or DD Form 2852 is also required.

## **8.6. Pulmonary Embolism (PE)/VTE Events During AE.**

8.6.1. PE is the obstruction of one or more pulmonary arteries by a thrombus usually originating in the deep veins of the legs. VTE occurs when a blood clot forms in a person’s veins.

8.6.2. Stresses of flight contributing to PE/VTE events.

8.6.2.1. Thermal: Excessive heat leads to additional dehydration.

8.6.2.2. Decreased humidity: Leads to dehydration. Dehydration effects the flow of venous blood volume and may cause additional stasis.

8.6.2.3. Fatigue: Excessive fatigue may cause patients to be static for longer periods of time. They may not have the energy to walk or complete the recommended movements or exercises.

8.6.2.4. G-forces: May cause additional venous stasis, leading to pooling of the blood.

8.6.2.5. Flights lasting longer than four hours compound the other stresses of flight.

8.6.3. Higher risk for PE/VTE includes patients with: Prolonged bed rest, long bone or pelvic trauma, obesity, history of smoking, history of thromboembolic disease, varicose veins, pregnancy, post-partum, history or family history of PE/VTE, estrogen use, heart failure, myocardial infarction, active cancer, recent surgery, leg cast or splint and/or over the age of 40.

8.6.4. PE signs and symptoms.

8.6.4.1. Dyspnea, pleuritic chest pain, wheezing, crackles on auscultation, restlessness, and hemoptysis. **Note:** In-flight auscultation is not a reliable assessment tool.

8.6.4.2. Elevate the head of bed, with a backrest if available; get a full set of VS and place on oxygen in accordance with AE Clinical Protocol – Emergency Oxygen.

8.6.4.3. The AECM notifies C2 who then contacts the governing PMRC for guidance.

#### 8.6.5. VTE signs and symptoms:

8.6.5.1. Pain in the calf or behind the knee that may increase with standing or ambulating, the feeling of being on pins and needles, swelling (especially unilateral), skin that is warm to touch, erythema, and a systemic temperature greater than 100.4F. Many VTEs are asymptomatic.

8.6.5.2. Homan's sign is often unreliable due to false positives. It is no longer recommended.

8.6.5.3. VTE prophylaxis is essential to preventing complications of immobility in the AE system. Prophylactic methods or measures may include:

8.6.5.3.1. Frequent ambulation, if possible, as well as stretching and flexing of calf muscles. Adequate hydration and frequent changes in position are required throughout the AE system.

8.6.5.3.2. Sequential Compression Devices (SCD) or foot pumps provide non-pharmacologic VTE prophylaxis in critical care and immobilized patients. Some patients being transported benefit from use of a combination of non-pharmacologic and pharmacologic VTE prophylaxis. Approved SCDs in the AE environment may be used on one or more extremities and provides improved benefit over no mechanical prophylaxis.

8.6.5.3.3. VFS may consider blood-thinning or clot preventing medications (e.g., heparin, low molecular weight heparins (Lovenox), or Coumadin).

### 8.7. Cardiovascular Management.

#### 8.7.1. Stresses of flight affecting the cardiovascular system.

8.7.1.1. Decreased partial pressure of oxygen: Increases myocardial workload, predisposing compromised patients to arrhythmias, chest pain and may lead to myocardial infarction. Consider cabin altitude less than 6,000 ft. for cardiac patients.

8.7.1.2. Barometric pressure changes: Gas expansion in the GI tract may cause diaphragmatic crowding and decrease in tidal volume.

8.7.1.3. Thermal: Excessive heat may cause patients on cardiac medication to become hypotensive. Hyperthermia and hypothermia may increase cardiac oxygen requirements.

8.7.1.4. Fatigue: Cumulative effect of stresses may exacerbate the patient's condition.

8.7.1.5. G-forces: Ascent may increase returning blood flow and cardiac workload for some cardiac patients. Use a backrest for cardiac patients on a litter.

#### 8.7.2. Preflight/in-flight considerations for cardiac patients.

8.7.2.1. Use alternate anti-hijacking procedures for patients and passengers with implantable cardiac pacemakers and defibrillators. **WARNING:** EMI from handheld and stationary surveillance systems interferes with these medical devices. Changes in pacing rates, shock, and possible cardiac arrest may occur.

8.7.2.2. Patients with a recent acute myocardial infarction are considered for AE on an individual basis. The referring privileged provider and VFS work together to determine

the appropriate AE precedence and clinical support for cardiac patients. When continuous cardiac monitoring or other critical care modalities are required, the VFS, in consultation with the referring privileged provider, determines if an ERCC team or MA such as a physician or ACLS trained nurse is required to accompany the patient. The final decision for determining these requirements rests with the VFS. A 12-Lead electrocardiogram taken within 24 hours of scheduled flight and read by a qualified physician accompanies the patient.

#### 8.7.2.3. Patient history.

8.7.2.3.1. Assess if patient is free of chest pain. Document the last episode and if it was associated with dyspnea, nausea and/or diaphoresis. Note what actions/medications were used to relieve pain/discomfort. List other current medications, allergies, and presence of pacemaker or other implantable cardioverter-defibrillator.

8.7.2.3.2. Assess ability to ambulate for prolonged periods and climb stairs.

8.7.2.3.3. All inpatient cardiac patients require preflight VS and pulse oximetry, repeat VS and pulse oximetry at altitude.

8.7.2.3.4. If the patient has nitroglycerin, ensure it is not expired and the patient notifies the AECM if consumed.

8.7.2.4. Use a backrest if on litter.

8.7.2.5. Place near O2 for flight.

8.7.2.6. The cardiac monitor, if ordered, is placed in a viewable position for an ACLS certified member in all phases of transport when feasible.

8.7.3. Cardiac emergencies/cardiac arrest: ERCC team/MA may be included in the medical emergency procedures if clinically qualified to assist. For defibrillation procedures reference current TNCC if available and current AHA or equivalent and DHA/J7 Education and Training guidelines on practices and assessment skills and AFMAN 11-2AEV3. The AECM notifies C2 who then contacts the governing PMRC. Complete a JPSR worksheet or DD Form 2852 for change of status.

8.7.4. Ischemic chest pain (reference AHA or equivalent, TNCC if available, and DHA/J7 Education and Training guidelines).

8.7.5. Congestive heart failure/cardiogenic shock: Heart failure may result from a myocardial infarction (MI), valvular malfunction, septal defect, left ventricular aneurysm or cardiac trauma.

8.7.5.1. Assess cardiopulmonary, neurological, and hemodynamic status of BP, heart rate, pulse oximetry, GCS, peripheral perfusion, presence of edema, color and warmth of skin.

8.7.5.2. Signs and symptoms: Anxiety, dyspnea/shortness of breath with rales and rhonchi, distended neck veins, tachycardia, hypertension, or hypotension (cardiogenic shock), diaphoresis, arrhythmias. Appears ashen with cool and clammy skin.



8.7.5.3. Treatment/Management: If symptoms develop during flight, the AECM notifies C2 who then contacts the governing PMRC for guidance (reference Lippincott or Mosby).

8.7.6. Cardiac tamponade. Rapid or slow accumulation of fluid into pericardial sac compresses the heart and decreases cardiac output. Results from inflammation, traumatic wound injury to heart, heart failure, cardiac contusion, neoplasm, and aortic dissection.

8.7.6.1. Assess signs and symptoms: Beck's Triad: (distended neck veins, low arterial pressure and distant/muffled heart sounds), dyspnea, tachypnea, cyanosis, tachycardia, hypotension, and severe anxiety. QRS may have smaller amplitude. **Note:** Recommend use of ultrasound to diagnose cardiac tamponade if available.

8.7.6.2. Treatment/Management of Cardiac Tamponade:

8.7.6.2.1. Reference AHA or equivalent, TNCC if available, and DHA/J7 Education and Training guidelines.

8.7.6.2.2. Avoid positive pressure ventilation via bag-mask or endotracheal tube. The physician may order a fluid challenge. The only treatment alleviating the cause is pericardiocentesis. **WARNING:** Only a healthcare professional who has the scope of practice to accomplish a pericardiocentesis perform this procedure.

8.7.7. Symptomatic premature ventricular contractions, tachycardia, and cardiac arrest. Reference AHA or equivalent, TNCC if available, and DHA/J7 Education and Training guidelines.

8.7.8. Treatment and Management of Symptomatic bradycardia. Reference Transcutaneous Pacing (TCP) in AHA or equivalent, TNCC if available, and DHA/J7 Education and Training guidelines.

8.7.8.1. Contact C2 for mission diversion and VFS guidance on sedation and pain medication prior to starting TCP if patient is stable. AETs (operating within their SOP) may assist with set up but may not initiate TCP.

8.7.8.2. TCP is used for short intervals until transvenous pacing can be initiated.

8.7.9. Treatment and Management of Ventricular fibrillation/ventricular tachycardia. Reference AHA or equivalent, TNCC if available, and DHA/J7 Education and Training guidelines and AFMAN 11-2AEV3 and AE Medical Equipment Compendium for information specific to defibrillation on an aircraft.

8.7.10. Treatment and Management of Asystole and Pulseless Electrical Activity. Reference AHA or equivalent, TNCC if available, and DHA/J7 Education and Training guidelines.

## 8.8. Shock Management.

8.8.1. Stresses of flight affecting shock.

8.8.1.1. Decreased partial pressure: As altitude increases, ambient air pressure decreases, leading to a decrease in the oxygen tension which results in a decreased PaO<sub>2</sub>.

8.8.1.2. Thermal: Inadequate peripheral perfusion aggravated by the potential temperature extremes.

8.8.1.3. Humidity: The humidity in aircraft cabins is extremely low and exacerbates fluid loss.

8.8.1.4. Fatigue: Can exacerbate the patient's underlying condition/diagnosis due to the overall effect of stresses of flight and length of time the patient has been in the AE system. Disruption of circadian rhythms occurs when crossing multiple time zones.

8.8.2. General: Shock is a physiologic state characterized by a significant reduction of systemic tissue perfusion, resulting in decreased oxygen delivery to the tissues. This creates an imbalance between oxygen delivery and oxygen consumption. Prolonged oxygen deprivation leads to cellular hypoxia and derangement of critical biochemical processes at the cellular level, which can progress to the systemic level.

8.8.3. Types of shock.

8.8.3.1. Hypovolemic shock is a lack of oxygen to the tissues caused by reduced blood volume.

8.8.3.1.1. Hypovolemic shock may result from hemorrhage-induced blunt or penetrating trauma, GI bleeding, hemorrhagic pancreatitis, fractures, ruptured aorta, abdominal or left ventricular free wall aneurysm.

8.8.3.1.2. Also caused by fluid loss induced by diarrhea, vomiting, heat stroke, inadequate repletion of insensible losses, burns, and third spacing.

8.8.3.1.3. Treatment of hypovolemic shock. Reference AHA or equivalent, TNCC if available, and DHA/J7 Education and Training guidelines.

8.8.3.2. Cardiogenic shock is a lack of oxygen to the tissues caused by cardiac pump failure or pulmonary embolism.

8.8.3.2.1. Specific conditions/events lead to cardiogenic shock including myocardial infarction involving greater than 40 percent of the left ventricular myocardium, right ventricular infarction, dilated cardiomyopathies, stunned myocardium following prolonged ischemia, cardiopulmonary bypass, myocarditis and both atrial and ventricular arrhythmias.

8.8.3.2.2. Atrial fibrillation and flutter reduce cardiac output. Mechanical causes of cardiogenic shock include valvular defects, ventricular septal defects, or rupture, atrial myxomas and a ruptured ventricular free aneurysm. Other cardiac causes of cardiogenic shock include massive pulmonary embolism, tension pneumothorax, severe constrictive pericarditis, and pericardial tamponade.

8.8.3.2.3. Treatment of cardiogenic shock.

8.8.3.2.3.1. Attempt to determine the cause of cardiogenic shock: Myocardial infarction, myocardial depression due to advanced septic shock, atrial or ventricular arrhythmia, Brady arrhythmia, pulmonary embolism, tension pneumothorax, constrictive pericarditis, pericardial tamponade and severe pulmonary hypertension.

8.8.3.2.3.2. Perform fluid resuscitation to correct hypovolemia and hypotension unless pulmonary edema is present.

8.8.3.2.3.3. Additional drug therapy may be necessary as determined by a privileged provider.

8.8.3.3. Distributive (vasodilatory) shock is a lack of oxygen to the tissues caused by hypotension due to an infection or anaphylactic reaction. Examples include neurogenic, septic, and anaphylactic.

8.8.3.3.1. May result from systemic inflammatory response, pancreatitis, burns or multiple traumatic injuries. Also, from toxic shock syndrome, anaphylaxis and anaphylactoid reactions, drug or toxin reactions including insect bites, transfusion reactions, and heavy metal poisoning.

8.8.3.3.2. Other contributing factors include Addisonian crisis, myxedema coma, neurogenic shock after spinal cord injury, acute systemic inflammation following acute myocardial infarction, post-resuscitation syndrome and post-cardiopulmonary bypass.

8.8.3.3.3. Treatment for distributive shock.

8.8.3.3.3.1. Evaluate for decreased peripheral perfusion as indicated by delayed capillary refill and cool mottled extremities, dry skin, dry oral mucosa, or postural hypotension.

8.8.3.3.3.2. At least one to two liters of NS or Lactated Ringers are initially given as rapidly as possible in an attempt to restore tissue perfusion.

8.8.3.3.3.3. Continue fluid resuscitation at the initial rapid rate as long as the systemic BP remains less than 90mm Hg. Monitor fluid intake/urine output (UOP), BP, mental status, and peripheral perfusion.

8.8.3.3.3.4. If it is neurogenic shock, restore volume. Do not use vasoactive medications until volume is restored. Steroids are only be used after consultation with a neurosurgeon. Keep the patient as normo-thermic as possible.

8.8.3.3.3.5. If it is septic shock, treat the underlying infection. Antibiotics and fluid bolus in accordance with physician's orders.

8.8.3.3.3.6. If it is anaphylactic shock, initiate resuscitation and follow the AE Clinical Protocol - Anaphylactic Reaction.

8.8.3.4. Obstructive Shock.

8.8.3.4.1. Obstructive Shock may result from circulatory compromise due to direct failure of the heart muscle or compression or obstruction of blood flow through the heart or great vessels.

8.8.3.4.2. Contributing factors include cardiac tamponade, tension pneumothorax, and pulmonary embolism.

8.8.3.4.3. Signs and symptoms include apprehension, shortness of breath, tracheal deviation, jugular vein distention.

8.8.3.4.4. Treat the underlying pathology.

8.8.3.5. The different types of shock can coexist. As an example, patients with septic shock often have a hypovolemic component, a cardiogenic component (due to sepsis-related dysfunction), and a distributive component (due to the effects of inflammatory and anti-inflammatory cascades on vascular permeability and vasodilatation).

8.8.4. Clinical presentation of shock varies according to the type of shock, its cause, and its stage of presentation.

8.8.4.1. Early signs of shock are characterized by rapid compensation for the diminished tissue perfusion. The early symptoms may include anxiety, restlessness, tachycardia, pale clammy skin, and either a modest increase or decrease in systemic BP.

8.8.4.2. As compensatory mechanisms become overwhelmed, additional symptoms for late shock may include diaphoresis, decreased urine output, agitation, lethargy, dizziness, hypotension, obtunded, and coma.

8.8.5. Treatment/management and preflight/in-flight considerations for shock.

8.8.5.1. Control hemorrhage and maintain circulation, airway, and breathing (reference AHA or equivalent, TNCC if available, and DHA/J7 Education and Training guidelines).

8.8.5.2. Correct hypoxemia. Open airway with adjuncts if necessary. Maintain ventilator support if appropriate. Provide supplemental oxygen with high flow delivery (reference AE Clinical Protocol –Emergency Oxygen).

8.8.5.3. Place the patient in supine position to assist with perfusion. Keep the patient warm.

8.8.5.4. Establish two large bore IV's if not already in place.

8.8.5.5. Monitor BP as needed but at a minimum hourly.

8.8.5.6. UOP goal is 30-50 ml/hour.

## **8.9. Burn Management.**

8.9.1. Burn patients are frequently transported on AE missions and require intensive in-flight nursing care. The expert burn management consultants for worldwide AE are at the United States Army Institute for Surgical Research (USAISR). C2 and PMRC coordinates the delivery of the burn team and their equipment to the originating facility and subsequent AE airlift of the patient back to the burn center. In many cases, an ERCC team may accompany the burn patient to the ISR or to a civilian burn center. The PMRC and VFS refers to the JTS Burn Care CPG for burn care recommendations.

8.9.2. Stresses of flight affecting burn patients.

8.9.2.1. Decreased partial pressure of oxygen: Exacerbates oxygenation deficiencies due to compromised respiration and/or the decreased partial pressure of oxygen in the presence of any inhalation injury or ARDS.

8.9.2.2. Barometric pressure changes include increased gastric distention and discomfort.

8.9.2.3. Humidity: Exacerbates fluid loss.

8.9.2.4. Vibration: May increase pain.

8.9.2.5. Thermal: Loss of natural insulation and skin integrity leaves the patient prone to hypothermia. Severity of the burn affects the autonomic temperature regulatory functions.

8.9.2.6. Fatigue: Exacerbates the patient's underlying condition.

8.9.3. Intra-theater triggers to activate burn flight team. Patients with significant burns, as defined by ABA criteria (<http://www.ameriburn.org>), benefit from prompt consultation with a burn surgeon and transport to a burn center (reference **Attachment 10**).

8.9.3.1. The treating physician initiates the PM process and contacts USAISR Burn Center designated representative. Governing PMRC assists the sending physician with appropriate recommendations for PM process. Physician-to-physician communication is vital in developing optimal movement plan for each patient. The USAISR Burn Center can be contacted at 210-222-2876 or DSN 312-429-2876.

8.9.3.2. Burn patients are validated for movement precedence in consultation with the VFS, USAISR Burn Center and referring privileged provider. If TRAC2ES is not available, direct contact with servicing PMRC is recommended to facilitate PM. The USAISR Burn Center provides the name of accepting burn surgeon. Delay or inability to contact the USAISR Burn Center directly does not delay processing of the PMR.

8.9.4. Burns: Preflight/in-flight considerations.

8.9.4.1. Airway: Anticipate possible airway/trachea edema. If clinically indicated, secure airway early with the largest endotracheal tube possible prior to transport.

8.9.4.1.1. Signs and symptoms of inhalation injury. **Note:** Inhalation injuries are at high risk for rapid airway obstruction.

8.9.4.1.1.1. Nasal/mucosal charring, burns and/or soot on face, in mouth and nose, carbonaceous sputum, and hoarseness.

8.9.4.1.1.2. Carbon monoxide poisoning symptoms include pink to cherry-red skin, tachycardia, tachypnea, headache, dizziness, and nausea; central nervous system (CNS) symptoms vary with carboxyhemoglobin level. **WARNING:** Pulse oximetry reading is not accurate in carbon monoxide poisoning.

8.9.4.1.2. Evaluate individuals involved in blasts and/or confined in a burning environment for airway compromise. **Note:** Onset may be delayed, and other injuries may not be apparent.

8.9.4.1.3. Secure tubes with ties or suture rather than tape. Tape does not secure well on burned skin and increases risk of endotracheal tube dislodgement. Important to reassess endotracheal tube placement every hour for the first 24-48 hours as edema forms and resolves.

8.9.4.1.4. If non-vented, administer high flow O<sub>2</sub> via humidifier bottles in-flight to provide cool mist and maintain pulse oximetry greater than 92% or as directed by VFS.

8.9.4.1.5. Patients with known or suspected inhalation injury may require specialized mechanical ventilation.

8.9.4.2. For patients with burns 20% TBSA or more, excluding first-degree burns, consider placing an IV, NG/OG tube, and foley catheter for all phases of AE.

8.9.5. Burns: Fluid loss and IVF resuscitation.

8.9.5.1. IV access via two large bore (18 gauge or larger), if needed. Consider central venous access if the patient undergoes fluid resuscitation prior to transport.

8.9.5.2. First 24 Hours:

8.9.5.2.1. IVF resuscitation is performed for patients whose burn size is greater than or equal to 20% TBSA. Lactated Ringers (LR) is the preferred fluid for resuscitation. The goal of initial fluid resuscitation is to restore and maintain adequate tissue perfusion and vital organ function, in addition to preserving heat-injured but viable tissue. Fluid needs are based on the size of the patient and the extent of the burn.

8.9.5.2.2. The 'Rule of 10s' offers a simplified method of estimating initial fluid rate for thermal injuries and provides values generally between those calculated by the Modified Brooke Formula and Parkland formula. The Rule of 10s is as follows: Initiate fluid resuscitation using the Rule of 10s (10 mL/hour x % TBSA) for patients. The Rule of 10s is applied for patients weighing between 40 and 80 kilograms (kg). For patients weighing more than 80 kg, add 100 ml/hour to LR rate for each 10 kg >80 kg.

8.9.5.2.3. Clinical indicators for adequacy of fluid resuscitation are: Clear sensorium, heart rate < or equal to 120/minute (min), Mean Arterial Pressure (MAP) > or equal to 55 mmHg, strong peripheral pulses, serum and electrolytes within normal limits and the absence of metabolic acidosis.

8.9.5.3. Urinary output: Determines the adequacy of renal perfusion and fluid resuscitation.

8.9.5.3.1. The primary target for resuscitation is to maintain adequate UOP of 30-50 ml/hr in adults. Titrate fluid up or down approximately 20% every hour to achieve this goal. Document on the "Burn Flow Sheet" hourly. **Note:** Over resuscitation may cause more harm than periods of under-resuscitation. Examples of such harm are abdominal and extremity compartment syndromes. Thus UOP < 30 ml/hr is tolerated if crystalloid infusion rates are persistently high (>1L/hr) and adjuncts to crystalloid infusion are unsuccessful (e.g., colloid infusion).

8.9.5.3.2. With electrical burns, urine may be rusty red in color, indicating myoglobinuria. If this occurs, then maintain an output of 75-100 ml/hour.

8.9.5.3.3. In children less than 30 kg, hourly UOP is maintained at 1ml/kg/hour.

8.9.6. Burn dressings:

8.9.6.1. Ensure burns are dressed with clean, dry, non-constrictive, bulky dressings. Normally, dressings are not changed in-flight. Common dressings applied are:

8.9.6.1.1. Silverlon - Used on partial thickness to full thickness burns. This is a synthetic non-adherent dressing impregnated with silver that is applied to an open wound to prevent infection. This is moistened with sterile water prior to application to

activate the silver properties. Dressings are moistened with sterile water every 6 hours to keep moist.

8.9.6.1.2. Sulfamylon 5% solution - Used on partial thickness to full thickness burns. It prevents infection from gram negative and gram-positive bacteria. May cause pain upon application to partial thickness burns. This dressing also requires wet downs with the Sulfamylon 5% solution every 6 hours.

8.9.6.1.3. Bacitracin - Limited antimicrobial properties but easy to apply. Used for superficial burns.

8.9.6.1.4. Silver dressings are preferred for long range transport to minimize dressing changes.

8.9.6.2. Patient may see negative pressure wound dressings.

8.9.7. Cardiac monitoring: For patients with cardiac history, hypertension, electrical burns, and patients over 50 years of age.

8.9.8. Circulation checks: All extremities. Monitor peripheral pulses Q1hr for electrical, circumferential burns and those burns >20% TBSA. May require Doppler (difficult to hear on aircraft) and may have escharotomy or fasciotomy. If the pulse is undetectable, the AECM notifies C2 who then contacts the governing PMRC.

8.9.9. Mental status: Key indicator of hypoxia and cardiovascular stability. Perform neurological assessments frequently.

8.9.10. Temperature control: Patients with extensive burns are extremely prone to hypothermia. Monitor temperature and maintain a high temperature in the cabin, if possible. The AECM can speak with the PIC and or the Loadmaster/Boom Operator whenever patients are on board and the ambient temperature exceeds a comfortable level. **Note:** May cover patient with first aid thermal blanket (e.g., space blanket), clean blankets or sleeping bags for temperature control.

8.9.11. Positioning and exercise.

8.9.11.1. Essential to promote circulation and provide comfort. Prevents contractures, pressure sores, thrombosis, and conversion of burns.

8.9.11.2. Maintain the position of function (e.g., hands, joints, and feet).

8.9.11.2.1. Elevate upper torso: Assists cerebral venous return, slows down edema formation, and assists respiratory functions by offloading the diaphragm.

8.9.11.2.2. Elevate burned extremities: Reduces edema, increases venous return, and reduces pain.

8.9.11.3. Consider pain medication prior to ROM exercise or changing positions.

8.9.11.4. Perform ROM exercises according to provider's orders.

8.9.12. Narcotics/analgesics.

8.9.12.1. Used for both sedation and pain relief. Administered as ordered by the physician. Do not give supplemental acetaminophen (Tylenol) with oral narcotics containing acetaminophen (e.g., Percocet) as this may lead to toxicity risks.

8.9.12.2. Consider using continuous IV pain medication and sedation during transport.

8.9.12.3. IV pain medications may be administered by the AECM in accordance with the AE Clinical Protocol - Pain Management.

8.9.13. The Burn Flight Team may internally feed critically ill patients during flight if previous tube feedings were established. Patient may have an NG/OG tube inserted prior to flight for medication administration and possible gastric decompression.

8.9.14. Eye drops/ointment/lacri-lube/antibiotics are frequently given to these patients.

## **8.10. Hematological and Endocrine Management.**

8.10.1. Blood dyscrasia. Affects one or more of the blood components, the bone marrow, or the entire blood system. It can be acute or chronic, acquired, or congenital. Seen in chemotherapy, post-transplant, post-trauma, renal and liver disease.

8.10.2. Stresses of flight affecting patients with hematological disorders.

8.10.2.1. Decreased partial pressure of oxygen: Exacerbates the body's decreased oxygen transport capability in the blood leading to hypoxia and cardiac decompensation.

8.10.2.2. Thermal: Hot and cold temperatures increase the body's oxygen requirements.

8.10.2.3. Decreased humidity: Dehydration causes headaches and decreases blood volume.

8.10.2.4. Fatigue: Complicates the underlying pathology.

8.10.3. Red blood cells (RBCs): The efficiency of RBCs depends on the quantity and quality of the hemoglobin it contains. Normal Hgb concentration is 14-16 grams (g)/deciliter (dL) and varies with the patient's gender and age.

8.10.3.1. Patients with Hgb below 8.0 mg may be transported if the condition is chronic and stable, and not related to bleeding. Patients with a hematocrit (HCT) below 25% are not airlifted without concurrence of the VFS. Low flow O<sub>2</sub> is used continuously on patients with extremely low Hgb or HCT levels, as in dialysis and chemotherapy patients. A cabin altitude restriction below 5,000 ft. may be ordered by the VFS (reference [Table 8.2](#)).

8.10.3.2. Types of anemia.

8.10.3.2.1. Hemolytic: Destruction of erythrocytes caused by bacteria, parasites, venom, transfusions, chemicals, and genetics (thalassemia and sickle cell). Sickle cell crisis can occur at cabin altitudes as low as 4000 ft.

8.10.3.2.2. Aplastic: Failure of the bone marrow to produce erythrocytes due to chemicals, medications, and disease.

8.10.4. White blood cells (WBCs or leukocytes): The main function of leukocytes is to isolate areas of inflammation or infection.

8.10.4.1. Normal adult blood contains 5,000 - 10,000 WBC's per cubic millimeter of whole blood.

8.10.4.2. Leukocyte disorders. Caused by abnormal WBCs (too few, too many or abnormal morphology).



8.10.4.2.1. Monitor preflight absolute neutrophil count (ANC) and en route temperature. ANC below 1,000 is considered neutropenic and at risk for infection; below 500 is a severe risk for infection and for flight. Monitor temperature every four hours. Temperature above 100.4 F is considered significant; above 101.0 F requires communication. The AECM notifies C2 who then contacts the governing PMRC.

8.10.4.2.2. Use good hand washing, protective isolation with the patient wearing a N95 or surgical mask.

8.10.4.2.3. Dietary considerations:

8.10.4.2.3.1. Avoid all fresh/uncooked fruits, nuts, and vegetables, including all fresh garnishes, raw or rare-cooked meat, fish, and eggs. All eggs are thoroughly cooked. Avoid yogurt and yogurt products with live and active cultures.

8.10.4.2.3.2. All canned, bottled, and powdered beverages and sports drinks are OK. Brewed coffee and tea are acceptable.

8.10.5. Platelets (thrombocytes).

8.10.5.1. Normal platelet count is greater than 150,000/cubic millimeter.

8.10.5.2. Thrombocytopenia: Observe for bruising, uncontrolled bleeding, petechiae, hematuria, hematomas, and GI bleeding. Avoid aspirin and other platelet inhibiting medications.

8.10.6. Preflight/in-flight nursing care for blood dyscrasias.

8.10.6.1. Oxygen administration as needed (reference AE Clinical Protocol – Emergency Oxygen). **Note:** These parameters are based on Hgb because HCT may be decreased or elevated in dehydration or fluid overload.

8.10.6.2. Litter with backrest.

8.10.6.3. Offer blankets; patients with anemia tend to have a greater sensitivity to cold.

8.10.6.4. Offer fluids often to avoid headaches and decreased blood volume.

8.10.6.5. Administer blood products, as ordered. AF Form 1225, *Informed Consent for Blood Transfusion*, signed if feasible.

8.10.6.6. Use standard and transmission-based precautions.

8.10.7. Diabetes Mellitus (DM). A condition in which the pancreas no longer produces enough insulin, or cells stop responding to the insulin produced, thus presenting glucose in the blood from absorbing into the cells of the body. Symptoms include frequent urination, excessive thirst, hunger, and lethargy.

8.10.7.1. Stresses of flight affecting patients with DM, hypoglycemia, and hyperglycemia.

8.10.7.1.1. Decreased partial pressure of oxygen: Diabetic retinopathy and peripheral vascular symptoms may be exacerbated.

8.10.7.1.2. Decreased humidity: Leads to dehydration.

8.10.7.1.3. Thermal: May contribute to poor circulation, exacerbating sensitivity.

8.10.7.1.4. Fatigue: May precipitate/exacerbate condition.

8.10.7.2. Preflight/in-flight considerations for DM.

8.10.7.2.1. Assess patient's knowledge of condition, symptoms, treatment, and dietary restrictions.

8.10.7.2.2. Determine time of last meal.

8.10.7.2.3. Type, time, and amount of hypoglycemic medication.

8.10.7.2.4. Assure medications and special diets are onboard and available.

8.10.7.2.5. Ensure meals and snacks are served on time.

8.10.7.2.6. There is no glucose monitor or chemical strips in the AE allowance standard. ERCC team may be able to assist with a glucose assessment in an emergency situation using approved equipment. Although glucose monitors are not included in the AE allowance standard, use of a glucose monitor approved for in-flight use is authorized.

8.10.7.2.7. MTFs at RON destinations provides patient education and approved AE glucose monitors. MTF's test approved glucose monitors prior to flight to ensure operation.

8.10.7.2.8. Blood glucose is checked prior to departure and/or at en route stops. If glucose monitoring may be required ensure an approved glucose monitor accompanies the patient in-flight. AECMs are prepared to assist patients and/or attendants in performing blood glucose.

8.10.7.2.9. If a patient presents with objective and/or subjective signs of hyperglycemia or hypoglycemia, assist the patient with obtaining a blood glucose reading, contact the PMRC, and take additional action as required.

8.10.7.3. Hyperglycemia. Hyperglycemia is defined as an abnormally high blood glucose level. Early symptoms of hyperglycemia include: Polydipsia, polyuria, fatigue, blurred vision, headache, and dry warm flushed skin.

8.10.7.3.1. Late symptoms of hyperglycemia include sweet breath, hypotension, nausea and vomiting, abdominal pain, dry mouth, weakness, shortness of breath, confusion, Kussmaul respiration and coma.

8.10.7.3.2. Treatment/management. Insulin, fluids, electrolyte replacement as directed by a privileged provider.

8.10.7.4. Hypoglycemia. Hypoglycemia is defined as a sub-therapeutic plasma glucose concentration exposing an individual to harm. The American Diabetes Association and the Endocrine Society Workgroup on Hypoglycemia published a clinical classification system for hypoglycemia in patients with diabetes mellitus. This classification system includes documented symptomatic hypoglycemic events and severe hypoglycemic events. The low-normal cut-off value for a diabetic's self-monitored blood glucose (SMBG) level has been debated; with the low normal value ranging from <63 mg/dl to <70mg/dl. However, a known diabetic with a SMBG level of <70 alerts the clinician to look for further signs and symptoms associated with hypoglycemia.

8.10.7.4.1. The sending facility provides known diabetic patients with a supply of simple and complex carbohydrates as these food items may not be available on the aircraft.

8.10.7.4.2. Symptomatic mild hypoglycemia signs and symptoms.

8.10.7.4.2.1. Plasma glucose concentration of <70 mg/dl (if available).

8.10.7.4.2.2. Early signs and symptoms include diaphoresis, tremors, pallor, tachycardia, palpitations, nervousness. Previous patient history is also valuable.

8.10.7.4.2.3. Later signs and symptoms include light-headedness, headache, irritability, slurred speech, and weakness.

8.10.7.4.3. Severe hypoglycemia signs and symptoms.

8.10.7.4.3.1. Classified as a severe event if it required the assistance of another person to initiate resuscitative actions for the diabetic patient.

8.10.7.4.3.2. Severe hypoglycemia can potentially be life-threatening and caused by an overdose of insulin, a reduction in diet or increased exercise without sufficient caloric intake.

8.10.7.4.3.3. Signs and symptoms include aggressive or unusual behavior, normal or rapid respirations, tachycardia, paleness, diaphoresis, headache, dizziness, fainting, disorientation, confusion, seizure, loss of gag reflex, and loss of consciousness.

8.10.7.4.3.4. If any signs or symptoms are present, immediately rule out hypoxia. Concurrently obtain VS, pulse oximetry, ascertain last meal and check a glucose level if possible.

8.10.7.4.3.5. For all known or suspected hypoglycemic events notify the VFS and AOC/AECT for guidance and possible diversion to a MTF capable of handling the situation.

8.10.7.4.4. Treatment/management (reference AE Clinical Protocol – Hypoglycemia Management).

8.10.7.4.5. Documentation includes subjective and objective data for giving the medication; VS, known allergies, date and time of administration and notification of a physician, and the outcome. The following statement is documented on the EHR or AF Form 3899 “(Insert name of drug) was administered in accordance with AE Clinical Protocol - Hypoglycemic Management.” Complete a JPSR worksheet or a DD Form 2852.

8.10.7.5. Diabetic ketoacidosis (DKA). DKA is an acute complication of diabetes mellitus (usually type I) characterized by hyperglycemia, ketonuria, acidosis and dehydration. An underlying infection is the most common cause.

8.10.7.5.1. Signs and symptoms include polydipsia, polyuria, fatigue, malaise, drowsiness anorexia, nausea and vomiting, abdominal pain and muscle cramps.

8.10.7.5.2. Late signs include Kussmaul (dep) respirations and fruity, sweet breath.

8.10.7.5.3. For suspected DKA event, notify the VFS and AOC/AECT for guidance and possible diversion to a MTF capable of handling the situation. IV fluids, IV insulin and electrolyte replacement per the VFS orders.

## 8.11. Decompression Sickness.

8.11.1. Caused by the evolution of free gas bubbles from the tissues and fluids of the body as a result of marked decreases in barometric pressure. Nitrogen, a metabolically inert gas, is primarily involved. Nitrogen behaves predictably according to Henry's Law (reference [paragraph 7.2.3](#)). It evolves in a manner similar to the formation of bubbles in a bottle of carbonated beverages when the cap is removed.

8.11.2. Stresses of flight affecting patients with decompression sickness.

8.11.2.1. Decreased partial pressure of oxygen: Exacerbates existing hypoxia.

8.11.2.2. Barometric pressure changes: Nitrogen escapes and exacerbates symptoms.

8.11.2.3. Noise, decreased humidity, thermal changes, vibration, and fatigue: Exacerbates underlying pathology.

8.11.3. Symptoms of decompression sickness. There is no regular sequence, and it is possible to exhibit various symptoms simultaneously.

8.11.3.1. Skin: Itching, tingling, cold or warm sensations, and occasionally a mottled rash referred to as the "Creeps."

8.11.3.2. Joints: Pain in or around the body joints referred to the "Bends." More commonly, the larger joints of the elbows, shoulders, knees, and ankles are involved.

8.11.3.3. Respiratory: Deep and sharp sub-sternal pain, dry progressive cough, and a feeling of suffocation referred to as the "Chokes."

8.11.3.4. CNS: Most dangerous includes muscular weakness, headache, visual impairment, speech difficulties, mental confusion, bowel and bladder dysfunction, paralysis, and coma referred as the "Staggers".

8.11.3.5. **Table 8.9** lists considerations for CNS-injured/Neurologic Disease/Comatose/Vented Patient.

8.11.4. Preflight/in-flight considerations for patients with decompression sickness.

8.11.4.1. Requires continuous 100% O<sub>2</sub> via a tight-fitting mask, unless otherwise ordered.

8.11.4.2. Requires destination field altitude as the cabin altitude restriction (recommended) en route.

8.11.4.3. Establish a large bore IV (18 gauge or larger) to maintain hydration.

8.11.4.4. The use of narcotics may mask CNS symptoms.

8.11.4.5. Specifically, for decompression sickness, immobilize joints and maintain complete bed rest, unless otherwise ordered. **WARNING:** Trendelenburg position increases cerebral edema and ischemia and is contraindicated.

8.11.5. Suspect if individual has been scuba diving within the last 24 hours or involved in a loss of cabin pressurization. Any individual experiencing symptoms during flight needs prompt treatment.

8.11.5.1. Immobilize the painful area.

8.11.5.2. Request a lower cabin altitude and the AECM notifies C2 who then contacts the governing PMRC.

8.11.5.3. Possible diversion to a MTF capable of handling the situation, as required.

8.11.5.4. Evaluation by a flight surgeon, even if the symptoms disappear during descent.

8.11.6. Patients en route to the hyperbaric (decompression) chamber may also include the following diagnoses; carbon monoxide poisoning, gas gangrene, or extensive wound infections.

## 8.12. Neurological Management.

8.12.1. Stresses of flight affecting neurological patients.

8.12.1.1. Decreased partial pressure of oxygen: Lower levels of O<sub>2</sub> causes brain cell and tissue ischemia. Brain cell ischemia produces cerebral edema which leads to increased ICP, then hypoventilation and further hypoxemia. **Note:** One hypoxic episode in the presence of traumatic brain injury may lead to a catastrophic secondary brain injury.

8.12.1.2. Barometric pressure changes: Penetrating head injuries, skull fractures and severe facial fractures may produce air in the cranium, causing increased ICP. The potential for ear block exists in those patients who have a decreased level of consciousness, inability to follow directions or a physical disability. Valsalva increases ICP. **Note:** A cabin altitude restriction minimizes the stresses of barometric pressure changes and decreased partial pressure of oxygen.

8.12.1.3. Vibration: May cause motion sickness and vomiting, thus increasing ICP.

8.12.1.4. Thermal Changes: A consideration for patients with hypothalamus involvement.

8.12.1.5. Decreased humidity: Dries the corneas of patients with decreased corneal/blink reflex, and possibly increase dehydration and headaches.

8.12.1.6. G-Forces: Takeoff may increase ICP and bleeding for litter patients or decrease cerebral blood flow to ambulatory patients. Litter patients are secured and padded on a backrest (if not contraindicated) with the head mid-line. **Note:** Physician determines head aft or forward litter positioning for flight.

8.12.2. Traumatic brain injury (TBI).

8.12.2.1. TBI mechanism of injury: Acceleration/deceleration, penetrating/non-penetrating forces from an explosion/over-pressurized blast wave (the speed of sound), fall, direct impact, or motor vehicle/aircraft crash. Penetrating TBI is typically identified and cared for immediately.

8.12.2.2. Types of TBI:

8.12.2.2.1. Closed head injury.

8.12.2.2.2. Skull fractures. **WARNING:** Do not use a BVM on patients with a skull fracture to correct ear block.

8.12.2.2.3. Hemorrhage (subdural and epidural hematomas).

8.12.2.3. Management and treatment of TBI. It is essential to complete a baseline preflight assessment, including pulse oximetry and neurologic checks.

8.12.3. Neurological checks (reference [Attachment 11](#)).

8.12.3.1. Immediate TBI signs/symptoms: Alteration in mental status typically resulting in the temporarily related onset of: Headache, nausea, vomiting, dizziness/balance, fatigue, insomnia/sleep disturbances, drowsiness, sensitivity to light/noise, blurred vision, difficulty remembering, and/or difficulty concentrating. **WARNING:** TBI may be missed, especially in the presence of other more obvious injuries such as heat or toxic injury, hypovolemic shock/dehydration, eye and spinal injury, and acute stress reactions.

8.12.3.2. GCS indicators - Moderate TBI = 9-13; Severe TBI = 3-8 (reference [paragraph 8.4.2.2.3](#)).

8.12.3.3. The treatment goals are to prevent the secondary brain injury and progressive damage from hypoxemia, hypotension, cerebral hypoxia and edema, and to recognize and to treat the early signs of intracranial hypertension or increasing ICP by maintaining an adequate airway, monitoring pupils, LOC and the GCS for sudden or subtle changes. Avoid hypoxia and maintain oxygen saturations >92% with prn oxygen via nasal cannula. Call C2 and the VFS if O2 saturations are <92%. Reference DoD Policy Guidance for Management of Mild TBI/Concussion in the deployed Setting and Management of patients with severe head injury and [Table 8.6](#)

**Table 8.6. Management and Treatment Considerations/Recommendations for TBI and Increased ICP.**

<b>Management of TBI</b>
Administer Tylenol as ordered for headache
<b>Note:</b> Tramadol, narcotics, non-steroidal anti-inflammatory drug, aspirin, or other platelet inhibitors are contra-indicated.
Elevate head to increase cerebral venous return
<b>WARNING:</b> Concomitant thoracic or lumbar fractures are transported flat.
Minimize cerebral venous blood volume
<b>WARNING:</b> Prevent endotracheal tube struggle, Valsalva, and overhydrating.
<b>WARNING:</b> Do not use NG tube on patients with skull or facial fractures.
<b>Management of Increased ICP</b>
If “MACE Red Flags” reference <a href="#">Table 8.6</a> (signs of increased ICP and <a href="#">paragraph 8.12.4.1</a> .)

Deliver high flow O <sub>2</sub> and rule out hypoxia and hypoglycemia
Maintain patent airway, adequate breathing and circulation, a pulse oximeter reading > 92% or as directed by VFS.
If ordered, implement hyperventilation if patient's pupil/pupils are dilated and nonreactive.  <b>WARNING:</b> Excessive hyperventilation/ hyper oxygenation to control increased ICP without ICP monitoring may have adverse results. Keep assisted breathing rate < 20/min. If situation occurs in flight, consider lower cabin altitude if operationally feasible. Notify C2 for guidance and possible diversion to a definitive care MTF (if required).
If ordered, initiation of hypertonic saline (3%), normal saline not greater than 100ml/hour (if not hypovolemic). May receive mannitol as ordered.
Document I&O
Drug-induced comas require an ERCC team and a ventilator.

#### 8.12.4. Intracranial pressure.

##### 8.12.4.1. Signs and symptoms increased ICP.

8.12.4.1.1. LOC is the most important indicator of brain function.

8.12.4.1.2. Elevated BP with a widening pulse pressure (the difference between systolic and diastolic).

8.12.4.1.3. Change in pupil size.

8.12.4.1.4. Tachycardia initially, followed by bradycardia as ICP increases.

8.12.4.1.5. Tachypnea (early) and then slowing with lengthening period of apnea.

8.12.4.1.6. Headache: Increasing intensity and may be aggravated with movement.

8.12.4.1.7. Vomiting, with or without nausea, may become projectile.

8.12.4.2. When ICP increases, the body attempts to perfuse the compressed brain tissue at all cost. Hypotension in head injured patients can be catastrophic because cerebral blood vessels cannot auto-regulate and therefore cannot constrict to preserve cerebral blood flow during hypotension. When autoregulation is lost, massive cerebral vasodilation occurs, and secondarily increases ICP. Monitor patient's ICP with an arterial line and ICP monitor (reference [Table 8.7](#)).

**Table 8.7. ICP and Cerebral Perfusion Pressure (CPP) Parameters.**

ICP (mmHg)	CPP (mmHg) = MAP-ICP
0-10 Normal	80-100 Average
> 15-18 Treat	60 Possible Brain Ischemia
> 40 Poor Prognosis	40 Irreversible Brain Ischemia
> 60 Probably Fatal	30 Neuronal Cell Death

#### 8.12.5. Cerebral perfusion pressure (CPP).

8.12.5.1. Pressure gradient that drives blood and nutrients into the brain. Normal range:  $CPP \geq 80\text{mmHg}$ . ( $CPP = MAP - ICP$ ).

8.12.5.2. Dependent upon: Automatic/auto-regulation dilation and constriction of the cerebral blood vessels to maintain constant blood flow despite fluctuations in the systemic blood pressure. Normal range: Systolic BP  $\geq 90\text{ mmHg}$ , ICP  $\leq 20\text{ mmHg}$ .

#### 8.12.6. Military Acute Concussion Evaluation (MACE).

8.12.6.1. Mandatory completion by sending MTF during the first 48 hours for all individuals involved in an explosion/blast, fall, blow to the head and/or motor vehicle/aircraft crash who were dazed, confused, “saw stars” or lost consciousness, even if momentarily (reference [Attachment 11](#)).

8.12.6.2. Casualties displaying any of the signs/symptoms in [Table 8.8](#) MACE - Red Flags are referred for additional medical evaluation as soon as operationally possible. If new symptoms occur before takeoff, the patient is not stable for flight, and needs to be cleared by a flight surgeon. Notify Theater PMRC, as soon as possible.

**Table 8.8. MACE - Red Flags.**

Double vision	Seizures
Breathing Difficulties	Slurred Speech
Headache that worsens	Unsteady on feet
Can't recognize people or places/Disorientation	Repeated vomiting
Can't be awakened easily	Weakness or numbness in arms/legs
Behaves unusually or seems confused/irritable	Progressively declining neurological exam

8.12.6.2.1. If symptoms manifest in-flight, start high flow O<sub>2</sub>; the AECM notifies C2 who then contacts the governing PMRC of any change in patient status or classification as soon as possible.

8.12.6.2.2. MACE scores below 25 may represent clinically neurocognitive impairment requiring further evaluation for a more serious brain injury.

#### 8.12.7. Spinal cord injuries.

8.12.7.1. The goal is to maintain spine stability and prevent further deterioration of the patient's neurological condition during transport. The VFS orders the appropriate stabilization device.

8.12.7.2. May exhibit signs of shock (reference [paragraph 8.8](#)). **Note:** Rule out TBI with all spinal cord injuries.

8.12.7.3. May be respiratory-compromised and require ventilator support: “C3, 4, and 5 keep the diaphragm alive;” and T2-8 innervates the intercostal muscles.

8.12.7.4. Disability and dependency is determined by level of injury.

#### 8.12.8. Cerebral vascular accident (CVA).



8.12.8.1. The disruption of cerebral blood supply from ischemia, thrombosis, embolism, or hemorrhage.

8.12.8.2. CVA assessment:

8.12.8.2.1. Obtain VS, GCS, pulse oximetry, cardiac rhythm, and temperature.

8.12.8.2.2. Signs and symptoms: Altered level of consciousness; sudden, severe headache; numbness, facial droop, weakness, or unilateral paraplegia; hemiparesis; slurred speech; dysphagia; aphasia; visual disturbance; and/or altered cognitive abilities. **Note:** First rule out TBI with diagnoses of CVA.

8.12.8.2.3. Check blood sugar if on the ground or if ERCC team is on board and treat if indicated.

8.12.8.3. CVA treatment and management: Reference AHA or equivalent, TNCC if available, and DHA/J7 Education and Training guidelines.

**Table 8.9. Considerations for CNS-injured/Neurologic Disease/Comatose/Vented Patient.**

Protect airway	If gag reflex diminished
Talk to patient	Hearing is last sense to go; orient to surroundings; explain procedures prior to performing; and touch patient while talking with them. May need to repeat information several times.
Prevent corneal abrasions	Artificial tears and steri-strip lids closed if corneal reflex absent.
Reposition patient if able	Every 2 hours reposition and massage area to prevent skin breakdown.
Passive ROM	Every 4 hours (if not contraindicated)
Oral hygiene	Every 2 hours
Assist with activities of daily living	Meals and toileting; MA may be required en route
Possible modalities	Tube feedings; Foley catheter; and/or external urinary catheter
Monitor	VS (with temperature); pulse oximetry; GCS; pupils, I&O

8.12.9. Seizures/Status epilepticus. This is a serious neurologic emergency. Status epilepticus has high morbidity and mortality (permanent brain damage/severe neurologic deficits). It is characterized by acute, prolonged, repetitive seizure activity or series of generalized seizures without return to consciousness between attacks. Factors precipitating status epilepticus in patients with pre-existing seizure disorder include medication withdrawal, fever, metabolic or environmental stresses, alcohol or drug withdrawal, and sleep deprivation. The stresses of flight are considered a potential precipitating factor. The

VFS and sending provider determines the need for an IV for patients with a diagnosis of seizure disorder.

8.12.9.1. Signs and symptoms.

8.12.9.1.1. Staring and subtle body movement.

8.12.9.1.2. Brief loss of awareness.

8.12.9.1.3. Stiffening of muscles especially the back, arms, and legs.

8.12.9.1.4. Rhythmic, jerking muscle movements, usually affecting the neck, face and arms or sudden brief jerks or twitches of the arms and legs.

8.12.9.1.5. Loss of muscle control, which may cause a sudden collapse or fall to the ground.

8.12.9.1.6. Loss of consciousness, body stiffening and shaking, and sometimes loss of bladder control or biting the tongue.

8.12.9.2. Classic signs.

8.12.9.2.1. The seizure lasts more than five minutes.

8.12.9.2.2. Breathing or consciousness does not return after the seizure stops.

8.12.9.2.3. A second seizure follows immediately.

8.12.9.3. Reference AE Clinical Protocol – Status Epilepticus for management and treatment.

8.12.9.4. Notify the TFVS and AOC/AECT for guidance and possible diversion to a MTF capable of handling the medical emergency.

8.12.9.5. Documentation in the EHR or AF Form 3899 of the use of the AECP includes the subjective and objective assessments leading up to, during, and post seizure activity and include:

8.12.9.6. A description of the seizure activity (body movement and presentation of tonic/clonic states).

8.12.9.6.1. Presence of a preceding aura.

8.12.9.6.2. Order of symptoms.

8.12.9.6.3. Position of the eyes (open or closed), pupil size changes (did they change together or individually).

8.12.9.6.4. Incontinence of urine or feces.

8.12.9.6.5. If there was a loss of consciousness and how long it lasted.

8.12.9.6.6. Observation of chewing of the mouth, biting the tongue and/or rolling of the eyes.

8.12.9.6.7. Skin appearance, clammy/flushed/ashen.

8.12.9.6.8. Compliance with medication regime (if known).

8.12.9.6.9. Complete set of vitals, date, and time of medication administration, and VFS notification.

8.12.9.6.10. Documentation of any medication administered in accordance with the AECP.

**Table 8.10. Seizure Precaution and Treatment.**

<b>Prior to Seizures</b>	
Maintain airway	Maintain adequate breathing and circulation (pulse oximetry >92% or as directed by VFS).
Maintain	Ordered medication regimen and patent IV (if clinically indicated).
Position near	Oxygen and suction.
Position away from	Windows near propellers/rhythmic flashes of light.
<b>During Seizures</b>	
Protect from injury	Assist to floor; recline the seat; do not restrain; position to side to prevent aspiration.
Prepare to	Suction; apply high flow O <sub>2</sub> ; and/or assist respirations. DO NOT attempt placing a bite block.
Observations to record	<ul style="list-style-type: none"> <li>- Assess for aura; rigidity superseded by jerks/ convulsions? When/where did this occur and in what order?</li> <li>- Did the body change position during the seizure?</li> <li>- Did you observe any chewing of the mouth, biting tongue and/or rolling of the eyes?</li> <li>- If the eyes were open, what did the pupils look like? Did they change in size? Together or individually?</li> <li>- What was the respiratory pattern?</li> <li>- What was the skin appearance? Flushed/ashen/clammy?</li> <li>- If unconscious, how much time elapsed before the patient regained consciousness?</li> <li>- Was the patient incontinent of urine or feces?</li> <li>- Did the patient sleep afterwards? If so, how long?</li> </ul>
<b>Treatment After Seizure (Postictal)</b>	
Maintain airway/breathing	Rule out hypoxia.

Litter	As needed.
Obtain VS, neurological assessment	Pulse oximetry and detailed neurological assessment.
Postictal Improving	<ul style="list-style-type: none"> <li>- Maintain seizure precautions and O2.</li> <li>- Decrease stimuli as much as possible.</li> <li>- Minimize the situation if patient has chronic seizure history.</li> <li>- Provide support, reassurance, and comfort</li> <li>.</li> </ul>

### 8.13. Musculo-Skeletal System/Wound Disorders/Injuries.

8.13.1. Stresses of flight affecting patients with musculo-skeletal and wound disorders/injuries.

8.13.1.1. Decreased partial pressure of oxygen: Exacerbates the effects of hemorrhage, shock, and low H&H.

8.13.1.2. Barometric pressure changes: May contribute to compartment syndrome if patient is in a circumferential cast or resultant condition causes extremity hypo-perfusion.

8.13.1.3. Vibration: Severe jarring may affect alignment and/or positioning of unstabilized fractures. Vibration alone can increase pain at fracture sites.

8.13.1.4. Humidity: May lead to dehydration predisposing individuals to VTEs and may also cause skin dryness over time, leading to itching under cast.

8.13.1.5. Thermal: Changes of temperature may compromise circulation and increase pain; patient can sweat under cast/dressings on the flight line and then become cold at altitude.

8.13.2. Preflight/in-flight considerations.

8.13.2.1. Neurovascular assessment: Compare to unaffected extremity. Important to obtain a baseline assessment prior to flight to recognize changes during flight. Sensation: Compare to peripheral nerve block side to unaffected side. Assess level of epidural effectiveness, utilizing the dermatome map in [Figure 8.1](#)

8.13.2.2. Peripheral pulse qualities (proximal/distal to injury). Presence does not rule out injury; re-assess frequently and compare to unaffected extremity.

8.13.2.3. Capillary refill less than two seconds is normal. Can be hard to assess in dark/shadows, affected by extremity temperature, staining of extremity with blood/prep solutions.

8.13.2.4. Presence of edema. Remove constricting items above and below the injury (rings and watches, tight clothing, tight dressings/splints; casts are bivalved unless contraindicated).

8.13.2.5. Color and temperature. Affected by ambient temperature, therapeutic cooling, Peripheral Nerve Block (PNB)/epidural catheter.

8.13.2.6. Motor function. Affected by PNB/epidural catheter.

8.13.2.7. Reassess after position change and immobilization.

8.13.2.8. Instruct the patient to report any pain and motor sensory changes (tingling, numbness, weakness, increasing pain).

8.13.2.9. External fixators: pin care is completed during preflight. Fixators may be handled/manipulated by medical care personnel (nursing care/transportation/wound care) and used to transmit traction to affected limb in select situations (skeletal traction). Fixators may also be suspended from fixed devices in select situations (preparation for surgery or edema control).

### 8.13.3. Considerations for orthopedic and soft tissue injuries.

8.13.3.1. Ensure skin integrity remains intact.

8.13.3.2. Maintain injured extremity/fracture immobility to control bleeding, maintain circulation, and to prevent fat embolism.

8.13.3.3. Maintain traction if applicable. **WARNING:** Do not use free hanging weights in-flight. **WARNING:** Stagnant positions for extended periods of time, and/or injury and infection may lead to a VTE or a blood clot deep in the tissues of the calves or groin. Thrombosis prophylaxis is part of preflight assessment. Ensure stability when using the following equipment

8.13.3.3.1. Stryker ® frame.

8.13.3.3.2. HALO/external fixation.

8.13.3.3.3. C-Collar, backboard, vacuum spine board or other non-shifting medium.

8.13.3.3.4. Hare, Sager, Kendrick traction devices and Thomas splints.

8.13.4. Compartment syndrome: The compromise of muscle viability due to swelling of or bleeding into tissues encased within the fascial sheath of an extremity. Resultant pressure change in the extremity blocks venous outflow and subsequent “backup” of blood flow, ultimately preventing arterial inflow. Associated with open/closed fractures, external fixation/skeletal devices, compression/crushing injuries or constrictive bandages/casts, vascular injuries, burns. Can occur in upper and lower extremity injuries. **WARNING:** This is a limb-threatening emergency.

8.13.4.1. Assess for signs and symptoms: Classic signs of edema, pulselessness, pallor, paresthesia, or sensory deficit with late signs of paralysis and cyanosis. Severe unremitting pain, pain on passive stretch of muscle or pain that is out of proportion to what is expected by the provider and compartment firmness are earliest signs. Compartment pressure measurement with invasive needle device is not required for diagnosis but can be used by physicians in obtunded/sedated patients.

### 8.13.4.2. Treatment and Management.

8.13.4.2.1. Remove constrictive dressings. Consider bivalving prior to leaving the MTF if cast is less than 48 hours old unless otherwise ordered by sending physician or VFS (reference [paragraph 8.5.2](#)).

8.13.4.2.2. Maintain extremity at heart level. Neither elevation nor dependency of the extremity has been shown to benefit. Do not elevate extremity above the level of the heart.

- 8.13.4.2.3. Administer pain medication after assessment. **WARNING:** Frequently assess adequacy of pain control measures. Pain medicine is often inadequate to control the symptoms of CS, and even when successful, could potentially hide the emergent nature of the problem. This is a surgical emergency. The measures listed here are of potential benefit in an impending compartment syndrome, but once established these patients need fasciotomy. The AECM notifies C2 who then contacts the governing PMRC to consider diversion to a location where surgical care is available.
- 8.13.5. Amputation: Control bleeding and pain. Assess dressings. Amputation stumps are prone to swelling, causing initially adequate dressings to become compressive. If the limb has been fitted with a prosthesis, the socket or sleeve may become too tight or loose and require removal.
- 8.13.6. Pelvic fractures: Complete bed rest. May have external fixation devices. Assess VS and assess distal pulses regularly. Extensive blood loss and internal vascular injuries are associated with pelvic fractures. PE/VTE prophylaxis is essential (reference [paragraph 8.6](#)).
- 8.13.7. Application of splints or wraps:
- 8.13.7.1. Proper splint placement: Splint the joint above and the joint below the injury (Do not splint the shoulder when splinting an elbow and do not splint the hip when splinting the knee).
  - 8.13.7.2. Proper alignment: In the position of function/comfort as long as distal perfusion and neurological exam unchanged.
  - 8.13.7.3. Security of splint/ace. Re-wrap if too tight or too loose.
  - 8.13.7.4. Air splints: **WARNING:** Air expands at altitude. Requires close observation and adjustments during ascent, at altitude and descent, and are not be used in-flight if alternate splinting devices are available.
  - 8.13.7.5. Positioning and alignment.
    - 8.13.7.5.1. Reposition every two hours with pillows.
    - 8.13.7.5.2. Pad and elevate extremities. **WARNING:** Do not tie extremities to any portion of the aircraft to maintain elevation.
  - 8.13.7.6. ROM exercises.
  - 8.13.7.7. Avoid resting extremities on the bulkhead or the interior of the aircraft due to effects of vibration.
  - 8.13.7.8. Spica casts require two litter spaces (these are now rare, usually confined to pediatric patients, special attention to toileting needs is required).
  - 8.13.7.9. Mobility impaired ambulatory patients are not seated near emergency exits.

## 8.14. Wound Management.

- 8.14.1. Provider's orders for all wound management include frequency of dressing changes and type of wound care, including surgical debridement.
- 8.14.2. All combat wounds are considered contaminated and may not be closed initially.

8.14.3. Note type and amount of drainage on dressings. Do not change dressings, reinforce only, on the aircraft.

8.14.4. Any wound associated with a fracture is managed as if it was an open fracture and treatment is started within eight hours. This includes debridement, when appropriate, and IV antibiotics prior to and during flight.

8.14.5. Monitor for increased temperature. Note presence of drains (note amount, color, and location).

8.14.6. Control bleeding with direct pressure, elevation, and pressure points. If that is not effective, a tourniquet or Quick Clot may be used if available. **Note:** The Aircraft First Aid Kit contains a tourniquet and Quick Clot. Monitor BP closely in actively bleeding patients. The AECM notifies C2 who then contacts the governing PMRC of any change in patient status or classification as soon as possible.

8.14.7. Pain medication, as ordered. Frequently assess adequacy of pain control measures. Avoid over-sedation and nausea, especially in supine patients.

8.14.8. Wound drainage tubes (Jackson-Pratt [JP], T-tube, Hemovac etc.).

8.14.8.1. Assess insertion site and assure suction is maintained at altitude, if indicated.

8.14.8.2. Document I&O.

8.14.8.3. Use standard precautions for disposal of blood and body fluids.

8.14.9. Negative-pressure wound therapy (NPWT).

8.14.9.1. NPWT systems are generally indicated for the management of wounds, burns, ulcers, flaps, and grafts. NPWT applies negative pressure to the wound to remove fluids, including wound exudates, irrigation fluids, and infectious materials. Benefits of NPWT include augmented wound granulation, wound contraction, improved control of wound exudates, decreased wound edema, reduced skin maceration, and improved pain management.

8.14.9.2. NPWT is contraindicated in the presence of exposed anastomotic sites, exposed vasculature, exposed nerves, exposed organs, necrotic tissue with eschar present, untreated osteomyelitis, non-enteric and unexplored fistulas, and malignancy in the wound. Also, carefully consider the use of this therapy in patients with certain risk factors, including those with a high risk for bleeding and hemorrhage, and those receiving anticoagulants or platelet aggregation inhibitors.

8.14.9.3. Do not continue therapy in-flight if problems occur on the ground preflight.

8.14.9.4. Assess patient comfort and system functioning every two hours in-flight.

8.14.9.4.1. Be vigilant for potentially rare life-threatening bleeding complications.

8.14.9.4.2. NPWT is not be interrupted for greater than two hours within a 24-hour period due to the potential for infection.

8.14.9.4.3. Assess proper function by examining for alarms on the pump unit and inspecting the dressing. The dressing for a properly functioning system has a “raisin-skin” appearance.

8.14.9.4.4. **WARNING** : The NPWT may cease effective pressure if the occlusive dressing is not sealed. Occlusive reinforcement may need to be applied.

8.14.9.4.5. For non-correctable NPWT system failures in-flight, the overlying occlusive film is opened by making two to three slits into the film to allow for wound drainage. DO NOT remove the occlusive film or the sponge inside the wound for risk of bleeding or wound contamination. A dry dressing is then applied over the site and reinforced as needed. Report wound vacuum system failure and actions taken to receiving facility during hand off for follow-on care. Complete a JPSR worksheet or DD Form 2852 and notify C2 at end of mission. **WARNING:** Do not interchange different types of NPWT devices and dressings. Other suction units may not provide adequate and consistent suction thereby increasing risk of infection.

8.14.9.4.6. Extra NPWT canisters are available in the event the current ones become full or cracked. **Note:** This guidance is for use in-flight if a full system failure occur. If NPWT system failure occurs while on the ground, at originating station, or during en route stops contact the appropriate TPMRC.

8.14.9.5. Document amount of drainage from the NPWT canisters.

## 8.15. Medical Devices.

8.15.1. Special considerations are made to ensure extremities and devices are not impeding egress of the aisles and exits.

8.15.2. Casts. Casts are bivalved if tissue edema and vascular compromise is possible, or if cast restricts emergency egress. Cast cutters are not available in-flight. If casts are not to be bivalved, specific orders “*Do not Bivalve for flight*” are written on proper documentation.

8.15.2.1. If the cast is over a surgical wound site, “window” the cast to allow for tissue expansion. Always replace the “window” in the cast after assessment to prevent focal edema through the window.

8.15.2.2. Assess cast for: Proper drying, cracks, rough edges, drainage, and bleeding (outline, date and time site), foul odor, and pressure points.

8.15.2.3. Perform circulation and neurovascular checks prior to flight. If abnormal, contact the MTF to bivalve the cast or loosen the bivalved cast. Cast padding can be cut on both sides with scissors to further reduce compression if necessary, without compromising immobilization.

8.15.2.4. Patients with crutches or full leg casts, or whose condition prevents them from using seats, are classified, and transported as litter patients. The AECM is final authority on whether patients are enplaned via litter. **Note:** Crutches and canes accompany patients who require such items.

8.15.3. The Stryker® Wedge Turning Frame 965 Military Option (reference AFMAN 10-2909 and the AE Medical Equipment Compendium).

8.15.4. Vacuum spine board (VSB).

8.15.4.1. Purpose is to provide full body immobilization for suspected spine, pelvic, hip fractures, and patients with multiple fractures.



- 8.15.4.1.1. VFS provides appropriate documentation requesting use of VSB and have ERCC team assigned to patient.
- 8.15.4.1.2. Originating facilities are responsible for assisting ERCC team with putting the patient on the VSB.
- 8.15.4.1.3. Always use a cervical collar (C-Collar), in conjunction with the VSB, if C-Spine injury is suspected.
- 8.15.4.1.4. Patients requiring spinal traction, or lying prone position, are transported on a Stryker not with a VSB.
- 8.15.4.1.5. VFS considers if patient needs VSB or can be transported in C-Collar on NATO litter with AE mattress.
- 8.15.4.1.6. Preventative measures are taken to protect the occiput, back, coccyx and heels.
- 8.15.4.1.7. If total transport time is anticipated to be greater than 10 hours, open the VSB valves every 2 hours, release straps, safely adjust the position (ensuring appropriate alignment is maintained), to ensure adequate time for relief of pressure points. **Note:** If contraindicated, a credentialed provider writes an order not to deflate the VSB and adjust the position of the patient. Documentation includes why deflation of the VSB, and re-positioning was not completed.
- 8.15.4.1.8. Conduct thorough skin assessment prior to placing on VSB and ensure documented on the EHR or AF Form 3899.
- 8.15.4.2. In-flight nursing considerations for the VSB.
  - 8.15.4.2.1. The black litter mattress is placed on the NATO litter and the VSB on top of mattress. Ensure the hand pump accompanies the patient.
  - 8.15.4.2.2. Patient are not be transported without use of a NATO litter/Over-Sized Litter and AE mattress.
  - 8.15.4.2.3. Apply straps in accordance with AE Medical Equipment Compendium and the ERCC Team.
  - 8.15.4.2.4. Do not retighten chest or abdominal straps after suction applied, as over tightening may restrict chest wall movement and affect breathing.
  - 8.15.4.2.5. Patients are repositioned every two hours unless otherwise ordered and documented. Turn schedule is documented on the EHR or AF Form 3899. AECMs are responsible for assisting with turning/repositioning patient with ERCC team members. The AECM coordinates turn schedule and any special requirements with ERCC team physician.
  - 8.15.4.2.6. Monitor occiput, back, coccyx and heels for signs of skin breakdown.
  - 8.15.4.2.7. Monitor patient temperature regularly as part of VS assessment. **Note:** VSB may retain heat and cause elevated temperature.
  - 8.15.4.2.8. Optimally maintain respiratory and hemodynamic parameters.
  - 8.15.4.2.9. Ensure gastric decompression (as required).

8.15.4.2.9.1. Ensure suction is easily accessible in all phases of transport.

8.15.4.2.9.2. If patient vomits, if able, tilt the litter by lowering the stanchion/straps on one side.

8.15.4.2.10. Assess for pain, tenderness, sensation (dermatome level) with VS and document on the EHR or AF Form 3899.

8.15.4.3. VSB deplaning considerations.

8.15.4.3.1. Brief deplaning procedures: Ensure VSB straps and all litter straps are secure.

8.15.4.3.2. Ensure IV tubing, urinary catheter tubing and collection bag are secure.

8.15.4.3.3. Patient are in supine position for landing and ground transport.

8.15.4.3.4. Deplane patient, using (minimum) four person carry ensuring all personnel are briefed in proper lifting and carrying techniques.

8.15.4.3.5. Ensure documentation of post-flight skin condition documented on the EHR or AF Form 3899.

8.15.4.4. VSB cleaning.

8.15.4.4.1. Ensure VSB valve is closed. Use normal detergents/cleaners to disinfect. May hose off/wipe down with cold water if soiled.

8.15.4.4.2. All straps are removable for cleaning in washing machine. Follow manufacturer instructions.

**8.16. Eyes, Ears, Nose, and Maxillofacial Management.**

8.16.1. Eyes.

8.16.1.1. Stresses of flight.

8.16.1.1.1. Decreased Partial Pressure of Oxygen: May cause increased intraocular pressure and vasodilatation due to hypoxia and may aggravate retinal hemorrhage, detached retina, and glaucoma.

8.16.1.1.2. Barometric pressure changes: Causes increased pressure with pain and reduced blood flow to the eye. Post-op eye surgery patients may have trapped air in the globe; certain gases used in surgery may persist three to nine weeks. A closed penetrating eye injury may also have trapped air in the globe; air normally is reabsorbed in three days. Expanding air at altitude may lead to increased pressure, pain and/or extrusion of eye contents.

8.16.1.1.3. Decreased humidity: Excessive drying of the eyes leads to corneal irritation and abrasions of the sclera, especially in comatose patients or patients whose eyes do not completely close.

8.16.1.1.4. Vibration/thermal/turbulence: Leads to motion sickness, vomiting, and increased intraocular pressure and pain.

8.16.1.2. Preflight/in-flight considerations.

8.16.1.2.1. Chemical Injuries.

8.16.1.2.1.1. Immediately begin copious irrigation with NS or balanced salt solution.

8.16.1.2.1.2. Assess extent of visual impairment/in-flight risks.

8.16.1.2.1.3. Shield and transport.

8.16.1.2.2. Traumatic Injuries.

8.16.1.2.2.1. Avoid any maneuver that places pressure on the globe. Do not place any dressing under the shield or that touches the eye. Do not place a head wrap over an unshielded eye.

8.16.1.2.2.2. Shield with a rigid eye shield or an alternative such as a cup, the casualty's eye armor or other device that does not place pressure on the globe.

8.16.1.2.2.3. Do not attempt to open the eye. Do not remove foreign bodies. Do not use topical anesthetics. Shield and transport.

8.16.1.2.3. Suspect air in the globe with recent surgery and penetrating eye injuries (may also have associated facial trauma/burns and head and C-Spine injuries).

8.16.1.2.4. Post-op eye surgery patients are cleared by an ophthalmologist prior to flight. **Note:** O2 requirements needed during flight are ordered by the ophthalmologist, or the VFS, if the ophthalmologist is not available.

8.16.1.2.5. Successful outcomes for penetrating eye injuries with documented air in the globe are highly dependent on rapid transportation to specialized care. Maintain the cabin altitude restriction which may be ordered by the VFS. **Note:** Flying at lower altitudes may decrease speed and increase fuel consumption; however, rapid transportation to definitive care takes precedence.

8.16.1.2.6. Hyphema or blood in the anterior chamber may re-bleed two to seven days post-injury. Re-bleeding may cause pain and substantial visual disability or blindness.

8.16.1.2.7. Medication: Is ordered on the appropriate patient treatment form and provided by the originating MTF. Prescribed eye drops may affect vision.

8.16.1.2.8. Patients with suspected bacterial or viral eye infections do not have eye patches.

8.16.1.2.9. Patients with a severe detached retina or penetrating injury are on complete bed rest on a litter with the head immobilized, bilateral eye patches, and O2 in-flight. **Note:** Signs and symptoms of detached retina: Light flashes, floating black spots, curtain-like narrowing of peripheral vision.

8.16.1.2.10. If vision worsens or pain and drowsiness develop en route:

8.16.1.2.10.1. Assess oxygenation. Administer high flow O2 and call C2.

8.16.1.2.10.2. The AECM notifies C2 who then contacts the governing PMRC for guidance and possible diversion to a MTF capable of handling the situation, as required.

8.16.1.2.11. May have diminished corneal/blink reflex: Use artificial tears as often as needed.

8.16.1.2.12. Consider a preflight antiemetic for motion sickness.

8.16.1.2.13. May ambulate during enplaning/deplaning with assistance, if not contraindicated.

8.16.1.2.14. Position in seats away from emergency exits, near an able-bodied individual, inboard, with the good eye toward the aisle. Positioning is the same for the blind patient.

8.16.1.2.15. Consider administering preflight nasal decongestant to prevent ear block. Prevention of ear block starts at originating MTF. Evaluate risk for ear block. Brief patients on signs and symptoms, as well as techniques to prevent potential ear block (if not contraindicated), and to notify AECM immediately if difficulty in clearing ears occurs. **Note:** Blast victims are evaluated and treated for possible infection and trapped air following ruptured tympanic membranes; tape dressing to absorb blood and fluid from the external ear canal, and monitor to ensure it does not block or enter the external canal. **WARNING:** Valsalva is not performed by patients with acute eye injuries, post-op eye surgery, glaucoma, detached retina, hyphema. These patients are evaluated by a flight surgeon prior to flight and have decongestants available.

8.16.1.2.16. Information for patients with vision impairment.

8.16.1.2.16.1. Noise may be excessive and unfamiliar.

8.16.1.2.16.2. Instruct on clearing of ears on descent.

8.16.1.2.16.3. Provide assistance and preplan for emergencies by assigning an able-bodied individual or AECM.

8.16.1.2.16.4. Provide information on scheduled meal plan, lavatory location, destination and, estimated time of arrival information, as well as how to notify an AECM if needed.

8.16.1.2.16.5. Assist with meals, restroom, ambulating as necessary.

8.16.1.2.16.6. Seeing eye dogs. Patient may have a service animal (reference [paragraph 10.16](#)).

8.16.2. Ears.

8.16.2.1. Stresses of flight.

8.16.2.1.1. Barometric pressure changes: Gas expansion or contraction affects the middle ear when pressure in the air-filled cavities does not equalize with the cabin pressure. Equalization depends on the patency of the eustachian tube. During ascent, pressure is normally passively vented. During descent, the eustachian tube needs active “opening” as the pressure becomes negative.

8.16.2.1.2. Noise: Exposure for even a short period of time can lead to tinnitus, mild to severe pain, fatigue, and temporary to permanent hearing loss. Position away from high noise areas of aircraft and provide ear protection.

#### 8.16.2.2. Preflight/in-flight considerations.

8.16.2.2.1. Ear block. Potential patients at risk are: Upper respiratory infections (URI), sinus infections, allergies, otitis media, on high-flow O<sub>2</sub>, facial injury, nasal packing, infants, post-ears-nose-throat (ENT) surgery, difficulty swallowing, language barriers, unconscious/comatose patients.

8.16.2.2.2. Prevention techniques. The following may help prevent ear blocks on descent: Swallowing, yawning, moving jaw from side to side, chewing gum, Toynbee maneuver (swallowing water with the nostrils closed), valsalva (the action of attempting to exhale with the nostrils and mouth or the glottis, closed). This increases pressure in the middle ear and is used as a means of equalizing pressure in the ears. If the patient is able to turn their head away from the blocked ear and stretch the opposite ear to the shoulder, this stretches the eustachian tube of the blocked ear, which may facilitate the valsalva. **WARNING:** With certain diagnoses (e.g., glaucoma, recent eye surgery or injury, nasal/facial fractures, post-operative nasal surgery, history of aneurysm, acute head injuries, severe hypertension, cardiac disease and arrhythmias, and neurological disease with ICP) valsalva is contra-indicated. Assess for signs/symptoms. Fullness, pain (mild to severe), pressure in ear(s), decreased hearing (mild to acute), vertigo, and tinnitus.

#### 8.16.2.2.3. Treatment/management.

8.16.2.2.3.1. Premedicate with oral or nasal decongestants unless contraindicated per VFS.

8.16.2.2.3.2. AECM may delay transport if patient is unable to “clear” ears or if a cabin altitude restriction is required but operationally unrealistic. The AECM notifies C2 who then contacts the governing PMRC for guidance.

8.16.2.2.3.3. Ensure parents of infants/children have full bottle or cup with straw to aid in clearing of ears.

8.16.2.2.3.4. If unable to clear ears during descent, have the PIC reascend and slow the rate of cabin descent, if operationally possible.

8.16.2.2.3.5. Medications per AE Clinical Protocol – Over-the-Counter Medication Administration.

8.16.2.2.4. To use BVM to clear the ears: The patient is alert and oriented. Two AECMs may be required. Patients are placed in the sitting position with the affected ear pointed towards the ceiling. One AECM stands behind the patient and hold the BVM mask up against the face. The other AECM stands in front of the patient and does a verbal count (one, two, three) and squeeze the bag at the same time as the patient swallows.

8.16.2.2.4.1. Document and reassess patient after landing. Requires ongoing evaluation if there are other en route stops.

8.16.2.2.4.2. Assess if the patient is able to clear ears and is pain free to continue flight and if an evaluation by a flight surgeon is required.

8.16.2.2.4.3. Direct patient and MTF representative to seek evaluation at

destination MTF.

### 8.16.3. Nasal.

#### 8.16.3.1. Stresses of flight.

8.16.3.1.1. Barometric Pressure Changes: Any obstruction of the nasal passage can result in an ear/sinus block (e.g., facial fractures, nasal packing, nasopharyngeal tube and/or NG).

8.16.3.1.2. Decreased humidity: Can cause drying of mucous membranes, thickening of secretions and increased risk of epistaxis (nosebleed).

8.16.3.1.3. Vibration: May cause pain and increased bleeding in facial fracture patients.

#### 8.16.3.2. Preflight/in-flight considerations.

8.16.3.2.1. Decongestant prior to flight (if not contraindicated) per VFS orders.

8.16.3.2.2. May require a cabin altitude restriction.

8.16.3.2.3. Anterior bleeding (most common).

8.16.3.2.3.1. Lean forward in a sitting position and encourage mouth breathing.

8.16.3.2.3.2. Pinch nostrils for four to ten minutes, and place cold packs to the posterior neck and bridge of nose, if available.

8.16.3.2.4. Posterior bleeding.

8.16.3.2.4.1. Are not be transported if known to be actively bleeding.

8.16.3.2.4.2. Sit up to allow drainage.

8.16.3.2.4.3. Monitor VS; may be hypertensive.

8.16.3.2.4.4. Initiate IV for blood loss greater than 240ml and the AECM notifies C2 who then contacts the governing PMRC of any change in patient status or classification as soon as possible.

8.16.3.2.4.5. If nasal packing is present, leave in place. If a foley is being used for nasal packing, have the physician fill it with NS prior to flight.

8.16.3.2.4.6. Encourage fluids en route.

### 8.16.4. Sinus block.

8.16.4.1. Sinuses normally equalize and vent during ascent. On descent, individuals who have colds, allergies, and chronic or acute sinus conditions, are more at risk for sinus blocks.

8.16.4.2. Prior to flight, brief patients on signs and symptoms, and how to notify AECMs. Premedicate with oral analgesic or mild vasoconstrictors per VFS orders.

8.16.4.3. Assess for signs/symptoms: Include pain (mild to severe), burning sensation, and tenderness over the affected sinus, bloody/mucopurulent discharge, teary eyes, and a sucking/crackling noise in the sinus area.

8.16.4.4. Position in a seat or with head of litter elevated.

8.16.4.5. Provide humidification, force fluids.

8.16.4.6. Sinus block occurs, treatment includes:

8.16.4.6.1. Coordinate with the PIC to ascend from the current altitude or request a slower rate of descent.

8.16.4.6.2. Medications per AE Clinical Protocol – Over the Counter Medication Administration.

8.16.4.6.3. Observe for relief of pain, pressure, and bleeding/drainage.

8.16.4.6.4. Evaluation by a flight surgeon at en route stop or RON to assess whether the patient may continue with the mission. If the patient continues the mission, coordinate slower descents and provide patient with vasoconstrictor for the subsequent descents; may require a cabin altitude restriction. Observe for bleeding/drainage.

8.16.5. Maxillofacial.

8.16.5.1. Stresses of flight.

8.16.5.1.1. Barometric pressure changes: Gas may become trapped or partially trapped in sinuses and teeth, increasing pain.

8.16.5.1.2. Decreased humidity: Causes mucous membranes to dry out leading to pain and/or discomfort.

8.16.5.1.3. Vibration: May increase pain and exacerbate underlying condition.

8.16.5.2. Preflight/in-flight considerations.

8.16.5.2.1. Pharyngeal injuries less than 72 hours old require a tracheostomy prior to flight.

8.16.5.2.2. Jaw immobilization: Assess for type of immobilizer and release mechanisms. Have suction set up and available next to patient.

8.16.5.2.2.1. Wired jaw: Ensure wire cutters or scissors are attached to the patient.

8.16.5.2.2.2. Quick release mechanism: Ensure the patient and AECMs know how to operate.

8.16.5.2.2.3. Anti-emetics to prevent vomiting per VFS orders.

8.16.5.2.2.4. Only in an emergency (e.g., possible loss of airway) release the jaws when vomiting is likely. Restabilize with cravat or wrap.

8.16.5.2.2.5. Liquid diet.

8.16.5.2.2.6. Patient's classified for a litter require a backrest prior to flight. Ambulatory patients require a seat.

8.16.5.3. Teeth.

8.16.5.3.1. Tooth pain may be associated with trapped gas in a decayed tooth or pressure on the tooth below the blocked sinus. May require a cabin altitude restriction until tooth is evaluated and treated. Have a flight surgeon evaluate the patient prior to flight.

8.16.5.3.2. If pain occurs at altitude, descend until pain is diminished, if operationally possible and document and communicate with receiving MTF for further evaluation.

## **8.17. Gastrointestinal (GI)/Genitourinary/Tube Management.**

### **8.17.1. Stresses of flight.**

8.17.1.1. Barometric pressure changes: Gas expansion may cause increase in nausea and abdominal discomfort, vomiting, decreased lung expansion and volume, and may require NG tube decompression preflight or in-flight.

8.17.1.2. Vibration: May exacerbate patient's underlying condition or diagnosis and make more susceptible to motion sickness.

8.17.1.3. Thermal: Underlying condition or diagnosis may make the patient more sensitive to thermal changes.

8.17.1.4. Fatigue: May exacerbate the patient's condition.

8.17.1.5. Decreased humidity: May lead to dehydration.

8.17.1.6. G-Forces: Turbulence and acceleration changes can be exaggerated in the rear of the aircraft. This can lead to an increase in motion sickness in susceptible patients. Consider placing patients who are susceptible to motion sickness, forward or over the wing to reduce the exaggeration of changes in the aircraft.

### **8.17.2. Acute abdomen.**

#### **8.17.2.1. Preflight/in-flight considerations.**

8.17.2.1.1. Current and past disease processes may present or exacerbate in-flight. History includes, but is not limited to, previous abdominal surgeries, adhesions, intestinal obstruction, neoplasms, ulcerative colitis, kidney disease, cardio-pulmonary disease, pregnancy, and stroke.

8.17.2.1.2. Assess for signs and symptoms: Fever, chills, abdominal pain, nausea, vomiting (bilious, feculent, blood, and/or coffee-ground appearance), dysuria, and hematuria. There may also be fluctuations in BP.

8.17.2.1.3. Assess VS, bowel sounds and percuss the abdomen preflight.

#### **8.17.2.2. Acute abdomen: Treatment/management.**

##### **8.17.2.2.1. NPO. Monitor I&O.**

8.17.2.2.2. Insert a NG tube if there is gastric distention, nausea and vomiting are severe, and/or if the airway may be compromised. **Note:** If symptoms occur preflight or in-flight, the patient is not stable. The AECM notifies C2 who then contacts the governing PMRC for guidance and possible diversion to a MTF capable of handling the situation.

### **8.17.3. GI Bleeding.**



#### 8.17.3.1. Preflight/in-flight considerations.

8.17.3.1.1. Seen in trauma to the GI tract; inflammatory/ulcerative disease, response to stress, varices, alcohol, aspirin compounds anticoagulants for coagulation abnormalities, VTE, heart valve replacement; neoplasms, and hemorrhoids or fissures.

8.17.3.1.2. Assess for signs and symptoms: Bright red or “coffee grounds” emesis, tarry stool or coating of stool.

8.17.3.1.3. NG tube will not have active bleeding or coffee ground material preflight. **(T-0).**

8.17.3.1.4. Usually is not airlifted less than three days post-GI bleed. Orthostatic postural changes (measure BP and pulse: Supine-to-sitting-to-standing; a twenty-point pulse increase or a systolic 10% decrease is positive for orthostatic postural changes and may need fluids or blood administered) are not present.

8.17.3.1.5. Should have a preflight H&H (Hgb > 8 g/dL and HCT > 25 %) and O2 at 2-4 LPM in-flight per VFS orders. **Note:** For patients with a HCT below 24% strong consideration is given for patient to receive blood product replacement, repeat H&H and cleared by VFS prior to flight.

8.17.3.1.6. Obtain preflight VS, including pulse oximetry.

#### 8.17.3.2. Treatment/management.

8.17.3.2.1. NPO. Monitor I&O.

8.17.3.2.2. IV access for medications and fluid replacement.

8.17.3.2.3. Onset of upper GI bleeding in-flight. Initiate treatment and the AECM notifies C2 who then contacts the governing PMRC for guidance and possible diversion to a MTF capable of handling the situation.

8.17.3.2.3.1. Administer high flow O2 to maintain pulse oximetry at or above 92% or as directed by VFS.

8.17.3.2.3.2. Start LR or NS with large bore IV access to maintain BP, heart rate and UOP. If blood infusion tubing is used, prime with NS.

8.17.3.2.3.3. Litter for comfort.

8.17.3.2.3.4. Assess and address the underlying cause, if known.

8.17.3.2.3.5. Consider NG tube insertion.

#### 8.17.4. Chronic GI conditions.

8.17.4.1. Bowel inflammation, peptic ulcer, and enteritis (Crohn's Disease and Ulcerative Colitis).

#### 8.17.4.2. Preflight/in-flight considerations.

8.17.4.2.1. Consider proximity to bathroom, medications, hydration, and diet restrictions.

8.17.4.2.2. Special diet: AE crew makes certain the diets are onboard.

8.17.4.2.3. Ostomy patients may have more bowel movements due to gas expansion.

8.17.4.2.3.1. Ensure patient has extra bags, wafers, and stoma adhesive.

8.17.4.2.3.2. Empty contents preflight. Check immediately after ascent. Vent bag if possible. **Note:** If non-venting colostomy apparatus, vent collection bag to avoid excess gas from dislodging the bag from the stoma wafer. Using a straight pin, puncture two holes in the ostomy bag, above the wafer ring. Patient may be self-conscious about the odor emanating from the vented bag.

8.17.4.2.4. Advise patient to expect an increase in flatus and stool during ascent and in-flight.

8.17.4.2.5. Peptic ulcer: Monitor H&H and observe for signs of acute GI conditions.

8.17.5. Abdominal distention.

8.17.5.1. Observe for abdominal distention.

8.17.5.2. Ambulate or change positions to relieve symptoms of abdominal distention.

8.17.5.3. If lower abdominal area, have patient roll first from right upper quadrant to left upper quadrant of abdomen to move flatus.

8.17.5.4. Insert a soft rubber urinary catheter no more than two inches into stoma to relieve gas buildup. Do not irrigate the colostomy in-flight. **Note:** Follow surgeon's orders for fresh post-op stoma care.

8.17.6. Tube feedings. In the event of altered transportation plans, the ERPS obtains adequate nutritional provisions for patients, obtains and provides 1-day tube feeding supply for intra-theater patient movement and three-day supply for inter-theater PM. If on a continuous feeding, allow for venting.

8.17.6.1. Types of Feeding Tubes.

8.17.6.1.1. [NG/OG] Salem Sump.

8.17.6.1.1.1. Purpose: Diagnostic; gastric decompression/ evacuation; fluid/nutrient replacement; medication administration.

8.17.6.1.1.2. Management: NG tube is contraindicated in basal skull and nasal fractures. X-Ray is required to confirm placement.

8.17.6.1.2. Jejunal.

8.17.6.1.2.1. Purpose: Fluid/nutrient replacement; medication administration.

8.17.6.1.2.2. Management: Requires KUB X-Ray placement confirmation showing the tip is beyond ligament of Treitz either day before or day of transport; may require simultaneous NG/OG decompression of stomach to prevent aspiration; may have physician order to position/secure litter head forward (towards cockpit) with backrest (if not contraindicated) and aspiration for residual gastric content may not be possible.

8.17.6.1.3. Gastrostomy or Jejunostomy.

8.17.6.1.3.1. Purpose: Fluid/nutrient replacement; medication administration;

decompression/ evacuation.

8.17.6.1.3.2. Management: X-Ray to confirm placement; assess insertion site, evaluate for leaking or infection (redness, induration (hardness), warmth, purulence, pain). **Note:** If feeding tube becomes occluded and irrigation is unsuccessful, hold feedings and the AECM notifies C2 who then contacts the governing PMRC for guidance.

#### 8.17.6.2. Management of Feeding Tubes:

8.17.6.2.1. Assess all GI tubes for placement and gastric residual at every patient care hand-off, every four hours, including during continuous feeding, and before injecting any fluids or medications:

8.17.6.2.2. Auscultate lung sounds.

8.17.6.2.3. Note distention of the abdomen, presence of bowels sounds, rigid/soft, tenderness, flatus, bowel movement, and feeding tolerance including nausea, vomiting and diarrhea.

8.17.6.2.4. Aspirate stomach contents for gastric residual and document amount and characteristics. **Note:** Do not discard aspirate (place in drainage bag) allow tube to gravity drain.

8.17.6.2.5. Administer all tube feedings if gastric residual is less than 50% the hourly rate or in accordance with physician's order.

8.17.6.2.6. Hold all tube feedings if gastric residual is greater than 200 ml or greater than 50% the hourly rate or in accordance with physician's order. Recheck in one hour and resume if within normal range. **Note:** If residual remains above limits after the second assessment, hold tube feeding and the AECM notifies C2 who then contacts the governing PMRC for guidance.

8.17.6.2.7. After replacement of gastric contents, medications and bolus feeding add 30-60 ml distilled H<sub>2</sub>O and allow gravity to clear the tube. Avoid infusing air.

8.17.6.2.8. Clamp the tube for 30-45 minutes to ensure medication absorption before reconnecting to suction, if ordered. **Note:** Do not clamp tube for the entire flight; secure glove/other gravity drainage device if feeding is held or apply suction if indicated (e.g., nausea; vomiting; abdominal distention; excessive residual posing risk of aspiration).

8.17.6.2.9. Maintain head of bed/litter elevated at least 45°. **Note:** If condition prevents elevation, additional care is taken to prevent aspiration, including holding feedings 30-60 minutes prior to takeoff and landing. and administering bolus feedings preferably at cruise altitude to decrease risk of aspiration.

8.17.6.2.10. While in ERPS, oral care is accomplished every two hours with NS or clean distilled water and includes cleaning/brushing of the teeth and tongue.

8.17.6.2.11. Documentation includes at a minimum tube location (e.g., oral/nasal/J-G, landmarks, bowel sounds, lung sounds), intake/output, feeding type, GI assessment, position, oral care, etc.

8.17.6.2.12. VS and temperature and I&O every four hours on the EHR or AF Form 3899.

8.17.6.2.13. Additional feeding tube care/supplies and formula is required for the destination facility.

8.17.6.2.14. If administration set becomes occluded during transport, change and prime, then set at the previous administration rate. **Note:** If feeding tube becomes occluded irrigation is unsuccessful, hold feedings and the AECM notifies C2 who then contacts the governing PMRC for guidance.

#### 8.17.7. Motion sickness.

8.17.7.1. Organic motion sickness. Caused by disease processes affecting the inner ear resulting in sensitivity to labyrinth stimulation.

8.17.7.2. Non-organic motion sickness. Caused by turbulence, hypoxia, fear, emotional stress, odor, heat, visual stimuli, reactive hypoglycemia, an empty stomach, self-imposed stresses, dehydration, caffeine, and carbonated drinks.

8.17.7.3. Motion sickness: Preflight/in-flight considerations.

8.17.7.3.1. Assess for signs and symptoms: Headache, apathy, pallor, diaphoresis, nausea, and vomiting.

8.17.7.3.2. Administer preflight antiemetic as ordered by the VFS 30-60 minutes prior to flight.

8.17.7.3.3. Medications per AE Clinical Protocol – Over the Counter Medication Administration.

8.17.7.3.4. Instruct patient to take slow, deep, and relaxing breaths to decrease anxiety and sympathetic tone.

8.17.7.3.5. Restrict head movements.

8.17.7.3.6. Have patient visually fixate on a stationary object; provide O2 blow by.

8.17.7.3.7. Cool the cabin and/or the patient (cool compresses, open air vents if available in the mode of transportation). **Note:** If patient is vomiting, keep NPO, and consider starting an IV of LR or NS. The AECM notifies C2 who then contacts the governing PMRC for further instruction and possible orders for intramuscular (IM) and IV medications if symptoms are severe.

#### 8.17.8. Urinary disorders.

8.17.8.1. Stresses of flight.

8.17.8.1.1. Barometric pressure changes: May increase nausea and pain from gastric distention (causing pressure on bladder).

8.17.8.1.2. Decreased humidity: May lead to dehydration.

8.17.8.1.3. Fatigue: Exaggerates underlying condition.

8.17.8.2. Foley catheter/suprapubic catheters/ileal conduit.

8.17.8.2.1. Empty, measure, and document prior to flight.

- 8.17.8.2.2. Drainage bag needs to be lower than the site to drain properly and not on the floor. Consider covering drainage bags.
- 8.17.8.2.3. Document I&O on EHR or AF Form 3899.
- 8.17.8.3. Nephrolithiasis (renal stone disease)/Urolithiasis (stones in the urinary system).
  - 8.17.8.3.1. Preflight/in-flight considerations:
    - 8.17.8.3.1.1. Pain management.
    - 8.17.8.3.1.2. Anti-emetics.
    - 8.17.8.3.1.3. IVF as needed.
    - 8.17.8.3.1.4. Avoid milk products and encourage fluids per patient's preference.
  - 8.17.8.3.2. Observe for anuria, hematuria, dysuria, oliguria, and signs and symptoms of urinary tract infection.
- 8.17.8.4. Renal failure.
  - 8.17.8.4.1. Preflight/in-flight considerations.
    - 8.17.8.4.1.1. O2 available.
    - 8.17.8.4.1.2. Special diet and fluid restriction as ordered.
    - 8.17.8.4.1.3. Document I&O.
    - 8.17.8.4.1.4. Peritoneal dialysis and hemodialysis may be performed in-flight by specialty teams, e.g., ERCC.
    - 8.17.8.4.1.5. MTF documents the most recent dialysis and the next scheduled dialysis.
    - 8.17.8.4.1.6. Peritoneal dialysis; assess site for signs of infection.
  - 8.17.8.4.2. Hemodialysis site - vascular access is present with internal and external shunts. A "bruit" or a "thrill" may be felt over the blood vessel or tubing and/or auscultated with a stethoscope. **WARNING:** Do not flush or use for IV access. Do not take BP on same extremity as the shunt.
    - 8.17.8.4.2.1. Assess site for infection. Assess distal circulation and neurovascular status.
    - 8.17.8.4.2.2. Protect access site from cold, pressure, venipuncture, disconnection, and infection.
    - 8.17.8.4.2.3. Have clamps available for external shunts to control bleeding if disconnected.

## **8.18. Obstetrics (OB)/In-Flight Child Birth Management.**

### **8.18.1. Stresses of flight.**

- 8.18.1.1. Decreased partial pressure of oxygen: May cause an increase in cardiac workload with a decrease in diaphragmatic excursion. Lower concentration of O2 to the placenta results in fetal hypoxia.

8.18.1.2. Barometric pressure changes: Gas expansion may cause pain and uterine irritability and decrease capacity for lung expansion. Decreased barometric pressure is also associated with onset of labor and premature rupture of membranes.

8.18.1.3. Noise/vibration: May increase seizure risk in pre-eclamptic and eclamptic patients and may cause uterine irritability and excessive stimulation and movement of the fetus.

8.18.1.4. Decreased humidity: Dehydration may induce or complicate preterm labor. Pregnant women are also especially prone to dehydration and its effects.

8.18.1.5. Fatigue: Excess weight, physiological changes, overall effects of the previously mentioned stresses, and the length of time in the AE system fatigues the patient.

8.18.1.6. G-Forces: May result in pushing fetus onto the maternal vena cava or the placenta.

#### 8.18.2. General considerations.

8.18.2.1. Patients who are beyond the 34th week of pregnancy are not routinely accepted for AE but are moved if determined necessary by a physician.

8.18.2.2. Patients in premature labor, or with prematurely ruptured membranes, may be airlifted after labor is assessed on a case-by-case basis.

8.18.2.3. Patient positioning: If on strict bed rest, patient is positioned in the left lateral recumbent position. If the patient is placed in the supine position, place a pillow under either hip to promote uterine displacement and relieve pressure on the inferior vena cava, which can lead to hypotension and decreased oxygen flow to the fetus. If ambulatory, seatbelt is placed low on the abdomen across the hips and may be padded with a blanket or pillow. A litter is available if needed for ambulatory pregnant patients where a back rest may be used.

8.18.2.4. Pregnant patients are at increased risk of VTE. Hydration is encouraged, seated patients are encouraged to ambulate and litter patients are encouraged to perform ROM exercises.

#### 8.18.2.5. Supplies and equipment.

8.18.2.5.1. Universal OB pack.

8.18.2.5.2. Safe to fly approved transport incubator if greater than 34 weeks or otherwise indicated.

8.18.2.5.3. Oxygen and suction available.

8.18.2.5.4. Doppler or Doptone.

8.18.2.5.5. Pulse oximeter.

8.18.2.5.6. IV infusion pump.

8.18.2.5.7. Cardiac monitor.

#### 8.18.3. Preflight assessment and documentation.

- 8.18.3.1. Maternal VS including pulse oximetry, temperature, and respiratory rate. Assess for edema.
- 8.18.3.2. OB history, including expected date of delivery, gestational age, summary, current pregnancy course, previous OB history including complications and mode of delivery.
- 8.18.3.3. Presence of any signs/symptoms of labor to include duration, frequency, and intensity of contractions, back pain, pelvic/rectal pressure, or abdominal cramps.
- 8.18.3.4. Status of membranes: if ruptured, date/time of rupture, amount, and character of fluid.
- 8.18.3.5. Presence of vaginal bleeding (amount and any associated pain).
- 8.18.3.6. Most recent cervical exam.
- 8.18.3.7. Urinalysis results if indicated.
- 8.18.3.8. Fetal assessment: Fetal heart tones (FHTs), presentation, last ultrasound findings, and known abnormalities.
- 8.18.3.9. Other significant medical history: Epigastric pain, cardiac history, headache, infectious disease status, medical conditions such as diabetes and hypertension. History of smoking, alcohol, or drug use in pregnancy.
- 8.18.4. Treatment/management priorities and in-flight considerations.
  - 8.18.4.1. If gestation is greater than 20 weeks, FHTs are obtained before departure, at cruise altitude (if possible) and every 12 hours thereafter. If rupture of membranes occur, FHTs are obtained immediately (ambient noise may make it impossible to hear FHTs). Normal range for FHTs are 120-160/minute.
  - 8.18.4.2. Obtain maternal VS at cruise altitude and if indicated by a status change. Maternal oxygenation is particularly important to ensure fetal well-being.
  - 8.18.4.3. Patient comfort may be the greatest concern in stable pregnancies. Comfort items, hydration/snacks, ambulation, and position change are offered as appropriate.
- 8.18.5. Considerations for high-risk OB: A qualified MA accompanies high-risk OB patients.
  - 8.18.5.1. Hypertensive disorders of pregnancy.
    - 8.18.5.1.1. Chronic hypertension: Preexisting hypertension may affect maternal health, fetal growth, oxygenation, placental function, and predispose patient to other pregnancy complications.
    - 8.18.5.1.2. Gestational hypertension: Hypertension diagnosed after 20 weeks of pregnancy not accompanied by other symptoms. May affect maternal health, fetal growth, oxygenation, placental function, and predispose patient to other pregnancy complications.
    - 8.18.5.1.3. Pre-eclampsia: Condition generally diagnosed after 20 weeks of pregnancy. Multi-organ system disease usually evidenced by elevated BP (>140/90), proteinuria, epigastric pain, visual changes, headaches, and abnormal liver function

tests. HELLP (**H**emolysis, **E**levated **L**iver Enzymes, and **L**ow **P**latelets) Syndrome: Variant of preeclampsia characterized by hemolysis, elevated liver enzymes, and low platelets. The only resolution to preeclampsia is delivery or termination of pregnancy.

8.18.5.1.4. Eclampsia and HELLP Syndrome: Patients with active eclampsia or HELLP Syndrome are not moved.

#### 8.18.5.2. Placental disorders.

8.18.5.2.1. Placental abruption: Premature separation of normally implanted placenta. Placental abruption cannot be diagnosed before 20 weeks of gestation. Cause is unknown although risk factors include hypertension, abdominal trauma, short umbilical cord, uterine anomaly, cocaine use, and abruption in previous pregnancy. Signs and symptoms may include abdominal pain or short, frequent contractions, vaginal bleeding, change in maternal VS or change in fetal heart rate. If suspected abruption occurs in-flight, patient are treated for hemorrhage/shock and C2 is contacted for guidance and possible diversion to a MTF capable of handling the situation. **WARNING:** This is a life-threatening condition for mother and baby.

8.18.5.2.2. Placenta previa: Implantation of placenta in the lower uterine segment, completely or partially covering the internal cervical os. Placenta previa cannot be diagnosed before 20 weeks of gestation. Placenta previa may be stable or may result in episodes of painless vaginal bleeding. If an unanticipated bleed occur in-flight, treat for hemorrhage/shock and contact C2 for guidance and diversion to a MTF capable of handling the situation. **WARNING:** A severe bleed or onset of labor is life threatening for mother and baby.

8.18.5.3. Preterm labor: Progressive cervical dilation and effacement prior to 37 weeks of pregnancy. Signs and symptoms may include uterine contractions, back pain, vaginal discharge or bleeding, rupture of membranes, and pelvic pain. Preterm labor is generally slowed with medication and mother may be transported to facilitate higher level care for the premature infant. There are no known effective treatments to stop preterm labor but may successfully prevent delivery long enough to facilitate transfer. Normally patients are not transported in active preterm labor.

8.18.5.4. Gestational diabetes: Diabetics diagnosed during pregnancy may be controlled by a combination of diet, exercise, oral medication and/or insulin. Gestational diabetes require orders for diet, glucose testing, and medications if needed.

#### 8.18.5.5. Medications used in high risk pregnancy:

8.18.5.5.1. Magnesium sulfate: May be used for seizure prophylaxis in preeclampsia/eclampsia or for neuroprotection of the fetus in pre-term labor. It is also used to reduce uterine contractility in pre-term labor.

8.18.5.5.1.1. Magnesium sulfate is a high-risk medication and is always be administered via infusion pump. **WARNING:** May produce cardiac arrhythmia, bradycardia, or cardiac arrest. Stop infusion if chest pain occurs. Contact C2 for further guidance and possible diversion.

8.18.5.5.1.2. Maternal BP, respirations, strict I&O, and deep tendon reflex are monitored carefully during magnesium sulfate therapy. Patients may experience



flushing, warmth, dizziness, and malaise as normal symptoms of magnesium sulfate therapy.

8.18.5.5.1.3. Patients on magnesium sulfate have orders for NPO or fluid restriction due to the risk of fluid overload.

8.18.5.5.1.4. Magnesium sulfate toxicity: Severe CNS depression and pulmonary edema may occur. The patient stable on magnesium sulfate and/or serum magnesium sulfate are measured for therapeutic levels prior to transport. If severe lethargy, slurred speech, decreased respirations, or other symptoms occur, discontinue the infusion. Patient is placed on a cardiac monitor prior to administering magnesium sulfate and calcium gluconate antidote may be administered per physician order if indicated.

8.18.5.5.2. Tocolytic agents: Terbutaline, nifedipine, indomethacin, and less frequently, magnesium sulfate may be used for inhibition of uterine contractions. These medications tend to produce flushing, headache, and tachycardia. Generally, they are effective in delaying delivery for 24-48 hours.

8.18.5.5.3. Treatment for Magnesium sulfate toxicity.

8.18.5.5.3.1. IV access - central line (preferably) and arterial line/Swan Ganz (SG) may be present (ensure balloon is deflated in SG prior to takeoff).

8.18.5.5.3.2. Infusion Pumps: Mainline/MgSO<sub>4</sub> infusion.

8.18.5.5.3.3. Foley catheter is placed to monitor strict I & O. **Note:** Consider left lateral recumbent position when monitoring foley output.

8.18.5.5.3.4. Calcium gluconate for MgSO<sub>4</sub> toxicity. **Note:** Is ordered on the patient treatment form and provided by the originating MTF. **Note:** Not a part of the in-flight medical kit.

8.18.5.5.3.5. Be vigilant for loss of deep tendon reflexes, pulse less than 60/min; BP less than 90 mmHg/systolic; UOP less than 30cc/hour.

8.18.5.5.3.6. Place on cardiac monitor.

8.18.5.5.3.7. Administer calcium gluconate 10% solution, per physician's order (usually 1 gram), slow IVP over three minutes.

8.18.5.5.4. Steroids: Betamethasone injections are typically given to women when preterm delivery is threatened to promote fetal lung maturity.

8.18.6. In-flight considerations and care for unexpected labor and delivery.

8.18.6.1. Contact C2 for guidance and diversion to a MTF capable of handling the situation. Request the receiving facility send qualified medical personnel to the aircraft.

8.18.6.2. Patient positioning for in-flight birth.

8.18.6.2.1. If the expectant mother is a litter patient and there is another patient underneath her, try to move the lower patient to another position. This way you can facilitate care and privacy.

- 8.18.6.2.2. If ambulatory, move patient to a litter. Patient may be positioned side-lying, sitting with her back supported, or whatever position is most comfortable.
  - 8.18.6.2.3. Set up supplies and equipment to include OB pack, doppler, absorbent pads, and blankets.
  - 8.18.6.2.4. MA or NMA accompanying patient or an AECM reassures the mother to remain calm and if possible, to avoid pushing until set up is complete.
  - 8.18.6.2.5. Start flowchart: Obtain maternal VS q 1 hour and FHTs q 15 mins.
  - 8.18.6.2.6. Start an IV of LR at 125ml/hour depending on hydration and renal, cardiac, magnesium sulfate therapy and pulmonary status.
  - 8.18.6.2.7. Administer high flow O2 if needed.
  - 8.18.6.2.8. Delivery procedures: Follow Lippincott or Mosby. In a precipitous delivery, support baby's head and body during expulsion and guide baby to the maternal abdomen. Maternal pushing efforts generally facilitate delivery without any provider intervention.
  - 8.18.6.2.9. If neonatal resuscitation is required, it is performed by the MA or AECM in accordance with Neonatal Resuscitation Program Guidelines.
- 8.18.6.3. Immediate care of the newborn. Infant is dried, stimulated, and placed on the maternal abdomen. If needed, infant's mouth and nose may be cleared with a bulb syringe. Suction the mouth first to avoid aspiration. If sterile scissors are available, cord may be clamped twice and cut, otherwise cord may be left intact.
- 8.18.6.3.1. After delivery of placenta, place it in a towel or chux pad and then into a red biohazard bag with label. If cord is left intact, placenta is placed near and approximately level to infant. The placenta is offloaded with the patient and not discarded.
  - 8.18.6.3.2. Breastfeeding is encouraged within the first hour of life to promote uterine involution and avoid neonatal hypoglycemia. Baby is placed directly skin to skin with mom and both covered with a blanket to maintain temperature.
- 8.18.6.4. Labor and delivery and postpartum emergencies - these emergencies require contacting C2 and diversion to a MTF capable of providing care.
- 8.18.6.4.1. Shoulder dystocia: Following delivery of the fetal head the fetal anterior shoulder may become stuck on the pubic bone and baby appears to be turtling. Delivery of the shoulder is attempted by the mother assuming McRoberts position on her back (flexion of maternal legs), suprapubic pressure, maternal position change to hands and knees, and attempting to rotate the fetal shoulders either towards each other to decrease the shoulder girdle or to rotate the fetus to the oblique to deliver. These maneuvers are continued until the fetus is delivered or fetal death.
  - 8.18.6.4.2. Breech presentation: A fetus presenting buttocks or feet first may be delivered vaginally but is at increased risk of injury or cord compression. Allow maternal pushing efforts to occur and do not attempt to manipulate the baby as the gentle traction of the baby's weight provides support and facilitate delivery of the head. After delivery up to the fetal umbilicus you may assist the delivery of the arms

by sweeping them downward if they do not deliver spontaneously. Following birth, place the baby on the maternal abdomen to assess and provide routine care.

8.18.6.4.3. Cord prolapse: The umbilical cord precedes the presenting part and presents a risk of cord compression and hypoxia to the fetus. This is most likely to occur following rupture of membranes and is suspected if sudden decrease in FHT occurs with rupture. The cord may be visualized at the introitus or palpated in the vagina alongside the presenting part. The mother is placed in Trendelenburg or knee-chest position and the presenting part is lifted off the cord. **WARNING:** Maintain this position until fetus can be delivered via cesarean section; do not discontinue until directed by a physician. If cord prolapse occurs during second stage, baby may be delivered vaginally before cesarean can be performed. Assess fetal heart tones q 15 minutes. If baby is delivered, place on the maternal abdomen and assess for resuscitation.

8.18.6.4.4. Postpartum hemorrhage: Blood loss greater than 500 ml following a vaginal delivery. Patient may experience dizziness, fainting, tachycardia, and decreased BP. Treatment for hemorrhage is provided along with aggressive fundal massage. Nipple stimulation may be provided manually or through breastfeeding to encourage uterine contraction.

#### 8.18.6.5. Documentation.

8.18.6.5.1. For the infant, initiate the EHR or AF Form 3899, AE patient record. Document time of birth; Apgar score at one- and five-minutes post birth (per Lippincott); VS; and any concerns with labor. Document no vitamin K or ophthalmic ointment was given. Add infant to the AF Form 3830, *Patient Manifest*.

8.18.6.5.2. On mother's chart, annotate the following: Course of labor; time of birth in ZULU time (Universal Time); time of placenta delivery ZULU time; fundal massage and lochia checks; and VS q 15 minutes for 2 hours, then q 30 minutes for 1 hour, then every 4 hours for 24 hours

8.18.6.5.3. Annotate events on AF Form 3829 (TRAC2ES Cover Sheet).

8.18.6.5.4. Annotate events on a JPSR worksheet or DD Form 2852.

8.18.7. A postpartum mother may accompany an infant to more definitive care. Ensure medication and supplies accompany the patient. If determined to be unstable, the AECM notifies C2 who then contacts the governing PMRC for guidance and possible diversion to a MTF capable of handling the situation. If the patient is nursing the infant, all nursing supplies, breast pump and refrigeration capability is the responsibility of the patient/sending facility.

### 8.19. Pediatric Management.

#### 8.19.1. Stresses of flight.

8.19.1.1. Decreased Partial Pressure of Oxygen: Infants and younger children are more susceptible to hypoxia and become hypoxic earlier than adults.

8.19.1.2. Barometric Pressure Changes: Encourage the use of a pacifier/bottle on descent to help the infant/child clear their ears. Gastric compression may restrict

diaphragmatic movement, especially if supine; elevate head and consider decompression with an oral or NG tube if necessary.

8.19.1.3. Thermal: Thermal changes have the greatest impact on infants and young children who have a very sensitive thermoregulating system. Increase the cabin temperature, if necessary and possible.

8.19.1.4. Decreased Humidity: Infants and children are more susceptible to dehydration. If infant is in a safe to fly approved transport incubator, ensure that the proper amount of distilled sterile water is present in the humidification sponge. If not NPO or receiving IVs or tube feedings, give fluids at least every two hours. **Note:** Assess for infant dehydration: palpate for depressed anterior fontanel.

8.19.1.5. Noise: Infants/children are sensitive to excessive noise. Earplugs are cut in half (vertically) to fit the smaller ear canals. Infants in a safe to fly approved transport incubator also wear earplugs, even though the double paned construction muffles aircraft noise.

8.19.1.6. Vibration: Ensure infants are padded when in car seats or the incubator.

8.19.1.7. Fatigue: Fatigue has the greatest impact on pediatric patients newborn to 12 years old.

#### 8.19.2. General Considerations:

8.19.2.1. Assess airway and breathing: Is the child able to maintain independently or are adjuncts/assistance to maintain patency required?

8.19.2.1.1. Respiratory dysfunction is the most common cause of cardiac arrest: stabilization of the airway is of primary concern. Assess rate; mechanics (retractions, grunting, nasal flaring, use of accessory muscles); chest expansion, breath sounds stridor, wheezing or paradoxical chest movement.

8.19.2.1.2. Proper positioning is essential because a child's trachea is narrow, the tongue is large and intercostal muscles are weak.

8.19.2.1.3. Use jaw thrust or chin lift maneuver to open the airway.

8.19.2.1.4. For spinal immobilization use jaw thrust. **WARNING:** Hyperextension or flexion of the neck causes airway compression. A rolled towel placed under the shoulders of the infant or child aids in maximizing airway size and reducing resistance. For neutral alignment of the C-Spine, align the external auditory meatus with the shoulders.

8.19.2.2. If intubated, an MA accompanies the patient capable of managing the airway and a ventilator.

8.19.2.2.1. Use cuffless endotracheal tubes up to age ten.

8.19.2.2.2. Have on hand one size larger and one size smaller endotracheal tube.

8.19.2.2.3. Monitor pulse oximetry and titrate O<sub>2</sub> to maintain SaO<sub>2</sub> greater than 93%.

8.19.2.2.4. Ensure adequate humidification of the O<sub>2</sub> delivery systems.

- 8.19.2.2.5. Assess color (pale or cyanotic); capillary refill; skin temperature; presence of mottling.
  - 8.19.2.2.6. Infants requiring temperature control, apnea monitoring, pulse ox/cardiac monitor for flight, or ventilator support require an MA.
  - 8.19.2.3. VS: Normal Heart Rate. Count apical pulse for a full minute. **WARNING:** Bradycardia is life threatening and is associated with hypoxemia, perform BLS if the child is bradycardic with poor perfusion or is pulseless.
    - 8.19.2.3.1. Infant: 120 - 160/min.
    - 8.19.2.3.2. Toddler: 90 - 190/ min.
    - 8.19.2.3.3. Preschool: 80 - 110/min.
    - 8.19.2.3.4. School age: 75 - 110/min.
    - 8.19.2.3.5. Adolescent: 60 - 90/min.
  - 8.19.2.4. Normal Respiratory Rate. Count for a full minute. **Note:** A respiratory rate greater than 60/min is abnormal for any child.
    - 8.19.2.4.1. Infant: 30 - 60/min.
    - 8.19.2.4.2. Toddler: 20 - 40/min.
    - 8.19.2.4.3. Preschool: 20 - 30/min.
    - 8.19.2.4.4. School age: 18 - 30/min.
    - 8.19.2.4.5. Adolescent: 12 - 16/min.
  - 8.19.2.5. Blood Pressure. Average systolic pressure for children one year old and over:  $(\text{Age in years} \times 2) + 90\text{mm Hg}$ ; lower limit:  $(\text{Age in years} \times 2) + 70\text{mm Hg}$  indicates hypotension.
  - 8.19.2.6. Skin Color. Cyanosis is a late sign of hypoxia.
  - 8.19.2.7. Mental Status/Level of Activity: Active and alert? Lethargic or unresponsive?
  - 8.19.2.8. UOP.
    - 8.19.2.8.1. Infant: 2 ml/kg/hour.
    - 8.19.2.8.2. Child over 2 yr: 1 ml/kg/hour.
  - 8.19.2.9. Offer fluids every one to two hours (unless contraindicated). **Note:** IV infusion pumps are used for all neonatal/pediatric patients.
  - 8.19.2.10. CNS perfusion: Responsiveness and recognizes parents.
  - 8.19.2.11. Muscle tone.
  - 8.19.2.12. Pupil size, posturing.
- 8.19.3. Rapid Cardiopulmonary Assessment/Treatment. Reference AHA or equivalent, TNCC if available, and DHA/J7 Education and Training guidelines. **Note:** PALS is not mandatory. If PALS certified, then follow PALS guidelines. If not, practice within the SOC.

8.19.3.1. Early recognition of the symptoms of progressive deterioration in respiratory and circulatory function and prompt initiation of therapy can often prevent cardiac arrest. **WARNING:** Bradycardia is life threatening and is associated with hypoxia; Cardio-Pulmonary Resuscitation (CPR). CPR is indicated if the child is bradycardic with poor perfusion or is pulseless.

8.19.3.2. Notify AOC/PMRC for guidance and possible diversion to a MTF capable of handling the situation.

8.19.4. Assessment of Signs/Symptoms of Severe Respiratory Distress: Notify AOC/PMRC for guidance and possible diversion to a MTF capable of handling the situation.

8.19.4.1. Respiratory Distress: Respiratory rate over 60 per minute, grunting or forced expiration, and head bobbing.

8.19.4.2. Retractions: Use of accessory muscles: sternal retractions, chest muscles visibly pulling and prolonged expiratory time.

8.19.4.3. Nasal Flaring: Obligated nose breathers for the first four months of life. Keep nares clear of secretions.

8.19.4.4. Cardiovascular: poor peripheral perfusion, tachycardia.

8.19.4.4.1. Neurological: decreased muscle tone, altered mental status.

8.19.4.4.2. Pallor precedes cyanosis. Assess capillary refill (<2 seconds).

8.19.5. Signs/Symptoms Respiratory Distress/Respiratory Failure.

8.19.5.1. Respiratory: Respiratory rate less than 10 per minute and/or irregular respirations.

8.19.5.2. Cardiovascular: Slower than normal or absent heart rate, weak or absent peripheral pulses, hypotension.

8.19.5.3. Neurological: Unresponsiveness, limp muscle tone.

8.19.6. Treatment/Management of Respiratory Distress/Respiratory Failure.

8.19.6.1. Airway.

8.19.6.1.1. Assessment: Open airway using the jaw thrust/chin lift maneuver. If neck injury is suspected, use the jaw thrust. Rule out foreign body, anatomic or other obstruction.

8.19.6.1.2. Treatment/Management: Place on 100% oxygen via non-rebreather mask, blow-by if mask is not tolerated. Consider oral airway, nasopharyngeal airway, and intubation per PALS guidelines when operationally feasible. **WARNING:** Performed by specially trained healthcare professionals working within their AFSC scope of practice.

8.19.6.1.3. Breathing.

8.19.6.1.3.1. Assessment: Is breathing ineffective?

8.19.6.1.3.2. Treatment/Management: Rescue breathing either mouth to mouth or mouth to nose, bag mask, and endotracheal intubation per PALS guidelines

when operationally feasible. Place on pulse oximetry.

#### 8.19.6.2. Circulation.

8.19.6.2.1. Assessment: Heart rate, pulses (central and peripheral), place on cardiac monitor, capillary refill, and blood pressure.

8.19.6.2.2. Cardiac compressions and fluid resuscitation.

8.19.6.2.2.1. Intravenous access: During CPR in children six years old and younger, intraosseous access is established if reliable venous access cannot be achieved within three attempts or 90 seconds, whichever comes first, per PALS guidelines when operationally feasible.

#### 8.19.6.3. Neurological.

8.19.6.3.1. Minimize anxiety.

8.19.6.3.2. Involve parents.

8.19.6.3.3. Evaluate muscle tone.

8.19.6.3.4. Evaluate pupil size and posturing if present.

#### 8.19.7. Selected diagnosis for the pediatric population.

8.19.7.1. Epiglottitis – a rapidly progressing bacterial infection of the epiglottis and surrounding soft tissue. Usually effects children between the ages of three and seven years. Symptoms can mimic croup, but the child is more ill-appearing.

8.19.7.1.1. Signs and Symptoms: Illness or sudden onset (usually six to eight hours from initial symptom) dysphasia, “barking” cough, inspiratory stridor, hoarse or muffled voice, fever, or drooling. Child may prefer sitting up or leaning forward.

8.19.7.1.2. Treatment/Management.

8.19.7.1.2.1. **WARNING** : Do not attempt to visualize/assess the airway or place anything in the airway.

8.19.7.1.2.2. Minimize anxiety and allow child to choose position of comfort.

8.19.7.1.2.3. Cool mist, blow-by oxygen.

8.19.7.1.2.4. Consider deferring IV access if child is severely agitated. Extreme agitation and anxiety may result in complete upper airway obstruction.

8.19.7.1.2.5. If IV access is in place, administer fluids, antibiotics and steroids as ordered.

8.19.7.1.2.6. Acetaminophen for fever. Refer to manufacturer’s recommendations for dosages.

8.19.7.2. Foreign Body Aspiration - Children between the ages of six months and four years are at high risk.

8.19.7.2.1. Signs and Symptoms: Sudden onset of coughing or wheezing associated with an episode of choking.

- 8.19.7.2.2. Treatment/Management. Reference AHA or equivalent, TNCC if available, and DHA/J7 Education and Training guidelines.
- 8.19.7.2.2.1. Severe Distress: Infants – back blows and chest thrusts.
  - 8.19.7.2.2.2. Children – abdominal thrusts.
  - 8.19.7.2.2.3. Minimal to moderate distress – Oxygen with cool mist and IV fluids.
- 8.19.7.3. Allergic Reaction – An immediate life-threatening situation. Reference AE Clinical Protocol – Anaphylaxis.
- 8.19.7.4. Croup. Croup is a common term for a viral infection that affects the larynx but may extend to the trachea and bronchi.
- 8.19.7.4.1. Signs and Symptoms: Barking cough, hoarse or raspy voice, noisy or labored breathing, rash, eye redness and swollen lymph nodes. May worsen when awakened from sleep. A history of cold symptoms and fever; wheezing may develop as a later symptom.
  - 8.19.7.4.2. Treatment /Management: Same as for epiglottitis (reference [paragraph 8.19.7.1](#)).
  - 8.19.7.4.3. Primarily supportive. Prevent dehydration and treat respiratory distress.
- 8.19.7.5. Asthma. The most common chronic illness in the pediatric population is asthma. Asthma is caused by a variety of environmental and immunologic factors.
- 8.19.7.5.1. Signs and Symptoms include expiratory wheezing, particularly in an acute attack; signs of respiratory distress, e.g., retractions, nasal flaring, cyanosis, accessory muscle use and eventual altered mental status.
  - 8.19.7.5.2. Treatment/Management:
    - 8.19.7.5.2.1. Ascertain history; home medication use; visits to the Emergency Department or hospital admissions
    - 8.19.7.5.2.2. Supplemental oxygen and beta-adrenergic and anti-cholinergic aerosols (albuterol and atrovent).
- 8.19.7.6. Pneumonia. Pneumonia is an inflammation of the pulmonary parenchyma caused by viral, bacterial, or fungal organisms.
- 8.19.7.6.1. Signs and Symptoms include fever; grunting respirations; decreased breath sounds; tachypnea.
  - 8.19.7.6.2. Treatment/Management includes supportive treatment; prevent dehydration and hypoxia. Treat fever with Tylenol (acetaminophen) per physicians' order. Administer antibiotics if bacterial in origin.
- 8.19.7.7. Bronchiolitis and Respiratory Syncytial Virus (RSV). Bronchiolitis and RSV are common infections of the respiratory tract in children, usually before their second birthday. For most, it is similar to the common cold, for a small percentage it can lead to pneumonia and inflammation of the smaller airways of the lungs.



- 8.19.7.7.1. Signs and Symptoms. Cold like symptoms, runny nose, and cough; whistling or wheezing; unusually upset or inactive; refusing to eat; and signs of dehydration.
- 8.19.7.7.2. Treatment and Management. Treat the symptoms. Use a bulb syringe to remove mucous; cool-mist vaporizer; offer small amounts of clear fluids and use non-aspirin fever reducers.
- 8.19.7.8. Hypothermia. Core temperature below 35 degrees centigrade, or 95 degrees Fahrenheit. Hypothermia can be caused by both environmental and therapeutic interventions such as rapid fluid infusion.
  - 8.19.7.8.1. Signs and Symptoms: Clinical signs of hypothermia are subtle: A change in mental status, cool, mottled skin and shivering in mild to moderate hypothermia. VS vary with the level of severity.
  - 8.19.7.8.2. Treatment/Management include removing the child from the cold stresses. Removing wet clothing, warm oxygen, warm fluids, and warm the room.
- 8.19.7.9. Hyperthermia. Presents with a core temperature of greater than 41 degrees centigrade, or 105.8 degrees Fahrenheit. Usually seen in children left in hot cars, athletes, cystic fibrosis.
  - 8.19.7.9.1. Signs and Symptoms: Patients have hot, dry skin; seizures; renal failure.
  - 8.19.7.9.2. Treatment/Management includes remove from the heat stress. Immerse in cool or iced water, direct fans to increase evaporation.
- 8.19.7.10. Descent.
  - 8.19.7.10.1. Monitor infant/child closely during actual descent. Encourage the use of a pacifier/bottle. If allowed to cry during descent, this usually clears the ears.
  - 8.19.7.10.2. Instruct nose-blowing technique for valsalva.

## **8.20. Mental Health Patient Management.**

- 8.20.1. Stresses of flight.
  - 8.20.1.1. Decreased partial pressure of oxygen and low humidity, may exacerbate the effects of mental health patients.
    - 8.20.1.1.1. Rule out hypoxia.
    - 8.20.1.1.2. Exacerbates effects of medication.
  - 8.20.1.2. Noise, fatigue, vibration, thermal changes in the aircraft and prolonged confinement place both physical and psychological stress on patients. **Note:** With psychiatric patients, this stress may be manifested by heightened awareness; mood changes to include increased irritability, depression, apprehension, paranoia, excitability or worsening suicidal thoughts.
- 8.20.2. The acute exacerbation of psychiatric or behavioral disorders in-flight may place the aircraft, crew, other patients, and passengers at risk. If a patient presents a risk to flight safety, a danger to themselves or others, restraints may be required. The goal is to use the

safest and least restrictive measures to control behavior within the AE environment while maintaining the patient's dignity.

8.20.2.1. Physicians, nurses, MAs, and family members may be used to comfort and talk to the patient.

8.20.2.2. An extra headset from the wireless communication system may be used with the patient to allow for comfortable speaking, follow HIPAA as implemented by DoDI 6025.18.

8.20.3. Patient classifications (reference [paragraph 3.7](#)).

8.20.4. Validation criteria of mental health patients.

8.20.4.1. Look carefully for signs mental health patients may have a change of status during flight that may directly threaten the aircraft or personnel onboard.

8.20.4.2. The VFS needs to know if the patient is a danger to self, others, or the aircraft/facility.

8.20.4.3. The AECM may refuse a patient for AE transport if the patient's behavior is determined to be detrimental to self and others, the patient has not been adequately prepared for AE movement, the AE crew is unable to make corrections before departure, and therapeutic interventions are ineffective. Document in the health record and the AECM notifies C2 who then contacts the governing PMRC at time of refusal. The AECM completes and submits a JPSR worksheet or DD Form 2852.

8.20.5. General considerations for mental health patients.

8.20.5.1. Physical factors: Age, cognitive level, sleep patterns, nutrition/hydration, elimination, touch, comfort, and physical activity. If appropriate based on classification, allow ambulation, sitting in "get up" seats, "stretch breaks" at en route stops, and comfort breaks. Offer fluids and nutrition frequently.

8.20.5.2. Pathophysiological factors: Drug interactions, substance abuses, dehydration, poor nutrition, underlying disease/illness, and metabolic and endocrine disturbances.

8.20.5.2.1. Correct underlying pathology (dehydration; alcohol and drug detoxification).

8.20.5.2.2. Observe for and treat hypoxia.

8.20.5.2.3. Sedated patients may be more susceptible to dehydration and/or hypoxia, and aspiration during patient movement.

8.20.5.2.4. Assure adequate hydration and nutrition.

8.20.5.3. Psychological factors: Anxiety/fear, fatigue, depression/grief, denial, boredom, communication barriers, stress, and post-traumatic stress. **Note:** History of physical or sexual abuse may affect individual reactions to physical contact and place the individual at greater psychological distress. Mental health patients are typically physically healthy and therefore capable of independent actions that could directly threaten the aircrew, patient staging personnel and other patients. If the patient is exhibiting aggressive and uncontrollable behavior, is extremely agitated or violent and/or is determined to be a danger to flight safety, self, or others, give as needed (PRN) medication as ordered. If no

PRN medication is ordered, give Haldol or Valium in accordance with AE Clinical Protocol – Acute Exacerbation of Mental Health or Behavior Disorders. Consult with the PMRC VFS and C2 for guidance and possible diversion to a MTF capable of handling the situation and for further medical direction as soon as operationally feasible.

8.20.5.4. Environmental factors: Confined space, noise, lighting, positioning, temperature, aircraft systems, and personal items.

8.20.6. Physician orders for mental health patients.

8.20.6.1. The originating physician writes orders for routine medications as well as PRN medications for increasing symptoms while the patient is in the AE system.

8.20.6.2. Extremely high-risk mental health patients travel with an experienced psychiatric technician/RN or medical provider capable of recognizing the need for the medication administration and/or providing specialized care.

8.20.6.3. The requirement for an MA is determined by the originating physician in consultation with the PMRC VFS. **Note:** If operationally feasible, all mental health patients requiring ongoing supervision have an MA of the same gender and commensurate rank during movement between the originating and the destination facility.

8.20.7. Preflight/in-flight care for mental health patients.

8.20.7.1. General:

8.20.7.1.1. Position litter patients in the lowest litter space, away from the flight deck, emergency exits, and O2 shutoff valves. Assign ambulatory patients a seat near the bulkhead, away from the flight deck, emergency exits and O2 shut off valves. Assess potential safety risks of nearby objects and cargo.

8.20.7.1.2. Inform flight crew as to where the mental health patient is placed on the aircraft and where they are at all times. For confidentiality purposes, no further information is given.

8.20.7.1.3. Give clear behavioral expectations (examples include seatbelts, no smoking, stretch breaks, no access to the flight deck, and use of the lavatory) and establish a verbal contract, including when medication or restraints can be used.

8.20.7.1.4. Use neutral language and speak in a non-threatening, non-judgmental manner.

8.20.7.1.5. Mental health inpatients and their hand-carried bags will be searched by an AECM for sharps, matches, lighters and cigarettes prior to enplaning. **(T-1)**. These items will be inventoried, secured, and deplaned to the receiving MTF. **(T-1)**. Use AF Form 3854, *Receipt for Patient's Valuables*. Litter patients are allowed to carry eyeglasses, toothbrush, and a small amount of money, wedding band, rings, wristwatch, ID card, and wallet.

8.20.7.1.6. The designated MA or AECM maintains line-of-sight or one-to-one observation of patients in restraints and/or with suicidal, homicidal or elopement precautions. Assign one AECM, preferably the same gender to act as the team leader.

This caregiver coordinates with the AECM and the MA if further interventions are required.

8.20.7.1.7. Disposable eating utensils do not need to be removed for high-risk patients but are inventoried when trays are collected.

8.20.7.1.8. Offer fluids every two hours.

8.20.7.1.9. Medications are to be given preflight and PRN if behavior becomes unmanageable. Monitor SpO2 and temperature for patients on antipsychotic medications (e.g., risperidone, olanzapine).

8.20.7.1.9.1. Determine whether medication is effective. Document findings.

8.20.7.1.9.2. Body temperature of 102°F and above along with increased agitation while on antipsychotic medication may indicate neuroleptic malignant syndrome (NMS) which can be life-threatening. If symptoms appear preflight, the patient is not stable for flight. The AECM notifies C2 who then contacts the governing PMRC for guidance. **WARNING:** If symptoms appear in-flight, hold medication, monitor VS, apply cooling blanket if available. Assess for increased agitation, which may require PRN anti-anxiety medication as ordered by the physician. Document the medication administration; the AECM notifies C2 who then contacts the governing PMRC.

8.20.7.1.9.3. High potency neuroleptics, such as Haldol, may cause extrapyramidal symptoms (EPS) within hours or days after starting medication. EPS may present as muscle spasms or distortion of the neck, jaw, tongue, rotating of the eyes, or inability to be still. Other side effects may include cardiac irregularities, hypotension, respiratory suppression, and over-sedation. Patients on these medications require orders to treat potential EPS. **WARNING:** If symptoms appear in-flight and no orders are available, hold neuroleptic medications, and the AECM notifies C2 who then contacts the governing PMRC for guidance. Cogentin and Benadryl are available in the in-flight kit (IFK) if ordered by the VFS. **WARNING:** If previously untreated EPS symptoms are present preflight, the patient is not stable for flight.

8.20.8. Acute exacerbation of psychiatric or behavior disorder. If the patient is exhibiting aggressive and uncontrollable behavior, is extremely agitated and violent, and/or is determined to be a danger to flight safety, self, or others on the aircraft, administer PRN medication as ordered. Consult C2 and the PMRC for guidance, medication orders and possible diversion to a MTF capable of handling the situation. If no PRN medication is ordered, give Haldol or Valium in accordance with AE Clinical Protocol – Acute Exacerbation of Mental Health or Behavior Disorders. Consult with the PMRC VFS and C2 for guidance and possible diversion to medical treatment facility (MTF) capable of handling the situation and for further medical direction as soon as operationally feasible.

8.20.8.1. An AECM trained and competent in the application of restraints acts as the team leader and coordinates with the MA. The team leader establishes and is responsible for patient interaction while en route.

8.20.8.2. Inspect short and long restraint belts and wrist and ankle cuffs for cuts, tears, or excessive wear. Assure there are compatible/operable restraint keys available and the caregivers know the location of the keys. Prior to takeoff, verify the restraint key opens the locking device. The patient's restraints are not attached to or around the litter itself (reference [paragraph 8.20.9](#)).

8.20.8.3. The safest and least restrictive alternative methods for controlling violent and uncontrollable behavior in the AE environment is utilized. These include but are not limited to:

8.20.8.3.1. Countermeasures. Appropriate use of medications and/or physical restraints in AE are used to prevent patients from physically harming themselves, others, or becoming a safety risk to the flight. The least restrictive methods are used to maintain safety of the patient, others, and the aircraft. Verbal deescalating techniques are always used first. De-escalating techniques can include allowing the patient to verbalize their feelings in an appropriate manner and talking to the patient in a calm but firm direction. An extremely agitated, high-risk patient may require an upgraded classification or may need to stay behind. Appropriate standing PRN medications (PO/IM) is required.

8.20.8.3.2. Verbal de-escalation, verbal contract, explanation of consequences for not changing behavior, MA/family intervention, and medication as ordered.

8.20.8.3.3. Perform brief examination to rule out and treat underlying organic medical causes of agitation to include but not limited to hypoxia, hypoglycemia, alcohol/drug intoxication or withdrawal, medication effect/overdose, and hypotension.

8.20.8.3.4. Assessment to include but not limited to orientation to time, person and place, ability to follow commands/recall directions, or accepts limits and reliably contracts for safety. Identify if a danger to flight safety, increased risk to self or others, or too agitated/violent and needs sedatives administered. **Note:** If attempts at verbal de-escalation have failed and the patient is extremely violent, out of control or a threat to flight safety, then medicate with prescribed PRN medications and apply restraints. Call C2 and request a patch to the PMRC if in-flight or call the VFS if in the staging facility. **Note:** If this situation occurs prior to takeoff, the patient is not stable for flight. Stabilize the patient with medication prior to takeoff in coordination with C2, PMRC, and/or local physician. The mission is not be delayed in order to meet this requirement.

8.20.8.4. When alternative measures are unsuccessful, the AECM and the MA:

8.20.8.4.1. Ensure the patient, the crew, and others are not in immediate danger.

8.20.8.4.2. Direct the notification of the flight crew to include securing access to the flight deck.

8.20.8.4.3. Make every effort to maintain the patient's dignity and privacy.

8.20.8.4.4. Inform the patient and family member (if present) he/she has escalating symptoms, and the crew is assuming control until he/she is able to regain control.

8.20.8.4.5. If restraints are required, apply in accordance with AFMAN 10-2909 and follow the AE Clinical Protocol - *Acute Exacerbation of Mental Health or Behavioral Disorders*.

8.20.9. Management of patients requiring restraints in the AE environment. **WARNING:** When applying physical restraints, there is a potential to produce serious consequences, such as physical and psychological harm, loss of dignity, violation of an individual's rights, and even death.

8.20.9.1. The goal for restraint use is to provide the most effective method to ensure and maintain the safety of the patient and staff/aircrew. Restraints may also be utilized for patients at risk for dislodging vital therapeutic devices.

8.20.9.2. Restraints are not applied as punishment or for crew convenience.

8.20.10. Physician written time limited orders for restraints:

8.20.10.1. Physicians annotate restraint orders on the EHR or AF Form 3899. Each order for physical restraints covers the timeframe the patient is in the AE system. A PRN restraint order is not a valid order.

8.20.10.2. In an emergency, AECM may initiate the use of restraints before an order is obtained. The AECM may determine a patient requires restraints or the patient requires the continuation of restraints in the AE environment beyond initial order. In either situation, the use of restraints does not exceed 24 hours.

8.20.10.3. Document application, continuation of restraints and clinical observations to the governing PMRC through C2.

8.20.10.4. After the original restraint order is obtained, the patient receives a face-to-face assessment by a physician or licensed independent practitioner, usually done at the RON or destination facility, whichever is sooner.

8.20.10.5. In the AE system, contact C2 when restraints are initiated without an order. Document all C2 contact attempts/contacts on the EHR or AF Form 3899. **Note:** In the AE system contact C2 and PMRC with any change in the patient's condition and delay of the time frames below.

8.20.10.6. The following time constraints are ideally required for physician assessment after initiation of restraints:

8.20.10.6.1. Four (4) hours for adults.

8.20.10.6.2. Two (2) hours for children and adolescents age 9 to 17.

8.20.10.6.3. One (1) hour for patients under age nine.

8.20.11. Level of observation required for restrained patients is direct observation for the duration of the restraint episode. During the restraint period, the AECM may remove wrist restraints but not the ankle restraints. This is consistent with maintaining flight safety and facilitates patient feeding and other personal activities while the patient adapts to the AE environment.

8.20.12. Documentation of patient in restraints and release criteria.

- 8.20.12.1. Patient assessment and behavior/justification for PRN sedation medication or restraint application.
- 8.20.12.2. Date/time of administration of medication and/or application of restraints, and outcome.
- 8.20.12.3. Date/time of notification of the physician.
- 8.20.12.4. Complete a JPSR worksheet or DD Form 2852.
- 8.20.12.5. Maintain direct observation, including during takeoff and landing.
- 8.20.12.6. Perform neurovascular assessment to extremities and document observations every 15 minutes according to the EHR or AF Form 3899.
- 8.20.12.7. Assess hydration, nutrition, skin integrity, and toileting needs every two hours
- 8.20.12.8. Turn and reposition patient at least once every two hours, removing one extremity restraint at a time to check skin integrity.
- 8.20.12.9. Perform skin care to the area and ROM exercises at least once every two hours
- 8.20.12.10. Leg restraints are not removed while in-flight. During patient staging, if the patient is reassessed by a physician, the physician may write an order to remove the restraints.

8.20.13. Alcohol and drug withdrawal.

- 8.20.13.1. Level of withdrawal is determined according to the Clinical Institute Withdrawal Assessment for alcohol (CIWA) guidelines (reference [Attachment 12](#)).
- 8.20.13.2. Signs and symptoms may be mild-moderate such as restlessness, agitation, anxiety, and fear, nausea, vomiting, malaise, weakness, tachycardia, diaphoresis, elevated temperature, tremors, and dilated but reactive pupils.
  - 8.20.13.2.1. Critical symptoms may include abnormal VS, tremors, seizures, delirium (fluctuating mental status), and hallucinations.
  - 8.20.13.2.2. A detoxification period of three to five days is required to be accepted for flight.
  - 8.20.13.2.3. If residual withdrawal symptoms are present, IV access is required.
  - 8.20.13.2.4. Medications per AE Clinical Protocol - Acute Exacerbation of Mental Health or Behavior Disorders Medication Administration.
  - 8.20.13.2.5. Documentation includes subjective and objective data for giving the medication; VS; known allergies; for women of childbearing years, date of last menstrual cycle; date and time of administration and notification of a physician, and the outcome. The following statement is documented on the EHR or AF Form 3899. “(Insert name of drug) was administered in accordance with AE Clinical Protocol - Acute Exacerbation of Mental Health or Behavior Disorders. Complete a JPSR worksheet or DD Form 2852.

8.20.14. Acute stress disorder/post-traumatic stress syndrome (PTSD).

8.20.14.1. Special consideration are provided to mental health patients experiencing acute stress reactions and PTSD. Acute stress and PTSD develop after experiencing a psychologically traumatic event outside the range of usual experience (e.g., combat, bombings, sexual assault).

8.20.14.1.1. Individuals may re-experience the event through recurrent thoughts, images, flashback episodes and dreams.

8.20.14.1.2. Individuals may present with symptoms such as increased arousal or irritability, sleep deprivation, hypervigilance, exaggerated startled response, survival guilt, poor concentration, anxiety, and motor restlessness.

8.20.14.2. Assess for signs and symptoms (may be associated with other injuries: Tremors, profuse sweating, dry mouth, tachycardia, shortness of breath and hyperventilation (rule out hypoxia), irritability, flat affect, staring, crying, insomnia, and avoidant or emotional numbness). **Note:** May be more prone to violent and aggressive behaviors while in the AE environment due to stress of flight.

8.20.14.3. Treatment/Management begins as soon as symptoms are noticed.

8.20.14.3.1. Keep acute stress disorder/PTSD patients together for mutual support and away from other patients, if feasible. Provide comfort measures to include fluids, nutrition, blankets, and medications.

8.20.14.3.2. Talk to patients in a calm, reassuring manner, avoid approaching individual from behind and keep from touching if possible.

8.20.14.3.3. Anxiolytic medications may be necessary preflight and in-flight for increased anxiety, extreme agitation, and restlessness.

8.20.15. Post-mission/RON requirements.

8.20.15.1. The receiving MA assumes responsibility of the patient and remains with the patient at all times until released. Restraints remain in place during transportation to the MTF. Restraints are not placed for the convenience of the receiving facility. Continuity of care and patient dignity is maintained en route to the receiving MTF.

8.20.15.2. A physician or licensed independent practitioner performs a face-to-face reassessment of the patient to determine if restraints are to be continued while in the AE environment.

8.20.15.3. Higher acuity psychiatric patients (e.g., 1A or 1B) or alcohol abuse patients, or in extreme situations where a patient has required restraints for more than 24 hours, a RON bed may be required at an off-base psychiatric facility. Notify PMRC personnel of requirements in the event of unscheduled RON's.

## **8.21. Pain Management.**

8.21.1. Stresses of flight.

8.21.1.1. Decreased partial pressure of oxygen: Decreases tissue oxygen availability and exacerbates oxygenation deficiencies due to preexisting hypoxias related to injury, disease, and/or treatment. May exacerbate the CNS effects of pain medication.



8.21.1.2. Barometric pressure changes: Gas expansion in the abdominal cavity at cruise altitude may lead to crowding of the diaphragm increasing pain and splinting. Splinting and diaphragmatic crowding decreases lung volume and expansion and may exacerbate the risk of hypoxia. Consider placing an NG tube.

8.21.1.3. Thermal: Cold temperatures may lead to vasoconstriction, shivering and exacerbated pain. Keep patient warm and limit exposure to cold temperatures.

8.21.1.4. Vibration/turbulence: Increases muscle activity, metabolic rate, and peripheral vasoconstriction. Avoid excessive speed of ground transportation assets. Secure patients away from the bulkhead and floor of ground vehicles and aircraft, encourage and assist with position changes, and provide adequate padding and skin care, especially for orthopedic patients with internal/external fixators.

8.21.1.5. Gravitational forces: Seat belts in side-facing and rear-facing seats may cause injury during acceleration/deceleration; use extra padding between abdomen and seat belt for patients with abdominal surgery.

8.21.1.6. Fatigue: Exacerbates the patient's underlying condition/diagnosis due to the overall effect of previously mentioned stresses of flight, and length of time the patient has been in the AE system.

8.21.2. General: Pain is a complex experience with multiple dimensions and is always subjective. Pain is defined by the International Association for the Study of Pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage. **Note:** The inability to communicate verbally does not negate the possibility that an individual is experiencing pain and is in need of appropriate pain-relieving treatment. **Note:** Do not give supplemental acetaminophen (Tylenol) with oral narcotics containing acetaminophen as this may lead to toxicity risks.

8.21.2.1. Undertreated and poorly managed pain may lead to adverse physical and psychological consequences and complications such as pneumonia, VTE, delayed recovery and/or progression to chronic pain. Reassessment of pain is required whenever the patient's environment changes. Pain management needs change frequently and can dictate whether transport is possible (or recommended).

8.21.2.2. For any patient with escalating pain control requirements, vigilant monitoring, and documentation during and after all interventions is mandatory to assess the patient's response to therapy and to prevent problems such as oversedation and airway obstruction. Proper documentation of orders, VS, pulse oximetry monitoring, patient response and a coordinated hand-off when providers change duties is critical.

8.21.2.2.1. IV pain medications in accordance with AE Clinical Protocol - Pain Management.

8.21.2.2.2. Phenergan is sedating and when used with opioids may increase the risk of respiratory depression. Respiratory depression, airway obstruction, and apnea are much more common when these medications are used in combination. Tolerance to respiratory-depressant effects usually develop within 1 week of starting regularly scheduled opioid therapy.

- 8.21.2.2.3. Benzodiazepines, such as diazepam, clonazepam, or lorazepam, due to their sedative and respiratory depressant effects, are used cautiously with opioids. The opioids' dose may need to be decreased. Respiratory depression, airway obstruction, and apnea are much more common when these medications are used in combination.
- 8.21.2.2.4. Frequent monitoring of VS, including Motor Activity Assessment Scale (MAAS) sedation score, is essential not only when administering the medications, but for 15 – 30 minutes further to ensure these complications do not occur.
- 8.21.3. Pain assessment: When assessing pain, always rule out and treat life-threatening conditions, such as cardiac pain/pulmonary embolism.
- 8.21.3.1. Indicators of pain by hierarchy:
- 8.21.3.1.1. Patient self-report – single most reliable measure of intensity of pain.
  - 8.21.3.1.2. Pathological conditions or procedures known to be painful.
  - 8.21.3.1.3. Observed pain-related behaviors (grimacing, restlessness, vocalization, groaning).
  - 8.21.3.1.4. Reports of pain by family or attendant.
  - 8.21.3.1.5. Physiological changes (increased pulse and BP).
- 8.21.3.2. Types of pain scales. When choosing a pain scale, select the one that best aligns with the age and condition of the patient (reference [Attachment 13](#)).
- 8.21.3.2.1. 0-10 Numeric Pain Rating Scale.
- 8.21.3.2.1.1. Most commonly based on a scale from zero to 10.
  - 8.21.3.2.1.2. Zero represents no pain at all while 10 represents the worst imaginable pain.
- 8.21.3.2.2. Wong-Baker faces.
- 8.21.3.2.2.1. Represented by faces with expressions. Zero is represented by a smiley face, while 10 is represented as a distraught, crying face.
  - 8.21.3.2.2.2. Useful when rating pain in children, or for adults with mild cognitive impairments.
- 8.21.3.2.3. Defense and Veterans Pain Rating Scale. This scale includes visual cues and verbal descriptors to improve interpretability of incremental pain intensity levels supplemental questions assess pain interference with general activity, sleep, mood, and stress.
- 8.21.3.2.4. Face, Legs, Activity, Crying and Consolability (FLACC). Observer rated pain scale for children between the ages of two and seven and for people who are unable to communicate their pain (e.g., ventilator patients).
- 8.21.3.3. Obtain VS (including pulse oximetry) and assess pain at least every four hours for patients who require en route pain medication administration. Rule out hypoxia and consider compartment syndrome.

8.21.3.4. Determine characteristics of pain: Quality, region, radiation, what provokes/triggers (movement/dressing changes/deep breathing and coughing), palliates/eases (repositioning/elevation/support/medication), and the adequacy/adverse effects of pain medication.

8.21.3.5. Ascertain the patient's pain level and their acceptable level of pain. The acceptable level of pain is the level of pain the patient can tolerate. **Note:** Individual practice may lead to differences in delivery of pain medication. **Note:** Healthcare providers' bias, prejudice and stereotyping may lead to differences in delivery of pain medication. Avoid attributing pain to psychological causes, and respect/accept patient's self-report of pain.

8.21.3.6. If appropriate, educate the patient on the availability of medications.

8.21.3.7. A pain score of three or more usually indicates the need for pain medication. Assess current medications to evaluate potential interactions to include hypoxia before administering pain medication.

8.21.3.8. Pain is reassessed as ordered and after interventions.

8.21.3.8.1. Pain and VS are reassessed 15-30 minutes after pharmacologic interventions.

8.21.3.8.2. Take into consideration the type of medication, time of onset based on route, and duration of known effectiveness.

8.21.3.9. When operationally feasible:

8.21.3.9.1. Assess cultural attitudes, stoicism, guilt, potential frustration, helplessness, mental functioning, mood, and fear of pain.

8.21.3.9.2. Educate patients, family, and attendants regarding reporting pain, availability of pain medication, as well as the low risk of addiction from long-term use and/or high doses of medication for pain relief, and document in the health record. **Note:** Include information about PRN medications being available around-the-clock.

8.21.4. Pain: Treatment/management:

8.21.4.1. Administer pain medication, as ordered, prior to potential painful events such as transportation movement and en route staging treatments and dressing changes. Take into consideration the type of pain medication, time of onset based on route, and duration of known effectiveness. For example, opioid analgesic onset is immediate when administered intravenously, and rapid when administered via intramuscular and oral routes (approximately 30 - 60 minutes); duration is usually one to eight hours. Also consider adjunct medications such as anxiolytics. **Note:** Document all known allergies in the health record.

8.21.4.2. Assess adequacy of pain medication at all patient care hand-offs, en route staging locations and in-flight. Consider medication for breakthrough pain (pain that occurs in between regularly scheduled doses of pain medication). Start pain control at least 60 minutes prior to patient movement from bedside (en route to aircraft) when feasible. **Note:** If medication is inadequate or absent at the staging facility, the physician

evaluates the patient and orders pain medication prior to continuation of PM. **Note:** If a physician is not present and pain medication is not available or is insufficient, request and establish contact with PMRC for a physician order.

8.21.4.3. Non-drug interventions to assist in alleviating pain: Maintain body alignment, elevate extremity, change position; readjust splints and bivalved casts; encourage physical activity, if operationally and clinically feasible. Consider heat/cold application if not contraindicated.

8.21.4.4. Prescribed controlled medications entrusted to a patient/attendant are considered the property of the individual, who is then responsible for safeguarding and administering the drug(s) during all phases of PM. Ensure patients understand use and have an adequate supply for duration of movement to the receiving MTF. Medical personnel determines if the patient or attendant is competent to safely manage these medications. **Note:** Patients and NMA do not carry or administer controlled medications without a current written physician's order.

8.21.4.5. The originating facility supplies the patient's pain medication for their time in the AE system. Intratheater requires a 1-day supply and intertheater requires a three-day supply of medication.

#### 8.21.5. Epidurals and PNBs.

8.21.5.1. Epidural analgesia and PNBs are a proven adjunct for severe pain management for patients transiting the continuum of care. Patients are managed by ERCC team, MAs, and/or AECMs and ERPS personnel. All active staging facility nursing personnel accomplish the approved AMC/SG training plan annually. All other ERPSS personnel completes the training within 90 days of deploying to an active patient staging location. This training is documented in the RN's competency assessment folder and the medical technician Air Force Training Record. The CNE is responsible for ensuring all staging facility nursing personnel have accomplished training prior to caring for patients with PCA/PNB or epidural analgesia. The training is located on the AMC SG/A3 website.

8.21.5.2. The following apply to patients moving in the AE system without an attendant/ERCC team:

8.21.5.2.1. An epidural analgesia or PNB infusion will be in place and running without incident for a minimum of 4 hours prior to departing the sending facility. (T-2).

8.21.5.2.2. Only analgesic concentrations of local anesthetics are infused via epidural. Narcotics (or any other medication) are NOT be added to the epidural infusions.

8.21.5.2.2.1. Only amides such as bupivacaine and ropivacaine are used. Esters, such as procaine and chlorprocaine are not permitted due to increased risks associated with these medications.

8.21.5.2.2.2. More dilute solutions, e.g., 0.125% Bupivacaine, are used to decrease the risk of sympathetic blockade.

- 8.21.5.2.3. All infusions are stable at an analgesic level, not a surgical anesthesia level, at the T10 dermatome (umbilicus) level. The patient is then able to regain partial “motor” control of the lower extremities.
- 8.21.5.2.4. Other pain medications or narcotics may be administered orally, intravenous (IV) or by PCA using established protocols or in conjunction with written physician orders.
- 8.21.5.2.5. All epidural analgesia or PNB infusions are administered using an approved infusion pump. Non-approved pumps require a waiver from AMC/A3VM. The pump and the IV tubing is labeled as **“EPIDURAL INFUSION”** or **“PERIPHERAL NERVE BLOCK INFUSION.”**
- 8.21.5.2.6. A patient hand off is completed and documented on the EHR or AF Form 3899 each time a different clinician accepts care of the patient. The hand-off is performed consistently with high alert IV medications to prevent programming errors. An independent double-check is defined as two medical persons familiar with the process/equipment/medication (at least one being a RN), independently verifying the practitioner’s/provider’s orders, medication hanging, and the correct set up of PCA or IV pump in use (rate, dose, volume to infuse, medication concentration, basal rate, bolus lockout, etc.). This hand-off includes a review and documentation of history on the infusion pump. Documentation of double checks are reflected by two signatures on required forms/flow sheets or in the health record. This is applicable to MTFs, ERPS, ERCC team, and AECMs. Double-checks are conducted and documented when initiating high alert medications, during hand-offs of care, following a change in orders, and when a new bag is started. The only time total volume remaining is changed is when medication bags are replaced.
- 8.21.5.2.7. Sufficient orders for the epidural analgesia or regional block infusion are fully documented in the health record. These orders include the medication, infusion rates/settings as well as back-up pain management orders if the pump should fail, or inadequate pain relief occurs while the patient is in transit.
- 8.21.5.2.8. In the event there are complications related to the epidural infusion or regional block, nursing personnel terminates the infusion and treats the patient as appropriate and per established clinical guidelines established by AMC/SGK. Interventions could include a range of activities from administering alternate pain adjuncts to airway/circulatory support. Changes in status and interventions are documented in the health record and communicated to C2 who then contacts the governing PMRC.
- 8.21.5.2.9. At each en route location, an anesthesia provider is contacted, if needed, for consultation.
- 8.21.5.2.10. Sterile dressings to insertion site are not changed in the aircraft. They may be reinforced if necessary. The epidural catheter is secured so the catheter is not stretched or pulled at the site with any movement of the patient.
- 8.21.5.3. At each patient care hand off and every two hours, assess pain status, MAAS sedation score, dermatome level of analgesia, VS, motor function, and drug side effects.

8.21.5.4. Assessing motor/sensory dermatome levels includes motor and sensory function checks. **Note:** a dermatome is best defined as that area of the skin that is supplied by a single spinal nerve or more specifically, the vertebral level at which the spinal nerve exits the spinal cord that innervates the skin in a contiguous sensory band or stripe (~ 1-2 inches wide). These bands arise posteriorly, from the spinal column laterally/anteriorly. Each stripe or band is referred to as a dermatome and each dermatome corresponds to a specific nerve root. Dermatome segments are standardized to a specific nerve root and enable clear/consistent communication about the level of anesthesia (sensory blockade).

8.21.5.4.1. Assessing motor function:

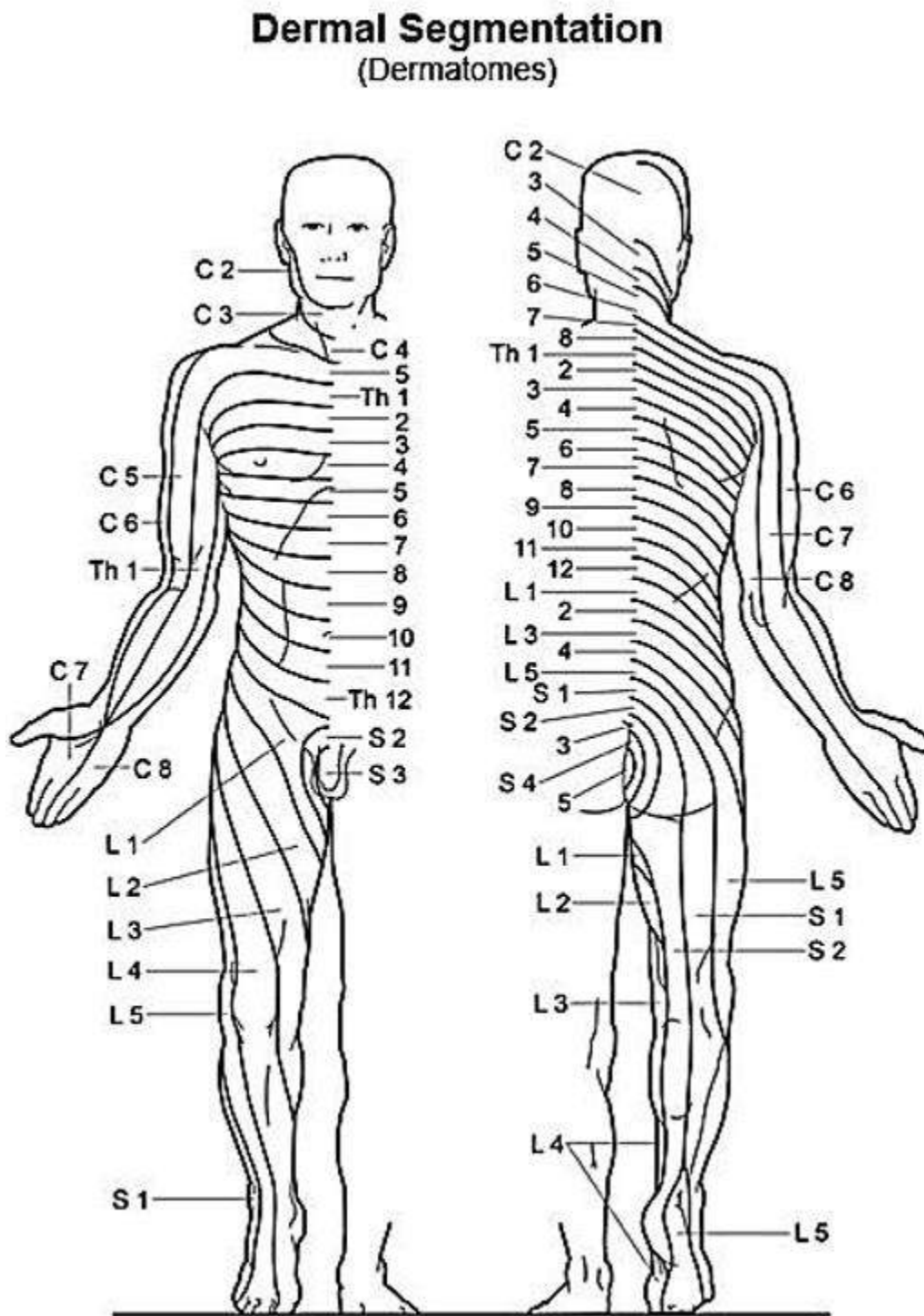
8.21.5.4.1.1. Ask patient to wiggle toes, dorsiflex foot.

8.21.5.4.1.2. Ask patient to bend knees/raise leg.

8.21.5.4.1.3. Tense the rectus muscles by lifting the head.

8.21.5.4.2. Reference **Figure 8.1** to determine the level of motor blockade.

Figure 8.1. Dermal Segmentation (Dermatome Map).



8.21.5.4.2.1. Above [Figure 8.1](#) Supplied by American Society of Electroencephalography Technicians (ASET), 2011.

8.21.5.5. Assessing sensory function: **Note:** Positive findings indicate return of motor function. It does not, however, indicate resolution of the sensory/autonomic blockade therefore adequate pain control may still be present.

8.21.5.5.1. Temperature - use a cold object (e.g., ice/alcohol swab).

8.21.5.5.2. Touch - apply a sharp and dull object to the skin (e.g., paper clip).

8.21.5.5.3. Begin the assessment along the sternum moving from side to side, progressing downward until the patient identifies a 'change' in 'touch' sensation and 'temperature' sensation (cold warmth or no sensation). Sensation levels may return faster on one side than the other, therefore clear documentation identifying the sensory levels (left and right) is documented.

8.21.5.6. Peripheral nerve blocks.

8.21.5.6.1. There are several types of regional anesthesia currently used including axillary, femoral, and popliteal PNBs. With these blocks, the anesthesia provider injects or infuses the local anesthetic into the tissue surrounding the nerve. Needle placement is determined initially by using anatomic landmarks. Next, a peripheral nerve stimulator is used to facilitate precise location of the appropriate nerve. The anesthetic effect occurs primarily distal to the injection sites. For example, a popliteal block may be used for distal surgical procedures, such as the achilles tendon repair. In contrast, intravenous (Bier) nerve blocks are administered distal to the surgical site and rely on diffusion rather than direct injection to achieve anesthetic effects.

8.21.5.6.2. All local anesthetic agents used in PNBs induce physiologic responses via the same mechanism. Specifically, anesthetics interfere with the neuronal membrane's permeability to sodium. Disruption of sodium exchange results in inhibition of neuronal impulses between the affected extremity and the brain. Consequently, sensory, motor, and sympathetic neural pathways are affected, and the patient is unable to feel or move the anesthetized limb.

8.21.5.6.3. Signs of systemic toxicity include tinnitus, sudden metallic taste, confusion that progresses rapidly to loss of consciousness, seizures, and abrupt onset of cardiac dysrhythmias. Neurologic symptoms are likely to appear before cardiovascular disturbances unless epinephrine (EPI) has been added to the block. Inadvertent systemic administration of anesthetic combinations containing epinephrine cause transient tachycardia and hypertension (reference AE Clinical Protocol - local anesthetic toxicity [LAST] Treatment).

8.21.5.7. Patient care responsibilities for epidural/PNB infusions.

8.21.5.7.1. Ensure the patient is on continuous pulse oximetry for epidurals. Assess and document the respiratory rate and oxygen saturation, MAAS sedation score, VS, pain scale, dermatome level, motor and sensory function and side effects (if present) every 2 hours Document this on the EHR or AF Form 3899. AETs may perform these duties in accordance with their Career Field Education and Training plan (CFETP). The AET reports these VS to the FN. If the oxygen saturation falls below 92% (reference AE Clinical Protocol – Emergency Oxygen).



8.21.5.7.2. Some motor weakness in patients undergoing epidural analgesia or PNB therapy to a lower extremity is expected and the patient is considered a risk for falls and requires assistance when ambulating. Identify the patient as a fall risk via the “Epidural Patient” or “PNB patient” wrist band.

8.21.5.7.3. Assess the dressing for leakage every four hours and record on the EHR or AF Form 3899.

8.21.5.7.4. Catheters are not removed until reevaluated by an anesthesia provider at the next scheduled en route stop. Only an anesthesia provider removes the catheter if required. Staging facility personnel and AECMs never remove the catheter. Administration of PRN medications per physician’s orders are administered for pain management if the approved AE infusion pump is turned off due to adverse side effects.

8.21.5.7.5. Caution is taken with any patient receiving epidural or PNB analgesia via an indwelling catheter who is also receiving anticoagulation therapy, to include coumadin, heparin infusions, or low molecular weight heparin or lovenox.

8.21.5.7.6. Maintain IV access of #20 gauge or larger.

8.21.5.7.7. Change epidural/PNB medication bag before infusion runs out.

8.21.5.7.8. Ensure the approved AE infusion pump and IV tubing is labeled “EPIDURAL ANALGESIA OR PERIPHERAL NERVE BLOCK” and the catheter is taped with label indicating “FOR EPIDURAL ANALGESIA or PERIPHERAL NERVE BLOCK USE ONLY.” The patient’s placement on the aircraft is clearly marked on the load plan and specifically identified to the AE crew during pre-mission crew brief.

8.21.5.7.9. Adverse effects of local anesthetics typically occur as a result of high blood levels of the drugs and are similar among all agents in use. Neurologic symptoms are likely to appear before cardiovascular disturbances unless epinephrine has been added to the block. Inadvertent systemic administration of anesthetic combinations containing epinephrine causes transient tachycardia and hypertension. Hypersensitivity, or allergic reactions, although rare, are also a concern with regional anesthetic agents, and are more likely to occur with ester-based agents than with amides. Esters include procaine, chlorprocaine, tetracaine, and piperocaine, whereas amides include bupivacaine, mepivacaine, and prilocaine. **WARNING:** For all problems related to these infusions during flight, terminate the infusion (turn off the approved AE infusion pump) and resort to other established pain management techniques.

8.21.5.7.10. While controversy exists regarding the mechanism of lipid rescue, the most accepted theory is that Intralipid creates a new intravascular lipid compartment, or “lipid sink,” that increases the volume distribution of lipophilic drugs. Distribution of drugs to this additional lipid compartment rapidly decreases the concentration of overdosed medicines on vital organs and quickly reverses the effects of the toxins. Thus far, lipid rescue has been proven to work in anesthetic overdoses of commonly used emergency department [ED] anesthetics such as bupivacaine and lidocaine (reference AE Clinical Protocol – LAST).

8.21.5.7.11. If in-flight, notify the VFS (via phone patch) for:

8.21.5.7.11.1. CNS symptoms.

8.21.5.7.11.1.1. Metallic taste in the mouth.

8.21.5.7.11.1.2. Tinnitus.

8.21.5.7.11.1.3. Tingling of the lips; difficulty swallowing.

8.21.5.7.11.1.4. Agitation.

8.21.5.7.11.1.5. Seizures.

8.21.5.7.11.2. Cardiovascular symptoms.

8.21.5.7.11.2.1. Bradycardia.

8.21.5.7.11.2.2. Decreased myocardial contractility.

8.21.5.7.11.2.3. Atrial-ventricular block.

8.21.5.7.11.2.4. Vasodilation.

8.21.5.7.11.2.5. Ventricular arrhythmias.

8.21.5.7.11.2.6. Cardiac Arrest.

8.21.5.7.11.3. Respiratory symptoms.

8.21.5.7.11.3.1. Shortness of breath.

8.21.5.7.11.3.2. Dizziness or light-headedness.

8.21.5.7.11.3.3. Respiratory rate of 10/minute or less, or 50% below baseline.

8.21.5.7.11.4. Patient expressions of impending doom.

8.21.5.7.11.5. Pain out of proportion to injury or out of character for the patient's history.

8.21.5.7.11.6. Increasing MAAS sedation score or presence of confusion.

8.21.5.7.11.7. Inadequate analgesia.

8.21.5.7.11.8. Pruritus or nausea/vomiting unrelieved after initial treatment.

8.21.5.7.11.9. Oxygen saturation less than 92% on room air.

8.21.5.7.11.10. Hypotension: Postural BP drop > 15mmHg from baseline.

8.21.5.7.11.11. High sensory level: Numbness at or above nipples.

8.21.5.7.11.12. Motor blockade: Inability to bend knees while lying bed.

8.21.5.7.11.13. Dislodgement or Leakage on the catheter dressing.

8.21.5.7.11.14. Catheter disconnection.

8.21.5.7.11.15. Temperature >101 F and/or presence of shaking chills.

8.21.5.8. Documentation includes subjective and objective data for giving the medication; VS; known allergies; for women of childbearing years date of last menstrual

cycle; date and time of administration and notification of a physician, and the outcome. Document the rate (ml/hour), and dose (ml) with VS on the EHR or AF Form 3899 every two hours. The following statement is documented on the EHR or AF Form 3899 “(Insert name of drug) was administered in accordance with AE Clinical Protocol - LAST.” Complete a JPSR worksheet or DD Form 2852.

8.21.5.9. Epidural analgesia therapy and PNB therapy to a lower extremity can cause motor weakness and is normal; therefore, the patient requires assistance with all activities. The staging facility nurses and FNs will be responsible for assessing the patient’s motor strength. **(T-0)**. If a patient cannot move their legs due to excessive motor block from the infusion, notify the VFS immediately.

8.21.5.10. If the patient has a MAAS score of less than two or greater than four, consider other causes like hypoxia, pain, and the need to use the restroom, etc. and the AECM notifies C2 who then contacts the governing PMRC.

**Table 8.11. Motor Activity Assessment Scale (MAAS) Sedation Scoring System.**

0 Unresponsive	Does not move with noxious stimuli (e.g., suctioning or five seconds of vigorous sternal or nail bed pressure)
1 Responsive only to noxious stimuli	Opens eyes, raises eyebrows, turns head towards stimulus or moves limbs with noxious stimuli
2 Responsive to touch or name	Opens eyes, raises eyebrows, turns head towards stimulus or moves limbs when name is spoken loudly
3 Calm and cooperative	No external stimulus required to elicit response, movements purposeful, follows commands
4 Restless and cooperative	No external stimulus required to elicit response <b>AND</b> patient is picking at sheets or tubes <b>OR</b> uncovering self and follows commands
5 Agitated	No external stimuli required to elicit response <b>AND</b> attempting to sit up <b>OR</b> move limbs out of bed <b>AND</b> does not consistently follow commands
6 Dangerously agitated, uncooperative	No external stimuli required to elicit response <b>AND</b> patient is pulling at tubes or catheters <b>OR</b> thrashing side-to-side <b>OR</b> striking at others <b>OR</b> trying to climb out of bed <b>AND</b> does not calm down when asked

8.21.5.11. If pain medication is not available or is insufficient, request and establish immediate radio communication with C2 who notifies governing PMRC for a physician

order. The AECM completes a JPSR worksheet or DD Form 2852 and document the occurrence on AF Form 3829 if flight related.

#### 8.21.6. Patient controlled analgesia.

8.21.6.1. Various pieces of PCA equipment/pumps for the administration of pain medication may be encountered in the AE system. Refer to specific equipment manuals contained in the EFB or at the patient staging location. **WARNING:** In addition to correct labeling of IV and pain medication containers/bags, ensure all IV and pain management tubing is taped/labeled with drug/location/date/time in ZULU. For example, “PCA IV Morphine, Right Forearm, Date/ZULU time.” Ensure all medical personnel lock the PCA pump after set up, dose change, and hand off.

#### 8.21.6.2. Prior to flight. Anesthesia services/pain service personnel:

8.21.6.2.1. Provides consultation and programming of the PCA infusion pump at the MTF for all patients transiting the AE system, including during ERPS RON.

8.21.6.2.2. Orders and/or reviews all pain medication loading dose(s), PCA bolus dose amount, lock-out interval, basal flow (continuous) rate, breakthrough pain orders, continuous peripheral IV infusion or saline lock, and over-sedation protocol on the EHR or AF Form 3899.

8.21.6.2.3. After confirming infusion programming, the pump and narcotic reservoir are placed in the protective casing (if available) and locked. **Note:** Assure pain management tubing is taped/labeled with drug/location/date/time in ZULU.

8.21.6.2.4. Considers increasing the dose or decreasing lock-out interval to account for increased pain during patient transport.

#### 8.21.6.3. At each patient care hand-off (e.g., aircraft/ERPS/MTF) and/or “Change of Shift”:

8.21.6.3.1. Assess pain score, VS, pulse ox, and MAAS baseline score every two hours. Treat pain PRN. Assess for the presence of medication side effects (nausea, pruritus, constipation). **Note:** While on PCA, have continuous pulse ox monitoring as indicated by patient condition.

8.21.6.3.2. Inspect the PCA narcotic reservoir bag for adequate supply of medication for the duration of the transport and verify tubing label location. **Note:** Assess every two hours and assure tubing and pump are secured to the patient.

8.21.6.3.3. Document and verify pump infusion history and current configuration with the sending/receiving nurse or MTF representative and annotate remaining fluid (ml’s) on the EHR or AF Form 3899. The only time total volume remaining is changed is when medication bags are replaced.

8.21.6.3.4. Confirm with the sending/receiving nurse or MTF representative: Physician orders, to include any medication loading dose(s), PCA bolus dose amount, lock-out interval, basal flow rate, over-sedation protocol and breakthrough pain orders. Also confirm tubing is labeled with date initiated/last changed, and the tubing is secured.

#### 8.21.6.4. While en route, at RON location or ERPS.

8.21.6.4.1. Document amount of PCA medication administered for each leg of the mission/patient care hand-off and/or shift change in the EHR, on the EHR or AF Form 3899.

8.21.6.4.2. If unresponsive to painful stimulation and/or respirations are 10 or less per minute, stop PCA pump infusion immediately (reference AE Clinical Protocol - Narcotic or Benzodiazepine Overdose). The AECM notifies C2 who then contacts the governing PMRC. If in the ERPS, notify anesthesia and/or flight surgeon. Document all assessment data and follow-up in the patient health record and a JPSR worksheet or DD Form 2852.

8.21.6.4.3. If the PCA infusion pump is discontinued, the unused volume of narcotic in the reservoir bag, 2 medical personnel witness and dispose it. One of the medical personnel is an RN and the amount is documented as “wasted” on the EHR or AF Form 3899.

8.21.6.4.4. If the pump malfunctions or is emptied or if the catheter is dislodged (leaking), shut the pump off and provide alternate pain medication. Document in the health record (if in-flight document on the EHR or AF Form 3829) and submit a JPSR worksheet or DD Form 2852.

8.21.6.5. Discontinued pumps are returned to the nearest PMI center in accordance with current CONOPS/OPLAN.

8.21.6.6. Patient/family education.

8.21.6.6.1. Benefits of the pain control system (basal rate, extra dose delivery).

8.21.6.6.2. Safety mechanisms/operation of pump including administration, alarms, and signals.

8.21.6.6.3. Administration of the pain medication is to be completed by only the patient due to possible adverse reactions if initiated by others.

8.21.6.6.4. Utilize the AF Form 3899N, *Patient Movement Pain Adjunct Flow sheet* to document adjunct pain therapies, pain management and patient handoffs.

## **8.22. Medications.**

8.22.1. Ensuring every patient has an ample medication supply to meet their individual requirements throughout the patient movement system is the responsibility of every care provider at every hand-off location. Variables such as the patient's inpatient or outpatient status, the geographic location, and the capability of the originating and final destination MTF, along with patient safety, is considered when determining the required amount of medications. The general intent is to minimize the logistical demand on deployed locations while meeting medication requirements for all patients en route to their final destination MTF and/or follow-up outpatient appointment.

8.22.2. Providers use electronic order entry for prescriptions whenever available, in accordance with AFI 44-102, *Medical Care Management*.

8.22.3. Inpatients receive controlled substance medications from the IFK or patient staging facility narcotics, when available. MTF's will send those medications not maintained in the in-flight kit. (T-1). MTFs are not required to send a supply of those medications available in

the IFK. If the inpatient is traveling via CAA, MTFs check with the PMRC arranging transport to determine what medications need to accompany the patient. Staging Facility patient care providers and AECMs are responsible for the accounting and administration of all controlled and non-controlled medications prescribed to inpatients.

#### 8.22.4. Self-administration of medications (SAM) patients.

8.22.4.1. An outpatient may carry their own supply of controlled substances, if determined by the sending provider to be competent to self-medicate and when designated by the VFS. **Note:** Outpatient mental health patients (5C) are cleared to self-medicate after consultation by a provider licensed or credentialed in Mental Health.

8.22.4.2. When a patient is allowed to self-administer his/her own medications, AECMs do not have to count them and those medications remain under the patient's control. Medications are prescribed, dispensed, and accounted for by the dispensing pharmacy.

8.22.4.3. Qualified health care providers counsel the patient with instruction and information regarding their prescribed medication. Education is documented in the health record.

8.22.4.4. Patients who self-administer their medications ensure the medications are not stored/kept where other individuals have access to them and are not left in their checked bags.

8.22.4.5. Prior to flight, an AECM personally interacts with the patient to verify the patient's understanding and knowledge, and provide additional education, as appropriate, on proper SAM. This process begins with the ERPS/MTF and continues throughout the AE system.

8.22.4.6. Healthcare professionals remain cognizant of potential abuse and misuse of controlled medications. Outpatients deemed compliant and competent to self-medicate may carry and administer their own supply of controlled and non-controlled medications if the following is clearly documented on the EHR or AF Form 3899.

8.22.4.6.1. Provider's order for "SAM."

8.22.4.6.2. "Will self-medicate" boxes are marked on the front and reverse of the AF Form 3899 or EHR equivalent.

8.22.4.6.3. The following statement written and signed by the verifying provider or nurse stating the patient is compliant and competent to self-medicate: "Patient is hand-carrying medication(s); has been instructed on self-administration of (list medication name[s]) and verbalizes understanding."

8.22.4.6.4. At a minimum, SAM patients are reassessed at every hand-off for continued competency and compliance.

8.22.4.6.5. SAM patients do not require a medication administration record (MAR) to be completed unless medication is administered in accordance with an AECP or out of the AE in-flight kit allowance standard.

8.22.4.7. If an outpatient is not compliant and/or not competent to SAM at any point of the movement process, the respective care provider (e.g., AECM or ERPS personnel):

- 8.22.4.7.1. Immediately assumes responsibility for and administration of that patient's medication(s).
- 8.22.4.7.2. Clearly documents the change in the patient's SAM status on the EHR or AF Form 3899.
- 8.22.4.7.3. Verbally communicates changes in status to the accepting care provider at the next patient hand-off.
- 8.22.4.7.4. Initiates a JPSR worksheet or DD Form 2852.
- 8.22.4.8. MTFs at en route stops refill the controlled substance as required for onward movement. This reduces excessive quantities of controlled medications being moved through the PM system. All medication is appropriately labeled with the patient's name and directions for administration by the sending facility.
- 8.22.4.9. Deployed locations send a 1-day supply for patients moving from a Role 2 to a Role 3 facility in the combat operations theater and a two-day supply for patients moving from the Role 3 to the Role 4 medical center (reference JP 4-02).
- 8.22.5. Medication quantities required for PM.
  - 8.22.5.1. Outside the continental United States (OCONUS) to CONUS PM.
    - 8.22.5.1.1. Inpatients moving directly from an OCONUS MTF to port of entry accepting MTF/final destination require a two-day supply (e.g., Landstuhl Regional Medical Center [LRMC]) to Walter Reed National Military Medical Center.
    - 8.22.5.1.2. Inpatients moving from an OCONUS MTF to port of entry ERPS, RON and then move on to accepting MTF/final destination require a three-day supply (e.g., LRMC to Andrews ERPS to Fort Benning).
    - 8.22.5.1.3. All outpatients require a five-day supply.
  - 8.22.5.2. CONUS to CONUS. The majority of CONUS to CONUS moves are completed in an 8-12 hour time frame; therefore a 1-day supply of medication is adequate.
  - 8.22.5.3. CONUS to OCONUS. Inpatients follow [paragraph 8.22.5.1](#), and outpatients follow [paragraph 8.22.5.1.3](#). Variations to this policy regarding amount and type of medication to be sent with outpatients are authorized only if transportation is arranged using an alternate mode of travel such as commercial air, rail or ground movement based on anticipated length of travel. In accordance with DoDI 6000.11, documentation in TRAC2ES for all PM greater than 100 miles is mandatory, regardless of conveyance.
- 8.22.6. Administration of medication.
  - 8.22.6.1. General information. Administer medications in-flight on the same schedule as in the originating MTF, or as near as possible. The goal of administering any type of medication or treatment in the AE system is to maintain the continuity of care from the originating MTF to the destination MTF without significant delays.
  - 8.22.6.2. Prior to departing the ERPS or MTF, the patient will be assessed for pain and given pain medications needed within 1 hour of departure. **(T-0)**. If required, administer

other medications within 1 hour of departure. Consider adjusting dosing schedule for diuretics to ensure patient restroom access.

8.22.6.3. Administration of medication according to established protocols. In emergency situations, the AECM initiates care based on individual competency, level of knowledge, AFSC scope of practice and skill. Reference the Nursing Drug Handbook in the in-flight kit and AHA or equivalent; TNCC if available; DHA/J7 Education and Training guidelines.

8.22.6.4. 4N0s/X4N0s trained in accordance with the AFMS medication administration program are allowed to administer medications in accordance with the most current work center authorized drug list. The AE authorized drug list is the allowance standard. Applicable areas of CFETP are signed off, to include routes of administration and schedule of medications commensurate with skill level.

8.22.6.5. Controlled medications.

8.22.6.5.1. A controlled drug accepted by the healthcare provider becomes his/her responsibility for accountability, control, safeguarding, and disposition. Nurses are responsible for daily/mission accountability of patient narcotics on each applicable AF Form 3899 or EHR equivalent. Annotate drug and number available on the EHR or AF Form 3899 during patient hand-off. **WARNING:** USAF enlisted ground personnel may only take control of Schedule II through V medications after they have been trained and certified by someone appointed by the MTF or equivalent commander in accordance with the CFETP.

8.22.6.5.2. If positive control of the medication kit has NOT been maintained or if controlled medication is stored at remote location other than a pharmacy (e.g., a nurse's station) or if lock-out tag is compromised, a nurse and another qualified person will count them at change of shift or the beginning/end of every mission and when accessed for patient use and document on AF Form 579, *Controlled Substances Register*, or in automated equipment logs (e.g., Pyxis ® log), as appropriate. **(T-1)**. This form is included in the narcotics box for all controlled medications.

8.22.6.5.3. When controlled medications are brought onboard the aircraft, the AECM and MTF representative together completes an inventory.

8.22.6.5.3.1. The name and quantity of medications are noted and signed for on the AF Form 3899A, (Front).

8.22.6.5.3.2. If these medications are returned to the MTF, the representative and AECM annotates in the EHR or AF Form 3899 the statement "Refused and Returned," and both persons sign the form.

8.22.6.5.4. During RONS, controlled medications are always secured and are the responsibility of the FNs when a DoD MTF is not located at the RON site.

8.22.6.5.5. All controlled medications, not in the IFK, accompanies the patient to the destination MTF.

8.22.6.5.6. Upon termination of the mission, all unaccompanied/unserviceable controlled medications are documented on the AF Form 3859, *Turn-In of Unaccompanied Narcotics*, and turned into the medication room for disposition per



local policy and annotated on the AF Form 3829. **Note:** If controlled medications are off loaded at the incorrect MTF, notify C2 for immediate tracking.

8.22.6.5.7. Controlled medications missing/unaccounted for during mission execution.

8.22.6.5.7.1. As soon as the AECM identifies controlled medications are missing, report the loss immediately to the PIC.

8.22.6.5.7.2. As soon as possible, the AECM creates a memorandum for record or affidavit documenting the circumstances surrounding the loss, type, and quantities of medications missing. If possible, obtain written statements or affidavits from any persons having knowledge of the circumstances surrounding the loss. This is submitted to the Chief Nurse for review.

8.22.6.5.7.3. Contact C2 as soon as possible and prior to landing at the next en route stop or final destination.

8.22.6.5.7.4. C2, in consultation with the governing PMRC, notifies the Office of Special Investigations or the security police to ensure appropriate steps are taken upon landing.

8.22.6.5.7.5. If the medications are still not located, the investigating agency dictates follow on actions. A JPSR worksheet or DD Form 2852 is also be completed.

8.22.6.5.7.6. Medical personnel assigned as an AECM or to an ERCC UTC may hand-carry controlled medications when necessary. The member holds orders stating “may transport controlled medications” and if traveling via commercial air, has a letter, signed by the commander, stating they are authorized to be a courier for controlled medications. A copy of the letter signed by the commander is placed inside of the controlled medication container.

8.22.7. Anaphylaxis. Reference AE Clinical Protocol – Anaphylactic Reaction.

8.22.7.1. Anaphylaxis is a severe, systemic, allergic reaction involving the respiratory and/or cardiovascular system. It is an immediate, life-threatening reaction caused by injection, ingestion, inhalation, insect stings or bites. It usually occurs within 30 minutes of exposure but may take up to two hours to develop.

8.22.7.2. Signs and symptoms may occur within minutes of exposure to allergen and may include flushing of the skin, itching, hives, edema (primarily of face, tongue, laryngeal), bronchospasm, cough, wheezing, stridorous breathing, retractions, hypotension, tachycardia, arrhythmia, palpitations, pallor, dizziness, syncope, anxiety, lethargy, sudden loss of consciousness, seizures, and coma.

8.22.7.3. Documentation includes subjective and objective data for giving the medication; VS, if indicated; known allergies; for women of childbearing years, date of last menstrual cycle; date and time of administration, notification of a physician, and the outcome. The following statement is documented on AF Form 3899 “(Insert name of drug) was administered in accordance with AE Clinical Protocol – Anaphylactic Reaction. Complete and submit DD Form 2852 or JPSR worksheet.

#### 8.22.8. Documentation.

8.22.8.1. All inpatients will have an up-to-date MAR to ensure accurate and timely medication administration is conveyed and documented throughout the continuum of care. (T-0).

8.22.8.2. Every effort is made to ensure the MAR, as well as the electronic forms in the TRAC2ES, are in agreement.

8.22.8.3. The sending MTF or staging facility is responsible for ensuring the MAR is completed and sent with the patient.

8.22.8.4. En route MAR documentation is completed at the MTF, ERPS, and in-flight. Any changes are updated on the MAR and annotated in TRAC2ES by the clinician initiating the change utilizing the electronic AF Form 3899A within TRAC2ES. If changes occur in-flight or at an en route staging or RON facility, the PMCC is notified to update the AF Form 3899A in TRAC2ES.

#### 8.22.9. OTC medication administration.

8.22.9.1. This AFI provides the AECM with the ability to administer OTC medication to patients, without notifying a physician in advance. The medication is documented on the EHR or AF Form 3899. In emergency situations, the AECM initiates care based on individual competency, level of knowledge and skill. Reference the current edition of the Nursing Drug Handbook or Physicians' Desk Reference. Medications may be administered one time, unless otherwise stated, by a trained and competent AECM. If treatment is not effective contact the VFS and C2 for further physician orders (reference AE Clinical Protocol – Over-the-Counter Medications Administration).

8.22.9.2. Documentation includes subjective and objective data for giving the medication; VS, known allergies, for women of childbearing years: date of last menstrual cycle, assessment, complaint, pain control management, pertinent past treatment/medication, date and time of administration and notification of a physician, and the outcome. The following statement is documented on the EHR or AF Form 3899 “(Insert name of drug) was administered in accordance with AE Clinical Protocol - Over the Counter Medication Administration”.

8.22.9.2.1. In the EHR or AF Form 3899. Document all medication administration times in ZULU.

8.22.9.2.2. If patient arrives without an AF Form 3899, but instead with a NATO, DD Form or service specific medical document, then the information from those documents are transcribed onto EHR or AF Form 3899, the original documentation is attached to the EHR or AF Form 3899, and becomes a permanent part of the patient's medical record.

#### 8.22.10. High alert medications.

8.22.10.1. High alert medications have a heightened risk of causing patient harm if they are used in error. The Institute for Safe Medication Practices provides a listing of high alert medications. The more common high alert medication in the AE system includes (but not limited to): IV narcotics/opiates, IV anticoagulants, total parenteral nutrition, and all epidurals and PNBs.

8.22.10.2. Conduct and document independent double-checks with all high-alert IV medications, all PCA's, epidurals, and PNBs. Documentation of double-checks is reflected by two signatures on required forms/flow sheets. This is applicable to ERPS, ERCC team and AECMs. **Note:** Documenting "Checked with (other clinicians)" in an EHR current field is adequate.

8.22.10.2.1. An independent double-check is defined as two authorized medical persons familiar with the process/equipment/medication (at least one being a RN), independently verifying the practitioner's/provider's orders, medication infusing, and the correct set up of PCA, PNB, Epidural or IV pump in use (rate, dose, volume to infuse, medication concentration, basal rate, bolus lockout, etc.).

8.22.10.2.2. Double-checks are conducted and documented when initiating high alert medications, during hand-offs of care, following a change in orders, and when a new bag is started.

#### 8.22.11. Unconscious/Difficult to Arouse Patients.

8.22.11.1. Various factors may lead to an unconscious/difficult to arouse patient in the AE environment. Opiate/narcotic or sedating medication overdose produce inadequate ventilation/respiration and an altered mental status. For unconscious/difficult to arouse patients, due to a suspected narcotic or benzodiazepine overdose (reference AE Clinical Protocol - Narcotic or Benzodiazepine). Otherwise, provide BLS and immediately contact C2/VFS.

8.22.11.2. For all unconscious/known or suspected narcotic overdose notify the VFS and C2 for guidance, treatment options and possible diversion.

8.22.11.3. Signs and symptoms of a narcotic overdose.

8.22.11.4. Mental status changes.

8.22.11.5. Hypotension/hypertension.

8.22.11.6. Decreased or absent respiratory rate or tachycardia.

8.22.11.7. Pinpoint pupils, and seizures. Normal pupil examination does NOT exclude opioid intoxication. Users of meperidine and propoxyphene may present with normal pupils. The presence of coingestants (such as sympathomimetic or anticholinergics) may make pupils appear normal or large.

8.22.11.8. If on a PCA (regional or epidural pump) and patient suddenly becomes difficult to arouse; turn pump off and continue BLS management.

8.22.11.9. Do not rely on patient history of ingestion, especially in patients with psychiatric history.

8.22.11.10. Make sure patient is not still carrying other medications or has any weapons.

8.22.11.11. Symptoms of opioid withdrawal can include nausea/vomiting, hyperactivity, increased pain, and combativeness.

8.22.11.12. Documentation includes subjective and objective data for giving the medication; VS, if indicated, known allergies; for women of childbearing years: date of last menstrual cycle, date and time of administration and notification of a physician, and

the outcome. The following statement is documented on AF Form 3899 or EHR equivalent “(Insert name of drug) was administered in accordance with AE Clinical Protocol - Narcotic or Benzodiazepine Overdose.” Complete and submit DD Form 2852 or JPSR worksheet.

### 8.23. IV Therapy.

#### 8.23.1. Stresses of flight.

8.23.1.1. Barometric pressure changes: Air expansion at altitude may cause IV rates to fluctuate.

8.23.1.2. Situations potentially dangerous to a patient are a sudden surge of fluid, unregulated flow to the patient, and air bubbles in the administration tubing.

8.23.1.3. Critical area of consideration: Accurate administration of IV therapy poses one of the greatest concerns in-flight. If the IV is not regulated by the use of an IV infusion pump, drip rates are reevaluated once cruise altitude is reached, frequently throughout the flight, after descent, and after a rapid decompression.

#### 8.23.2. IV containers.

8.23.2.1. Plastic IV containers: Plastic solution containers are preferred for in-flight use because they are easy to handle and secure, do not break, and expand/contract with changes in barometric pressure without venting.

8.23.2.2. Glass IV containers: IV glass bottles without integral venting rods do not allow for the escape of expanding air. The expansion of air forces the fluid out of the bottle or the IV does not flow. **Note:** Do not use glass bottles without venting them.

8.23.2.3. Venting procedures: Any rigid plastic or glass IV bottle requires venting.

8.23.2.3.1. Insert an 18-gauge needle through the bottle cap into the lumen of the integral air rod of the bottle.

8.23.2.3.2. Remove the cap from the air vent on the drip set and insert a sterile 3 ml syringe into the vent.

8.23.2.3.3. Secure the syringe and plunger into the vent by running a strip of tape over the plunger of the syringe and around the neck of the IV bottle. As the air of the bottle expands it leaves via the needle inserted into the air rod; the syringe acts as a plug, held in place by the tape, and prevents fluid from pouring out of the bottle.

8.23.2.3.4. Non-vented drip sets: When non-vented drip sets are used, it is necessary to insert a needle only into the integral air rod of the IV bottle.

8.23.2.3.5. Volutrol (metered drip sets constructed of pliable plastic): The meter chamber is filled and clamped off between the bottle and the chamber. Since the meter chamber collapses as it empties, air does not enter or expand in the chamber.

8.23.2.3.6. Metered drip sets constructed of rigid plastic: Systems with air vents in the metering section of the drip set allow air in the tubing during rapid decompression and are not used.

#### 8.23.3. IV therapy: Preflight/in-flight considerations.

8.23.3.1. Document the IV start time, site, catheter gauge, and the last dressing change, if known.

8.23.3.2. Label IV bag with solution, date, start and stop times and initials. Do not use markers because they are absorbed into the plastic bag.

8.23.3.3. Infusion pumps are used for heparin, cardiac and vasoactive medications, neonatal/ pediatric patients, and total parenteral nutrition (reference AE Medical Equipment Compendium).

8.23.3.4. Ensure the line is patent.

8.23.3.5. Assess insertion site and evaluate for infection/irritation: Redness/red streaks at insertion site, warmth, edema, purulence/drainage, and pain.

8.23.3.6. Ensure patient has enough IVs, medications, and supplies to reach the destination facility.

8.23.3.6.1. When patient medical supplies and PMI are coordinated with the AE system in advance, most items are provided from the AE staging base.

8.23.3.6.2. Without advance coordination, the originating facility is responsible for providing these items and for providing a one-day minimum of supplies, except for patient movement from theater to CONUS and within CONUS where a three-day minimum is provided.

8.23.3.7. Place patients receiving IV therapy to facilitate IV flow, if possible (if the IV is not managed with an IV infusion pump).

8.23.3.8. After a rapid decompression, the following difficulties may be encountered: Bags/bottles break, drip sets pop out, blood backs up into tubing, and excessive air and fluid is forced into patient.

8.23.3.9. AECM actions following a rapid decompression: Clamp tubing, check infusion site, bottle or bag, infusion pump (if applicable), and tubing. Assess for signs and symptoms of infiltration. Clear the tubing of air and resume infusion if not clotted or infiltrated.

## **8.24. Management/Administration of Blood and Blood Products.**

8.24.1. All blood products carried in the AE system are transported as rapidly as possible at the appropriate temperature, in standard blood shipping boxes consisting of an outer cardboard box with a Styrofoam insert. Blood temperature during transport needs to be maintained between 1-10 degrees C for liquid RBCs. Fresh frozen plasma and frozen cryoprecipitate is maintained in the frozen state (it is usually shipped in dry ice). **Note:** AE usually does not transport blood shipments which is handled through class VIII B channels.

8.24.2. Blood shipping containers are not be exposed to extreme temperatures (below 1 degree C or over 27 degrees C). All blood components remain securely packed in the approved container for the duration of the flight or administered. The container is always secured during transport.

8.24.2.1. Either DD Form 1502, *Frozen Medical Materiel Shipment*, or DD Form 1502-1, *Chilled Medical Materiel Shipment*, is posted on the front of all blood shipping boxes.

8.24.2.2. All blood products are packed in accordance with sending facility protocols.

8.24.2.3. Re-icing is the responsibility of the originating and RON MTF. If there is an en route delay of more than 48 hours, the AECM, or the carrier agent, contacts the special handling department on the flight line for guidance and assures the re-icing of the blood products. The re-icing is annotated on DD Form 1502 or DD Form 1502-1. The PMRC is informed of any blood product transfer so arrangements are made with an en route MTF(s) for re-icing. **WARNING:** Do not use dry ice, salted wet ice, water frozen in polyurethane bags, super cooled canned ice, and commercial “blue ice” containers for re-icing liquid blood product shipments.

8.24.3. AECMs/Specialty team only accept blood components that are:

8.24.3.1. To be administered during the AE mission.

8.24.3.2. In an approved blood shipment container, which can be opened briefly and checked for the correct amount and components according to the written order. **Note:** The blood products check includes comparison of the blood products with three identifiers for the patient (full name, DOB, Social Security Number [SSN]) and the written order.

8.24.3.3. With adequate ice. Do not accept a container of blood with little or no visible ice.

8.24.3.4. All discrepancies are brought to the immediate attention of the person(s) shipping the container. If the discrepancies are not resolved, the AECM may refuse to transport the blood products. Notify the PMRC.

8.24.4. Blood and blood product administration guidelines.

8.24.4.1. A provider writes the order for administration of blood or blood components.

8.24.4.2. Use standard precautions when handling blood and blood products.

8.24.4.3. Pre-administration of blood products includes: Current patient consent for transfusion, documentation of patient understanding of blood transfusion reason, and potential side effects.

8.24.4.4. Verify patient identification with another clinician by patient stating full name, DOB, SSN. This information is checked against the wrist band.

8.24.4.5. Verify patient identification and blood product label. Compare the name, date of birth, and SSN number on the wristband with the bag tag. Compare blood group and rhesus factor compatibility by comparing the bag label, bag tag, medical record, and transfusion form. **Note:** Check bag label for expiration date and satisfactory serologic testing.

8.24.4.6. Document on transfusion record names of persons starting the infusion and stopping infusions.

8.24.4.7. Utilize blood transfusion tubing and filter as prescribed. Prior to initiation of blood product take a full set of VS to include temperature. No medications or solutions are added to or transfused concurrently with blood components except NS.

8.24.4.8. The total volume infused is documented on available I&O record.

8.24.4.9. Start infusion slowly (e.g., 2 ml/minute). Note the time from the time the blood begins infusing at the IV port site. Remain with the patient for fifteen minutes and assess for transfusion reaction in accordance with [paragraph 8.24.5](#)

8.24.4.10. Reassess patient for signs and symptoms of transfusion reaction (e.g., acute hemolytic, anaphylactic) at least hourly. **Note:** Transfusion reactions usually occur within the first 50-100 ml.

8.24.4.11. Acute reactions can occur at any time during the transfusions.

8.24.4.12. Documentation of assessment is required. **Note:** For all blood component infusions, it is imperative that the patient be closely monitored for acute reactions.

8.24.4.13. Whole blood, RBC, and fresh frozen plasma (FFP) is hung within thirty minutes of removal from the blood-shipping container.

8.24.4.14. Whole blood and RBCs is transfused within 4 hours and at the prescribed rate.

8.24.4.15. FFP infused at the rate prescribed. The infusion may be completed within 15 to 30 minutes depending on total volume.

8.24.4.16. Cryoprecipitate, once thawed, is infused immediately. Run over 3 - 15 minutes.

8.24.4.17. Platelets may be transported at room temperature between 20-24° C or 68 - 75.2° F. The transfusion may be completed within 20-60 minutes depending on total volume.

8.24.4.18. Blood and blood components may be administered during emergent contingency and wartime ground and in-flight operations, and consent for transfusion is implied.

8.24.5. Blood transfusion reactions. Unexpected complications can occur in any blood transfusion recipient. These adverse reactions can be categorized as immunologic, infectious, chemical, and physical, and some are further subdivided into acute and delayed reactions. The most clinically important adverse effects of transfusion are infectious or immunological occurrences. Stringent screening requirements have drastically reduced the risk of transfusion acquired pathogens such as Hepatitis B, HIV and Hepatitis C thereby resulting in a marked reduction in infectious related reactions. Additionally, infectious complications and delayed hemolytic transfusion reactions generally manifest themselves 3-7 days post transfusion and therefore are outside of the scope of the AECP.

8.24.5.1. The classic transfusion reactions are immunologic in nature. Acute reactions occur in 1% to 2% of transfused patients. Severe transfusion reactions are most likely to occur during the first 15 minutes of infusion. Therefore, to facilitate early recognition of potentially life-threatening complications, patients are monitored closely upon initiation of any blood transfusion product. Examples of classic immunologic transfusion reactions include febrile non-hemolytic transfusion reactions (FNHTR); acute hemolytic transfusion reaction (AHTR) and allergic reactions (urticarial and anaphylactic allergic reactions) (reference AE Clinical Protocol - Reaction to Blood Products).

8.24.5.2. For all known or suspected blood transfusion reactions notify the VFS and C2 for guidance and possible diversion to a MTF capable of handling the situation.

8.24.5.3. Documentation of any blood product reaction includes subjective and objective data for giving medication; VS, known allergies, women of childbearing years, date of last menstrual cycle; date and time of administration and notification of a physician, and the outcome. The following statement is documented on the EHR or AF Form 3899 “(Insert name of drug) was administered in accordance with AE Clinical Protocol - Reaction to Blood Products.” Complete DD Form 2852 or JPSR worksheet.

## 8.25. Infection Control.

8.25.1. Infection control can be difficult in the dynamic physical environment of AE. Therefore, originating physicians are vigilant of the presence of communicable diseases that could spread to other patients, the crew, or the destination MTF community.

8.25.2. General principles of infection control.

8.25.2.1. The guidelines for personnel and recommended standards of patient care are contained in the most current Centers for Disease Control and Prevention (CDC) guidelines and in local cleaning directives.

8.25.2.2. All medical personnel in the AE environment implements Standard Precautions with all patients coupled with Transmission Based Precautions as required. AFMAN 44-156, *Treatment of Biological Warfare Agent Casualties*, is available for additional guidance.

8.25.2.3. Brief all infectious patients and their attendants on isolation procedures and precautions.

8.25.2.4. Each aircraft and mission is unique. Environmental lighting in most cases is poor, making the visualization of blood and body fluids highly uncertain. The practice of infection control within the AE setting adheres to the following principles:

8.25.2.4.1. The aircraft is considered a dirty environment. Normally dressings are reinforced unless there is evidence of significant blood loss.

8.25.2.4.2. Medical personnel with “actively” exudative lesions or weeping dermatitis are not scheduled for missions until resolved/cleared by a flight surgeon. If excess drainage occurs during flight, bandage the wound area and limit patient contact until seen by a flight surgeon.

8.25.2.4.3. Fingernails comply with AFI 44-108, *Infection Prevention and Control Program*.

8.25.2.4.4. NOMEX/leather gloves are not worn while administering patient care.

8.25.2.4.5. Eating, drinking, applying cosmetics, and handling contact lenses is prohibited in work areas where there is a likelihood of exposure to blood and body fluids (BBF).

8.25.2.4.6. Food and drinks are prohibited on countertops where blood and other potentially infected material are stored or placed. **Exception:** On cargo aircraft this may not be feasible. Ensure the loadmaster/boom operator is notified of the storage/placement of such items, in order that they may disseminate the information to the rest of the crew.



8.25.2.5. Patient assignment and placement of patients. **Note:** The airflow of each aircraft governs litter and seat assignments for high risk immune compromised patients or patients on airborne or droplet precautions (reference [Attachment 14](#)).

8.25.2.5.1. High-risk patients (e.g., those particularly susceptible to infection: leukemia, cancer and post-op patients) are located as far as possible from infectious patients. All efforts are made to limit the number of care givers to either highly infectious or neutrophilic patient populations. Consider the direction of airflow in the aircraft and having the high-risk patient wear the N-95 mask en route.

8.25.2.5.2. Known or suspected infectious patients not requiring airborne precautions are placed in the lowest litter position.

8.25.2.5.3. When feasible, assign a single caregiver to infectious patients or to those who are at high risk for infection. Avoid mixing infectious patients and those at high risk for infection, whenever possible.

8.25.2.5.4. Patients with known or suspected wound infections are not placed in the same area as patients with clean wounds.

8.25.2.5.5. Infectious ambulatory patients are seated away from other patients if possible.

8.25.2.5.6. In the event there are patients who have active infections with the same disease (e.g., TB, measles, tularemia, cholera), they may be moved as groups or cohorted in another area of the aircraft that meets safe ventilation and airflow requirements for Airborne Precautions.

8.25.2.5.7. In austere ground operation settings with limited airflow (e.g., AMBUS, Humvee, tentage), the infectious patient wears a surgical mask or N95 mask. The patient is placed downwind, to the greatest extent possible, near the airflow exit and away from other patients. **Note:** When in confined areas and/or in areas with poor air circulation, both the patient and the health care worker (HCW) wear a N95 mask.

### 8.25.3. Standard precautions.

#### 8.25.3.1. Handwashing.

8.25.3.1.1. Handwashing is the single most important method for preventing the spread of infection.

8.25.3.1.2. Handwashing is accomplished with soap and running water, when available.

8.25.3.1.3. AE approved waterless hand cleaners/antiseptics may be used as an adjunct to routine hand washing or when hand washing facilities are inadequate, inaccessible, or when there is an interruption in the water supply. Waterless hand antiseptics may come in a foam, gel, or towelette. **Note:** If visible soiling is present on the hands, a towelette offers the physical removal of the dirt and is the first choice for hand antisepsis. Follow manufacturer's directions for use. **Note:** Waterless hand cleaners/antiseptics are not effective against all organisms (e.g., *C. Difficile*).

8.25.3.1.4. Wash hands or use hand antiseptic before and after each patient contact; immediately after removing gloves or other personal protective attire (e.g., gowns,

masks, goggles); before dispensing medications, performing invasive procedures, touching wounds or touching patients who are susceptible to infection; before serving meals; and after sneezing, coughing, eating, and performing personal hygiene.

8.25.3.2. Personal protective equipment (PPE). Worn appropriate for the task, whenever exposure to BBF is anticipated.

8.25.3.2.1. Gloves.

8.25.3.2.1.1. Use disposable, single-use gloves.

8.25.3.2.1.2. Change gloves after contact with contaminated materials, even if care of that patient is not complete. Remove gloves using glove in glove technique.

8.25.3.2.1.3. Change gloves between each patient.

8.25.3.2.1.4. Wear gloves while serving/handling patient's food.

8.25.3.2.1.5. Remove gloves promptly after use and before touching non-contaminated items/surfaces.

8.25.3.2.1.6. Wash hands immediately after removing gloves.

8.25.3.2.2. Gowns.

8.25.3.2.2.1. Fluid-repellent gowns are worn to protect skin and prevent soiling of clothing during procedures and patient care activities likely to generate splashes or sprays of BBF. In the event the HCW clothing is contaminated with BBF, a gown may be worn for a short duration to prevent cross contamination.

8.25.3.2.2.2. Promptly discard BBF contaminated disposable gowns after use in designated biohazard trash bags.

8.25.3.2.3. Goggles and masks.

8.25.3.2.3.1. Goggles, safety glasses with side shields or mask with a visor are worn anytime splashing of BBF is anticipated. Normal eyeglasses are not considered protective apparel. When worn for PPE, masks and goggles protect the wearer from splashes or sprays of BBF.

8.25.3.2.3.2. Fluid resistant surgical masks are appropriate and are changed when moist; or change after two hours of wear or when wet.

8.25.3.2.3.3. The N95 respirator is approved for in-flight wear and is worn by all caregivers when providing immediate care to a patient with a suspected or actual airborne transmissible infection. Additionally, the patient for whom the disease is suspected wears the N95 (without an exhalation valve) or surgical mask.

8.25.3.2.3.3.1. The N95 mask is fit tested for all AECMs by a local Bioenvironmental Engineer or a certified fit-tester in accordance with AFI 48-137, *Respiratory Protection Program*, and local policy prior to wear by medical personnel.

8.25.3.2.3.3.2. All personnel and patients changes the mask whenever wet or contaminated with BBF, if the straps are loose or if the mask is damaged, and

by personnel after completing direct patient care. **Note:** The N95 mask cannot be reused once it is removed.

8.25.3.2.3.4. Use a resuscitation mask or bag-valve mask to avoid mouth-to-mouth contact.

8.25.3.3. Needles and syringes/sharps.

8.25.3.3.1. Do not recap used needles. **Note:** Recapping is acceptable if blood is drawn and no blood tubes are available, use a one-handed scoop technique. Secure the cap with tape.

8.25.3.3.2. Do not bend or break needles.

8.25.3.3.3. Place needles in a puncture resistant container maintained as close to the point of use as possible.

8.25.3.3.4. After securing the sharps container in the closed position, off load sharps container according to local policy.

8.25.3.4. Biohazardous waste.

8.25.3.4.1. Biohazardous waste is defined as liquid or semi-liquid blood or other potentially infectious materials, contaminated items that would release blood, or other potentially infectious materials, in a liquid or semi-liquid state if compressed. Items that are caked with dried blood or other potentially infectious materials and can release these materials during handling; contaminated sharps (Ref [paragraph 8.25.3.3](#)) or pathological and microbiological wastes containing blood or other potentially infectious materials.

8.25.3.4.2. Place a red biohazard bag at the end of the patient's litter, if BBF is expected. Biohazard bags are not used for trash not contaminated with BBF waste.

8.25.3.4.3. Double-bag waste if there is a potential for leakage.

8.25.3.4.4. Off-load with the patient for disposal at the local MTF.

8.25.3.5. Linen.

8.25.3.5.1. All used linen is handled as if potentially infectious.

8.25.3.5.2. Handle used linen as little as possible, with a minimum agitation, to prevent the potential dissemination of microorganisms.

8.25.3.5.3. Place soiled linen in a clear plastic bag to offload with the patient unless contaminated with BBF. Linen contaminated with BBF is placed in a red bag.

8.25.3.6. Urine and feces.

8.25.3.6.1. Urine and feces from all patients, including those on isolation precautions, can be flushed down the aircraft toilet.

8.25.3.6.2. Disposable urinals are used as needed and discarded in the proper waste bag.

8.25.3.6.3. The equipment table of allowances for bedpans is limited. If unavoidable, use of bedpans for several patients is accomplished by lining bedpans with a plastic

bag and taping securely to prevent slippage and spillage. For truly immobile patients, the patient stage or MTF provides a bedpan per patient.

8.25.3.6.4. Dispose of waste in aircraft toilet, then carefully remove bag, keeping the soiled portion of the bag to the inside, roll/gather bag closed and dispose in the proper waste bag.

8.25.3.6.5. Separate toileting is preferred when patients require second tier isolation precautions for known or suspected pathogenic microorganisms, communicable diseases, or colonized pathogenic microorganisms. When separate toileting is not practical, AECMs disinfect the latrine after patient use with approved disinfectant wipes/solution.

8.25.3.7. Cleaning/disinfecting. **Note:** Performed by AECMs.

8.25.3.7.1. Routine cleaning in accordance with CDC guidelines/recommendations of contaminated areas of the cabin that come in direct contact with patients helps prevent the spread of microorganisms.

8.25.3.7.2. PPE is worn appropriate for the task minimally, gloves are worn.

8.25.3.7.3. Use AE approved detergent/disinfectant to clean and disinfect patient care areas in accordance with CDC guidelines/recommendations.

8.25.3.7.4. Clean/disinfect surfaces using a damp cloth/disposable washcloth or AE approve pre-package kits; allow to air dry.

8.25.3.7.5. Areas used for medication and food preparation areas are cleaned/disinfected prior to use.

8.25.3.7.6. BBF spill cleanup.

8.25.3.7.6.1. Place an absorbent material over spill.

8.25.3.7.6.2. Blot up and dispose of in a red biohazard bag.

8.25.3.7.6.3. Pour/spray/clean area with AE approved disinfectant/detergent.

8.25.3.7.6.4. Allow to air dry.

8.25.3.7.7. BBF contamination of seats/cushions.

8.25.3.7.7.1. Coordinate with loadmaster/crew chief in accordance with local policy.

8.25.3.7.7.2. Remove web seat/seat cushion and seat back and place in a red biohazard bag.

8.25.3.7.7.3. Label with suspected/known BBF source.

8.25.3.7.8. Offloading patients.

8.25.3.7.8.1. Send all used disposable patient care items with the patient, or as directed by AMC/SG.

8.25.3.7.8.2. There is no need to “decontaminate” the interior of the aircraft for routine transport of patients. If using transmission-based precautions, clean surfaces the patient had immediate contact with by wiping area off using a cloth

containing the approved detergent/disinfectant. Seat cushions and litters may need cleaning depending on the level of contamination.

8.25.3.7.9. Contaminated reusable patient care equipment.

8.25.3.7.9.1. Place in biohazard bag and label with type of contaminants.

8.25.3.7.9.2. AE equipment dedicated to patients follows the patient to final destination. AE allowance standard PMI equipment remains with the AE crew and is decontaminated in accordance with squadron policy.

8.25.3.7.9.3. If mission RONS, remove equipment and transfer to the staging facility or supporting MTF for decontamination or in accordance with local policy.

8.25.3.7.9.4. Decontaminate equipment prior to servicing or shipping. When this is not feasible, equipment is placed in a labeled universal biohazard bag with a listing of the contaminated portions of equipment.

8.25.3.7.9.5. In the staging facility, cleaning is accomplished using a germicidal/fungicidal liquid solution in accordance with local policy.

8.25.3.7.10. Aircraft decontamination. Not an AECM duty. In the event of suspected or known contamination, the PIC and the AECM notifies C2 who then contacts the governing PMRC and the VFS for further guidance.

8.25.3.7.11. Disinfect latrines after patient use as described in [paragraph 8.25.3.6.5](#)

8.25.3.8. Irrigation fluids, multi-dose vials, and sterile supplies.

8.25.3.8.1. Irrigation fluids – If used on an AE mission, discard at the end of the mission. If used in the ERPS, label with date and time and use for only 24 hours; discard remainder after 24 hours.

8.25.3.8.2. Multi-dose vials – If a multi-dose has been opened or accessed (e.g., needle-punctured), the vial is dated and discarded within 28 days unless the manufacturer specifies a different (shorter or longer) date. If a multi-dose vial has not been opened or accessed (e.g., needle-punctured), it is discarded according to the manufacturer's expiration date. Open and follow manufacturer's suggestion for disposal. **Note:** Some vials may appear to be multi-dose when in fact, they are single dose (e.g., NS). **Note:** Dispose of vials whenever sterility is compromised or questionable or if there is any sign of or known contamination, color change, or foreign particles found.

8.25.3.8.3. Sterile supplies - check prior to flight for expiration dates, tears, evidence of liquid spills, and/or color change.

8.25.3.8.3.1. Expired disposable items are not reprocessed.

8.25.3.8.3.2. Shelf-life sterility is either event-related and/or time-related:

8.25.3.8.3.3. Event-related sterility means as long as an "event" has not occurred to compromise sterility, the item is considered sterile. An event may include any of the following: the package is torn, ripped open, compromised in a way that causes the healthcare worker to question the integrity of the contents.

8.25.3.8.3.4. Date-related sterility is based on the type of packaging and has a tag with an expiration date.

8.25.3.8.4. Disposable items are not reused or reprocessed.

8.25.4. The following patient movements will be specifically coordinated by the PMRC and USTRANSCOM/SG and will follow USTRANSCOM Instruction 41-02; *Patient Movement of Contaminated, Contagious or Potentially Exposed Casualties*: Multi-drug resistant Mycobacterium Tuberculosis (MDR-TB), Congo Crimean Hemorrhagic Fever (CCHF), plague, smallpox, cholera, yellow fever, typhus, Ebola, malaria, polio, influenza, and any other diseases under special surveillance by the CDC. **(T-0)**.

8.25.5. Transmission based isolation precautions. There are two tiers to isolation. The first is the use of Standard Precautions with every patient contact. The second tier is the transmissions-based precautions for isolating known or suspected pathogenic microorganisms, communicable diseases, or colonized pathogenic microorganisms. For further guidance, AFMAN 11-2AEV3 and AFMAN 44-156.

8.25.6. Airborne precautions. Airborne precautions prevent transmission of infectious particles aerosolized or suspended in the air. When they are inhaled, they enter the respiratory tract and can cause infection. Since air currents can disperse these particles over long distances, airborne transmission does not require face-to-face contact with an infected individual. Only a limited number of diseases are transmissible via the airborne route. Airborne isolation cannot be maintained in open aircraft. Use of a biocontainment unit is strongly recommended to move this type of patient. Reference Transportation Isolation System (TIS) and Negative Pressure Conex (NPC) CONOPS on the EFB.

8.25.6.1. Patients are segregated to the greatest extent possible. If no biocontainment unit is available, patient placement is in a low traffic area, downwind and near the aircraft's airflow exit, if possible. The aircraft airflow (reference [Attachment 14](#)) determines patient placement. A litter is optional for ambulatory patients and is placed in the lowest position in the tier. Place ambulatory patients next to the sidewall.

8.25.6.2. Patients requiring airborne precautions are regulated on a designated/dedicated mission with limited crew and with no other patients or passengers on board.

8.25.6.3. The patient always wears a surgical mask (sent by the sending facility) unless contraindicated. The mask should not have noticeable gaps. **Note:** Patients requiring airborne precautions and O2 may wear a surgical mask over the nasal cannula (1-6 LPM). Alternatively, an infectious aerosol capture mask or other approved device demonstrated to contain respiratory aerosols may be used in lieu of a surgical mask. **WARNING:** Patients requiring higher levels of O2 are assessed prior to flight for eligibility for invasive respiratory support (intubation and mechanical ventilation) and may require a cabin altitude restriction or a non-rebreather (NRB) O2 mask. NRB O2 mask does not have High Efficiency Particulate Air (HEPA) filtration. Place patients using NRB O2 masks as close as possible to the aircraft's air outflow during the flight.

8.25.6.4. VFS receives approval from destination MAJCOM/CC and MAJCOM/SG, and the USTRANSCOM/CC and TCSG to use these aircraft during AE intertheater operations. **Note:** Consider regional medical intelligence reports and threats when planning AE transport. **WARNING:** TB, Measles, Varicella, and certain high

consequence infectious diseases (HCID) pose a high risk to both medical and air crews due to the potential for airborne or aerosolized respiratory particles.

8.25.6.5. All mission crewmembers (e.g., loadmaster, boom operator, pilot) will be fit tested for the N95 just-in-time for the mission. **(T-1)**. All aircrew will wear an N-95 respirator for the entire mission with the following exceptions: A biocontainment transport unit or KC-10 aircraft is utilized for the mission. **(T-1)**. HCWs, MAs and AECMs will wear a Powered Air Purifying respirator (PAPR) or a fit tested N-95 respirator. **(T-1)**. All personnel minimizes doffing respiratory protection. An IV may be ordered for hydration for patients.

8.25.6.6. On the KC-10, the flight deck crew may not require N-95 respirator wear during flight if the following conditions are met: smoke curtain remains closed to separate patient compartment from flight deck, crew board first through separate front entrance and activate HVAC high flow configuration, forward boarding door is closed and flight deck crew remain on board until patients deplaned and rear door is closed. All mission personnel in the patient care area require N-95 respirator or higher level of respiratory protection.

8.25.6.7. Air crew are trained on appropriate hand hygiene practice to include before and after eating or drinking, latrine use, or entering/exiting crew compartments.

8.25.6.8. All mission personnel minimizes food and drink exposure to open air (re-sealable containers, water bottles, camelbacks, etc.).

8.25.6.9. Ventilators have a HEPA filter connected to the air intake and exhalation limb of the ventilator circuit. Secure ventilation tubing connections and use in-line suctioning.

8.25.6.10. Portable suction devices have a HEPA filter connected to suction exhaust.

8.25.7. Cleaning of patient care area occurs as appropriate for infectious agent.

8.25.8. Airborne precautions: Pre-mission and post-mission requirements.

8.25.8.1. Pre-mission planning: AECM coordinates mission PPE requirements with the PIC and medical support personnel. This includes sufficient number of N-95 respirators and PPE to meet mission requirements as well as replacements due to contamination and damage of the PPE. Planning also includes PPE requirements for aircrew and ground support personnel servicing the mission.

8.25.8.2. Ensure AECMs have current N-95 fit test (reference AFI 44-108).

8.25.8.3. AECM coordinates via the off-load message N-95 respirator requirements with mission ground support personnel.

8.25.8.4. At mission termination, the following information is submitted to the PMRC and the unit infection control or public health officer, mission number/date, total time the patient was on the aircraft, personnel's name, rank, unit of assignment and phone number; mission position, and approximate time in direct patient care.

8.25.8.4.1. Upon mission termination, all exits and doors are opened and the interior of the aircraft is aired out. No one enters the aircraft without a N-95 respirator until the aircraft is aired out (reference [Attachment 14](#) and AFMAN 10-2503, *Operations*



*in a Chemical, Biological, Radiological and Nuclear (CBRN) Environment*, aircraft decontamination section).

8.25.8.4.2. All mission personnel follows-up after mission completion at their local MTF or in accordance with local policy. If any mission personnel have an infectious exposure, home station public health office evaluates the need for follow-up testing and prophylaxis. If not at home station, contact C2 of the mission for instruction. Results of any required testing is forwarded by home station Flight Surgeons Office to the PMRC 100 days post mission. The PMRC reviews and forwards personnel mission data to AMC/SGP.

8.25.8.5. Transport of patients with known TB; including infants and young children are transported using airborne precautions unless patients have received at least 14 or more days of appropriate treatment and have clinical improvement. Patients with laryngeal TB will receive at least 30 days of therapy with appropriate treatment regardless of smear status. **(T-0)**.

8.25.8.6. Patients with undiagnosed pulmonary infections with suspicion for TB or patients with HIV going for evaluation of a new undiagnosed pulmonary process are transported with airborne precautions unless they have negative sputum smears on three consecutive days or two negative MTb PCR assays (reference [Attachment 15](#)).

8.25.9. Droplet Precautions. Use with patients who have infections spread by particle droplets generally larger than 5 $\mu$  in size, generated by the infected patient during coughing, sneezing, talking, or during respiratory-care procedures. This includes microorganisms such as influenza, pneumonic plague, CCHF, rubella, diphtheria, mumps, pertussis, Neisseria meningitis, Hemophilus influenza, Mycoplasma pneumonia, Group A streptococcus, and adenovirus. Droplet precautions are continued throughout the course of illness for viral respiratory pathogens but may be discontinued after 24 hours of appropriate antibiotics for bacterial respiratory pathogens.

8.25.9.1. Patients on Droplet precautions are kept a minimum of 6 feet apart.

8.25.9.2. Transmitted through mucosal surfaces (conjunctiva, nasal, and oral mucosa).

8.25.9.3. Instruct the patient on the wear of the surgical mask, the use and disposal of tissues in the appropriate waste bag, and hand hygiene.

8.25.9.4. All caregivers and AECMs follow Standard, Droplet, and Contact Precautions (surgical mask, gown, gloves, and eye protection [face shield or goggles]).

8.25.9.5. Follow the guidelines for Airborne Precaution Guidelines regarding patient positioning on aircraft.

8.25.10. Contact precautions. Use with patients who are infected or colonized by a microorganism that spreads by direct contact (skin-to-skin) or indirect contact (touch) with a contaminated object in patient's environment. (e.g., GI illnesses such as Norovirus and Clostridioides difficile, respiratory infections such as Respiratory Syncytial Virus or Metapneumovirus, skin or wound infections such as Methicillin Resistant Staphylococcus aureus, multi-drug resistant microorganisms such as vancomycin resistant enterococcus and methicillin resistant staphylococcus aureus, extended spectrum beta lactamase producing gram negative bacilli, carbapenem resistant enterobacteriaceae, Acinetobacter baumannii,



and infestations such as scabies and pediculosis). Follow Standard Precaution guidelines.  
**Note:** Use gown, and gloves when providing direct patient care.

8.25.10.1. Suspect multi-drug resistant organisms in patients, who sustained a wound during combat or while deployed, have been hospitalized more than one week, were in a critical care setting, are recovering from multiple traumas, have indwelling catheters, and multiple tubes.

8.25.10.2. A clean sheet or chux may be placed over the wound site to prevent contamination of litter or seat. Treat all linens as contaminated.

8.25.10.3. Suspect *C. Difficile* if the patient has a history of recent antibiotic use and loose stools greater than 3 in 24 hours.

8.25.11. Infection control special interest items.

8.25.11.1. Vaccinia patients. Vaccinia virus infections are complications of smallpox vaccination. This infection should not be confused with smallpox disease, caused by variola virus. While vaccinia is a contact transmission hazard (e.g., contagious), it is significantly less infectious and pathogenic than variola (smallpox).

8.25.11.1.1. Vaccinia patients are contact transmission hazards and require standard/contact transmission-based precautions, including:

8.25.11.1.1.1. Thorough hand washing after patient contact is the most important.

8.25.11.1.1.2. Wear of PPE (gloves and gowns).

8.25.11.1.1.3. Handle of BBF as infectious for blood-borne pathogens.

8.25.11.1.1.4. Terminal cleaning of the patient area.

8.25.11.1.1.5. A clean sheet or chux is placed over the site to prevent contamination of the litter or seat; treat all linens as contaminated.

8.25.11.1.2. For those directly caring for a vaccinia patient, the following additional screening criteria completed by the home station flight surgeon's office, may be considered, but is not mandatory:

8.25.11.1.2.1. No immunosuppression due to medication or underlying medical condition.

8.25.11.1.2.2. No history of eczema, atopic dermatitis, or active skin disease (including psoriasis, moderately severe acne, and other forms of dermatitis).

8.25.11.1.2.3. Not pregnant.

8.25.11.1.2.4. No recent photorefractive keratectomy (PRK) or use of ophthalmic steroid drops.

8.25.11.1.3. Vaccinia wounds are covered, preferably with dry, cotton gauze dressings, and are reinforced in-flight, as needed. Occlusive dressings are avoided. Do not change dressings in-flight; reinforce only.

8.25.11.1.4. Requires dedicated PMI.

- 8.25.11.1.5. Minimize potential for cross-contamination of non-vaccinia patients. When feasible, assign a single caregiver. If operationally feasible, personnel caring for vaccinia patients are not assigned to care for patients with the following medical conditions: Immunosuppression, to include HIV, cancer, burns, sepsis, autoimmune disorders, trauma, steroid use, skin disease, pregnancy, or recent PRK.
- 8.25.11.2. Managing suspected highly communicable diseases (reference USTRANSCOM Instruction 41-02; *Patient Movement of Contaminated, Contagious or Potentially Exposed Casualties*).
- 8.25.11.2.1. Transported on a dedicated mission with the minimum number of crew members.
- 8.25.11.2.2. If possible, place a surgical mask on the patient to contain droplets expelled during coughing unless contraindicated. Instruct patient on cough etiquette, e.g., to cover the mouth/nose with tissue when coughing or cough into fabric of sleeve.
- 8.25.11.2.3. Oxygen delivery with a nasal cannula under a surgical mask, simple face mask or non-rebreather mask may be used to provide supplemental oxygen support during transport. In event of respiratory decompensation, positive-pressure ventilation via BVM is accomplished with a HEPA filter attached to BVM and a secure seal on patient face. A HEPA filter is placed on exhalation port of the ventilator circuit for mechanical ventilation.
- 8.25.12. Healthcare Worker Blood and Body Fluid Post-Exposure Plan.
- 8.25.12.1. This AFI provides guidance for Post-Exposure Plan (PEP) regimens.
- 8.25.12.2. The most important strategy for preventing occupationally acquired human immunodeficiency virus (HIV) infection and other blood-borne pathogens is to implement Standard Precautions coupled with Transmission-Based Precautions. The risk of acquiring an infection depends upon the type of injury, the volume of material, and the patient's virus titer.
- 8.25.12.3. Prompt management of occupational exposures and, if indicated, initiation of PEP as soon as possible after exposure provides the best outcome for personnel exposed.
- 8.25.12.4. Consultation with the VFS on post-exposure management strategies (especially determining whether an exposure has occurred and selecting PEP regimens, particularly when the source patient is antiretroviral treatment-experienced).
- 8.25.12.5. Testing of source patients (without delaying PEP initiation in the exposed provider) using methods that produce rapid results once the patient is at their final destination or first en route stop.
- 8.25.12.6. Counseling and follow-up of exposed HCW.
- 8.25.12.6.1. The current Public Health Service (PHS) guidance recommends prescribing medications as PEP for all occupational exposures to BBF.
- 8.25.12.6.2. The challenge to BBF exposure in the AE system is the HCW may not be in a facility. They may be in flight, in a high threat forward location, or in a temporary ERPS geographically separated from a fixed medical facility.

- 8.25.12.6.3. The PHS guideline has removed exposure codes. Contact the PMRC and the VFS as soon as operationally feasible.
- 8.25.12.7. Initial Treatment. Reference AE Clinical Protocol - HCW BBF PEP.
- 8.25.12.7.1. Information to relay to the PMRC and VFS includes: Name, SSN, date/time of injury/exposure, unit of assignment, phone, home phone, date of last hepatitis B vaccine, and results of last antibody/titer screening, if known, source of BBF and how the exposure occurred, protective items worn, volume, duration, severity of exposure, and cite number of the source patient.
- 8.25.12.7.2. Determine demographics of the source patient with the VFS if possible.
- 8.25.12.7.3. The exposed HCW reports to a MTF as soon as possible after the exposure, to address treatment options for the risk of hepatitis B virus exposure.
- 8.25.12.7.4. Administration of PEP for HIV is not delayed while waiting for test results. If the source patient is determined to be HIV negative, PEP is discontinued, and no follow-up HIV testing for the exposed provider is indicated.
- 8.25.12.7.5. PEP is most effective when begun as soon as possible after the exposure and PEP becomes less effective as time from the exposure increases. Occupational exposures to HIV is considered an urgent medical concern and treated immediately. PEP is not justified for exposures that pose a negligible risk for transmission, thus making the communication to the VFS critically important to establishing the need for PEP.
- 8.25.12.7.6. HCW, who has experienced occupational exposure to BBF, receives follow-up counseling, post exposure testing, and medical evaluation regardless of whether they take PEP. The psychological impact of needle sticks or exposure to blood or body fluid cannot be underestimated for the HCW. Exposed personnel are advised to use precautions (e.g., use of barrier contraception and avoidance of blood or tissue donations, pregnancy, and, if possible, breast-feeding) to prevent secondary transmission, especially during the first 6–12 weeks after exposure. Providing HCW with psychological counseling is an essential component of the management and care of exposed HCW.
- 8.25.12.7.7. If PEP is used, HCW is monitored for drug toxicity by testing at baseline and again 2 weeks after starting PEP. In addition, HCW taking antiretrovirals are evaluated if any acute symptoms develop while receiving therapy. Exposed HCW, who choose to take PEP, are advised of the importance of completing the prescribed regimen.
- 8.25.12.7.8. The PIC and AECMs assess the situation and the condition of the HCW in collaboration with C2 and the PMRC to determine if the mission continues or diverts to a MTF capable of handling the situation.
- 8.25.12.7.9. Documentation includes: Completion of a patient safety reporting form. The HCW maintains a copy of all paperwork and follows up with their local or home base military MTF.

## Chapter 9

### PATIENT MOVEMENT PATIENT SAFETY PROGRAM (PMPS)

**9.1. General.** This chapter defines the requirements and responsibilities for the PMPS Program as it applies to the AE system. The AMC AE PSP is aligned under the MEFPK and Lead Command authority of AMC/CC for the Aeromedical Evacuation mission. The AE PSP supports Air Mobility Command's Core mission of AE by promoting safety and the prevention of harm. It also supports and is aligned under the USTRANSCOM Command Surgeon (SG) mission as the DoD single-manager for global PM. The intent is to provide a structure and processes for engaging all AE Units, patient staging personnel, MAJCOMs, and service components, DoD, and Unified Commands to support and promote a culture of safety outlined in the objectives below. The PMPS utilizes the web-based Joint Patient Safety Reporting system for inputting and managing patient movement patient safety events. Additional patient safety resources are listed in [Attachment 2, A2.2](#).

#### 9.2. Objectives:

- 9.2.1. Advance a culture of high reliability and patient safety (PS) throughout the AE patient movement system.
- 9.2.2. Promote transparency, teamwork, and communication.
- 9.2.3. Establish policy/standards to incorporate PS initiatives at all levels.
- 9.2.4. Promote an open, receptive, and non-punitive event reporting environment.
- 9.2.5. Provide an ongoing and systematic approach for system improvement and risk reduction.
- 9.2.6. Reduce potential or actual patient harm events.
- 9.2.7. Disseminate PS data and initiatives for ongoing learning and involvement.
- 9.2.8. Track and trend patient satisfaction within the AE system for purpose of improvement/evidence-based practices.

#### 9.3. Responsibilities.

- 9.3.1. TCSG. The USTRANSCOM PSP is outlined in USTRANSCOM Handbook 41-1.
- 9.3.2. Geographic Combatant Command (GCC). GCC responsibilities are outlined in USTRANSCOM Handbook 41-1.
- 9.3.3. AMC/SG.
  - 9.3.3.1. AMC/SG establishes clinical practice standards and clinical training requirements and is responsible for the quality and safe delivery of medical care in the AE system. AMC/SG is the repository and process owner for AE PSP data, trend analysis, Medical Incident Investigations (MII), Root Cause Analysis (RCA), etc. Responsible for quality and safe delivery of medical care in the AE system.
  - 9.3.3.2. Appoints an AMC AE Patient Safety Program Director.

9.3.3.3. Collaborates with the TCSG to determine the appropriate level of review, CSA or investigation of AE PS events based on type of event and the organizations involved. Coordinates with DHA, Air Force Medical Readiness Agency (AFMRA), and MAJCOM/SGs.

9.3.3.4. Together with TCSG, receives all investigation and CSA outbriefs and makes final approval decisions on AE system related recommendations.

9.3.4. AMC/SG AE Patient Safety Manager (PSM).

9.3.4.1. Reports to the AMC/SG and is responsible for the management of the worldwide AE PS Program. Activities include but are not limited to:

9.3.4.2. Ensures a comprehensive and integrated AE PS Program is maintained in accordance with DoD PS principles. Coordinates with other safety programs such as Crew Resource Management/Airman Safety Action Program to communicate issues.

9.3.4.3. Identifies actual and potential patient safety risks or trends for the purpose of system improvement and risk reduction.

9.3.4.4. Coordinates/prepares instructions with TCSG, MAJCOM/SG, MAJCOM/A3 and functional experts for appropriate DoD and Air Force publications, SG Notice to Airmen (NOTAM), FCIF, COPSA, and policy letters.

9.3.4.5. Reviews, classifies, and trends all AE reported events in JPSR Transportation Command patient movement system and provides guidance to all theater and service components based on data and trends. Any patient movement events involving PMRC or other services are discussed with USTRANSCOM PSM for appropriate disposition.

9.3.4.6. Provides the AF/SG, AMC/SG and/or A3 and AE clinical working group with trend analysis and recommendations for a course of action to prevent identified PS issues. Serves as PS resource for all levels and theaters of personnel working within the AE system.

9.3.4.7. Facilitates and assists USTRANSCOM Patient Safety with the initiation of fact gathering, team selection, orientation of EPSI and CSA teams, setting up out briefs to leadership and with follow-up of implementation of AE System related recommendations.

9.3.4.8. Facilitates dissemination of AE “lessons learned” and PS initiatives through TCSG, AMC/SG and AMC/A3.

9.3.4.9. Develops and teaches PSM training for AES’ and ERPS based on DoD PS principles.

9.3.4.10. Maintains expertise in healthcare PS and incorporates those principles in the AE PSP and serves as consultant and advisor to leadership on PS issues and concerns.

9.3.5. AMC/A3.

9.3.5.1. Communicates information to AMC/SGK regarding clinical trends in training and evaluation.

9.3.5.2. Updates policy and operational guidance based on clinical and PS lessons learned.

9.3.5.3. Acts as advisor and liaison to TCSG and AMC AE PS process improvement. Member of the AE clinical working group.

9.3.5.4. Manages aircrew operationally related events submitted through the Aviation Safety Action Program and/ or JPSR system.

9.3.6. Theater MAJCOM SG.

9.3.6.1. Responsible for oversight of the Command AE PS Program, actively supports investigations, event reviews, and process improvement efforts within the theater and across the system.

9.3.6.2. Appoints a command-level PSM. This role may be delegated to the squadron level although authority and oversight is maintained at the MAJCOM level.

9.3.6.3. Notifies AMC/SG of any significant clinical AE events or any medical issues requiring command surgeon action. All MDGs, PMRCs and Active Duty (AD) AES' will have access and respond to AE patient safety events in the JPSR involving their Unit. **(T-0)**. The command-level AE PSM requests access to view AE patient safety events in the JPSR Transportation Command patient movement system.

9.3.6.3.1. Coordinates and works with TCSG and AMC/SG on the scope and direction of investigation/level of review needed for significant events based on classification of events (**Table 9.1**).

9.3.6.3.2. Provides all final investigation reports and event reviews to TCSG and AMC/SGK for system-wide transparency and process improvement.

9.3.6.3.3. Participates in investigations and CSA (e.g., root cause analysis) outbriefs to TCSG and HQ AMC/SG. Implements approved recommendations within respective theater of operation and disseminates "lessons learned."

9.3.7. Theater MAJCOM PSM.

9.3.7.1. Required for commands and theaters with owned or gained AE assets (even if dual role). Responsible for managing the MAJCOM PMPS Program.

9.3.7.2. Works closely with the Theater PMRC PSM to maintain awareness of theater-level events, trends, issues, and provides updates to MAJCOM SG.

9.3.7.3. Actively promotes and supports PS across the theater.

9.3.7.4. Acts as a MAJCOM/Theater advisor for AE PS requirements to unit level programs and a liaison to the TCSG Director PMPS Program and the AMC/SG AE PSM.

9.3.7.5. Evaluates significant events in assigned theater to determine if an EPSI or CSA (root cause analysis) is needed. Collaborates with TCSG PMPS Program Director and the AMC/SG AE PSM to coordinate and conduct the investigation process.

9.3.7.6. Implements EPSI and CSA (root cause analysis) approved recommendations within respective theater of operations and disseminates "lessons learned" to appropriate communities.

9.3.8. Commander, AES/OIC/Senior Officer/Flight Commander of ERPS.

9.3.8.1. Fosters an organizational commitment and culture that promotes high reliability, high quality patient care, collaborative teamwork, and communication. Supports and encourages PS event and near miss reporting, event review, analysis, and prevention of events that caused, or have potential to cause, patient harm during operational missions, exercises, and training missions to include Aeromedical Readiness Missions (ARM).

9.3.8.2. Ensures local policies and procedures governing the management of the AE PS Program are established and provide oversight of the program.

9.3.8.3. Appoints an AES PSM OIC or ERPS PS OIC and ensures member receives TCSG and AMC/SG approved AE PS Manager training within six months of starting the position. The AE Squadron PSM OIC is a minimum grade O3 and has at least 30 flying hours experience. All active, ARC, and deployed AES' and Staging units have a designated patient safety manager or OIC.

9.3.8.4. Reviews Unit PSMs internal quarterly reports and elevates concerns or issues to MAJCOM and AMC/SG AE PSM.

9.3.8.5. Reviews and approves Unit PS program appraisal of the past calendar year and the annual plan for the new calendar year. This can be two separate reports or addressed in one report. Ensures completion of the Annual Appraisal according to guidelines (reference [paragraph 9.3.9.12](#)).

9.3.8.6. Defines an internal process for reviewing events involving the unit that are submitted in the JPSR and other relevant events and ensures unit corrective actions are identified and taken and follow-up is accomplished. Patient safety events involving the unit are visible and actionable through the JPSR.

9.3.8.7. Ensures annual PS training is conducted for all members of the unit in accordance with AFI 44-119.

9.3.8.8. Appoints members of unit-level AE CSA/RCA team as determined either locally or by higher headquarters.

9.3.8.9. Ensures reporting of all information concerning significant events (typically those classified as death, severe permanent or severe temporary harm) into the JPSR system to the MAJCOM AE PSM, the AMC/SG AE PSM and the TCSG Director PMPS Program.

#### 9.3.9. PSM and PS OIC for AES and ERPS Units.

9.3.9.1. Responsible for administration of the unit PMPS program for either the AE Squadron or ERPSS. Assists the Commander in promoting a strong culture of safety and high reliability to eliminate preventable patient harm by implementing applicable DoD patient safety and high reliability tools within the AES or ERPSS.

9.3.9.2. All AD AES PSMs and/or designees obtain a JPSR account for managing PS events assigned to their unit to review/investigate. All AD ERPSS respond to AE PS events as assigned by their MTF PSM. All ARC Staging UTCs follow PS reporting guidance from their MAJCOM. A JPSR account can be obtained by first contacting HQ AMC Patient Safety.

9.3.9.3. Provides unit training on how to report PS events utilizing the DD Form 2852 or JPSR Worksheet and what information to include on the reporting form. The patient safety event forms are then turned in to the operational AES or Detachment.

9.3.9.4. Ensures all harm events are reported to the Unit Commander as soon as possible and submitted in the JPSR system within 24 hours of the event occurring. All other no harm and unsafe condition type of events are submitted as soon as possible but not to exceed five days of the event.

9.3.9.5. All AD PSMs will log into the JPSR System at a minimum, weekly to check for events assigned to the unit to investigate and add input, contributing factors, and lessons learned/corrective actions within seven days of the event being assigned. **(T-2)**. Initiates appropriate level of review, follow-up, and action as determined locally and/or by higher headquarters.

9.3.9.6. Uses a locally developed coordination process to document review and resolution of events by working with involved functional areas, units or agencies as needed (Wing/OG/A3V/ A3T/NAF/MAJCOM, TPMRC, MDG, etc.).

9.3.9.7. Analyzes PS event data to identify trends, actual issues/concerns and takes action to improve processes/reduce risk within the units' span of influence or control. Elevates, through the unit Commander, any issues/concerns beyond the units' span of influence or control.

9.3.9.8. Provides additional JPSR event information as requested by HQ AMC or USTRANSCOM Patient Safety. These requests can be through the JPSR System or by e-mail.

9.3.9.9. Maintains open communication on squadron/theater level issues with local leadership, and when applicable, MAJCOM PMPS Program Manager, AMC/SG AE PSM and TCSG Director PMPS Program.

9.3.9.10. Provides a quarterly report to the AES or MDG commander on unit patient movement event trends, PS issues and follow-up on actions taken.

9.3.9.11. Provides ongoing feedback to unit personnel on PS issues, trends, and actions or "lessons learned."

9.3.9.12. Provides AE PS annual appraisal. At the end of each calendar year, the unit prepares an appraisal signed by the unit commander of its PS program for that past calendar year and submits it to AMC/SG AE PSM, through the respective MAJCOM. Suspense for submission of this report is 1 February. At a minimum, the following areas are addressed:

9.3.9.12.1. PS training statistics for the past year. Include total number personnel trained/total number personnel requiring training. This includes initial training and annual training. Briefly identify topics covered. Include an action plan to address personnel not trained.

9.3.9.12.2. Provides a statistical review and analysis of the Unit's patient movement JPSR events in the JPSR System for the past year. Identifies issues or trends and local actions taken. Identify and summarize any CSA (e.g., root cause analysis) conducted.



- 9.3.9.12.3. Describe local PS initiatives on how the National Patient Safety Goals and AE System Patient Safety Goals were addressed.
- 9.3.9.12.4. Describe unit actions taken in response to any applicable SG NOTAMs, COPSAs, FCIF and/or PS related policy memos in the past year.
- 9.3.9.12.5. Identify any PS concern(s) or area(s) for improvement beyond the unit's control (if any) and include recommendations for improvement.
- 9.3.9.12.6. All unit annual appraisals are reviewed by AMC/SG AE PSM. Data from the appraisals may be incorporated into the AE/En Route Care Annual Patient Safety Report. Any system trends, issues or concerns may be elevated thru the AE governance structure with recommendations for course of action to prevent identified AE PS issues.
- 9.3.9.13. ALL AES/ERPS Units input a minimum of 4 training JPSR Worksheet or DD Form 2852 or events, per semi-annual period, into the TRAINING JPSR system for quality assessment and audit by AMC/SG PSM.
- 9.3.10. AES and ERPS unit personnel.
- 9.3.10.1. AES personnel utilize the JPSR Worksheet or DD Form 2852 to report AE PS events into the JPSR system and report all operational events into the Aviation Safety Action Program (ASAP) program. AD ERPSS report AE PS events directly into the patient movement JPSR web-based system. Only one patient safety issue per event report is made. If there are multiple issues, multiple patient safety reports are input.
- 9.3.10.2. If equipment or supplies are involved in an event while on a patient, remove it from the patient and tag it appropriately (reference [paragraph 12.5](#)) and turn it into the appropriate agency. Contact AMC AE PSM for guidance with non-equipment supply issues (mislabeled IV bags or medication bottles, etc.). **Note:** Do not clear the history or data from any malfunctioning equipment (e.g., history, settings, volume infused) as this is important to the Biomedical review of equipment.
- 9.3.10.3. Attends annual PS training taught by the unit PSM, incorporates PS initiatives and alerts into practice and participates with event reviews or investigations conducted for the purpose of system improvement.
- 9.3.11. MCD.
- 9.3.11.1. Responsible for in-flight medical mission management for the AE crew, ERCC team members, MAs, and patients.
- 9.3.11.2. MCD reports all harm related and/or concerning patient safety events to C2 who then contacts the governing PMRC. During the end of mission report, MCD completes and faxes necessary paperwork.
- 9.3.11.3. MCD/AECM complete the mission termination process in accordance with AFMAN 11-2AEV3.
- 9.3.11.4. At the end of mission, submits completed DD Form 2852s or JPSR Worksheets to Unit or Squadron PSM or through an en route Detachment supporting the mission for entering into the JPSR web-based reporting system.

#### 9.3.12. PMRC.

9.3.12.1. During mission, provides initial assistance and medical direction, as needed, when notified of a patient safety event involving harm. Supports TCSG and AMC/SG in reviewing or conducting an EPSI or CSA (e.g., root cause analysis) as required. Each TPMRC identifies a PSM to assist in the following activities including but not limited to:

9.3.12.2. Notifies the following of any death or significant harm events concerning medical issues within 24 hours of occurrence: TCSG patient safety office via e-mail to [transcom.scott.tcsg.mbx.patient-movement-safety-program@mail.mil](mailto:transcom.scott.tcsg.mbx.patient-movement-safety-program@mail.mil). AMC/SG patient safety office via e-mail to [amc.sgk.ae\\_pt\\_safety@us.af.mil](mailto:amc.sgk.ae_pt_safety@us.af.mil); and the GCC/Theater SG.

9.3.12.3. TPMRC PSM obtains a JPSR live account for managing patient movement PS events assigned to the TPMRC to review/investigate or provide additional information to an event.

9.3.12.4. Provides all relevant documentation, information, and originals of any form documenting validation, regulation, patient care, log entries related to a PS event for the purpose of quality assurance protected PS reviews or investigations. Assists as needed in obtaining copies of any paper AF Form 3899 medical records of the patient from the receiving facility.

9.3.12.5. Identifies potential problem areas in patient regulation and validation through analysis of data and review of internal processes.

9.3.12.6. Participates on EPSI and CSA (e.g., root cause analysis) teams.

9.3.12.7. Provides PM expertise and information/data to the TCSG Director PMPS and the AMC/SG AE PSM upon request. Provides consultative support on PS issues to the theater surgeon.

9.3.12.8. Provides PS training to all members of the TPMRC. Incorporates and disseminates “lessons learned” from clinical AE investigations and patient safety alerts, as applicable.

9.3.12.9. Initiates and participates in process improvement activities.

#### 9.4. Patient Movement Event/Near Miss Reporting Process.

9.4.1. PMPS Event. An incident or condition that may or may not have resulted in harm to a patient occurring in the AE system. This also includes “unexpected” changes in patient status and events that could have, but did not reach the patient (e.g., close calls and unsafe conditions).

9.4.2. PMPS event reporting boundaries. PMPS boundaries start with clinical and/or administrative validation activities and end 24 hours after transfer of care at the final destination MTF (civilian or military).

9.4.3. All patient safety events related to aeromedical evacuation patient movement, regardless if in flight, on the ground or within the MDG, are entered into the JPSR web-based system in the Transportation Command patient movement section.

9.4.3.1. Anyone throughout the En Route Care system can report a patient movement PS event. AES personnel completes a DD Form 2852 or JPSR Worksheet and give the form to a PSM or designee to enter the form into JPSR system. If PSM is unavailable to submit into the JPSR in the required time frame (reference [paragraph 9.4.3.2](#)) any unit member is able to submit into the JPSR. The reporting worksheet is available in TRAC2ES Documents, on the AE website, or by contacting TCSG Director PMPS or HQ AMC AE Patient Safety.

9.4.3.2. All events are entered as soon as possible. If a mission is in progress, harm events (death, severe harm, moderate harm, mild harm) the VFS will be notified and the event will be entered into JPSR system within 24 hours. **(T-0)**. All other event classifications (no harm, near miss, unsafe condition) will be entered within five days of the incident. **(T-0)**.

9.4.4. Do not document in the patient record that an event report was completed. Information on the DD Form 2852 and JPSR Worksheet is protected by the Privacy Act and from disclosure, except as specifically authorized, DoDI 6025.18 and DoDI 6025.13.

9.4.5. Guidelines for completing a DD Form 2852 or JPSR Worksheet are available in TRAC2ES Documents, on the AFMRA and AE Patient Safety websites or by contacting the TPMRC, TCSG Director PMPS, or AMC AE PSM.

9.4.6. When a DD Form 2852 or JPSR Worksheet is filled out and later entered into the JSPR System, the original hardcopy form is and uploaded as a pdf file into the JPSR. At a minimum this is completed for all PS events with a harm scale rating of death, severe harm, moderate harm, mild harm, and no harm. Once the hardcopy form is uploaded into JPSR system, it can be maintained in a secure manner for local data purposes or destroyed. In addition to the JSPR Worksheet, any applicable documents helpful in reviewing/understanding the event are also scanned as a pdf file and uploaded into the JPSR event (e.g., PMR, copy of hardcopy AF Form 3899, AF Form 3899I, *Patient Movement Medication Record*, AF Form 3899 doctor orders, memo of additional information concerning the event detail).

9.4.7. Once an event is submitted into JSPR it is reviewed by USTRANSCOM and HQ AMC AE PSMs who assign it to the identified involved unit. If the submitting unit is not the involved unit, the submitting unit does not have access to the event in JPSR. If the submitting unit has additional information after an event is submitted, notify HQ AMC AE PSM.

## 9.5. Event Degree of Harm.

9.5.1. Events are assigned a harm category to facilitate trending and analysis. Both the degree of harm and duration of harm are assigned (reference [Table 9.1 and 9.2](#)).

9.5.2. The submitting unit indicates the initial classification. TCSG Director of the PMPS or AMC/SG AE PSM make the final event classification determination.

**Table 9.1. Degree of Harm.**

Event Classification	Description

Death	Pt unexpected death while in the AE en route care system up to and including 24 hours after destination arrival.
Severe	Bodily or psychological injury (including pain or disfigurement) that interferes substantially with functional ability or quality of life.
Moderate	Bodily or psychological injury adversely affecting functional ability or quality of life, but not at the level of severe harm.
Mild	Bodily or psychological injury resulting in minimal symptoms or loss of function, or injury limited to additional treatment, monitoring, and/or increased length of stay.
No Harm	Event reached the patient, but no harm was evident.
Near Miss	Event did not reach the patient, either by chance or timely intervention, but could have resulted in harm, or the potential for harm, had it reached the patient. Also known as close calls or good catches.

**Table 9.2. Duration of Harm.**

<b>Permanent</b>	Harm that remains and is not expected to improve (e.g., not return to patient's baseline).
<b>Temporary</b>	Harm that is not permanent and expected to revert to approximate normal (e.g., patient's baseline).
<b>Unknown</b>	Duration of harm is unknown at the time of classification.
<b>Not Applicable</b>	The type of event does not lend itself to a harm duration classification (e.g., a near miss that does not reach the patient)

**9.6. Event Categories.**

9.6.1. Event categories are determined by USTRANSCOM PS Director or HQ AMC PSMs based on the main issue in the event. It is important the main issue is clear in the event description.

9.6.2. Multiple events are reported in separate event reports. If there are more than one type of event involving the same patient (e.g., meal issue and status change and equipment failure) then a separate PS report for each event is required.

9.6.3. Examples of JPSR type of events to report within the patient movement system can be found in [Attachment 16](#). Other CY 2019 reporting changes are summarized in [Table 9.3](#)

**Table 9.3. Reporting Changes.**

<b>Event Type</b>	<b>Reporting Changes</b>
Crew injuries	Report in ASAP Reporting Program
Civilian Facility Meals or anti-hijacking	Report only significant patient safety related issues in JPSR. AE crews expect no meals or anti-

	hijacking from civilian facilities and take corrective actions.
Waivered Equipment	Equipment with proper waivers do not get reported
Aircraft emergencies	Report in ASAP Reporting Program. If a patient is involved, then report in both JPSR and ASAP but no patient ID data in ASAP.
Baggage issues	No reporting mechanism, handle at local leadership level
EHR technical issues not involving patient safety	Report to EHR Help Desk: amc_ae_ehr@us.af.mil
Use of AE Clinical Protocol - Over the Counter (OTC) Medication Administration	No PS reporting needed for AE Clinical Protocol - Over the Counter (OTC) Medication Administration use that responds to treatment (e.g., Tylenol for headache) unless patient does not improve.

## 9.7. Reporting Events Involving Unexpected Death, Permanent Harm, or Severe Temporary Harm.

9.7.1. Notify executing C2/PMRC as soon as possible followed by reporting the event into the JPSR System as described in [paragraph 9.4](#) **Note:** Patient care and safety come first and are managed before beginning the reporting process.

9.7.2. Within three hours of notification of an unexpected death, permanent or severe temporary harm event, the regulating TPMRC collects and reviews all internal PMRC records (e.g., TRAC2ES audit history, PMR, all internal notes, daily log entries, and mission tracking records) regarding validation prior to movement. The TPMRC notifies USTRANSCOM and HQ AMC Patient Safety and provide collected information as requested by USTRANSCOM Patient Safety.

9.7.3. Upon notification of an unexpected death, permanent or severe temporary harm event, the USTRANSCOM and HQ AMC Patient Safety representatives collates reported event details into an I-SBAR summary and submit to respective leadership for awareness along with recommended actions.

9.7.4. A patient movement PS Event involving unexpected death, permanent harm or severe temporary harm can result in a patient movement CSA, EPSI, or other defined review. The GCC/Theater SG in conjunction with USTRANSCOM/SG, decides the level of investigation or review necessary for the event. Either investigative process is initiated within 15 days of the event notification with a report completed within 120 days of the event notification.

## 9.8. PM Comprehensive Systematic Analysis (CSA).

9.8.1. A PM CSA is structured similar to a Root Cause Analysis (RCA) and utilizes team members from each of the involved Units. The goal of the CSA is to identify system factors

that led to the event and solutions to prevent or reduce the likelihood of similar events in the future. The product of the Event Review is a written team report consisting at a minimum of a timeline of events across the continuum, identified contributing factors with root causes, and an action plan designed to eliminate or minimize the root causes of the event and improve safety of the process. The focus is on human factors, processes, and systems rather than individual blame. Any concern for professional competence is identified by the leadership for appropriate SOC review separate from the event review process.

9.8.2. May be considered for any type of event regardless of harm but is considered for all events involving unexpected death, permanent and severe temporary harm events.

9.8.3. Authority: Service or GCC/Theater SG, USTRANSCOM/SG, or HQ AMC SG can direct a PM System CSA involving multiple units. Local unit level leadership may also conduct a local CSA as determined.

9.8.4. The CSA report is a quality assurance document and is exempt from discovery or further disclosure except as specified in DoDI 6025.13. This is stated in the CSA report.

9.8.5. The team composition is determined by the type and severity of the event and is comprised of selected subject matter experts as determined by the event.

9.8.6. TCSG Director of the PMPS and AMC/SG AE PSM provide CSA Team training and assist the team with the process.

9.8.7. For system level event reviews, the event review team sends the final written report with findings, recommendations to the respective impacted Agency Safety Departments to include: GCC/Theater, Service, USTRANSCOM, and HQ AMC/SG AE PSM within 120 days of being directed to conduct an event review.

9.8.8. Leadership who directed the event review, determine requirements for a formal out brief.

## **9.9. PM External Patient Safety Investigation (EPSI).**

9.9.1. A formalized structured investigation process with a primary purpose to find out how the system contributed to the adverse outcome by thoroughly investigating the facts in a non-punitive way. The goal is to learn from the event and improve healthcare by recommending system changes to reduce the risk of recurrence, thereby decreasing harm to patients. A PM/AE MII may involve multiple geographic locations, services, and systems of care, which may complicate and significantly lengthen the investigative process.

9.9.2. Authority: TCSG, AMC/SG, or GCC/Theater SG may direct a PM EPSI. Upon initiation, the TCSG, as the single manager for patient movement, takes the lead for all EPSIs within the AE System involving multiple units.

9.9.3. The EPSI report is a quality assurance document and is exempt from discovery or further disclosure except as specified in DoDI 6025.13.

9.9.4. The team compliment is selected by TCSG and AMC/SG. If AFRC/ANG AECMs are involved, the respective MAJCOM identifies contacts for appropriate team representation. DHA/Service Patient Safety along with TCSG and HQ AMC Patient Safety provide EPSI Team training.

9.9.5. All DoD Reportable Events (defined in DHA PM 6025.13), will be evaluated for either a CSA or EPSI. **(T-0)**. An EPSI may be accomplished for, but not limited to, the following types of events:

9.9.5.1. Any event or series of events which in the opinion of GCC/Theater SG, USTRANSCOM/SG, or HQ AMC/SG, either caused, or could cause, serious injury or death. All events (particularly A, B, C) are evaluated for the requirement or need of an event review process (MII vs Event Review). At a minimum, an appropriate level of review is completed on all sentinel events (as defined by The Joint Commission and DoD). The following events may warrant a MII (list is not all-inclusive):

9.9.5.2. Incidents where a full objective evaluation cannot be accomplished by an internal CSA team.

9.9.5.3. Incidents with media attention or of a concerning nature, and incidents with high-level interest.

9.9.5.4. Patient suicide, attempted suicide, or self-harm resulting in serious disability.

9.9.5.5. Hemolytic transfusion reaction involving administration of blood, or blood products having major blood group incompatibilities resulting in permanent or severe temporary harm or death.

9.9.5.6. Any event resulting in unanticipated death or major permanent loss of function, not related to the natural course of the patient's illness or underlying condition.

9.9.6. The final written report with timeline, findings, and recommendations is forwarded to the respective impacted agency safety departments, to include as required, GCC/Theater, Service, USTRANSCOM and HQ AMC within 120 days of event notification.

9.9.7. A formal out brief is required. Attendees to the out brief are determined by the TCSG and AMC/SG. At a minimum, AFMRA/CC and the involved Theater/SG will be a part of the out brief. **(T-0)**. When possible, if ARC personnel are involved in the event, the ARC leadership are contacted for team inclusion.

## **9.10. Clinical Operations Patient Safety Alert (COPSA).**

9.10.1. A COPSA is a patient safety alert issued by USTRANSCOM SG and/or HQ AMC/SG in order to address a critical patient safety trend or a high-risk concern. The recommendations and guidelines are followed by personnel in the AE System. The specific target audience are identified in the COPSA and the directions and guidelines are followed by personnel in the AE system.

9.10.2. Current COPSAs are available on the AFMRA Patient Safety Website or through the TRAC2ES Documents section. Contact USTRANSCOM or HQ AMC AE Patient Safety website for questions regarding the COPSA.

9.10.3. Upon release, DoD MTFs, AES PSMs and ERPS PS OICs immediately work with their leadership to implement recommendations and ensure all personnel have reviewed and are familiar with the COPSA.

## Chapter 10

### MISSION IRREGULARITIES

#### 10.1. Cabin Altitude Restriction.

10.1.1. Cabin altitude restrictions may be required with clinical conditions associated with retained air such as head injuries, eye injuries, or decompression injuries. If an altitude restriction is required, it is identified on the patients PMR and documented on the EHR or AF Form 3899 prior to validating the patient.

10.1.2. Cabin altitude restriction could lengthen the flight time and increased turbulence may occur. The PRMC communicates the cabin altitude restriction to the governing AOC.

#### 10.2. Medical Emergency/Change in Patient Status.

10.2.1. In the absence of direct physician contact/supervision, AECMs immediately start interventions in accordance with AHA or equivalent, TNCC if available, and DHA/J7 Education and Training guidelines. All IV solutions are either LR or NS.

10.2.1.1. FN/AET refers to AFMAN 11-2AEV3 for operational information. ERPS personnel follow MTF guidelines.

10.2.1.2. Do not use any personal identifying information when transmitting medical information. **Note:** For patient related issues, the cite number is used to protect patient privacy.

10.2.2. Be ready to communicate demographical and medical information quickly and succinctly. Also, report any treatment/intervention and the outcome. Be prepared to request/receive orders, mission deviation/divert, to expedite meeting patient and mission requirements.

10.2.3. If instructed to divert or expedited landing is required, ensure proper off-load message using AF Form 3858, *Aeromedical Evacuation Mission Offload Message*, is provided to the airfield with equipment and personnel requirements.

10.2.4. Anytime a patient is removed from a flight or the staging facility for clinical evaluation or a significant change in status, the MCD/AECM/Chief Nurse notifies C2 who notifies the governing PMRC and complete DD Form 2852 or JPSR Worksheet.

10.2.5. A qualified member of the medical crew accompanies the patient to the MTF, if needed, maintaining the same level of care and providing report to the MTF's accepting privileged provider.

10.2.5.1. In some instances, a civilian ambulance responds to transport the patient to the MTF, and the local memorandum of agreement may not permit military medical personnel to ride in the ambulance.

10.2.5.2. If a member of the medical crew cannot accompany the patient to the MTF, report is provided to the accepting MTF privileged provider via radio or telephone. The cite number is used on the radio or telephone to identify the patient due to HIPAA regulations.



10.2.5.2.1. The original AF Form 3899 and other medical records accompany the patient to the MTF.

10.2.5.2.2. Whenever possible, the MCD/AECM ensures a copy of the AF Form 3899/DD Form 602, *Patient Evacuation Tag*, is faxed to the PMRC. If the AF Form 3899 cannot be copied, provide detailed information on AF Form 3829, and complete DD Form 2852 or JPSR Worksheet.

### **10.3. Death In-flight/Do Not Resuscitate (DNR).**

10.3.1. For Death in Flight reference AFMAN 11-2AEV3.

10.3.2. DNR orders. AE/ERPS can accept DNR patients with approval from the VFS and matched with the appropriate level of care. If a patient death is anticipated while a patient is in the AE system and a decision has been made not to resuscitate, an AF Form 3838 is completed and attached to AF Form 3899. Attending physicians addresses DNR status of peacetime AE patients facing imminent death or classified as very seriously ill, recognizing the stresses of flight may pose significant risk for precipitating death. The VFS reserves the authority to deny movement by AE of peacetime patients for whom AE poses an unacceptable risk of death or injury. Patients may also be moved for organ donation or family requests when a DNR would not be appropriate.

10.3.2.1. The originating physician provides the following documentation before flight:

10.3.2.1.1. A completed AF Form 3838.

10.3.2.1.2. “Do Not Resuscitate” order on the EHR or AF Form 3899 is not written more than 72 hours before the originating flight.

10.3.2.1.3. Prior to flight, verify the order with the patient and/or the patient’s family.

10.3.3. Countermeasures aim to reduce the risk of precipitating the onset of death to the greatest extent allowed by mission constraints. The goal of AE for DNR patients is to deliver them successfully and safely to the requested destination ensuring highest level of comfort possible. Consequently, supportive supplemental oxygen therapy, IV hydration to combat dehydration, en route MAs, and a cabin altitude restriction is not automatically ruled out because the patient is a “DNR.”

### **10.4. Mission Delays.**

10.4.1. Refer to AFMAN 11-2AEV3. The medical crew is responsible for the welfare, safety, and clinical care when patients are deplaned for comfort during ground operations. Patient care continues without degradation through the delay; on the aircraft if delay is expected to be less than one hour or in the nearest medical facility if the delay exceeds three hours. MTF/ERPS personnel assist if available.

10.4.2. Medical considerations during mission delays are: Medical orders for treatments, medications and diet if applicable. Before continuing mission after a delay, ensure enough medication, supplies (if available), and nourishment are available for remainder of mission.

10.4.3. If a mission delay occurs while the patient is under the responsibility of the ERPS personnel, the ERPS personnel in collaboration with the AECM, evaluate the best location for the patient. (e.g., remain on the AMBUS or return to the staging area).

**10.5. Medical Delays.**

10.5.1. Medical hold. In the event of changes in the patient's condition, the flight surgeon may place a patient on medical hold, not to exceed 72 hours. Patients with status changes may require admission to a MTF whereupon the flight surgeon arranges for hospitalization and a continuation PMR is initiated. ERPS personnel notifies the PMRC of the interruption of PM.

10.5.2. In the event the MCD/AECM/Chief Nurse is concerned a patient is at significant risk for flight or requires care beyond the scope of the AE crew or ERPS, the MCD/AECM or Chief Nurse notifies C2 who then contacts the governing PMRC for additional MAs, support, or re-evaluation. Depending on the contingency/tactical environment, refusing a patient for flight may not be a viable solution.

**10.6. In-Flight Refueling Considerations.**

10.6.1. Refer to AFMAN 11-2AEV3.

10.6.2. During mission planning if in-flight refueling is required, the VFS approves.

10.6.3. Patients prone to motion sickness (e.g., pregnancy, GI disturbances), anxiety, and pain from surgical or orthopedic injuries may require medication 20-30 minutes prior to refueling.

10.6.4. Patients with head and spinal injuries, and those requiring advanced life-support, are reassessed just prior to refueling.

**10.7. En Route Diversions.**

10.7.1. If a request for diversion, unrelated to patient needs, be received, and the AECM determines this would place a patient(s) in jeopardy, immediate communication is established with C2. The airlift agency contacts the governing PMRC to discuss and resolve the situation. The MCD/AECM is responsible for determining what is beneficial for, or detrimental to patients on board.

10.7.2. All patients on the mission are briefed on the change in itinerary and the reasons for diversion.

10.7.3. AECMs assess equipment, medications, supplies, and nourishment for patient care due to diversion.

10.7.4. If available, Patient Staging personnel assist, as necessary.

**10.8. Scheduled and Unscheduled RONS.**

10.8.1. Refer to AFMAN 11-2AEV3.

10.8.2. AE missions may require either scheduled or unscheduled RON stops. MTF commanders at locations where RONS occur are responsible for the care of patients, securing medical records and narcotics.

10.8.3. RON in the MTF or other facilities. If patients need to RON in the MTF or other agency while transiting the AE system, they are not be formally admitted to the MTF. The MTF flight surgeon, or designee, manages the medical care of such patients and reaffirms

their readiness for flight. Patients in RON status at a civilian medical facility may be admitted, but the ERPS retains them administratively as ERPS RON patients.

10.8.4. Unscheduled RONs (reference AFMAN 11-2AEV3). The AECM coordinates with C2 and the governing PMRC for assistance with facility points of contact to assure patient needs are met.

10.8.5. MTFs at both scheduled and unscheduled RON stations are required to:

10.8.5.1. Assist with deplaning and enplaning patients.

10.8.5.2. Admit and assign patients to the MTF (civilian or military) or billeting facility as appropriate.

10.8.5.3. Provide food/meals for the patients.

10.8.5.4. Prepare and manage records.

10.8.5.5. Evaluate and maintain the continuum of care.

10.8.5.6. Provide medical supplies, medications, and nourishment for the rest of the AE mission.

## **10.9. Patients Requesting Release from the Aeromedical Evacuation System.**

10.9.1. Refer to AFMAN 11-2AEV3. AECMs/ Patient Staging personnel document patient's condition on the EHR or AF Form 3899 prior to the patient being released.

10.9.2. AECMs/ Patient Staging personnel require the patient or guardian complete AF Form 3841, *Certificate of Release*.

## **10.10. Prisoner-patients.**

10.10.1. If a prisoner-patient becomes ill or injured during flight, AECMs immediately give care within scope of practice. The AECM contacts C2 and the C2 agency contacts the governing PMRC as soon as possible to notify and receive orders and any other operational direction (reference AFMAN 11-2AEV3).

10.10.2. The responsibility of the clinician is to provide safe clinical support during transport.

10.10.3. Clinicians refrain from stating names, dates, times, or locations.

10.10.4. The guard of the prisoner may consider blindfolding the prisoner-patient if indicated for personnel safety.

10.10.5. When possible the prisoner-patient is assigned one caregiver.

10.10.6. When meals or snacks are provided do not allow handcuffs to be released except for ROM. At the guard's discretion, the blindfold may be removed during meals. If meals are provided with no visual blind, only the direct caregiver and guard are with the patient.

10.10.7. Prisoner-patients are treated as humanely as possible; all treatment is accomplished in coordination of the guard.

10.10.8. Offer toileting and liquids every two hours. The guard assists to the bathroom. The clinician monitors the prisoner-patient for safety and care only and assists as clinically required.

10.10.9. The prisoner-patient will be the last to enplane and first deplaned. (T-1).

10.10.10. If possible, attempt to seclude the patient away from other patients.

#### **10.11. Unaccompanied Minors/Incompetent Patients.**

10.11.1. Any unaccompanied minor, under the age of 18, or any unaccompanied non-active component patient who is incapable of directing their own care, will have an applicable power of attorney, attached to the DD Form 602 or AF Form 3899. (T-0). The PMRC; coordination with the originating MTF, is responsible for obtaining consent before manifesting on AE missions.

10.11.2. Minors under the age of 18 will have an NMA. (T-0).

#### **10.12. Conflict Resolutions.**

10.12.1. Conflicts are resolved at the lowest level possible prior to elevating to C2.

10.12.2. If AECMs or ERPS personnel experience conflicts with a patient in the AE system, contacts C2, who notifies the governing PMRC.

#### **10.13. Credentials Considerations.**

10.13.1. All registered nurses (RN) and medical technicians are familiar with credentialing standards of nursing practice as described in current texts and references listed in this AFI. The AECMs, specialty team members, Patient Staging personnel and any other MAs have a responsibility to notify the MCD/AECM or Chief Nurse of all incidents, accidents, and potential legal concerns detected during the mission. Such matters are carefully documented as close to the occurrence as possible in accordance with AFI 44-119.

10.13.2. The MCD/AECM is responsible for identifying and elevating the above issues to C2 and PMRC. The PMRC ensures notification to AMC/SG.

10.13.3. Clinicians are subject to adverse clinical action in response to a threat to patient safety under DHA-PM 6025.13.

10.13.4. In the event a patient or attendant is injured while in the AE System, the AE/ Patient Staging personnel document the injury and care rendered on the patient's medical record. Complete and forward a DD Form 2852 or JPSR worksheet to the unit patient safety manager. Document occurrence on AF Form 3829. These two forms are protected from disclosure under DoDI 6025.13 and are not included in the patient's record.

10.13.5. Special considerations for patients who are seriously ill and those at significant risk. The RN may sign a document as required on behalf of an unconscious, incompetent or infectious patient, if physically unable. When signing for the patient, indicate "for unconscious patient, John Doe." For other patients, an entry of "patient unable to sign" may be made. Two witnesses sign the form in both instances.

#### **10.14. Engine Running Off/On Loads (ERO).**

10.14.1. Refer to AFMAN 11-2AEV3. If an ERO is required, patient preparation includes: Eye protection, hearing protection, and securing all medical equipment or tubing accompanying the patient.

10.14.2. Explain to the patients what they can expect during this enplane/deplane procedure to minimize their anxiety.

#### **10.15. No and Low Light Conditions.**

10.15.1. Mobility aircraft used for AE typically provide poor to fair lighting for patient care. Flashlights or headlamps may assist with lighting conditions. Certain circumstances may require night vision goggle compatible lighting. Follow pilot in command, and/or loadmaster, boom operator guidance for appropriate lighting color (red, green, blue).

10.15.2. If care is indicated during low or no light conditions, use green lamps (flashlight or headlamp) unless otherwise directed by PIC. Explain situation to patients to minimize anxiety.

#### **10.16. Service Animals and Emotional Support Animals.**

10.16.1. Service animals are working animals, not pets. Service animals are individually trained to perform specific tasks for people with disabilities such as guiding people who are blind, alerting people who are deaf, pulling wheelchairs, alerting/protecting a person who is having a seizure, and/or performing other special tasks.

10.16.2. Emotional support animals are companion animals that provide therapeutic benefit, such as alleviating or mitigating some symptoms of the disability, to an individual with a mental or psychiatric disability. Emotional support animals are typically dogs and cats but may include other animals.

10.16.3. A service/emotional support animal is allowed to accompany a passenger/patient with a disability within the cabin on DoD aircraft or within Patient Staging area. Commercial aircraft chartered by DoD, or on behalf of DoD, may be subject to provisions of 14 C.F.R. § 382.117, *Must carriers permit passengers with a disability to travel with service animals?*

10.16.4. Service/emotional support animals may be accommodated on other aircraft, subject to reasonable limitations required by configuration of aircraft and/or operational necessity.

10.16.5. Due to an animal's weight/size, state and foreign country restrictions may limit transport of service animal within the cabin and/or cargo hold.

10.16.6. Service/emotional support animal are properly harnessed or leashed.

10.16.7. To avoid creating a safety hazard, service/emotional support animals do not obstruct the aisles.

10.16.8. Service/emotional support animal will be permitted to accompany passenger in all areas in which persons without disabilities are normally allowed to go. **(T-0).**

10.16.9. If a service/emotional support animal cannot be accommodated at a seat location of passenger with a disability, offer the passenger the opportunity to move with the animal to another seat location where the animal can be accommodated. A seat will not be booked for a service/emotional support animal. **(T-0).**

10.16.10. The handler/patient with the service/emotional support animal is responsible for all the needs of the service/emotional support animal including food, water, and toileting.

10.16.11. Certain unusual service/emotional support animals pose unavoidable safety and/or public health concerns and may not be transported (e.g., livestock, snakes, other reptiles,

ferrets, rodents, and spiders). The need for the animal to accompany a patient is evaluated on a case by case basis by the VFS.

10.16.12. Service animal certification documentation is in accordance with USTRANSCOM Handbook 41-2.

10.16.12.1. PMRC, in coordination with the sending MTF, ensures all documentation is complete and present.

10.16.12.2. Service animal removal from PM conveyance. If the owner does not control the animal, or the animal poses a threat to health or safety of others, every effort is made to mitigate the problem before excluding animal from terminal area or aircraft cabin.

**10.17. Military/Government Working Dogs.** Are authorized transport on all DoD missions (reference AFMAN 11-2AEV3).

**10.18. Passenger Requiring Medical Attention.**

10.18.1. Passenger, crewmember, or medical personnel may become ill, injured or otherwise become a patient.

10.18.2. In the event a passenger or crewmember becomes ill/injured during any type of AE mission, treat the medical emergency with AHA or equivalent, TNCC if available, and DHA/J7 Education and Training guidelines.

10.18.2.1. The AECM notifies C2 who then contacts the governing PMRC. Be prepared to accept verbal orders from the VFS.

10.18.2.2. If the ill/injured individual is in a crew position, remove them from the crew position and cover the duties as appropriate. Move to a litter if necessary.

10.18.2.3. If the ill/injured individual is a passenger, move to a litter if necessary.

10.18.2.4. Initiate an EHR or AF Form 3899 to document any treatment provided and the patient's response/outcome to the treatment.

10.18.2.5. If this is an operational mission, adjust the AF Form 3830 and AF Form 3829 (or TRAC2ES generated product) to account for an additional patient. If this is an ARM mission, C2 directs required documentation. Complete a JPSR worksheet or DD Form 2852 fully outlining circumstances leading to event, interventions, and outcomes for both operational missions and ARMs.

10.18.2.6. At mission termination, ensure the patient's care is turned over to the responding emergency services or is seen by an appropriate medical provider. AECMs follow up with a flight surgeon.

10.18.3. If the ill/injured individual is staging personnel, treat the medical emergency in accordance with AHA or equivalent, TNCC if available, and DHA/J7 Education and Training guidelines. (Call local EMS in this situation) and remove from the patient care area.

## Chapter 11

### POST-MISSION PROCEDURES

**11.1. Post-Mission Responsibilities.** AECMs are required to complete tasks for mission termination in accordance with AFMAN 11-2AEV3. The AECMs ensure:

11.1.1. All medical documentation is completed and properly dispensed.

11.1.2. Patient transfer report and care for inpatients is given to a same or higher level of care provider.

11.1.3. Outpatients regulated as PAX (are not patients) and may be dispositioned to any medical technician, nurse, family member or military personnel as designated by receiving facility. AE is transporting only.

#### **11.2. AE Patient and Customer Satisfaction Survey.**

11.2.1. The AE system requires a process, established by AMC/SG, to solicit patient feedback and comments. The AE Patient and Customer Satisfaction Survey is completed towards the end of mission with reasonable time to collect prior to completion of patient handoff. The handling during distribution and collection preserves the anonymity of the patient (e.g., utilize an envelope to manage the survey forms). The patient may choose to apply their name to the survey (reference [Attachment 17](#)).

11.2.2. AMC/SGK develops and updates the AE Patient and Customer Satisfaction Survey, as needed, as well as identify/provide a web-based system for entering data.

11.2.3. AESs conducting operational missions distributes surveys to patients and attendants on flights greater than 90 minutes.

11.2.3.1. This requirement may be impractical during contingency operations.

11.2.3.2. Each AES identifies an office responsible for reviewing all surveys for trends and identified concerns. The AES contacts patients and customers requesting a response to comments.

11.2.3.3. Completed surveys are input into the identified survey website by each AES within 1 week of completing the operational mission.

11.2.3.4. Survey data, comment overviews, return calls and actions taken are reported and recorded as part of the quarterly AES/MTF Executive Management Meeting minutes.

11.2.3.5. Notify AMC/SGK with concerns related to customer survey trends.

11.2.3.6. The AES identifies and implements local training requirements to ensure a successful patient and customer satisfaction program. Notify AMC/SGK via email ([amc.sgk@us.af.mil](mailto:amc.sgk@us.af.mil)) of local interventions, outcomes or process improvements based on an overall "Dissatisfied" survey or inputs requiring action.

11.2.3.7. In garrison or permanent staging facilities, utilize the host MTF customer satisfaction surveys. Deployed ERPS are not required to conduct patient satisfaction surveys.

**11.3. AMC Reviews And Analyzes AE System Surveys And Report Trends.** AMC reviews and analyzes AE system surveys and report trends and outcomes to the Total Force Aeromedical Evacuation Clinical Working Group.

11.3.1. Reports includes outcomes from unit level interventions and/or process improvements.

11.3.2. Reports include qualitative and quantitative information and provide recommendations for improvement.



## Chapter 12

### MEDICAL LOGISTICS

#### 12.1. MEFPAK.

12.1.1. AMC/SG is the MRA for Patient Staging and Aeromedical Evacuation capabilities. They develop and maintain materiel requirements, TTPs, training platforms and provide operational oversight.

12.1.2. AMC/SG is the MRA and Patient Movement Item Program Management Office for the global PMI program. AMC/SG is responsible for the development/maintenance of the PMI CONOPS, funding, management direction, oversight in support of PMI Centers, and PMI operational support, to include en route care training platforms.

12.1.3. Personnel with questions regarding the PMI program contact AMC/SGXM at 1-877-286-1931, DSN: 312-779-6952 or commercial 618-229-6952 or email: [hqamcpmi@us.af.mil](mailto:hqamcpmi@us.af.mil).

#### 12.2. PMI Asset Tracking System (PMI-ATS).

12.2.1. The PMI-ATS is the joint tool for asset tracking and essential for timely AE equipment recycle support to prevent degradation of forward element medical capability. Guidance for PMI is in JP 4-02 and AFMAN 41-209. Medical personnel are familiar with the many aspects of the Theater's PMI program, to include what is safe to fly certified, obtaining, storing, maintenance, tracking, and recycling practices of the PMI commodity.

12.2.2. PMI-ATS tracking. All personnel working in PMI Centers, theater PMI Cell, ERPS units, and AE units will scan all PMI equipment in their AOR in as Ready/Out/quality assurance (QA) as applicable. **(T-2)**. PMI equipment is routinely scanned while in the unit and each time it moves or changes category. Follow guidelines established in PMI Tracking Procedures for Center Operations and PMI Tracking Procedures for Ground Operations. Any unit receiving PMI is responsible for scanning PMI "in" in order to maintain in-transit visibility of PMI and scanning PMI "out" when recycling equipment back into the PMI system. Before returning the equipment to the PMI system, the receiving facility/ERPS is responsible for cleaning PMI items in accordance with AFI 44-108.

12.2.3. Training. All personnel working in PMI Centers, theater PMI Cell, ERPS units and AE units will complete PMI training (one-time requirement) on the JKO website, US026-PMI-ATS. **(T-2)**. Once logged in, select "Course Catalog" and search for "PMI-ATS," then select "PMI-ATS Overview and Basics Training." **(T-2)**. **Exception:** PMI-ATS training is not required for 1C0X2, 3D1X3, 3F2X1, 8F000 or 17D3X.

#### 12.3. PMI Levels.

12.3.1. PMI center levels are found in allowance standard 887P and managed by AMC/SGXM. PMI levels for deployed locations are established by the Combatant Commander's SG OPLANS in coordination with AMC/SGXM. Initial quantities of PMI are pushed to AE Hub location sending facilities/ERPS who maintains initial quantities of approved PMI in appropriate medical assemblages. MTFs should not assume or plan for shortfalls of PMI being satisfied by designated PMI centers/cell.

12.3.2. During peacetime, special equipment can be provided by the AE system if the referring MTF coordinates with the appropriate PMRC at the time the patient is reported for transportation, and safe-to-fly PMI equipment is identified in the PMR for AE to hand carry. At other times, the referring facility works with the designated supporting theater PMI lead to establish local policies/procedures and maintain prepositioned levels of PMI equal to three (3) days of expected patient flow in accordance with TCSG and AMC/SGXM guidance.

#### **12.4. Equipment Responsibility.**

12.4.1. The host medical equipment maintenance activity provides organizational maintenance for all AE/ Patient Staging medical equipment as outlined in AFI 41-201, *Managing Clinical Engineering Programs* and AFMAN 41-209. This includes initial inspections, preventive maintenance inspections, calibrations, repairs, modifications, incident investigations, equipment defect reporting, and disposal.

12.4.2. All medical equipment coming from the staging or originating facility accompanying a patient is preflighted in accordance with AE Medical Equipment Compendium or the equipment operating manual to ensure all components are present and the unit is operating/functioning correctly. The PMI program is outlined in JP 4-02 Appendix B, and AFMAN 41-209.

12.4.3. All AE certified and PMI equipment will have the AF Form 4033, *PMI/AE Certification Label*, and the DD 2163, *Medical Equipment Verification Certification* or AFTO Form 394 *TMDE Certification*. **(T-1)**. The medical equipment maintenance activity will ensure AF Form 4033 is affixed to each AE or PMI medical equipment item certified for flight. **(T-1)**. Biomedical maintenance individuals performing specific calibration or certification procedures will affix a completed DD 2163, on the item. **(T-1)**.

12.4.4. Maintenance assistance for equipment repairs beyond the capability of the host MTF maintenance activity are obtained from the regional medical equipment repair center (MERC) or designated deployed biomedical maintenance repair activity. The regional MERC or designated deployed biomedical maintenance repair activity provide intermediate maintenance for all AE/Patient Staging medical equipment. This includes support for organizational maintenance activities, special maintenance actions, and quality assurance actions, as required.

12.4.5. The medical logistics section with the AES/ Patient Staging works with host logistics account/Medical Equipment Management Office (MEMO)/Biomedical Equipment Technician (BMET) to ensure compliance/maintenance is completed and recorded on DD Form 2163, affixed to the equipment.

12.4.5.1. This includes establishing procedures to ensure defibrillator batteries are properly conditioned and annotated, ensuring proper operation and use of equipment, cleaning, minor operational adjustments, and replacement of consumable accessories.

12.4.5.2. AES/ Patient Staging ERCC team units in non-deployed status ensure their unit owned equipment is maintained on unit assigned Defense Medical Logistics Standard Support accountable records. Deployed PMI equipment accountability is maintained on AMC SG FM4444 deployed MEMO account records.

12.4.6. PMI and AE/Patient Staging equipment calibration requirement date will not be exceeded during the planned mission scenarios. **(T-1)**. These dates are recorded on the DD Form 2163, affixed to the equipment, and updated in the PMI-ATS system maintenance date field.

12.4.7. PMI and AE/Patient Staging equipment will be made available for preventive maintenance inspections and calibration verification as required by the local BMET. **(T-1)**.

12.4.8. Maintained in mission-ready status, to include clean, calibrated, charged, and with one complete set of required accessories.

## **12.5. Equipment Malfunction/Failure.**

12.5.1. If equipment malfunction/failure occurs during an operational mission, the MCD/AECM ensures the following paperwork/actions are accomplished:

12.5.1.1. When malfunctioning equipment is identified and removed from a patient, assess the patient for any harm. Do not clear any settings from the malfunctioning equipment. This aides biomedical maintenance in their investigation.

12.5.1.2. Complete AF Form 4449, *En Route Care Equipment Malfunction Report Tag*. (reference [Attachment 18](#)). If unavailable, complete AFTO Form 350, *Reparable Item Processing Tag*.

12.5.1.2.1. Upon arrival to home station, immediately send tagged equipment and all accessories to host medical equipment maintenance activity/MTF. Medical equipment maintenance impounds the equipment and conduct the investigation. The designated receiving BMET acknowledges receipt of the item (s) with accessories along with the AF Form 4449. The receiving BMET location sends an email to AMC/SGXM: [amc.sgxm@us.af.mil](mailto:amc.sgxm@us.af.mil) acknowledging receipt accompanied by a copy of both sides of the AF Form 4449. **Note:** BMETs report equipment defects as Category I or II type complaints, in accordance with AFI 41-201, Chapter 2. Applicable forms, with directions, are available at: <https://www.medical.dla.mil/Portal/Customer/ProductQualityDeficiency.aspx>. Completion of forms alerts AFMRA of the incident.

12.5.1.2.2. BMETs coordinate complaints involving aeromedical equipment with AMC/SGXM DSN 312-779-6952; [amc.sgxm@us.af.mil](mailto:amc.sgxm@us.af.mil). AMC/SGXM provides disposition action. If additional testing is required, AMC/SGXM forwards the authorization to the AFLCMC/Aeromedical Test Laboratory for further evaluation. AMC/SGXM facilitates shipping arrangements.

12.5.1.2.3. Complete a JPSR worksheet or DD Form 2852 and turn into the squadron PSM. If the equipment is plugged into the aircraft or affects the aircraft, an ASAP report in conjunction is submitted.

12.5.1.2.4. Describe the problem as accurately as possible on the above forms. Provide circumstances leading to the event and include any pertinent information such as O2 source, patient activity, turbulence, cabin altitude, trouble-shooting attempted, etc. Also provide names and contact information of individuals involved.

12.5.1.2.5. When equipment malfunction affects the aircraft, notify the Pilot in Command (PIC), and provide details of the incident to facilitate mishap reporting (to be forwarded to wing safety).

12.5.1.3. Upon arrival, immediately send tagged equipment and all items in the equipment chain of events (e.g., tubing, power cords, electrode sets) to the closest supporting biomedical maintenance organization. Ensure servicing Biomedical Maintenance Personnel are notified when equipment failed while in use on a patient or in a plane. Medical maintenance impounds the equipment, and notifies AMC/SGXM DSN 312-779-6952; [amc.sgxm@us.af.mil](mailto:amc.sgxm@us.af.mil) prior to conducting an investigation.

12.5.1.3.1. Medical maintenance inputs data on Optional Form (OF) 380, *Reporting and Processing Medical Material Complaints/Quality Improvement Report*, and notify AMC/SGXM of the incident.

12.5.1.3.2. AMC/SGXM forwards authorization to appropriate testing agency for further evaluation. AMC/SGXM facilitates shipping arrangements.

12.5.1.4. Complete safety reporting form and turn into the squadron PSM who enters the event into the JPSR.

12.5.1.4.1. Describe the problem as accurately as possible on the above forms. Provide circumstances leading to the event and include any pertinent information such as: Equipment serial number (within the event description), O2 source, patient activity, turbulence, cabin altitude, trouble-shooting attempted, as well as location equipment was offloaded, etc.

12.5.1.4.2. Provide names of individuals involved and contact information. When equipment malfunction affects the aircraft, notify the PIC and provide details of the incident to facilitate mishap reporting (to be forwarded to wing safety) and AMC/SGXM at DSN 312-779-6952; [amc.sgxm@us.af.mil](mailto:amc.sgxm@us.af.mil).

12.5.1.5. Notify local or unit supported medical maintenance organization as soon as possible of unusual or repeated equipment failure and safety incidents.

## **12.6. Procurement of Medical Materiel.**

12.6.1. AMC/SGXM, in conjunction with the AE Operations Directorate, monitors policies and procedures established for the procurement of medical materiel needed to accomplish the AE mission. At unit level, an officer is designated to have responsibility for all medical logistics activities. Medical allowance standards are located at the AF medical logistics website. Contact your host MTF for resupply. Medical equipment, requiring maintenance, is serviced by the host medical equipment repair activity or designated MERC.

12.6.2. Resupply is accomplished through the host medical logistics activity in accordance with AFMAN 41-209 and locally established procedures.

12.6.3. Medical Equipment requiring maintenance is serviced by the host medical equipment repair activity or designated MERC in accordance with AFI 41-201 and locally established procedures.

**12.7. ERPS Medical Logistics.**

12.7.1. During peacetime operations, the property custodian orders medical and non-medical materiel through the medical logistics function of the supporting MTF in accordance with AFMAN 41-209 and locally established procedures. Local policies need to be followed regarding item selection, sources of supply, and funding support. Equipment is requested through the medical equipment management office of the supporting MTF.

12.7.2. During contingency operations, the ERPS property custodian orders supplies using the procedures established by the responsible theater medical logistics offices, and/or as directed in the OPORD/OPLAN for resupply procedures. These procedures, obtaining medical re-supply and joint support activities, are the function of the TLAMM.

**12.8. Recommending Allowance Standard Changes.** Recommended changes to any en route care allowance standard are emailed to the POC at the appropriate pilot unit with a courtesy copy sent to the AMC/SGXM org box at: [amc.sgxm@us.af.mil](mailto:amc.sgxm@us.af.mil).

DOROTHY A. HOGG  
Lieutenant General, USAF, NC  
Surgeon General

**Attachment 1****GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

**14 CFR 14 C.F.R. § 382.117**, *Must carriers permit passengers with a disability to travel with service animals?* 1 January 2012

**DHA PM 6025.13**, *Clinical Quality Management in the Military Health System, (MHS)* 1 October 2019

**DoDI 4515.13**, *Air Transportation Eligibility*, 23 October 2020

**DoDI 6000.11**, *Patient Movement (PM)*, 22 June 2018

**DoDI 6000.14**, *DoD Patient Bill of Rights and Responsibilities in the Military Health System (MHS)*, 26 September 2011

**DoDI 8580.02**, *Security of Individually Identifiable Health Information in DoDI Health Care Programs*, 12 August 2015

**DoDM 6025.18**, *Implementation of the Health Insurance Portability and Accountability Act (HIPAA) Privacy Rule in DoD Health Care Programs*, 13 March 2019

**JP 4-02**, *Joint Health Services*, 18 September 2018

**USTRANSCOM Instruction 41-02**, *Patient Movement of Contaminated, Contagious or Potentially Exposed Casualties*, 13 February 2019.

**USTRANSCOM Handbook 41-1**, *Global Patient Movement Operations*, 3 May 2016

**AF Doctrine, Volume 1**, *Air Force Basic Doctrine*, 27 February 2015

**DAFPD 10-21**, *Rapid Global Mobility*, 26 August 2019

**DAFPD 10-29**, *Worldwide Aeromedical Evacuation Operations*, 13 February 2019

**DAFPD 48-1**, *Aerospace and Operational Medicine Enterprise*, 7 June 2019

**DAFPD 46-1**, *Nursing Services*, 20 March 2018

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**AFI 11-202V2**, *Aircrew Standardization and Evaluation Program*, 6 December 2018

**AFI 11-202V2 AMC Supp**, *Aircrew Standardization/Evaluation Program*, 2 November 2020

**AFI 11-202V3 AMC Supp**, *General Flight Rules*, 14 February 2019

**AFI 13-1AOCV3**, *Operational Procedures-Air Operations Center (AOC)*, 2 November 2011

**AFI 13-207-O**, *Preventing and Resisting Aircraft Piracy (Hijacking)*, 4 February 2019

**AFI 24-301**, *Ground Transportation*, 22 October 2019

**AFI 24-302**, *Vehicle Management*, 21 February 2020

**AFI 31-117**, *Arming and Use of Force by Air Force Personnel*, 5 August 2020

**AFI 33-322**, *Records Management and Information Governance Program*, 23 March 2020

AFI 38-101, *Manpower and Organization*, 29 August 2019

AFI 41-106, *Air Force Medical Readiness Program*, 29 July 2020

AFI 41-201, *Managing Clinical Engineering Programs*, 10 October 2017

AFI 44-102, *Medical Care Management*, 17 March 2015

AFI 44-108, *Infection Prevention and Control Program*, 5 June 2019

AFI 44-119, *Medical Quality Operations*, 16 August 2011

AFI 46-101, *Nursing Services and Operations*, 30 January 2015

AFI 48-116, *Food Safety Program*, 11 September 2018

AFI 48-137, *Respiratory Protection Program*, 12 September 2018

AFI 48-107V2, *En Route Critical Care*, 24 November 2020

AFI 48-107V3, *En Route Care Documentation*, 12 April 2016

AFMAN 10-206, *Operational Reporting (OPREP)*, 18 June 2018

AFMAN 10-2503, *Operations in a Chemical, Biological, Radiological, and Nuclear (CBRN) Environment*, 14 May 2019

AFMAN 10-2909, *Aeromedical Evacuation (AE) Equipment Standards*, 13 March 2019

AFMAN 11-2AEV1, *Aeromedical Evacuation Aircrew Training*, 7 Dec 2020

AFMAN 11-2AEV3, *Aeromedical Evacuation (AE) Operations Procedures*, 19 October 2020

AFMAN 31-129, *USAF Small Arms and Light Weapons Handling Procedures*, 2 January 2020

AFMAN 41-209, *Medical Logistics Support*, 4 January 2019

AFMAN 44-144, *Nutritional Medicine*, 20 January 2016

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AFH 10-222V1, *Civil Engineer Bare Base Development*, 23 January 2012

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AFH 10-222V14, *Civil Engineering Guide To Fighting Positions, Shelters, Obstacles And Revetments*, 1 August 2008

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AFTTP 3-42.52, *Aeromedical Evacuation Command Squadron (FFQCC)*, 1 May 2019

AFTTP 3-42.53, *Aeromedical Evacuation Operations Team (FFQNT) and AEOT Manpower Augmentation Team (FFQCM)*, 31 July 2019

AFTTP 3-42.57, *En Route Patient Staging System*, 10 Aug 2016

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Mosby Principles and Practice, Mosby's Clinical Nursing, Current Edition

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Battlefield and Disaster Nursing Pocket Guide, 2<sup>nd</sup> edition; 2020

AMC Airframe Particle Testing Final Report; 30 April 2020

### ***Adopted Forms***

**AF Form 579**, *Controlled Substances Register*

**AF Form 847**, *Recommendation for Change of Publication*

**AF Form 1052**, *Envelope for Storing Patient's Valuables*

**AF Form 1094**, *Diet Order*

**AF Form 1225**, *Informed Consent for Blood Transfusion*

**AF Form 1297**, *Temporary Issue Receipt*

**AF Form 3829**, *Summary of Patients Evacuated by Air*

**AF Form 3830**, *Patient Manifest*

**AF Form 3838**, *Do Not Resuscitate (DNR) Certification for Aeromedical Evacuation*

**AF Form 3841**, *Certificate of Release*

**AF Form 3851**, *Patient Baggage Data*

**AF Form 3854**, *Receipt for Patient's Valuables*

**AF Form 3858**, *Aeromedical Evacuation Mission Offload Message*

**AF Form 3859**, *Turn-In of Unaccompanied Narcotics*

**AF Form 3899**, *Aeromedical Evacuation Patient Record*

**AF Form 3899A**, *Patient Movement Record Progress Note*

**AF Form 3899E**, *Patient Movement Intake/Output*

**AF Form 3899I**, *Patient Movement Medication Record*

**AF Form 3899N**, *Patient Movement Pain Adjunct Flow sheet*

**AF Form 4033**, *PMI/AE Certification Label*

**AF Form 4449**, *En Route Care Equipment Malfunction Report Tag*

**AFTO Form 350**, *Reparable Item Processing Tag*

**AFTO Form 394**, *TMDE Certification*

**DD Form 600**, *Patient's Baggage Tag*

**DD Form 602**, *Patient Evacuation Tag*

**DD Form 1502**, *Frozen Medical Materiel Shipment*



**DD Form 1502-1**, *Chilled Medical Materiel Shipment*

**DD Form 1610**, *Request and Authorization for TDY Travel of DoD Personnel*

**DD Form 2163**, *Medical Equipment Verification Certification*

**DD Form 2852**, *Patient Movement Event/Near Miss Report*

**Optional Form (OF) 380**, *Reporting and Processing Medical Material Complaints/Quality Improvement Report*

**SF 600**, *Health Record - Chronological Record of Medical Care*

### ***Abbreviations and Acronyms***

**μ**—Microns

**ABA**—American Burn Association

**ACLS**—Advanced Cardiac Life Support

**AD**—Active Duty

**AE**—Aeromedical Evacuation

**AECM**—Aeromedical Crew Member

**AECP**—AE Clinical Protocol

**AECS**—AE Command Squadron

**AECT**—AE Control Team

**AELT**—Aeromedical Evacuation Liaison Team

**AEOT**—Aeromedical Evacuation Operations Team

**AES**—Aeromedical Evacuation Squadron

**AES/CC**—Aeromedical Evacuation Squadron Commander

**AET**—Aeromedical Evacuation Technician

**AF/SG**—Air Force Surgeon General

**AFI**—Air Force Instruction

**AFMAN**—Air Force Manual

**AFMS**—Air Force Medical Service

**AFMRA**—Air Force Medical Readiness Agency

**AFR**—Air Force Reserve

**AFRC**—Air Force Reserve Command

**AHA**—American Heart Association

**ARCT**—Air Refueling Control Team

**AMC**—Air Mobility Command

**AMC/A3**—AMC Directorate of Operations

**AMC/A3TM**—AMC Aeromedical Evacuation Training and Operations

**AMC/A3VM**—AMC Aeromedical Evacuation Standardization and Evaluation

**AMC/SG**—AMC Command Surgeon

**AMC/SGK**—AMC En Route Medical Care Division

**AMC/SGP**—AMC Aerospace Medicine Division

**AMC/SGS**—AMC Medical Support Division

**AMC/SGX**—AMC Medical and Aeromedical Evacuation, Readiness and Plans Division

**AMC/SGXM**—AMC Medical Equipment Force Packaging

**AFSC**—Air Force Specialty Code

**AFTTP**—Air Force Tactics, Techniques, and Procedures

**AMBUS**—Ambulance Bus

**AMD**—Air Mobility Division

**ANC**—Absolute Neutrophil Count

**ANG**—Air National Guard

**AOC**—Air Operations Center

**AOR**—Area of Responsibility

**ARDS**—Acute Respiratory Distress Syndrome

**ARC**—Air Reserve Component

**ARM**—Aeromedical Readiness Mission

**ASAP**—Aviation Safety Action Program

**ASTNA**—Air and Surface Transport Nurses Association

**BBF**—Blood and Body Fluids

**BLS**—Basic Life Support

**BMET**—Biomedical Equipment Technician

**BOS**—Base Operating Support

**BP**—Blood Pressure

**BVM**—Bag Valve Mask

**C2**—Command & Control

**CAA**—Commercial Air Ambulance

**CC**—Commander

**CCATT**—Critical Care Air Transport Team

**CCDR**—Combatant Commander  
**CCHF**—Congo Crimean Hemorrhagic Fever  
**CCMD**—Combatant Command  
**C**—Collar—Cervical Collar  
**CDC**—Centers for Disease Control and Prevention  
**CE**—Civil Engineering  
**CFETP**—Career Field Education and Training Plan  
**CIWA**—Clinical Institute Withdrawal Assessment for Alcohol  
**CNE**—Chief Nurse Executive  
**CNS**—Central Nervous System  
**COMAFFOR**—Commander, Air Force Forces  
**CONOPS**—Concept of Operations  
**CONPLANS**—Concept Plans  
**CONUS**—Continental United States  
**COPD**—Chronic Obstructive Pulmonary Disease  
**COPSA**—Clinical Operations Patient Safety Alert  
**CPP**—Cerebral Perfusion Pressure  
**CPR**—Cardio—Pulmonary Resuscitation  
**CSA**—Comprehensive Systematic Analysis  
**CVA**—Cerebral Vascular Accident  
**DAFPD**—Department of the Air Force Policy Directive  
**DIRMOBFOR**—Director of Mobility Forces  
**DM**—Diabetes Mellitus  
**DNR**—Do Not Resuscitate  
**DoD**—Department of Defense  
**DoDI**—Department of Defense Instruction  
**EFB**—Electronic Flight Bag  
**EHR**—Electronic Health Record  
**EPSI**—External Patient Safety Investigation  
**ERCC**—En Route Critical Care  
**ERPS**—En Route Patient Stage  
**ERPSS**—En Route Patient Staging System

**FAA**—Federal Aviation Administration

**FCIF**—Flight Crew Information File

**FFP**—Fresh Frozen Plasma

**FHT**—Fetal Heart Tones

**FiO<sub>2</sub>**—Fraction of Inspired Oxygen

**FN**—Flight Nurse

**FLACC**—Face, Legs, Activity, Crying and Consolability

**G**—Gravitational

**GCC**—geographic combatant commanders

**GCS**—Glasgow Coma Scale

**GI**—Gastrointestinal

**H&H**—Hemoglobin and Hematocrit

**HCT**—Hematocrit

**HCW**—Health Care Worker

**HELLP**—Hemolysis, Elevated Liver Enzymes, and Low Platelets

**HEPA**—High Efficiency Particulate Air

**Hgb**—Hemoglobin

**HIPAA**—Health Insurance Portability Accountability Act

**HMMWV**—High Mobility Multipurpose Wheeled Vehicles

**I&O**—Intake and Output

**ICP**—Intracranial Pressure

**ID**—identification

**ICU**—Intensive Care Unit

**IFK**—Inflight Kits

**IM**—Intramuscular

**I-SBAR**—Identify, Situation, Background, Assessment, and Recommendation

**ITV**—In-transit Visibility

**IV**—Intravenous

**IVF**—Intravenous Fluids

**JOA**—Joint Operations Area

**JPMRC**—Joint Patient Movement Requirements Center

**JPSR**—Joint Patient Safety Reporting

**JTF**—Joint Task Force  
**kg**—Kilogram  
**LNO**—Liaison Officer  
**LOC**—Level of Consciousness  
**LPM**—Liters Per Minute  
**LR**—Lactated Ringers  
**LRMC**—Landstuhl Regional Medical Center  
**MA**—Medical Attendant  
**MAAS**—Motor Activity Assessment Scale  
**MACE**—Military Acute Concussion Evaluation  
**MAJCOM**—Major Command  
**MAP**—Mean Arterial Pressure  
**MAR**—Medication Administration Record  
**MCD**—Medical Crew Director  
**MDG**—Medical Group  
**MDR-TB**—Mycobacterium Tuberculosis  
**MEFPAK**—Manpower and Equipment Force Packaging System  
**MEMO**—Medical Equipment Management Office  
**MERC**—Medical Equipment Repair Center  
**MHS**—Military Health Services  
**MII**—Medical Incident Investigations  
**ml**—Milliliter  
**mmHg**—Millimeter of Mercury  
**MRA**—MEFPAK Responsible Agency  
**MRE**—Meals Ready to Eat  
**MTF**—Medical Treatment Facility  
**NAF**—Numbered Air Force  
**NATO**—North Atlantic Treaty Organization  
**NC**—Nasal Cannula  
**NDC**—needle decompression  
**NG**—Nasogastric  
**NG/OG**—Nasogastric/Oral Gastric

**NMA**—Non-Medical Attendant  
**NOTAM**—Notice to Airmen  
**NPO**—Nothing by Mouth  
**NPWT**—Negative-Pressure Wound Therapy  
**NS**—Normal Saline  
**OB**—Obstetrics  
**OCONUS**—Outside the Continental United States  
**OG**—Operations Group  
**OIC**—Officer in Charge  
**OPLANS**—Operational Plans  
**OPORD**—Operational Order  
**OPR**—Office of Primary Responsibility  
**ORM**—Operational Risk Management  
**OTC**—Over-The-Counter  
**P**—Priority  
**PACAF**—Pacific Air Forces  
**PACAF/SG**—Pacific Air Forces/Command Surgeon  
**PAD**—Patient Administration  
**PaO<sub>2</sub>**—Partial Pressure of Oxygen in Arterial Blood  
**PAPR**—Powered Air Purifying Respirator  
**PCA**—Patient Controlled Analgesia  
**PE**—Pulmonary Embolism  
**PEEP**—Positive End Expiratory Pressure  
**PHO**—Public Health Officer  
**PHS**—Public Health Service  
**PIC**—Pilot in Command  
**PM**—Patient Movement  
**PMCC**—Patient Movement Clinical Coordinator  
**PMI**—Patient Movement Items  
**PMI**—ATS—PMI Asset Tracking System  
**PMOO**—Patient Movement Operations Officer  
**PMPS**—Patient Movement Patient Safety

**PMR**—Patient Movement Request  
**PMRC**—Patient Movement Requirements Center  
**PNB**—Peripheral Nerve Block  
**PO**—Oral/By mouth  
**PPE**—Personal Protective Equipment  
**PRK**—Photorefractive Keratectomy  
**PRN**—As Needed  
**PS**—Patient Safety  
**PSM**—Patient Safety Manager  
**PSP**—Patient Safety Plan  
**PT**—Physical Training (PT)  
**PTSD**—Post-Traumatic Stress Disorder  
**R**—Routine  
**RBCs**—Red Blood Cells  
**RCA**—Root Cause Analysis  
**RNs**—Registered Nurses  
**ROM**—Range of Motion  
**RON**—Remain Overnight  
**SAM**—Self-Administering Medication  
**SCD**—Sequential Compression Device  
**SG**—Command Surgeon  
**SGH**—Chief of Medical Staff  
**SGXM**—AMC Medical Readiness Logistics/MEFPAK Management Branch  
**SITREP**—Situation Report  
**SL**—Sea Level  
**SOC**—Standards of Care  
**SpO2**—Oxygen Saturation  
**SSN**—Social Security Number  
**Stan/Eval**—Standards and Evaluation  
**TACON**—Tactical Control  
**TAES**—Theater Aeromedical Evacuation System  
**TB**—Tuberculosis

**TBI**—Traumatic Brain Injury

**TBSA**—Total Body Surface Area

**TCP**—Transcutaneous Pacing

**TCSG**—USTRANSCOM Command Surgeon

**TDY**—Temporary Duty

**TLAMM**—Theater Lead Agent for Medical Materiel

**TMDS**—Theater Medical Data Store

**TMO**—Travel Management Office

**TNCC**—Trauma Nurse Core Course

**TPMRC**—USTRANSCOM Patient Movement Requirements Center

**TPMRC-A**—**TPMRC**—Americas

**TPMRC-E**—**TPMRC**—East

**TPMRC-W**—**TPMRC**—West

**TRAC2ES**—Transportation Command Regulating and Command & Control Evacuation System

**TTP**—Tactics, Techniques, and Procedures

**U**—Urgent

**UOP**—Urine Output

**USAFE**—U.S. Air Forces Europe

**USAFE/AFAFRICA/SG**—U.S. Air Forces Europe/USAFRICOM/ Command Surgeon

**USAISR**—U.S. Army Institute of Surgical Research

**USAFRICOM**—United States African Command

**USCENTCOM**—United States Central Command

**USEUCOM**—United States European Command

**USNORTHCOM**—U.S. Northern Command

**USINDOPACOM**—U.S. United States Indo-Pacific Command

**USSOUTHCOM**—U.S. Southern Command

**USTRANSCOM**—U.S. Transportation Command

**USTRANSCOM/CC**—United States Transportation Command Commander

**UTC**—Unit Type Code

**V**—Volume

**VAP**—Ventilator Associated Pneumonia

**VCNCO**—Vehicle Control Non-Commissioned Officer



**ZULU**—Greenwich Mean Time (Universal Time)

## Attachment 2

## HELPFUL RESOURCES

## A2.1. AE Resources.

A2.1.1. Aeromedical Evacuation Clinical Protocols:  
<https://cs2.eis.af.mil/sites/13241/sg/training/AE%20Clinical%20Protocols/Forms/AllItems.aspx>

A2.1.2. JTS CPG site: <http://www.usaisr.amedd.army.mil/default.html>

A2.1.3. Air Force Medical Equipment Development Laboratory websites:  
<https://eis.af.mil/cs/aeromed/default.aspx> or  
<https://cs3.eis.af.mil/sites/27468/default.aspx>

A2.1.4. Elsevier Skills Plus site:  
<https://kx.health.mil/kj/kx1/AFMOAEdandTraining/Pages/Elsevier-Clinical-Skills-Plus-.aspx>

A2.1.5. Battlefield and Disaster Nursing Pocket Guide (current ed.)

A2.1.6. DoD Interactive Customer Evaluation site: <https://ice.disa.mil/>

A2.1.7. AMC AE A3/Sg Website: <https://cs2.eis.af.mil/sites/13241/default.aspx>

A2.1.8. DHA MTN: <https://info.health.mil/edu/mtFDIV/mtn/SitePages/Home.aspx>

A2.1.9. DHA/J7 COVID Resources <https://info.health.mil/edu/SitePages/Home.aspx>

A2.1.10. AE Documents on EFB:  
<https://cs2.eis.af.mil/sites/12679/Aircrew%20Pubs%20Library/Forms/Better.aspx?RootFolder=%2Fsites%2F12679%2FAircrew%20Pubs%20Library%2FMaster%5FLibrary%5FVerified%2FAE&FolderCTID=0x01200021370D19BF5D9F459D8FD907C237955A&View={701BF038-D3D9-416D-BBEC-BF178FBE44E9}>

A2.1.11. Infectious Disease Documents on EFB:  
<https://cs2.eis.af.mil/sites/12679/Aircrew%20Pubs%20Library/Forms/Better.aspx?RootFolder=%2Fsites%2F12679%2FAircrew%20Pubs%20Library%2FMaster%5FLibrary%5FVerified%2FAI%5FGlobal%2FInfectious%20Disease&FolderCTID=0x01200021370D19BF5D9F459D8FD907C237955A&View={701BF038-D3D9-416D-BBEC-BF178FBE44E9}>

## A2.2. Helpful Patient Safety Internet Resources.

A2.2.1. Aeromedical Evacuation Portal Patient Safety:  
<https://cs2.eis.af.mil/sites/13241/sg/patientsafety/Patient%20Safety%20Documents/Forms/AllItems.aspx>

A2.2.2. Air Force Medical Readiness Agency Patient Clinical Quality and Safety:  
<https://kx.health.mil/AFMOA/ClinicalQuality/SitePages/Home.aspx>

A2.2.3. Agency for Healthcare Research and Quality: <http://www.ahrq.gov/>

A2.2.4. Centers for Disease Control and Prevention: <http://www.cdc.gov/>

A2.2.5. Commission of Accreditation for Medical Transport (CAMTS)  
<http://www.camts.org>

A2.2.6. Department of Defense Patient Safety Learning Center:  
<https://info.health.mil/hco/clinicsup/patientsafety/PSLCHome/SitePages/Home.aspx>

A2.2.7. Institute for Safe Medication Practices: <http://www.ismp.org/>

A2.2.8. The Joint Commission National Patient Safety Goals:  
[http://www.jointcommission.org/standards\\_information/npsgs.aspx](http://www.jointcommission.org/standards_information/npsgs.aspx)

A2.2.9. Joint Patient Safety Reporting LIVE Website: <https://patientsafety.csd.disa.mil/>

A2.2.10. National Accreditation Alliance of Medical Transport Applications (NAAMTA):  
<http://www.naamta.com/>

A2.2.11. The Joint Commission Comprehensive Accreditation Manuals

A2.2.12. ASTNA Patient Transport Principles and Practice, 4th Ed.

A2.2.13. AHRQ; National Guideline Clearinghouse; US Dept of Health and Human Services ([www.guideline.gov](http://www.guideline.gov)).

A2.2.14. TRAINING Joint Patient Safety Reporting website:  
<https://psrdemotraining.csd.disa.mil/>

**Attachment 3****NON-MEDICAL, FAMILY OR NON-MILITARY ATTENDANT INFORMATIONAL SHEET****Table A3.1. Aeromedical Evacuation (AE) Missions Non-Medical Attendant (Family or Non-Military) Duty List.****AEROMEDICAL EVACUATION (AE) MISSIONS  
NON - MEDICAL ATTENDANT (Family or Non-  
military)  
DUTY LIST**

PRIMARY DUTY is to support the needs of your assigned patient

Getting ready for flight ensure all personal items are secure

Bring personal items necessary for flight

Required travel documentation (e.g., ID, passport)

Food & snacks

STAY with the patient to the final destination (if operationally feasible)

COMMUNICATE with the AE CREW for any patient needs or concerns

PLEASE ASK for assistance to help your patient with restroom needs

YOU NEED BREAKS TOO. Please COORDINATE breaks with the AE crew

AE ENVIRONMENT CAN HAVE EXTREME TEMPERATURE

FLUCTUATIONS, NOISE, AND LIMITED SPACE

TEAMWORK & COMMUNICATION ARE CRITICAL

THANK YOU FOR MAKING PATIENT SAFETY A PRIORITY

## Attachment 4

## MEDICAL ATTENDANT DUTY LIST

Table A4.1. Aeromedical Evacuation (AE) Missions Medical Attendant Duty List.

## AEROMEDICAL EVACUATION (AE) MISSIONS MEDICAL ATTENDANT DUTY LIST

PRIMARY DUTY IS TO SUPPORT THE NEEDS OF YOUR ASSIGNED PATIENT(S):

- ✓ Getting ready for flight--ensure ALL personal items are secure prior to takeoff
- ✓ If you are on orders, your attendant time is considered "ON DUTY"
- ✓ Stay awake throughout flight unless relieved by an AE aircrew member—coordinate breaks with the AE crew
- ✓ Stay with the patient to the destination
- ✓ Communicate all concerns immediately to an AECM
- ✓ Ask for assistance to help your patient with restroom needs

BRING personal items necessary for flight:

- ✓ Required travel documentation (e.g., ID, passport, orders)
- ✓ Food & snacks

REVIEW assigned PATIENTS MEDICAL HISTORY prior to mission

- ✓ Know your patients and anticipate their potential needs
- ✓ ENSURE PATIENT PREPARATION IS COMPLETE prior to flight including:
  - ✓ All necessary equipment, supplies and medication are available for the patient
  - ✓ Patient's 3899 paperwork is complete (orders, medication record, etc.)
  - ✓ RECEIVE PATIENT HAND-OFF report from releasing facility
  - ✓ Ask questions if information is not complete or clear

DOCUMENTATION on AF Form 3899 is your responsibility

- ✓ Sign all documentation & follow signature with "medical attendant"
- ✓ Review documentation requirements for patient's medical condition throughout transport with sending facility nurse or flight nurse

MEDICATION ADMINISTRATION & DOCUMENTATION is your responsibility

✓ If NOT certified to administer medications, notify flight nurse

AE ENVIRONMENT CAN HAVE EXTREME TEMPERATURE  
FLUCTUATIONS, NOISE, AND LIMITED SPACE  
TEAMWORK & COMMUNICATION ARE CRITICAL  
THANK YOU FOR MAKING PATIENT SAFETY A PRIORITY

## Attachment 5

**NON-MEDICAL ATTENDANT DUTY LIST (MILITARY)****Table A5.1. Non-Medical Attendant Duty List (Military).**

<b><u>NON-MEDICAL ATTENDANT DUTY LIST (MILITARY)</u></b>	
PRIMARY DUTY is to support the needs of assigned patient	
✓ Getting ready for flight ensure all personal items are secure	
✓ If you are on orders, your attendant time is considered “ON DUTY”	
BRING personal items necessary for flight	
✓ Required travel documentation (e.g., ID, passport, orders)	
✓ Food & snacks	
STAY with the patient to the destination	
COMMUNICATE with the AE CREW for any patient needs or concerns	
ASK for assistance to help your patient with restroom needs	
COORDINATE breaks with the AE crew	
AE ENVIRONMENT CAN HAVE EXTREME TEMPERATURE	
FLUCTUATIONS, NOISE, AND LIMITED SPACE	
TEAMWORK & COMMUNICATION ARE CRITICAL	
THANK YOU FOR MAKING PATIENT SAFETY A PRIORITY	

## Attachment 6

## PATIENT PREP CHECKLIST

Figure A6.1. Example Patient Preparation Checklist.

EXAMPLE PATIENT PREPARATION CHECKLIST (not all inclusive; tailor to patient)		Date _____
Patient Name _____	Cite # _____	MSN # _____
<p><b>Initial each item after ensuring each item is complete</b></p> <p>____ Patient Identification Band on all patients and non medical attendants (Rt wrist as appropriate)</p> <p>____ Allergy Band (Rt wrist as appropriate) for inpatients</p> <p>____ Military Identification Card</p> <p>____ Passport, as required</p> <p>____ Orders (military)</p> <p>____ Medical Records/X-Rays</p> <p>____ Medication (documented last doses given on <b>AF 3899I</b>)</p> <p>____ If on litter, litter mattress, clean sheets, blankets and two litter straps . If back rest in place use 3 litter straps</p> <p><b>AF IMT 3899 – Patient Movement Record Series</b></p> <p>____ Narrative Summary</p> <p>____ Patient weight (Green canvas NATO litter max 250 lbs, Green/Black DECON Litter max 350 lbs; if greater use O/WL)</p> <p>____ En route medical/special equipment approved for flight or waiver requested/approved by AMC</p> <p>____ Appropriate Physician Treatments/Medications Ordered</p> <p><b>AF IMT 3899A – Patient Movement Progress Note and Appropriate AF IMT 3899 series</b></p> <p>____ Documentation of all patient care en counters, (Vital Signs, Intake/Output Totals)</p> <p>____ Risks for hypoxia en route (O2 for ground/rotor transport, ventilator, suction). Consider O2 order.</p> <p>____ Vital Signs/Temperature within normal limits **</p> <p>____ Pain Assessment and properly controlled</p> <p>____ Adequate amount of medications provided per TRANSCOM policy**</p> <p>____ Assessment for Risk of Skin Breakdown (turn every 2 hours)</p> <p>____ Bowel/Bladder toileting documented; urinary catheter if unable to void while on litter</p> <p>____ Colostomy/Ileostomy/urinary drainage bag clean/empty **</p> <p>____ External fixator pin care done prior to flight **</p> <p>____ Plaster casts should be 48 hours old and bivalved**</p> <p>____ Adequate circulation/neuro status of all extremities**</p> <p>____ Risks for DVT; prophylaxis considered</p> <p>____ Negative pressure device operating/orders if applicable</p> <p>____ Dressings changed within 12 hours of transport **</p> <p>____ IV tubing changed within 48 hours of transport **</p> <p>____ IV catheter changed within 48 hours of transport and patent**</p> <p>____ IVs labeled/timed/on pump**</p> <p>____ Fluids/meals as required; if NPO, IV fluids maintained</p> <p>____ Infection Control Precautions (Contact Precautions required for all combat wounds)</p> <p>____ Applicable lab work including pending cultures ordered</p>		
<p><b>AF IMT 3899I – Patient Movement Medication Record</b></p> <p>____ Self Administration of Medication (SAM) orders, knows use and documented (<b>AF 3899</b>) (outpatient only)</p> <p>____ Sufficient medication for the continuum, matches PMR and physician orders. Last doses documented</p> <p>____ Sufficient IV solutions for the continuum, matches PMR and physician orders</p> <p>____ IV medication labeled/timed/on pump</p> <p>____ Plan for administering scheduled medications/drips during ground/rotor transport</p> <p><b>Patient's Property:</b></p> <p>____ Weapons, explosives, lighters, matches identified/removed</p> <p>____ Knives removed from patient's control and inventoried. Use <b>AF Form 3854, Receipt of Valuables, and AF Form 1053, Record of Patient Storing Valuables or Service Specific List</b></p> <p>____ Items in excess of 60 pounds are inventoried and transportation is arranged by patient's service representative</p> <p>____ Thorough anti-hijacking search of person and bags, and written Anti-hijacking Certification complete</p> <p><b>Psychiatric Patients</b></p> <p>____ Search all baggage and person for sharps, matches, lighters and cigarettes, and medication</p> <p>____ Items not allowed will be inventoried and accounted for as above</p> <p>____ Litter (1A/1B) patients should travel in hospital clothing with a medical attendant; may carry eyeglasses, toothbrush, and a small amount of money (not to exceed \$25.00), wedding band, rings, wristwatch, ID card, and wallet.</p> <p>____ Leather Restraints IAW <b>AF IMT 3899F, Patient Movement Physician Orders for Behavior Management and Restraints</b>, and start <b>AF IMT 3899G, Patient Movement Restraint Observation Flow sheet</b></p> <p>____ Leather Restraints (not secured to litter)</p> <p><b>Medical Attendant/Non-Medical Attendant</b></p> <p>____ Appropriate skill level healthcare provider; same sex if accompanying psychiatric patients</p> <p>____ Coordinated/approved by PMRC</p> <p>____ Military ID</p> <p>____ Original deployment and travel orders to return to the AOR</p> <p>____ Personal items/baggage IAW theater policy (carry on, duffel)</p> <p>____ Received Point of Contacts for arrival and departure, and planned itinerary/tickets back to duty station</p> <p>____ No weapons, explosives, knives/sharp objects, matches or lighters</p> <p>____ Thorough anti-hijacking search of person and bags, and written</p> <p>____ Aware of duties/responsibilities to assigned patient/s</p>		
<p><b>ORIGINATING FACILITY</b></p> <p>Printed Name _____</p> <p>Signature _____</p>		<p><b>VERIFICATION (i.e. ASF/CASF Staff)</b></p> <p>Printed Name _____</p> <p>Signature _____</p>



## Attachment 7

## PATIENT MOVEMENT INPATIENT HANDOFF CHECKLIST – FRONT

Figure A7.1. Patient Movement (I-SBAR) Handoff Inpatient Checklist (Front).

PATIENT MOVEMENT (I-SBAR) HANDOFF INPATIENT CHECKLIST (FRONT)					
I (Identify)	DATE/TIME:	CITE #:	PATIENT NAME:	AGE:	RANK:
	CURRENT SENDING FACILITY:		RECEIVING FACILITY:	PATIENT CLASSIFICATION:	
	HANDOFF TO AE CREW BY FACILITY		REPORT BY:	HANDOFF BY AE CREW	
				REPORT BY:	
<b>S</b> (Situation)	Diagnosis: _____ Date of injury/admission: _____ Date of surgery: _____ Current status: <input type="checkbox"/> Alert/Oriented <input type="checkbox"/> Confused/Dissatisfied <input type="checkbox"/> Responds to verbal <input type="checkbox"/> Responds to pain <input type="checkbox"/> Unconscious Patient <u>onload</u> method: <input type="checkbox"/> Unassisted <input type="checkbox"/> Crutches/cane <input type="checkbox"/> Litter <input type="checkbox"/> Wheelchair Code status: <input type="checkbox"/> DNR <input type="checkbox"/> Medical <input type="checkbox"/> Non-medical			<input type="checkbox"/> No change in status/situation Status change: <input type="checkbox"/> A/D <input type="checkbox"/> Confused <input type="checkbox"/> Verbal <input type="checkbox"/> Pain <input type="checkbox"/> Unconscious Pt offload method: <input type="checkbox"/> Unassisted <input type="checkbox"/> Crutches/cane <input type="checkbox"/> Litter <input type="checkbox"/> Wheelchair Other information: _____	
<b>B</b> (Background)	Allergies: <input type="checkbox"/> NKDA <input type="checkbox"/> Lox _____ Medications: <input type="checkbox"/> None <input type="checkbox"/> SAM <input type="checkbox"/> Given to Flight Nurse <input type="checkbox"/> See 3899 for list <input type="checkbox"/> AE Stock Recent: Pain Meds/Route/Time Given (zulu) _____ Antiemetic/Route/Time Given (zulu) _____ Antibiotics/Route/Time Given (zulu) _____ Other Meds/Route/Time Given (zulu) _____ Other pertinent information/history: _____			<input type="checkbox"/> No change in medication Inflight: _____ Last Pain Meds/Route/Time Given (zulu) _____ Last Antiemetic/Route/Time Given (zulu) _____ Last Antibiotics/Route/Time Given (zulu) _____ Other Meds/Time Given (zulu) _____ Other information: _____	
<b>A</b> (Assessment)	Vitals: BP _____ P _____ R _____ SpO2 _____ T _____ Time: _____ Pain level: _____/10 Location/Description: _____ Airway: <input type="checkbox"/> No devices <input type="checkbox"/> Trach <input type="checkbox"/> Other: _____ Breathing: <input type="checkbox"/> Spontaneous <input type="checkbox"/> Labored <input type="checkbox"/> Assisted Oxygenation: <input type="checkbox"/> Room Air <input type="checkbox"/> NC <input type="checkbox"/> NRB Rate: _____ LPM Circulation: <input type="checkbox"/> A/eq <input type="checkbox"/> Altered (location): _____ Skin: <input type="checkbox"/> Skin intact/No Pressure Ulcers (PU) or concerns <input type="checkbox"/> Braden Scale score: _____ <input type="checkbox"/> Skin issue/location: _____ IV: <input type="checkbox"/> 0.9% NS <input type="checkbox"/> L <input type="checkbox"/> D5W <input type="checkbox"/> Other: _____ Rate: _____ mL/hour <input type="checkbox"/> Packed RBCs <input type="checkbox"/> Saline Lock Location: _____ Insertion date: _____ <input type="checkbox"/> Fluids brought onboard w/ patient <input type="checkbox"/> Tubing/Fluids/Medications labeled Devices: <input type="checkbox"/> Suction <input type="checkbox"/> Orthopedic device <input type="checkbox"/> NG tube <input type="checkbox"/> Pt Monitor <input type="checkbox"/> Restraints <input type="checkbox"/> Foley <input type="checkbox"/> Chest tube <input type="checkbox"/> IV pump <input type="checkbox"/> Cast <input type="checkbox"/> <u>Yes</u> Pressure Wound Therapy Device(s) x _____ SCDs <input type="checkbox"/> Feeding tube <input type="checkbox"/> Drain <input type="checkbox"/> Epidural <input type="checkbox"/> PCA pump <input type="checkbox"/> Peripheral Nerve Block <input type="checkbox"/> Other: _____ Pain equipment safety check: <input type="checkbox"/> Site: _____ <input type="checkbox"/> Line patent <input type="checkbox"/> Functional <input type="checkbox"/> 3899N <input type="checkbox"/> Right Medication/concentration <input type="checkbox"/> Right infusion rate/settings <input type="checkbox"/> Tubing unclamped Wound <u>xxx</u> safety check: <input type="checkbox"/> Site(s): _____ <input type="checkbox"/> Tube unclamped <input type="checkbox"/> Pump functional Abnormal labs: <input type="checkbox"/> H/H <input type="checkbox"/> Cardiac enzymes <input type="checkbox"/> Other Other pertinent information: _____			Last Vitals: BP _____ P _____ R _____ SpO2 _____ T _____ Pain level: _____/10 Location/Description: _____ Airway: <input type="checkbox"/> No change <input type="checkbox"/> Changed to: _____ Breathing: <input type="checkbox"/> No change <input type="checkbox"/> Changed to: _____ Oxygenation: <input type="checkbox"/> No change <input type="checkbox"/> Changed to: _____ at _____ LPM Circulation: <input type="checkbox"/> No change <input type="checkbox"/> Changed to: _____ Skin: <input type="checkbox"/> No change <input type="checkbox"/> Changed to: _____ IV: <input type="checkbox"/> No change <input type="checkbox"/> Changed to: _____ at _____ mL/hour Devices: <input type="checkbox"/> No change <input type="checkbox"/> Changed to/Issues during flight: Output Amount: _____ Device safety checks completed: <input type="checkbox"/> Yes <input type="checkbox"/> No* * If "No" is checked, please explain why below: Other information: _____	
<b>R</b> (Recommendation/Request)	Specific inflight orders/instructions for AE Crew (AF 3899, Section III: Other Orders): _____			<input type="checkbox"/> Inflight orders/instructions accomplished Other information: _____	
Standard Patient Preparation Items Completed? <input type="checkbox"/> Yes <input type="checkbox"/> No ** See back of checklist**					

CAO 20201028 (page 1 of 2) \* This form is not a part of the patient's permanent medical record. Implementation of the Health Insurance Portability and Accountability Act (HIPAA) Privacy Rule in DOD Health Care Programs, 13 March 2019; Privacy Act of 1974 applies.

Figure A7.2. Patient Movementpatient Handoff I Checklist (Back).

**PATIENT MOVEMENT INPATIENT HANDOFF CHECKLIST (BACK)***(To be completed by the originating MTF/patient stage prior to arriving at the aircraft)*

<b>TASK</b>	<b>DESCRIPTION</b>	<b>SUPPORTING REGULATION</b>
<b>Medication</b> <input type="checkbox"/> N/A		
<input type="checkbox"/> Adequate supply of medications given to the patient or flight nurse	Role 2 to Role 3 (i.e. Bastion to Bagram) movements in combat operations theater: <b>1-day minimum</b> ; Role 3 to Role 4 (i.e. Bagram to LRM) movements: <b>2-day minimum</b> ; inpatients from OCONUS MTF to port of entry MTF CONUS (i.e. LRM to Bethesda): <b>2-day minimum</b> ; inpatients from OCONUS MTF to other locations in CONUS with RON: <b>3-day minimum</b> ; all outpatient movements OCONUS to CONUS: <b>5-day minimum</b> ; CONUS to CONUS movements: <b>1-day minimum</b> .	
<input type="checkbox"/> Patient is pre-medicated prior to flight	<ul style="list-style-type: none"> <li>• Pain medication within 1 hours of departure (if applicable)</li> <li>• Antiemetic (if applicable)</li> <li>• Medication that would be scheduled to be given during patient loading and through 1 hour after takeoff (if applicable)</li> </ul>	
<input type="checkbox"/> Patient medication verified	<ul style="list-style-type: none"> <li>• Medication delivered to the aircraft is for the right medication for the right patient with the right time/frequency of administration annotated, and is the correct form/route</li> <li>• All medications are verified with order on AF Form 3899/DD Form 602</li> <li>• All medications have been documented and timed on MAR/PMR</li> </ul>	
<b>Equipment</b> <input type="checkbox"/> N/A		
<input type="checkbox"/> Working condition confirmed	Equipment must work properly and battery must be fully charged prior to leaving facility.	
<input type="checkbox"/> Approved for flight	Originating MTF must use only flight-certified medical equipment for use on AE missions. All "approved equipment" questions must be directed to the PMRC or appropriate theater AECT/PMRC.	AFI 48-107, Vol 1, En Route Care and Aeromedical Evacuation Medical Operations.
<input type="checkbox"/> Equipment waiver obtained		AFMAN 10-2909, Aeromedical Evacuation Equipment Standards
<input type="checkbox"/> All auxiliary parts present	Power cords/adapters, canisters, litter brackets/securing device, tubing	Approved AE Equipment: <a href="https://medlog.us.af.mil/">https://medlog.us.af.mil/</a>
<b>Supplies</b> <input type="checkbox"/> N/A		
<input type="checkbox"/> Adequate amount of supplies given to the patient or flight nurse	Role 2 to Role 3 (i.e. Bastion to Bagram) movements in combat operations theater: <b>1-day minimum</b> ; Role 3 to Role 4 (i.e. Bagram to LRM) movements: <b>2-day minimum</b> ; inpatients from OCONUS MTF to port of entry MTF CONUS (i.e. LRM to Bethesda): <b>2-day minimum</b> ; inpatients from OCONUS MTF to other locations in CONUS with RON: <b>3-day minimum</b> ; all outpatient movements OCONUS to CONUS: <b>5-day minimum</b> ; CONUS to CONUS movements: <b>1-day minimum</b> .	
<b>Documentation</b>		
<input type="checkbox"/> Documentation verified	<ul style="list-style-type: none"> <li>• Physician has signed the AF 3899/DD Form 602</li> <li>• Flight surgeon has cleared the patient; documented on form</li> <li>• AF Form 3899/DD Form 602, medical record, x-rays placed in an envelope affixed with completed DD Form 2267 or with the following information: patient's name, rank/status, SSN, nationality (if not a US citizen), organization, date of departure, and destination)</li> <li>• Military ID card with the patient or in envelope listed above</li> <li>• ID bracelet on patient with last name, first name, middle initial, cite #, and date of birth</li> </ul>	
<b>Anti-hijacking/Baggage</b>		
<input type="checkbox"/> Completion confirmed	<ul style="list-style-type: none"> <li>• Patients, attendants, and their baggage are inspected with a hand-held or walk-through metal detector, x-ray machine, or physical check for weapons or explosives.</li> <li>• All baggage is tagged appropriately and baggage manifest is provided to the AE crew.</li> </ul>	

## Attachment 8

## PATIENT MOVEMENT OUTPATIENT HAND-OFF CHECKLIST

Figure A8.1. Patient Movement Outpatient Hand-Off Checklist.

PATIENT MOVEMENT OUTPATIENT HANDOFF CHECKLIST		PATIENT MOVEMENT OUTPATIENT HANDOFF CHECKLIST	
<p>Pr Name: _____ Classification: _____ Chief: _____ DOB: _____</p> <p>Diagnosis: _____</p> <p>AF 2000 signed by PS: Y / N - Pr A Reg Anst Updact: Y / N - Pr ID Read On: Y / N</p> <p>Preflight VS: BP _____ P _____ R _____ SaO<sub>2</sub> _____ T _____ Psa _____ H<sub>2</sub> Location: _____</p> <p>Lab Results: Y / N - Oupg Results: Y / N - CD: Y / N - B patient's SAMT: Y / N - Neurotic: Y / N</p> <p>Medications: _____</p> <p>Next Medication(s) due: _____</p> <p>Done of injury surgery &amp; procedure: _____ Last driving change: _____</p> <p>Solent Lock: Y / N - Location: _____ OI requirement: _____</p> <p>Diet: 1500 regular full liquid - One liquid - cardiac: low Na - diabetic: other</p> <p>Equipment: Line (15 pump) - vaccine - vaccine - glucose - other</p> <p>Antibiotic: Device - vaccine - vaccine - vaccine - other</p> <p>If applicable, does last seizure - clear past - ETOH intake - Glucose: _____</p> <p>Other pertinent info/treatment info: _____</p> <p>Handoff by: AE CREW</p> <p><input type="checkbox"/> NO CHANGES</p> <p><input type="checkbox"/> CHANGES (SUMMARY: _____)</p>	<p>Pr Name: _____ Classification: _____ Chief: _____ DOB: _____</p> <p>Diagnosis: _____</p> <p>AF 2000 signed by PS: Y / N - Pr A Reg Anst Updact: Y / N - Pr ID Read On: Y / N</p> <p>Preflight VS: BP _____ P _____ R _____ SaO<sub>2</sub> _____ T _____ Psa _____ H<sub>2</sub> Location: _____</p> <p>Lab Results: Y / N - Oupg Results: Y / N - CD: Y / N - B patient's SAMT: Y / N - Neurotic: Y / N</p> <p>Medications: _____</p> <p>Next Medication(s) due: _____</p> <p>Done of injury surgery &amp; procedure: _____ Last driving change: _____</p> <p>Solent Lock: Y / N - Location: _____ OI requirement: _____</p> <p>Diet: 1500 regular full liquid - One liquid - cardiac: low Na - diabetic: other</p> <p>Equipment: Line (15 pump) - vaccine - vaccine - glucose - other</p> <p>Antibiotic: Device - vaccine - vaccine - vaccine - other</p> <p>If applicable, does last seizure - clear past - ETOH intake - Glucose: _____</p> <p>Other pertinent info/treatment info: _____</p> <p>Handoff by: AE CREW</p> <p><input type="checkbox"/> NO CHANGES</p> <p><input type="checkbox"/> CHANGES (SUMMARY: _____)</p>	<p>Pr Name: _____ Classification: _____ Chief: _____ DOB: _____</p> <p>Diagnosis: _____</p> <p>AF 2000 signed by PS: Y / N - Pr A Reg Anst Updact: Y / N - Pr ID Read On: Y / N</p> <p>Preflight VS: BP _____ P _____ R _____ SaO<sub>2</sub> _____ T _____ Psa _____ H<sub>2</sub> Location: _____</p> <p>Lab Results: Y / N - Oupg Results: Y / N - CD: Y / N - B patient's SAMT: Y / N - Neurotic: Y / N</p> <p>Medications: _____</p> <p>Next Medication(s) due: _____</p> <p>Done of injury surgery &amp; procedure: _____ Last driving change: _____</p> <p>Solent Lock: Y / N - Location: _____ OI requirement: _____</p> <p>Diet: 1500 regular full liquid - One liquid - cardiac: low Na - diabetic: other</p> <p>Equipment: Line (15 pump) - vaccine - vaccine - glucose - other</p> <p>Antibiotic: Device - vaccine - vaccine - vaccine - other</p> <p>If applicable, does last seizure - clear past - ETOH intake - Glucose: _____</p> <p>Other pertinent info/treatment info: _____</p> <p>Handoff by: AE CREW</p> <p><input type="checkbox"/> NO CHANGES</p> <p><input type="checkbox"/> CHANGES (SUMMARY: _____)</p>	<p>Pr Name: _____ Classification: _____ Chief: _____ DOB: _____</p> <p>Diagnosis: _____</p> <p>AF 2000 signed by PS: Y / N - Pr A Reg Anst Updact: Y / N - Pr ID Read On: Y / N</p> <p>Preflight VS: BP _____ P _____ R _____ SaO<sub>2</sub> _____ T _____ Psa _____ H<sub>2</sub> Location: _____</p> <p>Lab Results: Y / N - Oupg Results: Y / N - CD: Y / N - B patient's SAMT: Y / N - Neurotic: Y / N</p> <p>Medications: _____</p> <p>Next Medication(s) due: _____</p> <p>Done of injury surgery &amp; procedure: _____ Last driving change: _____</p> <p>Solent Lock: Y / N - Location: _____ OI requirement: _____</p> <p>Diet: 1500 regular full liquid - One liquid - cardiac: low Na - diabetic: other</p> <p>Equipment: Line (15 pump) - vaccine - vaccine - glucose - other</p> <p>Antibiotic: Device - vaccine - vaccine - vaccine - other</p> <p>If applicable, does last seizure - clear past - ETOH intake - Glucose: _____</p> <p>Other pertinent info/treatment info: _____</p> <p>Handoff by: AE CREW</p> <p><input type="checkbox"/> NO CHANGES</p> <p><input type="checkbox"/> CHANGES (SUMMARY: _____)</p>

**Attachment 9****BRADEN SCALE FOR PREDICTING PRESSURE SORE RISK BY LEVEL OF RISK**

**Figure A9.1. Braden Scale For Predicting Pressure Sore Risk By Level Of Risk.**

## BRADEN SCALE FOR PREDICTING PRESSURE SORE RISK

Patient's Name _____		Evaluator's Name _____		Date of Assessment _____	
<b>SENSORY PERCEPTION</b> ability to respond meaningfully to pressure-related discomfort	<b>1. Completely Limited</b> Unresponsive (does not moan, flinch, or grasp) to painful stimuli, due to diminished level of consciousness or sedation. OR limited ability to feel pain over most of body	<b>2. Very Limited</b> Responds only to painful stimuli. Cannot communicate discomfort except by moaning or restlessness. OR has a sensory impairment which limits the ability to feel pain or discomfort over 1/3 of body.	<b>3. Slightly Limited</b> Responds to verbal commands, but cannot always communicate discomfort or the need to be turned. OR has some sensory impairment which limits ability to feel pain or discomfort in 1 or 2 extremities.	<b>4. No Impairment</b> Responds to verbal commands. Has no sensory deficit which would limit ability to feel or voice pain or discomfort.	
<b>MOISTURE</b> degree to which skin is exposed to moisture	<b>1. Constantly Moist</b> Skin is kept moist almost constantly by perspiration, urine, etc. Dampness is detected every time patient is moved or turned.	<b>2. Very Moist</b> Skin is often, but not always moist. Linen must be changed at least once a shift.	<b>3. Occasionally Moist</b> Skin is occasionally moist, requiring an extra linen change approximately once a day.	<b>4. Rarely Moist</b> Skin is usually dry, linen only requires changing at routine intervals.	
<b>ACTIVITY</b> degree of physical activity	<b>1. Bedfast</b> Confined to bed.	<b>2. Chairfast</b> Ability to walk severely limited or non-existent. Cannot bear own weight and/or must be assisted into chair or wheelchair.	<b>3. Walks Occasionally</b> Walks occasionally during day, but for very short distances, with or without assistance. Spends majority of each shift in bed or chair.	<b>4. Walks Frequently</b> Walks outside room at least twice a day and inside room at least once every two hours during waking hours.	
<b>MOBILITY</b> ability to change and control body position	<b>1. Completely Immobile</b> Does not make even slight changes in body or extremity position without assistance.	<b>2. Very Limited</b> Makes occasional slight changes in body or extremity position but unable to make frequent or significant changes independently.	<b>3. Slightly Limited</b> Makes frequent though slight changes in body or extremity position independently.	<b>4. No Limitation</b> Makes major and frequent changes in position without assistance.	
<b>NUTRITION</b> usual food intake pattern	<b>1. Very Poor</b> Never eats a complete meal. Rarely eats more than 1/3 of any food offered. Eats 2 servings or less of protein (meat or dairy products) per day. Takes fluids poorly. Does not take a liquid dietary supplement. OR is NPO and/or maintained on clear liquids or IV's for more than 5 days.	<b>2. Probably Inadequate</b> Rarely eats a complete meal and generally eats only about 1/3 of any food offered. Protein intake includes only 3 servings of meat or dairy products per day. Occasionally will take a dietary supplement. OR receives less than optimum amount of liquid diet or tube feeding.	<b>3. Adequate</b> Eats over half of most meals. Eats a total of 4 servings of protein (meat, dairy products) per day. Occasionally will refuse a meal, but will usually take a supplement when offered. OR is on a tube feeding or TPN regimen which probably meets most of nutritional needs.	<b>4. Excellent</b> Eats most of every meal. Never refuses a meal. Usually eats a total of 4 or more servings of meat and dairy products. Occasionally eats between meals. Does not require supplementation.	
<b>FRICTION &amp; SHEAR</b>	<b>1. Problem</b> Requires moderate to maximum assistance in moving. Complete sliding without sliding against skin. Frequent sliding down in bed or chair, requiring frequent repositioning with maximum assistance. Spasmodic, contractures or agitation leads to almost constant friction.	<b>2. Potential Problem</b> Moves freely or requires minimum assistance. During a move skin probably slides to some extent, or patient needs skin restraints, or other devices. Maintains relatively good position in chair or bed most of the time but occasionally slides down.	<b>3. No Apparent Problem</b> Moves in bed and in chair independently and has sufficient muscle strength to sit up completely and move. Maintains good position in bed or chair.		
Total Score					

## Attachment 10

## BURN CENTER REFERRAL CRITERIA

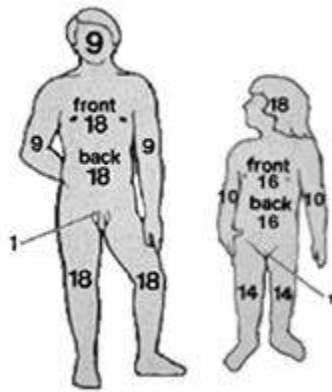
**A10.1.** A burn center may treat adults, children, or both. Burn injuries that should be referred to a burn center are included in [Table A10.1](#)

**Table A10.1. Burn Injuries.**

1. Partial thickness burns greater than 10% Total Body Surface Area (TBSA).
2. Burns that involve the face, hands, feet, genitalia, perineum, or major joints.
3. Third degree burns of any size in any age group.
4. Electrical burns, including lightning injury.
5. Chemical burns.
6. Inhalation injury.
7. Burn injury in patients with preexisting medical disorders that could complicate management, prolong recovery, or affect mortality.
8. Any patient with burns and concomitant trauma (such as fractures) in which the burn injury poses the greatest risk of morbidity or mortality. In such cases, if the trauma poses the greater immediate risk, the patient may be initially stabilized in a trauma center before being transferred to a burn unit. Physician judgment is necessary in such situations and is in concert with the regional medical control plan and triage protocols.
9. Burned children in hospitals without qualified personnel or equipment for the care of children.
10. Burn patients requiring mechanical ventilation and/or ERCC transport.
11. Burn injury in patients who require special social, emotional, or rehabilitative intervention.

**Table A10.2. Severity Determination.**

First Degree (Partial Thickness) Superficial	red	sometimes painful.	
Second Degree (Partial Thickness) Skin may be red	blistered	swollen. Very painful.	
Third Degree (Full Thickness) Whitish	charred	or translucent	no pin prick sensation in burned area.

**Figure A10.1. Percentage Total Body Surface Area.**

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

## Attachment 11

**MILITARY ACUTE CONCUSSION EVALUATION**

**A11.1.** Military Acute Concussion Evaluation should be completed at the MTF or ERPS prior to flight. Not an in-flight requirement.

**Table A11.1. Military Acute Concussion Evaluation.**

<b>Evaluation</b>	<b>Description</b>	<b>Score</b>
<b>History</b>	Mechanism of injury, amnesia, loss of consciousness, and symptoms	<b>None</b>
<b>Neurological Screening</b>	<b>Eyes:</b> Pupil response and tracking  <b>Verbal:</b> Speech fluency and word finding  <b>Motor:</b> Pronator drift (both arms extended shoulder level, palms upwards, eyes closed), gait/coordination	<b>None</b>
<b>Immediate Memory</b>	A brief repeated list learning test.  A list of five words is read once and then the patient is asked to repeat the list back, as many words as they can recall in any order.  Repeat 2 more times for a total of three trials, even if the patient scores perfectly on the first trial. (one word = one point)	<b>/15</b>
<b>Orientation</b>	One point for each: Month, Date, Time, Day of Week, Year	<b>/5</b>
<b>Concentration</b>	Reverse Digits: Patient restates a string of numbers (lengths of 3, 4, 5, 6 digits), in reverse order. Two attempts allowed per string: successful string = one point  Reverse Months: Patient states the months of the year in reverse order (one point if correct)	<b>/5</b>



<b>Delayed Recall</b>	Patient is asked to repeat back the original list of five words, as many words as they can recall in any order. One point for each recalled word	<b>/5</b>
	<b>TOTAL SCORE</b>	<b>/30</b>

**A11.2.** MACE scores below 25 may represent clinically neurocognitive impairment requiring further evaluation for a more serious brain injury.

## Attachment 12

## ALCOHOL WITHDRAWAL ASSESSMENT SCORING GUIDELINES

Figure A12.1. Alcohol Withdrawal Assessment Scoring Guidelines.

<p><b>Nausea/Vomiting</b> - Rate on scale 0 - 7</p> <p>0 - None</p> <p>1 - Mild nausea with no vomiting</p> <p>2</p> <p>3</p> <p>4 - Intermittent nausea</p> <p>5</p> <p>6</p> <p>7 - Constant nausea and frequent dry heaves and vomiting</p>	<p><b>Tremors</b> - have patient extend arms &amp; spread fingers. Rate on scale 0 - 7.</p> <p>0 - No tremor</p> <p>1 - Not visible, but can be felt fingertip to fingertip</p> <p>2</p> <p>3</p> <p>4 - Moderate, with patient's arms extended</p> <p>5</p> <p>6</p> <p>7 - severe, even w/ arms not extended</p>
<p><b>Anxiety</b> - Rate on scale 0 - 7</p> <p>0 - no anxiety, patient at ease</p> <p>1 - mildly anxious</p> <p>2</p> <p>3</p> <p>4 - moderately anxious or guarded, so anxiety is inferred</p> <p>5</p> <p>6</p> <p>7 - equivalent to acute panic states seen in severe delirium or acute schizophrenic reactions.</p>	<p><b>Agitation</b> - Rate on scale 0 - 7</p> <p>0 - normal activity</p> <p>1 - somewhat normal activity</p> <p>2</p> <p>3</p> <p>4 - moderately fidgety and restless</p> <p>5</p> <p>6</p> <p>7 - paces back and forth, or constantly thrashes about</p>
<p><b>Paroxysmal Sweats</b> - Rate on Scale 0 - 7.</p> <p>0 - no sweats</p> <p>1 - barely perceptible sweating, palms moist</p> <p>2</p> <p>3</p> <p>4 - beads of sweat obvious on forehead</p> <p>5</p> <p>6</p> <p>7 - drenching sweats</p>	<p><b>Orientation and clouding of sensorium</b> - Ask, "What day is this? Where are you? Who am I?" Rate scale 0 - 4</p> <p>0 - Oriented</p> <p>1 - cannot do serial additions or is uncertain about date</p> <p>2 - disoriented to date by no more than 2 calendar days</p> <p>3 - disoriented to date by more than 2 calendar days</p> <p>4 - Disoriented to place and / or person</p>
<p><b>Tactile disturbances</b> - Ask, "Have you experienced any itching, pins &amp; needles sensation, burning or numbness, or a feeling of bugs crawling on or under your skin?"</p> <p>0 - none</p> <p>1 - very mild itching, pins &amp; needles, burning, or numbness</p> <p>2 - mild itching, pins &amp; needles, burning, or numbness</p> <p>3 - moderate itching, pins &amp; needles, burning, or numbness</p> <p>4 - moderate hallucinations</p> <p>5 - severe hallucinations</p> <p>6 - extremely severe hallucinations</p> <p>7 - continuous hallucinations</p>	<p><b>Auditory Disturbances</b> - Ask, "Are you more aware of sounds around you? Are they harsh? Do they startle you? Do you hear anything that disturbs you or that you know isn't there?"</p> <p>0 - not present</p> <p>1 - Very mild harshness or ability to startle</p> <p>2 - mild harshness or ability to startle</p> <p>3 - moderate harshness or ability to startle</p> <p>4 - moderate hallucinations</p> <p>5 - severe hallucinations</p> <p>6 - extremely severe hallucinations</p> <p>7 - continuous hallucinations</p>
<p><b>Visual disturbances</b> - Ask, "Does the light appear to be too bright? Is its color different than normal? Does it hurt your eyes? Are you seeing anything that disturbs you or that you know isn't there?"</p> <p>0 - not present</p> <p>1 - very mild sensitivity</p> <p>2 - mild sensitivity</p> <p>3 - moderate sensitivity</p> <p>4 - moderate hallucinations</p> <p>5 - severe hallucinations</p> <p>6 - extremely severe hallucinations</p> <p>7 - continuous hallucinations</p>	<p><b>Headache</b> - Ask, "Does your head feel different than usual? Does it feel like there is a band around your head?" Do not rate dizziness or lightheadedness.</p> <p>0 - not present</p> <p>1 - very mild</p> <p>2 - mild</p> <p>3 - moderate</p> <p>4 - moderately severe</p> <p>5 - severe</p> <p>6 - very severe</p> <p>7 - extremely severe</p>

## Procedure:

1. Assess and rate each of the 10 criteria of the CIWA scale. Each criterion is rated on a scale from 0 to 7, except for "Orientation and clouding of sensorium" which is rated on scale 0 to 4. Add up the scores for all ten criteria. This is the total CIWA-Ar score for the patient at that time. Prophylactic medication should be started for any patient with a total CIWA-Ar score of 8 or greater (ie. start on withdrawal medication). If started on scheduled medication, additional PRN medication should be given for a total CIWA-Ar score of 15 or greater.
2. Document vitals and CIWA-Ar assessment on the Withdrawal Assessment Sheet. Document administration of PRN medications on the assessment sheet as well.
3. The CIWA-Ar scale is the most sensitive tool for assessment of the patient experiencing alcohol withdrawal. Nursing assessment is vitally important. Early intervention for CIWA-Ar score of 8 or greater provides the best means to prevent the progression of withdrawal.

## Attachment 13

## PAIN ASSESSMENT SCALES

## A13.1. Wong-Baker.

Figure A13.1. Wong-Baker.



**Brief word instructions:** Point to each face using the words to describe the pain intensity. Ask the child to choose face that best describes own pain and record the appropriate number.

**Original instructions:** Explain to the person that each face is for a person who feels happy because he has no pain (hurt) or sad because he has some or a lot of pain. **Face 0** is very happy because he doesn't hurt at all. **Face 1** hurts just a little bit. **Face 2** hurts a little more. **Face 3** hurts even more. **Face 4** hurts a whole lot. **Face 5** hurts as much as you can imagine, although you don't have to be crying to feel this bad. Ask the person to choose the face that best describes how he is feeling.

Rating scale is recommended for persons age 3 years and older.  
Download [FACES scale](#)

April 2005

**A13.2.** The above figure is Wong's Clinical Manual of Pediatric Nursing, 8e (Clinical Manual of Pediatric Nursing (Wong)) Spiral-bound – September 1, 2011.

**Figure A13.2. Face, Legs, Activity, Crying and Consolability (FLACC).****FLACC Scale**

Category	Scoring		
	1	2	3
<b>Face</b>	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant quivering chin, clenched jaw
<b>Legs</b>	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
<b>Activity</b>	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid or jerking
<b>Cry</b>	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints
<b>Consolability</b>	Content, relaxed	Reassured by occasional touching, hugging or being talked to, distractible	Difficult to console or comfort

Each of the five categories (F) Face; (L) Legs; (A) Activity; (C) Cry; (C) Consolability is scored from 0-2, which results in a total score between zero and ten.

**A13.3.** The Above Figure is Hicks CL et al The Faces Pain Scale-Revised: toward a common metric in pediatric pain measurement. Pain, 2003;93:173-183.

Figure A13.3. Defense and Veterans Pain Rating Scale.

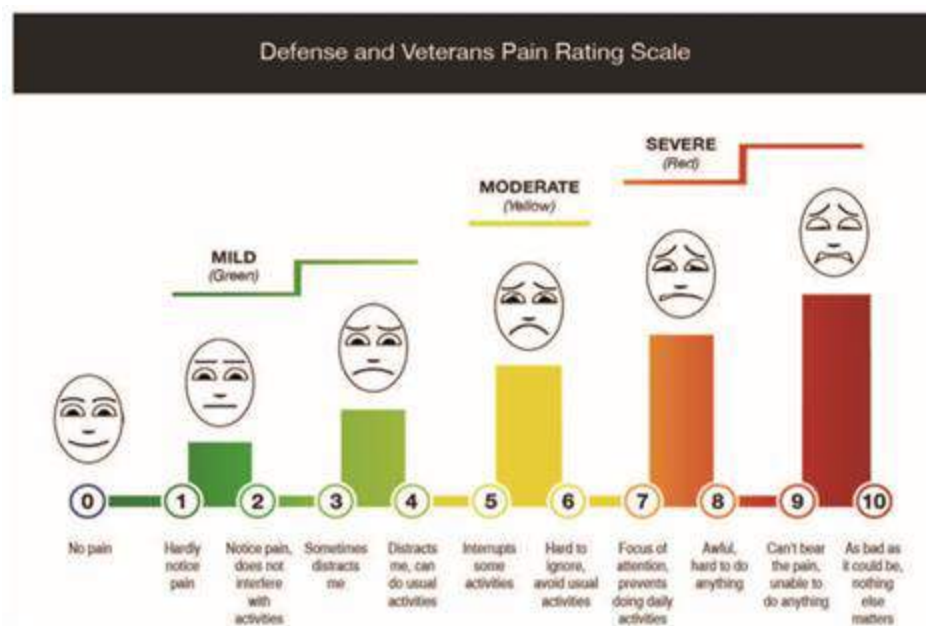


Figure A13.4. DoD/VA Pain Supplemental Questions.

**DoD/VA PAIN SUPPLEMENTAL QUESTIONS**

For clinicians to evaluate the biopsychosocial impact of pain

- Circle the one number that describes how, during the past 24 hours, pain has interfered with your usual **ACTIVITY**:  
 0 — 1 — 2 — 3 — 4 — 5 — 6 — 7 — 8 — 9 — 10  
 Does not interfere ————— Completely interferes
- Circle the one number that describes how, during the past 24 hours, pain has interfered with your **SLEEP**:  
 0 — 1 — 2 — 3 — 4 — 5 — 6 — 7 — 8 — 9 — 10  
 Does not interfere ————— Completely interferes
- Circle the one number that describes how, during the past 24 hours, pain has affected your **MOOD**:  
 0 — 1 — 2 — 3 — 4 — 5 — 6 — 7 — 8 — 9 — 10  
 Does not affect ————— Completely affects
- Circle the one number that describes how, during the past 24 hours, pain has contributed to your **STRESS**:  
 0 — 1 — 2 — 3 — 4 — 5 — 6 — 7 — 8 — 9 — 10  
 Does not contribute ————— Contributes a great deal

\*Reference for pain interference: Cleeland CS, Ryan RM. Pain assessment: global use of the Brief Pain Inventory. *Ann Acad Med Singapore* 23(2): 129-138, 1994.

v 2.0

**Attachment 14**  
**AIRCRAFT AIRFLOW**

**Table A14.1. Aircraft Airflow.**

Aircraft Type	Air Flow Direction	*Post-Mission Time Required for Airing Out.	Is there safe space on aircraft w/o respiratory protection
C-17	Top to Bottom; aft to forward; air is mixed circularly; minimum 6ft distance	90 minutes	No
KC-135	Top to bottom; forward to aft while in-flight. No movement on the ground.	60 minutes	No
C-130	Top to Bottom; aft to forward; air is mixed circularly; minimum 6ft distance	60 minutes	No
C-5	Forward to aft. Cargo/Passenger and Cockpit all on separate HVAC systems	60 minutes	No
KC-46	Top to bottom, forward to aft while in-flight; no recirculation.	60 minutes	No
KC-10	Top to bottom/forward to aft to wing outflow valves, then stagnant aft to outflow valves	60 minutes	Yes
C-21	Aft to forward	15 minutes	No
C-12	Forward to aft	20 minutes w/engine running continuously	No

**Notes:**

1. 0.3 PFU/m<sup>3</sup> indicates ventilation times required for aerosolized virus concentration to reach an exposure concentration for a three hour exposure at a respiration rate of 19L/min. (corresponding to light physical activity) required to reach the estimated negligible biological military exposure guideline (BMEG) dose of one PFU.
2. All doors are closed during ventilation. All air exchange is performed by the aircraft ventilation system. No additional sources of air exchange

impact aircraft ventilation. This enables more accurate timing of ventilation.

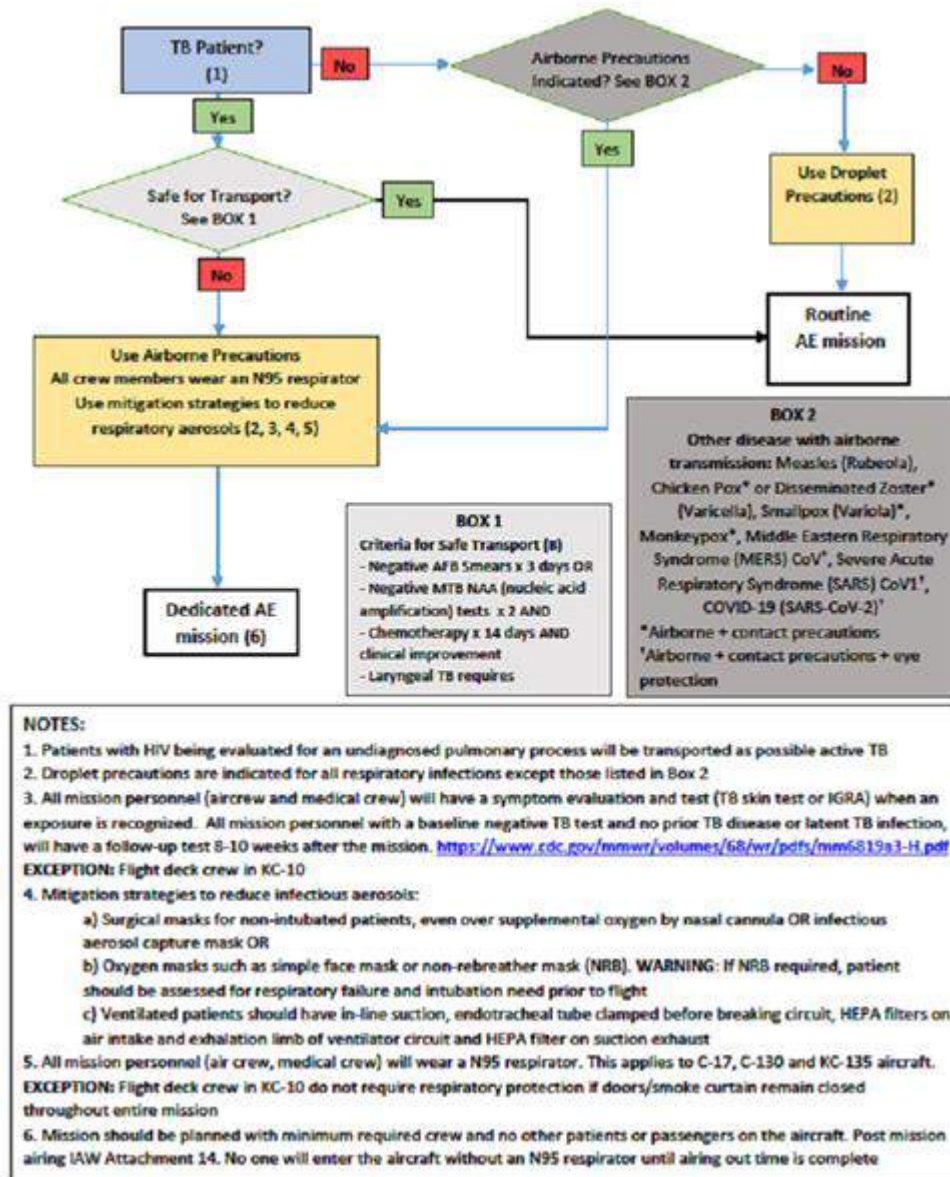
3. Deviations from air exchange times may be superseded with MDS-specific guidance provided by the respective SPO.

4. Reference AMC Novel Coronavirus 2019 Patient Movement Plan (PMP) or the most current PMP on the Electronic Flight Bag.

## Attachment 15

## RESPIRATORY DISEASE MISSION PLANNING ALGORITHM

Figure A15.1. Respiratory Disease Mission Planning Algorithm.





## Attachment 16

## PATIENT MOVEMENT PATIENT SAFETY EVENT REPORTING EXAMPLES

A16.1. The following is a guide to show examples of event reporting within the patient movement system. This is not an all-inclusive list .

Table A16.1. Event Reporting Guide.

Event Type	Description	Examples
Anti-Hijack	Completed Incorrectly	Part of anti-hijacking not completed or completed incorrectly
	Not Completed	Anti-hijacking not completed
Equipment	Not Approved for Flight	Equipment not approved for flight and NO waiver obtained
	Failure/Malfunction	Equipment malfunctions within the AE system. <b><u>INCLUDE NAME, MODEL NUMBER, SERIAL NUMBER AND DETAILED DESCRIPTION</u></b> of malfunction. Include where the equipment was turned in. Ensure an AF Form 4449 is completed.
Infection Control	Blood or Body Fluid Exposure	Any exposure to blood/body fluids
	Precautions Not Observed	Infection control precautions not followed with infectious patients.
Patient Injuries	Actual	Environmental injuries in/around aircraft resulting in actual harm to a patient.
	Falls	Any event resulting in a patient falling or litters carry issues.
Medication	Narcotics Not Accounted For, count incorrect, not counted, lost, or stolen	Narcotics not accounted for at any point within the AE system.
	Med Error	Wrong: Dose, medication, time, route, or patient while the patient is in transit
	PCA/PNB Issue	Not locked
		No handoff
		Incorrect Dose
		Incorrect settings
		Tubing not labeled
	Self-Administration (SAM) Issue	Issues associated with SAM patient. To include but not limited to: pt. took medication incorrectly, meds in checked bag, lost, or

		forgot medication
Patient Unexpected Status Change	Cardiac/Respiratory Issue	SOB, Arrhythmia, etc.
	Death in flight	Self-explanatory
	Death within 24 hours of AE movement	Self-explanatory
<b>Event Type</b>	<b>Description</b>	<b>Examples</b>
Patient Unexpected Status Change (cont.)	Unplanned Desaturation	Desaturation with no PRN orders
	Unplanned Nausea/Vomiting	Nausea/vomiting with no PRN orders
	Unplanned or unexpected Pain	Unplanned pain with no PRN orders or unexpected pain
	Seizures	Self-explanatory
	Mental Health Changes	Self-Injury, Anxiety, etc.
	Vital Sign Changes	Fever, Blood pressure, Heart Rate, Respirations, etc.
	Other Patient Status Change not listed above	Status changes not planned for or unexpected
Patient Preparation Issues	Attendant	Attendant not prepared or no attendant provided
	Treatment Not Done Prior To Flight	No IV, not premedicated, assessment not done, inappropriate footwear, 1A/1B not prepared properly, etc.
	Equipment/Supply Issues	Not provided, part/attachment issues, inspection/AE certification sticker issue, not requested, etc.
	Medication	Med not provided, Non-SAM with medication, med reconciliation issue, insufficient supply of medication, incorrect dose supplied, etc.
	Orders	No orders/partial orders, orders incorrect, orders not signed, conflicting/confusing orders, etc.

	Paperwork/Records	3899 missing-all/part, 3899 issue, no ID band/Card, patient data incorrect, problems with orders/travel documents (e.g., visa, passport, military orders) issue, No allergy band, etc.
	Meals	Meals not provided, meal issue, etc.
	Documentation	Med given not documented/signed off, documentation incomplete, transcription error, medication response not documented, MAR documentation issue, date/time issue, etc.
Communication	Patient Handoff	Inaccurate/incomplete report, handoff not done, medication handoff issue, inadequate personnel, no record transfer, etc.
	Notification Issue	Notification not made, no Command and Control (C2) notification, language barrier, etc.
<b>Event Type</b>	<b>Description</b>	<b>Examples</b>
Operational Issues related to patients	Aircraft Emergency w/Patients Only	Smoke/fire, pressurization issues, rapid decompression, emergency landing, etc. involving patients
	Mission/Crew/Equipment	In-flight care issues, AE did not provide equipment, equipment securing issues, preflight/function check issue, AE equipment (not life support equipment)/supply issue, etc.
	Transportation	Delayed transport/no show. K-Loader/HDPLP issue, insufficient transportation, ambulance transport issue, etc.
	Delays	Only if the required timeline for patient movement precedence is not met or an impact to the patient.

## Attachment 17

## AE PATIENT AND CUSTOMER SATISFACTION SURVEY

Figure A17.1. AE Patient And Customer Satisfaction Survey.

DATE: \_\_\_\_\_

TO BE COMPLETED BY AE CREW  
 Pt Load (Lib-Amb-Air) \_\_\_\_\_  
 MSN # \_\_\_\_\_ C-17 KC-135 C-21  
 130 \_\_\_\_\_

**AEROMEDICAL EVACUATION (AE)**  
**PATIENT AND CUSTOMER SATISFACTION SURVEY** v4.0  
*This form is subject to the Privacy Act of 1974 – Use blanket PAS – DD Form 2005*

**We want to know what you think!**

Please take a few moments to complete this survey. Your responses will let us know how we are doing and give us the valuable information we need to make improvements.

☐ Please check here if you have recently completed a survey, and you do not wish to provide more information at this time.

I am a (circle one): Patient    Medical Attendant    Non-Medical Attendant    Family Member

	Agree	Neutral	Disagree	N/A
1. Were you satisfied with your overall experience.				
2. An AE Crew Member spoke to me about my medical condition.				
3. The AE crew addressed my needs.				
4. My pain was addressed.				
5. The AE crew was professional.				
6. I am wearing an identification wristband with my name for this flight.				
7. The AE Crew checked my identification wristband and asked me to say my name before I was given medication.				
8. I was provided adequate information about my flight by the Staging facility.				
9. My baggage was handled appropriately				

Departure Location: \_\_\_\_\_ Arrival Location: \_\_\_\_\_

Is there something the Staging Facility or AE crews could have done to improve your AE experience?

\_\_\_\_\_

Is there anything that was particularly beneficial or positive about your AE flight?

\_\_\_\_\_

\_\_\_\_\_

If you would like a response to your comments, please write your name and address or e-mail:


Name: \_\_\_\_\_ Address/E-Mail: \_\_\_\_\_

Surveys can be mailed to: HQ AMC/SGON, 709Ward Dr., Scott AFB, IL 62225 Phone: Comm: 618-229-6036 DSN 779-6036

## Attachment 18

## EN ROUTE CARE EQUIPMENT MALFUNCTION REPORT TAG

Figure A18.1. En Route Care Equipment Malfunction Report Tag.



**En Route Care Equipment Malfunction Report Tag**

SECTION I - EQUIPMENT INFORMATION	
1. EQUIP NOMEN.	
2. SERIAL NO.	* 3. ECM/PMITS NO.
4. MODEL	5. MFR
6. MALFUNCTION/PROBLEM	
* 7. LIST ALL EQP/ACCESSORIES INVOLVED (Be specific)	
* 8. EQP SETTINGS AT TIME OF THE EVENT (Be Specific)	
* 9. IMMEDIATE ACTIONS TAKEN	
SECTION II - LOCATION	
10. DATE OF EVENT (YYYYMM)	11. TIME OF EVENT
12. LOCATION OF EVENT (Be Specific)	
a. MFR:	e. AIRCRAFT (GND):
b. GND SPORT:	f. AIRCRAFT (In-Flight):
c. ENROUTE HOLDING:	g. OTHER:
d. TAIL NO. TYPE AIRCRAFT	* h. ORIGIN:
	* i. DSTN:
<b>* INSTRUCTIONS</b> 3. DEVICE SHOULD BE TAGGED WITH AN EQUIPMENT CONTROL NO. STICKER, IF NOT, USE PMITS BAR CODE NO. 7. ITEMS IN THE EQUIPMENT CHAIN SHOULD BE SEQUESTERED & APPROPRIATELY TAGGED. (Example: ECAS Cbb, Frq Cnvtr, Vent tubing, IV pump cassettes, etc.) 8. EQUIPMENT CONTROLS/SETTINGS SHOULD REMAIN AS SET DURING THE MALFUNCTION/PROBLEM. 9. INCLUDE EQUIP/ACCESSORIES USED TO REPLACE FAILED EQUIPMENT PLUS ANY CORRECTIVE ACTIONS TAKEN PRIOR TO TURN IN. 12h. ORIGIN THEATER 12i. DESTINATION THEATER	

Figure A18.2. En Route Care Equipment Malfunction Report Tag (Back).

En Route Care Equipment Malfunction Report Tag	
13. WITNESS(S) TO THE EVENT	
a. NAME (Last, First, Grade)	b. ASSIGNED UNIT
c. EMAIL	d. PHONE NO.
a. NAME (Last, First, Grade)	b. ASSIGNED UNIT
c. EMAIL	d. PHONE NO.
SECTION III - ASSESSMENT	
14. EOP FAILURE RESULT IN (NEAR) DEATH/HOSPITALIZATION? YES <input type="radio"/> NO <input type="radio"/>	
15. PERSON AFFECTED/LIKELY AFFECTED BY MALFUNCTION (X appropriate) ***AN "A" EVENT MUST BE REPORTED WITHIN 24 HRS***	
<input type="radio"/> PATIENT	<input type="radio"/> CREW
<input type="radio"/> ATNDR	<input type="radio"/> N/A
<input type="radio"/> FLTY STAFF	<input type="radio"/> FAX
<input type="radio"/> CCATT MBR	<input type="radio"/> CCATT MBR
16. DO FORM 2852 OR HOSPITAL NEAR MISS RPT COMPLETED? YES <input type="radio"/> NO <input type="radio"/>	
16 a. COMMENTS	
SECTION IV - GENERAL INFORMATION	
17. SUBMITTING OFFICE/UNIT	18. REPORTING PERSON (Last, First, Grade)
18a. PHONE NO.	
18b. EMAIL	
19. SIGNATURE & DATE (Person Completing Form)	
TAG NO. <b>00001</b>	
SECTION V - BMET INFORMATION	
20. SIGNATURE (Receiving BMET)	
21. EQUIP NOVEN	
22. WORK ORDER NO.	23. ECH
24. SERIAL NO.	25. MODEL
TAG NO. <b>00001</b>	