

AEROMEDICAL EVACUATION

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Introduction

Air transportation of sick and injured patients is commonly employed in military and civilian medical care systems. Civilian "life-flight" operations have contributed greatly to improving survivability of serious injury and military evacuations have done no less in combat operations. In peacetime, military aeromedical evacuation other than scheduled patient movement flights to other facilities is rarely, if ever, justified. Yet we have seen them requested for reasons as poor as that of not trusting the ambulance to make the trip for mechanical reasons. The dangers of flight to the crew and the patient as well as the enormous cost (several thousand dollars an hour for an operational helicopter) are simply not justified. A thorough knowledge of aeromedical evacuation is essential for flight surgeons, less so for the Seabee medical officer. Integrating aeromedical expertise with critical care medicine makes this area challenging for the practicing flight surgeon, who should be consulted if at all possible before the decision is made for evacuation. While this chapter was originally written specifically for flight surgeons, it is presented here almost unchanged so that the reader may have an appreciation for the difficulties and dangers inherent in aeromedical evacuation. Considerations beyond normal medical factors are required to ensure optimal patient outcome. The naval flight surgeon may find that these factors are especially difficult to evaluate or predict. Factors such as the tactical situation, aircraft availability, shore facility capability, weather conditions, and diplomatic considerations must be included in aeromedical evacuation planning. Theatre evacuation is the responsibility of the operating forces. For example, if serving in an area with the Marine Corps, they take advantage of "lifts of opportunity". The Army has dedicated aircraft assets for evacuation from the field. Beyond that, the Air Force has the responsibility for worldwide aeromedical evacuation. Air Force policy has been radically changed in the last few years, with the concept of Joint Health Service Support, or

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JHSS. Formerly, all patients had to be stabilized and free of any complications before being accepted. Now, critical care in the air is considered a part of the new JHSS.

Historical Background

The use of aeromedical evacuation dates from World War I. In 1915, twelve casualties were flown in unmodified service type aircraft from the battle area during the retreat from Serbia. The French instituted the first airplane ambulance service organization with six airplanes that could carry three litter patients each. More than 1200 patients were transported from the Atlas mountain area of Morocco during the Riffian War. In 1919, the British Royal Air Force first transported casualties during the war against the Mad Mullah in Somaliland. Stretchers were placed inside the fuselage of a DH-9 aircraft. In 1923, some 359 patients were transported in Kurdistan.

In the United States, Captain George Gosman, MC, U.S. Army, had constructed an ambulance airplane near Pensacola, Florida in 1910. Requests for additional developmental funds were denied by the War Department. In 1918, at Gerstner Field, Louisiana, Major Nelson E. Driver, MC, U.S. Army and Captain William Ocker of the American Air Service modified the rear cockpit of a JN-4 aircraft to allow litter transport. During the next several years, ambulance aircraft were used by the U.S. Army on an emergency basis only, despite repeated urging by Army Medical Department officers for the routine use of transport airplanes for evacuating casualties in the event of war.

Large scale aeromedical evacuation first occurred during the Spanish Civil War (1936-1938) by the Germans. The sick and wounded of the Condor Legion were transported from Spain to Germany in JU-52 airplanes. Each aircraft was configured to carry ten litter cases and from two to eight ambulatory cases. The route involved flying over the Mediterranean to Northern Italy, then crossing the Alps at altitudes of up to 18,000 msl. The distance traveled varied between 1350 to 1600 miles with an elapsed air time of about ten hours. Oxygen was available and used while crossing the Alps. The extreme cold at altitude was a major difficulty because the airplanes did not have heating systems.

With the onset of World War II, most warring nations developed organized systems for aeromedical evacuation. The U.S. Army Air Corps formed medical air evacuation squadrons and established a school in 1942. Patients were transported by troop carrier aircraft within the various overseas theaters. Patients were returned to CONUS by the Air Transport Command. By the end of hostilities, the Army Air Corps had transported over 1.25 million patients.

The Korean Conflict of 1950-1953 saw the introduction of helicopters. They became the primary medical evacuation aircraft for the movement of casualties from the battlefield to the initial medical treatment facility. Helicopters also were used to transport patients between ships. By 23 February 1954, the U.S. Air Force Military Air Transport Service had transported over two million patients.

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The Vietnam Conflict from 1965 to 1973 saw a much fuller exploitation of the helicopter for aeromedical evacuation. Combat search and rescue helicopters rescued aviators who were shot down. Helicopters in support of U.S. Marines and Army forces picked up the wounded soon after injury, and quickly transported them to definitive treatment facilities. Helicopter aeromedical evacuation was considered a significant factor in the decreased mortality from wounds noted in that conflict. During World War II, about four percent of the casualties reaching medical treatment facilities died. During the Korean Conflict, this was reduced to two percent. The Vietnam conflict demonstrated fatality rates of one percent for casualties arriving at medical treatment facilities.

Physiological Factors Affecting Air Transportation

Any decision to evacuate a patient by air constitutes a major value judgement and should be made only after a thorough assessment of the medical benefits for the patient are compared to the hazards which might be associated with an evacuation flight. Prerequisites to this decision-making process are an in-depth understanding of the significant and unique risks imposed on patients during transport by aircraft. The flight surgeon must maximize patient outcome while minimizing patient risk.

There are no absolute medical contraindications to aeromedical evacuation. Much can be done by the flight surgeon to achieve a medically successful flight by preparation of the patient to better withstand the stresses and risk associated with flight or by manipulation of the patient's environment during the evacuation. These may include recommendation of flight level in an unpressurized aircraft or a specific pressurization profile in a pressurized aircraft in the case of dysbarism. Resuscitation and stabilization of the patient prior to evacuation cannot be overemphasized IF the situation permits. These principles more than any other influence the final therapeutic outcome. On occasion, it may be prudent to delay evacuation in order to stabilize the patient. The space limitations, light, noise or other en route environmental conditions make routine monitoring and therapeutic procedures extremely difficult. Conversely, there may be tactical situations where delay is not feasible.

There are specific risks inherent in aeromedical flight which interact with medical status. These are related to physical properties of flight and associated factors which include: reduced atmospheric pressure, decreased oxygen tension, dehydration, motion sickness, fatigue and inactivity.

Reduced Atmospheric Pressure

Although scheduled aeromedical evacuation flights are in pressurized aircraft, transport aboard nonpressurized aircraft and helicopters may be required. Rapid decompression may be experienced in pressurized aircraft. With the reduction of atmospheric pressure, the gases present within the body tend to expand in accordance with Boyle's Law. If unable to escape, this pressure may rupture the containing walls of the cavity or impair circulation. The use of pressurized splints and MAST trousers pose similar problems. There is a well-documented incident in which MAST

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trousers were used to stabilize a wounded patient. After the flight, the patient's feet were pulseless which ultimately lead to bilateral lower extremity amputations. Ideally, the patient's cardiovascular status should be stabilized before air transport - unless precluded by battlefield conditions.

Decreased Oxygen Tension

The decreased oxygen tension associated with reduced atmospheric pressure may have significant adverse effects. Oxygen saturation is decreased only slightly at cabin altitudes in pressurized aircraft and in flight below 10,000 msl in unpressurized aircraft. However, this reduction can be critical in patients with marginal sea level tissue oxygenation. Patients, at risk, include those with anemia, recent acute blood loss, impaired pulmonary function, cardiac failure, organic heart disease or sickle cell trait. Essentially, low flow O₂ is practically never contraindicated.

Dehydration

The relative humidity at altitude is reduced in both pressurized and unpressurized aircraft. Dehydration may represent a risk to the unconscious, marginally hydrated patient. Patients with tracheostomies or those who must breathe through their mouths may require humidified air or oxygen to prevent drying of respiratory secretions. Corneal drying in comatose patients may be averted by holding their eyelids closed with moistened cotton pads under eye shields.

Motion Sickness

There is a low incidence of motion sickness in large jet aircraft flying at altitude. However, motion sickness is more frequently encountered in helicopters and small aircraft operating at lower altitudes. Prior administration of antihistamines (25 to 50 mg of meclizine, 50 mg of cyclizine or 50 mg of dimenhydrinate) or "scopodex" (0.6 mg of scopolamine mg of d-amphetamine) may reduce symptoms if not medically contraindicated.

Fatigue and Inactivity

The ambulatory patient is sometimes transported aboard operational aircraft. In troop transport aircraft, the crowded seat configuration may discourage the patient from moving around during the flight. The enforced inactivity together with the anxiety and apprehension associated with illness may produce more fatigue than would be expected. Some geographical considerations dictate aeromedical evacuation in ejection seat equipped aircraft (such as the US-3A in the Indian Ocean). Such missions require careful estimation of risks and benefits.

Medical Conditions Requiring Special Management

Cardiovascular Diseases

Supplemental oxygen should be available in flight and vasodilating drugs should be provided for those patients with symptomatic angina pectoris. Cabin altitude should not exceed 6,000 msl. Patients in congestive failure or with a history of any myocardial infarction within eight weeks of the acute episode must be evaluated on a case-by-case basis prior to transportation. The American

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College of Chest Physicians recommends that a cabin altitude not exceed 2,000 ft msl without supplemental oxygen for such patients.

Pulmonary Diseases

In patients with artificial, traumatic or spontaneous pneumothorax, movement by air should be deferred until radiographic studies demonstrate gas absorption. However, if the volume of gas remaining is small, restriction of altitude may enhance safe movement. Chest tubes may be left in place, but the Heimlich Valve must be applied. All flight attendants must be instructed in the proper use and function of the Heimlich valve. Patients should not be airlifted for 72 to 96 hours after chest tube removal and a roentgenogram should be obtained within 24 hours of flight to document full lung expansion. Advise the receiving facility of the importance of a repeat chest X-Ray when the flight is completed.

Anemia

Patients with severe anemia or recent acute blood loss should have a hematocrit of above 30 percent prior to entering the aeromedical evacuation system. Hematocrit should be checked within 36 hours prior to flight. Patients with sickle cell trait pose additional risks. The use of a portable SAO₂ Monitor in flight is recommended. The presence of an acute infectious process in those patients experiencing reduced oxygen partial pressure may precipitate a sickling crisis manifested by sickle cell anemia, vomiting, and left upper quadrant pain.

Gastrointestinal Diseases

Large unreduced hernias, volvulus, intussusception, and ileus are particularly susceptible to trapped gas phenomena. The circulation of the involved bowel loop may be severely compromised from trapped gas expansion. Air transport of these patients should usually be deferred until after definitive therapy and recovery. If transport is mandatory, it can usually be accomplished safely if altitude is restricted. It is conceivable that weakened viscus walls in peptic, amoebic, typhoid, or tuberculous ulcers could rupture from the pressures of gas expansion. Disruption of a surgical incision postoperatively due to intra-abdominal gas expansion is a threat. A 10 to 14-day convalescence period prior to aeromedical evacuation is recommended after abdominal surgery if possible. Colostomy patients evacuated by air require an extra supply of colostomy bags and dressings.

Orthopedic Patients

Casts should be clearly marked with the date of application and the nature of the fracture or surgical procedure performed. All casts, including the underlying web rolling and padding, should be bivalved to allow for soft tissue swelling at altitude. The air splints commonly used for initial stabilization pose a similar potential problem and must be constantly monitored during flight and adjusted to prevent any tourniquet effect. It is preferable to use wire-ladder splints, wood splints or plaster splints to stabilize fractures and severe sprains. Traction devices using swinging weights are unsuitable for use in flight from the standpoint of efficiency and safety. The Hare traction

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device is an extremely effective tension device for providing traction to the extremities. Paraplegic patients are generally moved on a Stryker frame to facilitate care and comfort during the flight. It is important that the entire frame accompany the patient since parts from various frames may not be interchangeable.

Eye Injuries and Diseases

Perforating damage to the globe is a common cause of aeromedical evacuation. Because the eye is normally liquid filled, it is not affected by barometric pressure changes. After surgery or trauma, air may be introduced. In such instances, a lower cabin altitude must be maintained in order to prevent barotrauma reopening the wound or separating the surgical incision. In patients having choroidal or retinal disease or injury, oxygen should be administered at cabin altitudes above 4,000 msl.

Ear, Nose, Throat Disease

The presence of an incidental upper respiratory infection may complicate aeromedical evacuations for other injuries or illnesses. Administration of decongestants may be considered to prevent barotrauma. Aeromedical evacuation of patients with facial fractures may be required. The facial sinuses may have been damaged and contain mixtures of air and fluid. The ostia may be plugged. The patients may be unable to Valsalva due to medication, or impairment of dexterity or cognition. Such cases should be carefully evaluated.

Skull Fractures

Any patient with a skull fracture which extends into a paranasal sinus, external ear canal or middle ear must be carefully evaluated. The possibility of air having entered the cranial cavity must be excluded. If air has entered the cranial cavity, aeromedical evacuation must be accomplished at cabin altitudes maintained at as near sea level as possible.

Mandibular Fracture

Commonly, mandibular fractures are wired to stabilize the jaw. Should the patient become airsick, he may be at risk for massive aspiration of vomitus. If aeromedical evacuation is anticipated, the patient's upper and lower jaws should be immobilized using elastic bands. An emergency release mechanism must be provided which can be activated by either the patient or the attendant. Unless the patient is Class IA or IB (psychiatric litter patients requiring restraints or tranquilizers) or under guard, he should have a pair of scissors attached to his person.

Evacuation Precedence and Classes

Patient precedence for aeromedical evacuation is classified into three groupings by OPNAVINST 4630.9C: urgent, priority, and routine.

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Urgent

Describes an emergency case which must be moved immediately in order to save life, limb, eyesight or prevent complication of serious illness. A special mission will be required to pick up the patient and deliver him to his destination medical facility. An aircraft already in the air may be diverted or an alert aircraft may be launched. By definition, psychiatric cases or terminal cases with very short life expectancy are not considered urgent.

Priority

For patients requiring prompt medical care not available locally. Such patients should be picked up within 24 hours and delivered with the least possible delay.

Routine

For patients who should be picked up within 72 hours and moved on routine scheduled flights. Several classes of patients are detailed in OPNAVINST 4630.9C. These are summarized as follows:

1. Class 1- Neuropsychiatric Patients

- a. Class 1A. Severe psychiatric litter patients who require restraints, sedation, and close supervision at all times.
- b. Class 1B. Intermediate severity psychiatric litter patients who are sedated but not restrained. Restraint equipment should be available if needed because patients may react badly to air travel or commit acts likely to endanger themselves or the aircraft safety.
- c. Class 1C. Psychiatric walking patients of moderate severity, who are cooperative and proved reliable under observation.

2. Class 2. Litter patients other than psychiatric.

- a. Class 2A. Immobile litter patients who are unable to move about on their own under any circumstances.
- b. Class 2B. Mobile litter patients who are able to move on their volition in an emergency.

3. Class 3. Walking patients (other than psychiatric) who require medical treatment, care, assistance, or observation en route.

Evacuation Decision Consideration

The medical officer must account for many factors when making decisions regarding the evacuation of patients. The flight surgeon may be called on to supervise the patient's care during initial aeromedical transportation to the carrier. It is important for the flight surgeon to be actively involved in patient care as early as possible. Requests for aeromedical consultation may be

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received by message, by telephone or radio from shore facilities, or from troops in the field or from other ships. Flight surgeons are uniquely qualified to consider the many factors involved which include:

1. Diagnosis and prognosis of the patient.
2. Facilities available ashore.
3. Transportation modalities ashore.
4. Holding and transfer facilities available ashore.
5. Diplomatic and legal aspects.
6. Patient and crew safety in aeromedical evacuation.
7. Stretcher capabilities.

Diagnosis and Prognosis of the Patient

A patient who is going to die without neurosurgical intervention or one who will lose a limb without a vascular graft represent one extreme. The other is the patient with an undiagnosed illness which might reflect a normal variation (or might be fatal if not treated early.) Of paramount concern is the urgency of treatment, the uncertainty of diagnosis, and an estimate of the effects of treatment delay or deferral on the patient's prognosis.

Facilities Available Ashore

Flight surgeons and senior medical officers should be aware of hospital capabilities in their cruising area. The Air Operations Officer can supply lists with nearby airfields and their facilities. The Port Directory usually has a description of nearby hospitals. A list of U.S. military hospitals and facilities is generally available in foreign areas. Consular and embassy staffs can provide great assistance in determining local medical facilities and the diplomatic and administrative procedures required for admission of patients. Previous cruise reports also may be useful. Discussions with force medical officers may be informative. Planning for such eventualities should be included in preparations for deployments. Certain geographic locations and tactical scenarios may dictate prolonged stabilization and treatment aboard the carrier rather than transfer to inadequate facilities ashore

Transportation Modalities Ashore

Helicopter transfer to the selected hospital is the preferred method. Use of suitable ground or small ship alternatives may be required. Geographical considerations may require transportation via

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Carrier Onboard Delivery (COD) aircraft or air wing assets to a suitable airfield, with transfer to a hospital or awaiting Military Aircraft Command (MAC) aeromedical aircraft.

Holding and Transfer Facilities

Patients may have to be held pending transfer to other means of transportation. Facilities for such transfer must be appropriate. This should be included in the aeromedical evacuation plan.

Diplomatic and Legal Factors

Diplomatic considerations must be entertained for the nation in which the hospital and any en route airfield are located. Diplomatic clearance or other administrative procedures may require delays that the exceed time available.

Patient and Crew Safety in Aeromedical Evacuation

Safety of the crew of a helicopter or COD aircraft is a further consideration. It is far better to keep a questionable case on board than to subject the patient, crew, and aircraft to a flight made unsafe by reason of inclement weather, crew fatigue, enemy action, or mechanical unreliability. Aircrews often accept excess risk for medical evacuation missions. The flight surgeon must be aware of this when making evacuation decisions. He must consider the many facets of the problems mentioned here plus factors which will become apparent only on the scene and at the time. Each facet exerts its own influence as a determinant in the decision making process. Many aircraft and crews have been lost because they were launched on missions that proper prelaunch medical evaluation would have cancelled. The flight surgeon and senior medical officer must be integrated into the ship's command structure to ensure early notification and planning for medical evacuation eventualities.

Stretcher Capabilities

Three types of stretchers may be available on ships for medical use: Stokes (rigid), Neil-Robertson (semirigid), and the field (pole litter).

The Stokes Stretcher. The Stokes stretcher is a wire basket with a frame. It is contoured to give support to the occupant and to keep the frame between the patient and possible impacting objects. It has a wooden slat frame in the torso section, lines attached to the head and foot for lifting, and straps at the torso and midleg to restrain the patient. It is light, strong and usually readily available. Once a patient is properly placed on a Stokes litter, he can be transported directly to sickbay for care, carried to the flight deck, loaded aboard a helicopter and flown to more definitive medical treatment facilities, all without transferring him from the original stretcher.

The Neil-Robertson Stretcher. The Neil-Robertson semirigid stretcher is specifically designed to allow the patient to be packaged in the smallest possible volume. Thus he may be moved through restricted openings in the shipboard environment. Greater care must be utilized in transporting patients in the semirigid stretcher aboard ships because the stretcher offers minimal protection from aggravating existing or causing additional injuries during transport. The advantage of this

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stretcher is that it can be used in spaces where the Stokes rigid stretcher cannot be employed. It can also be lifted vertically in the escape trunk. It is the stretcher of choice in patient evacuation from or through confined spaces and restricted passages.

The Field Stretcher. The field stretcher or pole litter is carried aboard the ship primarily for use by the Marines and by landing parties. It occupies less floor space than the Stokes rigid litter and gives greater protection than a Neil-Robertson semirigid litter. However, it is inadequate for patient transportation from confined spaces. It is the required stretcher for MAC flights. It is the usual stretcher for helicopter medical evacuation flights. A Stokes litter is preferred if a patient will be catapulted from the carrier because of the additional protection from acceleration stresses. With the field stretcher, an air mattress must be used to give comfort comparable to that of a Stokes litter.

Aircraft Capability Considerations

The U.S. Navy and Marine Corps have no aircraft dedicated to aeromedical evacuation due to limited aircraft and flight deck capability. Instead, tactical aircraft must be diverted from operational assignments to perform aeromedical missions. This can pose significant problems and requires thoughtful interaction between the medical department, the receiving medical treatment facility, the air operations department, and other line organizations. Aboard the aircraft carrier, the senior flight surgeon should be intimately involved with all aeromedical evacuation operations from beginning to end. Aboard other aviation capable ships, the senior medical department representative or general medical officer should remain cognizant of medical evacuations. These represent high risk operations for the patient and other assets and demand thorough preparation.

Various military aircraft may be available for aeromedical evacuation. Fixed wing assets may include the C-130, C-9, C-141, C-5A, C-12, and P-3C. Helicopter assets may include the UH-1N, SH-2F, SH-3G, CH-46E, CH-53D, and SH-60B. However, capabilities and availabilities may vary considerably. Similar aircraft may have different capabilities due to installed equipment such as OMEGA navigation equipment, VHF communication radios, extended range fuel tanks, extended life rotor head bearings, etc. Such factors can mean the difference between success and failure for aeromedical evacuation missions. Flight surgeons must be aware of available aviation assets, their capabilities and procedures for obtaining those assets.

Aeromedical evacuation is undertaken to transport a patient to a more capable medical treatment facility, either afloat or ashore. Thus, patients may be transferred from destroyers and frigates to the aircraft carrier to utilize expanded diagnostic and treatment capabilities. Similarly, patients may be transported from the carrier to shore facilities for diagnostic and therapeutic reasons. Normally, the flight surgeon is concerned with forward, tactical, and certain intratheater aeromedical evacuations.

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Military Airlift Command Aeromedical Evacuation System

A cost effectiveness study was completed following World War II which showed aeromedical evacuation was more beneficial to the patient than surface evacuation. It also saved attendant time and resulted in better utilization of crew members and trained medical personnel. The Secretary of Defense in 1949 directed that evacuation of sick and wounded military personnel would be accomplished by air in both peace and war. Hospital ships and surface transportation might be utilized if deemed necessary in unusual situations. That policy was formalized in OPNAVINST 4630.9 series which limits aeromedical evacuation functions to units assigned to that mission. Local aviation assets may be used for aeromedical missions for medical urgent situations. The base commanding officer and medical officer must determine that utilizing routine aeromedical evacuation services is likely to endanger life, limb or cause a serious complications resulting in permanent loss of patient function.

Types of Aeromedical Evaluation Flights

OPNAVINST 4630.9 distinguishes various types of aeromedical evacuation flights based in part on origin and destination. Domestic aeromedical evacuation provides airlift for patients between points within CONUS and near offshore installations. Intertheater evacuation provides airlifts for patients between medical treatment facilities inside the combat zone and outside the combat zone. Forward aeromedical flights are limited to flights for patients between points within the battlefield and from the battlefield to the initial point of treatment and subsequent points of treatment within the combat zone. The Navy overseas commander is responsible for routes solely of interest to the Navy and Marine Corps when the Air Force cannot provide the services.

Aeromedical Evacuation Network

The Air Force Military Airlift Command (MAC) operates a world wide network of aeromedical flights and support facilities. The global system can be divided into three areas, each with its own command: the domestic system, the Pacific system, and the Atlantic system.

Domestic System. The domestic system supports CONUS, Caribbean and Northeast Atlantic, centered at Scott Air Force Base, Illinois. There are "trunk" and "feeder" lines to support the seven MAC aeromedical units: Scott AFB, Illinois; Lowry AFB, Colorado; Travis AFB, California; Kelly AFB, Texas; Maxwell AFB, Alabama; Andrews AFB, Maryland, and McGuire AFB, New Jersey.

Pacific System. The Pacific system operates from Hickam AFB, Hawaii and supports the Pacific fleet area.

Atlantic System. The Atlantic system operates from Rhein-Main AFB, Germany for flights in Europe and the Atlantic area.

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Staging Facilities. At selected sites along the air evacuation routes are Aeromedical Staging Facilities. The medical facilities provide reception, processing, ground transportation, feeding, and limited medical care for patients entering, en route, or leaving the aeromedical evacuation system. Similar in function, but more highly mobile are the Mobile Aeromedical Staging Facilities for use in combat zones.

Criteria for Aeromedical Evacuation

As much as possible, MAC will meet the following criteria in providing aeromedical evacuation services: Again, JHSS wartime considerations will now permit movement of critical patients.

1. Movement of patients within CONUS shall be no later than 36 hours after arrival.
2. Patients shall be delivered to their destination within 72 hours after entry into the domestic system.
3. There shall be an average of not more than one overnight (RON) stop between entry into the domestic system and delivery at the destination.
4. A RON stop shall not exceed 36 hours.
5. Time in transit shall not exceed 18 hours prior to an RON stop for rest and recuperation.

Humanitarian Aeromedical Evacuation

For purposes of air transportation eligibility, DOD regulation 4515.13R divides patients into U.S. armed forces and non-U.S. armed forces categories. U.S. armed forces patients are by definition active duty or eligible retired members of the armed forces, dependents of eligible active duty service members or retired members under provision of SECNAVINST 6320.8, or U.S. citizen civilian employees of the Department of Defense and their lawful dependents when stationed outside CONUS.

Emergency lifesaving aeromedical transportation is authorized for non-U.S. armed forces patients satisfying the following criteria.

1. The patient's illness or injury is an immediate threat to life.
2. The medical capabilities in the patient's immediate geo- graphical area are not adequate for diagnosis and treatment under generally accepted medical standards. In these cases, transportation will be furnished only to a medical treatment facility which can provide the necessary treatment.
3. Suitable commercial transportation is not available.

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Non-U.S. armed forces patients will not be accepted for movement if their condition is terminal or if the only reason to request military transportation is lack of personal funds, personal or family convenience, or medical experimentation (unless competent medical authority determines that such experimentation will save a life).

Patient Preparation

Proper patient preparation is critical. Well thought out medical evacuation preparations will reduce morbidity and mortality. A five minute helicopter flight to a nearby medical facility may require limited planning and preparations. Major planning is required for an aeromedical evacuation that includes a long helicopter flight to meet with a MAC aeromedical evacuation airplane at a foreign airport with further transport to a distant tertiary care hospital. It is probably better to over plan such activities than to have problems during the transport. Patient preparations include the following:

1. Brief the Patient

The patient should be briefed regarding his medical condition, medications, emergency procedures and prognosis. He should be familiar with the aeromedical system, routing, baggage limitations, need for personal funds, appropriate uniform, destination hospital, and any other, information.

2. Patient Medical Treatment Records

The patient's medical records, narrative summary and other medical information should be included. Prudence requires making copies of this information prior to transfer. Sending patients with inadequate medical documentation does a disservice to the patient and the receiving treatment facility. Do not neglect to send X-Rays.

3. Patient Personal Records

The patient must carry his military identification card and official orders. Personnel records, baggage, and other personal items may have to be gathered and sent along with the patient.

4. Medical Support Equipment, Supplies, and Medication

Sufficient medical support equipment, supplies, and medication for five days should accompany the patient. All drugs should have the name, strength, dosage, or prescription affixed. Extra batteries, bandages, IV fluid and tubing, or other needed items should be included, particularly for a complicated transfer. Reliance on other sources of medical equipment is fraught with problems. A fly-away medical kit should be maintained by the medical department since rapid response may be required.

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5. Medical Readiness for Transfer

Ensure Maximal Medical Readiness for Transfer.

- a. Give preflight medications as needed.
- b. Transfuse patients with hematocrit less than 30 per cent. Give IV fluids when required as close to departure time as possible, with access maintained as appropriate.
- c. Apply indwelling catheters in cases requiring frequent catheterization. Supply irrigation solution if required.
- d. Apply clean dressings as near the time of departure as possible, particularly for colostomies, draining wounds, burns, and pressure sores. Ensure that adequate dressing supplies accompany the patient.
- e. For patients with mandibular fractures, immobilize upper and lower jaws with elastic bands rather than wire, and provide an emergency release mechanism. For a patient with immobilized jaws, ensure that a pair of scissors is attached to his person unless he is a Class 1A or 1B patient or under guard.
- f. Bivalve all casts which are applied within 24 hours of departure.
- g. Sedate neuropsychiatric Class 1A or 1B patients and deliver them to the aircraft in a litter dressed in pajamas.
- h. Apply restraints to all Class 1A patients and to any Class 1B patients who are combative, suicidal, violent, or considered doubtful.

6. Medical Attendant

The patient should be accompanied by appropriate medical personnel. This may include a medical officer or corpsman. The needs of the patient must be balanced against the operational needs of the ship or unit. The attendant must have appropriate orders (with TANGO numbers), funding, uniforms, civilian clothes, passports, medical equipment, medications, or other necessary items.

7. Follow-up

The ship's medical department should follow up the medical evacuation. The status of the patient should be monitored throughout the transport and thereafter. The medical department, the patient's

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command, and his shipmates have an interest in him and his welfare. Requests for updates via message may be considered at ten day intervals after transfer.

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APPENDIX

CHECKLIST FOR AEROMEDICAL EVACUATION PROCEDURES

1. Evaluate the patient and the situation.
 - a. Is the patient stable enough to be transported?
 - b. How soon should the patient be transported?
 - c. Are medical evacuation assets available to pick up the patient and deliver him to adequate facilities?
 2. Notify the ship's captain of the need for medical evacuation.
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- a. This is a recommendation, the captain may decide against evacuation for reasons known only to himself. Ship's company and air assets will be as supportive as possible.
- b. Coordinate with accepting facility and transporting agency.
- 3. Provide for medical needs for evacuation.
 - a. Assure sufficient equipment, supplies, and medications are available for medical evacuation (e.g., oxygen, IV fluids and tubing, splints, blankets, helmets, cranials, flotation devices). A fly-away bag should be maintained with common requirements, medications and equipment for delays enroute.
 - b. Label each medical container with name, rank or rate, SSN, generic name, dosage rate, and date.
 - c. Provide clear instructions for medications, equipments, and supplies.
- 4. Ensure that manifest and personal identification requirements are met.
 - a. Provide manifest as per BUMEDINST 4650.2A DD form 601.
 - b. Ensure patient identification per BUMEDINST 4650.1A DD form 602.
 - c. Courtesy suggests a list of all patients in the flight should be sent to the accepting facility's senior medical officer. The list should include name, rank or rate, SSN, diagnosis, medications and special requirements.
- 5. Ensure that record requirements are met. Records should be enclosed in a large, sealed manila envelope clearly labeled with name, rank or rate, SSN, destination, and diagnosis.
 - a. Health record, including outpatient, inpatient with completed narrative summary describing problems (history, physical examination, laboratory, medications, and plan). A copy of appropriate records should be maintained if possible.
 - b. Dental records.
 - c. Pay records, service record book, etc.
 - d. Passport, official orders with TANGO number, etc.
- 6. Prepare medevac crew.

AEROMEDICAL EVACUATION

- a. Advise the pilot or HAC of the patient's condition. Make recommendations about flight altitude, pressurization requirements, equipment requirements, duration of expendables, handling of emergencies, etc. Request that the pilot or HAC notify the receiving authority 5 to 10 minutes prior to arrival. Inform the pilot or HAC to expect updates on the medical condition periodically during the flight.
- b. Brief aircrewman on the status of the patient and the need to make regular reports to the pilot or HAC on the patient's status. He also should be made aware of the patient's special needs.
- c. Prepare the medical attendant. He must know the diagnosis, medications and their administration, and how to use equipment and supplies. The medical attendant must also have appropriate clothes, ditty bag, official orders (including TANGO number), passport, money, credit cards, etc.

7. Brief the patient.

- a. Medical conditions, requirements for transfer, anticipated flight conditions, duration of flight, destination.
 - b. Emergency escape procedures.
 - c. Special equipment utilization and function.
- ### **8. Notify the receiving medical authority before the flight departs.**
- a. Name, rank or rate, and SSN of patient.
 - b. Diagnosis, symptoms, and reason for transfer.
 - c. Equipment, medication, and supplies.
 - d. Destination and ETA.