

# TOP KNIFE FIGHTER SURGEON COURSE

173 Fighter Wing  
Kingsley Field Oregon

RSV-2A

MEDICAL CLEARANCE FOR  
AEROMEDICAL EVACUATION

# Criterion Referenced Objectives

- Identify the components of the Aeromedical Evacuation System
- Identify the referring physician responsibilities
- Describe the medical validation and clearance process

# Overview

- The Aeromedical Evacuation System
- Referring physician responsibilities
- Reporting a patient for AE
- Contraindications to AE
- Medical clearance for specific conditions

# Aeromedical Evacuation System

- AES provides movement capability
  - Control casualty movement by air
  - Primary mission: Evacuate casualties from combat zone
  - CCATT capability
  - Ground based facilities and personnel to process, stage, and provide limited medical care for patients entering or transiting AES
  - Command and control of theater AES ops

# Specialized Medical Crews

- CCATT – Critical Care Air Transport Team
  - Critical care doc, critical care RN, cardiopulmonary technician
  - Able to transport critically ill patients
  - Theater validating flight surgeon in PRMC coordinates with sending MTF physician to determine when appropriate

# AES Medical Crew

- MCD – Medical Crew Director
- FN – Flight Nurse
- CMT – Charge Medical Technician
- AET – Aeromedical Evacuation Technician



# Patient Movement Definitions

- Aeromedical Evacuation (AE) – USAF Fixed Wing System
- Medical Evacuation (MEDEVAC) – Army rotary wing system
- Casualty Evacuation (CASEVAC) – Generic, unregulated movement

# AES

- When aeromedical staging facility (ASF) exists locally
  - Medical consultation for transient patients requiring special care
  - Daily evaluation by local flight surgeon
- When no local ASF
  - Local flight surgeon reviews records of transient patients and sees patients with problems en route



# Patient Movement Requirements Center

- Global Patient Movement Requirements Center (GPMRC), Scott AFB IL
  - Coordinates movement worldwide
- Theater Patient Movement Requirements Center (TPMRC)
  - Coordinates movement out of theater and within AOR
- Joint Patient Movement Requirements Center (JPMRC)
  - AE movement within combat zone

# PMRCs

- Validate, coordinate, communicate patient movement requirements within and from respective AORs



# Requests and Requirements

- Physicians at originating or accepting facilities submit requests for movement, timing, destination, suggested support therapies
  - Initiate Patient Movement Request (PMR)
- Patient Administrative Director (PAD), Medical Regulating Officer, or Administrative Clerk/Technician send PMR to servicing PMRC
  - Use USTRANSCOM Regulating Command & Control Evacuation System (TRAC2ES)
  - TRAC2ES gives In-transit Visibility (ITV)

# Requests and Requirements

- Validating Flight Surgeon (VFS) and the PMRC validate requests
  - PMR reviewed by Patient Movement Clinical Coordinator (PMCC)
  - Transformed into airlift requirements
  - Aeromedical evacuation airlift planners of AE Control Team in Air Mobility Division recognize and respond only to validated requirements
- AF Form 3899 used for in-transit record of patient care

# Validation and Clearance

- Validation – logistic event
  - Occurs at PMRC
  - VFS brings medical leadership/decision making to the process of prioritizing use of scarce aviation assets
  - VFS does flight surgeon common sense check on whether the patient should fly at all
- Aeromedical clearance – medical event
  - Occurs at MTF
  - Medical condition of the patient
  - Able to survive transit through an aviation environment?
  - What patient needs to make trip safely

# Reporting a Patient for AE

- Originating physician consults local flight surgeon
  - Define level of care and plan of care needed en route
  - Patients must be stabilized (ABCs, fx care)
  - IVs and catheters initiated before flight
  - Ordinarily should be able to tolerate 12 hr bed-to-bed move
  - If moving OCONUS-CONUS should be able to tolerate 24 hr bed-to-bed move

# Referring Physician Responsibilities

## Cont.

- Informed consent for transfer
- Valid indication for transfer
- Obtain accepting physician
- Pre-transfer medical screening and prep
- Communicate condition, AE category and precedence of patient to accepting physician and GPMRC

# Patient Categories

- Urgent
  - Save life, limb, or eyesight
  - Evacuate ASAP
- Priority
  - Evacuate within 24 hours
- Routine
  - Evacuate within 72 hours





# Patient Classification

- AE codes identify needs for litter, etc
- 1A-C – Psychiatric
- 2A/A – Litter
- 3A-C – Ambulatory
- 4A-E – Infant (under 3 years)
- 5A-F – Outpatient
- 6A/B – Attendant

# Contraindications to AE

- Imminent death is the only contraindication
  - In general, we do not move a patient who is expected to die en route via AE
  - Angel Flights are possible
- **ANYTHING ELSE** *can* go, but *should* it?
  - See specific conditions

# AES Critical Issues

- Attendants and flight surgeons should remain aware of these areas at the least
  - Patient history, especially recent surgery
  - Hgb/Hct
  - Acute blood loss
  - Heart disease
  - DCS
  - Sickle cell trait
  - Special diet
  - Supply of medications

# Specific Conditions

- Alcohol and drug abuse
  - No specific operational stresses of flight
  - Alcohol abuse patients detoxed 72 hrs prior to flight
  - Drug abuse patients must be detoxed prior to AE
- Anemia
  - Most anemic patients safely moved by air with supplemental O<sub>2</sub> Hgb less than 8.5 gm/100 ml: transfusion prior to transport should be considered
  - Current Hgb/Hct, date of last transfusion, if any
  - Stress of flight is decreased partial pressure of O<sub>2</sub> at altitude

# Specific Conditions

- Burns

- Reporting requirements – degree and percent burn, resuscitative measures taken, patient's respiratory status.
- Stresses of flight – decreased partial pressure of oxygen, thermal, decreased humidity, motion sickness. Countermeasures – O<sub>2</sub> for flight, thermal blanket; may need increased fluids, Foley, monitor I & Os, do not place burn dressings over IV sites; consider NG tube and antiemetics

# Specific Conditions

- Cardiac Patients
  - If h/o CAD, give the date of last MI, date of last angina, activity limitations, any dysrhythmias, whether pt requires cardiac monitor, current status
  - Operational stresses of flight – decreased partial pressure of O<sub>2</sub>
  - Countermeasures – O<sub>2</sub> for the flight, pulsox, altitude restriction.
  - If on monitor, ACLS attendant required and patient may require IV access.
  - If AE necessary despite recent cardiac complications, cardiac monitor and medical attendant required.



# Specific Conditions

- DCS
  - Reporting requirements – type of DCS, treatment measures taken, current status
  - Operational stress of flight – decreased barometric pressure
  - Countermeasures – Intravenous line, 100 percent oxygen by a tight fitting aviator's mask, fly at cabin altitude equal to the field level of the destination airfield



# Specific Conditions

- Diabetes
  - Reporting requirements – Whether pt is insulin dependent, insulin dose, blood sugar monitoring method/frequency, sliding scale for treatment coverage, baseline fasting blood sugar.
  - No specific stresses of flight but long days and crossing multiple time zones may conflict with regular meals and dosing schedules
  - Countermeasures – Ordering correct diet and sliding scale, counseling pt on how to adjust meals and dosing schedules when crossing time zones

# Specific Conditions

- Ear, Nose and Throat (ENT)
  - Reporting requirements - Whether pt able to clear ears, an air-fluid level in sinuses, cleared to fly by an ENT physician or by a flight surgeon, wired jaws?
  - Stresses of flight - Barometric pressure changes
  - Countermeasures - Altitude restriction, oral or topical decongestants, wire cutters or a quick release device. Antiemetics considered for wired jaws.

# Specific Conditions

- Gastrointestinal
  - Effects of gas expansion and any process that can weaken intestinal wall, (infection, infestation, ulceration) are potential sources of ruptured viscous at altitude.
  - Acute appendicitis, acute diverticulitis, strangulated hernias, or any degree of intestinal obstruction make poor candidates
  - Delay AE considered if recent gastrointestinal surgery to avoid increased pressure on bowel suture line
  - Reporting requirements – Ileus of any cause
  - Stress of flight – Decreased barometric pressure
  - NG, rectal tubes used when appropriate when absolutely necessary to airlift pt with GI path. Also NPO, IV hydration, suctioning available, and consider cabin altitude restriction

# Specific Conditions

- Hemorrhage
  - Reporting requirements - H/H; bleeding stopped
  - Stresses of flight – Decreased partial pressure  $O_2$
  - Countermeasures –  $O_2$
- HIV Patients
  - Universal precautions
- Unaccompanied Minor/Incompetent Patient
  - Reporting requirements - Whether pt competent to direct his/her own medical care
  - No specific stresses of flight for these pts
  - DD Form 2239, Consent for Medical Care and Transportation in the Aeromedical Evacuation System, completed, attached to DD Form 602



# Specific Conditions

- Infectious Disease
  - Reporting requirements - Whether disease communicable, isolation needed, TB suspected
    - If treated for TB, confirmed non-infectious, or TB drug resistant?
    - No specific stresses of flight but enclosed environment causes increased risk for transmission of communicable diseases
      - Not acceptable during infectious phase unless the properly isolated, adequate protection for others
      - If AE necessary, PMRC and consulting flight surgeon will apply Center for Disease Control (CDC) and Occupational Safety and Health Administration (OSHA) guidelines
      - Mask required for suspected or known TB not yet confirmed to be non-infectious



# Specific Conditions

- Neurological
  - Reporting requirements - Current neurological status; type, duration, degree of control of any sz's, date of last sz, whether on anti-sz meds; increased ICP; date of neurosurgery
  - Stresses of flight – Decreased barometric pressure, noise, vibration, thermal stress
  - Aircraft environment makes detection of subtle neurologic changes difficult
  - Recent skull fracture or craniotomy needs eval for presence of air in cranial vault
  - Leakage of CSF can allow air into skull
    - Altitude restriction if any chance intracranial air

# Specific Conditions

- Neurological patients cont.
  - Craniotomy pts must be 48 hours status post surgery, awake, alert
  - If increased ICP, do not valsalva; preflight decongestants and myringotomy tubes considered
  - Myringotomy tubes may be needed for comatose
  - Anti-sz meds considered



# Specific Conditions

- Neutropenia
  - Reporting requirements – Current WBC, absolute neutrophils, if isolation required
  - No specific stresses of flight
  - Reverse isolation possible, but aircraft is crowded, dirty environment

# Specific Conditions

- Obstetrics
  - Can move up to 36th week
  - Restrained in seats using double litter straps with small pillow between abdomen and straps
  - Screen for h/o air sickness, appropriate measures ordered when indicated
  - Reporting requirements – Gravida, para, weeks gestation, fetal heart tones, complications, status of membranes
  - If contractions, frequency, duration, status of cervix, station of the presenting part
  - No specific stresses of flight
  - If on IV drip for preeclampsia or premature labor, medical attendant required

# Specific Conditions

- Ophthalmology
  - Eye sensitive to hypoxia; IOT rises with hypoxia
  - Perforated eye further damaged if loss of cabin pressure
  - Free air in orbit must be ruled out with significant eye trauma
  - Supplemental oxygen provided with serious eye pathology
  - Reporting requirements – Vision status, nature of injury, air in globe, special positioning requirements
  - Stresses of flight – Decreased barometric pressure
  - Countermeasures – Altitude restriction for air in globe

# Specific Conditions

- Orthopedics
  - Specific reporting requirements - Cast, neurovascular status, traction
  - Stresses of flight – Decreased barometric pressure
  - Recent fractures casted and bivalved at least 48 hours prior to flight
  - Cast cutters not routinely carried on aircraft
  - If jaws immobilized, must have quick release devices or have wire cutters
  - Swinging weights not allowed
  - NATO or Collins traction available but applied by physician
  - Hare traction splint should also be considered

# Specific Conditions

- Pediatric
  - Reporting requirements – Any apnea episodes, what stimulation used to initiate breathing
  - Stresses of flight – Thermal, decreased humidity
  - Pulsox and /or a cardiac monitor should be used for AE
  - Consider ALSS incubator for neonates, small infants
  - If unaccompanied DD Form 2239



# Specific Conditions

- Post-operative patients
  - Reporting requirements – Date of surgery, complications, ileus, current status of patient and incision
  - Stresses of flight - Decreased barometric pressure for ileus
  - Countermeasures - Same as GI pts above
  - Some debilitated pts may have compromised respiratory system
    - If require evacuation, decreased partial pressure of oxygen may require supplemental O<sub>2</sub> or altitude restriction

# Specific Conditions

- Psychiatric Patients
  - Reporting requirements – Homicidal or suicidal, psychotic, in need of one-on-one care, elopement risk
  - Unless contraindicated, most pts sedated prior to transport, with order for PRN sedation
  - Class 1A pts in restraints, 1B pts restraints available
  - If one-on-one care needed, may require attendant per PMRC
  - Cooperative pts proven reliable under direct observation may not need sedation or restraints, 1C classification



# Specific Conditions

- Pulmonary Patients
  - Reporting requirements – Pulmonary status, need for O<sub>2</sub>, CO<sub>2</sub> retention, pneumothorax, chest tube(s), TB status (see ID section)
  - Stresses of flight – Decreased partial pressure O<sub>2</sub> even on vent and 100% O<sub>2</sub>, decreased barometric pressure, decreased humidity
  - Countermeasures - O<sub>2</sub>, pulsox, altitude restriction as appropriate. If PTX, chest tube(s) required with Heimlich valve attached. If require suction, Pleur-Evac unit as well
  - Should not be airlifted within 24 hrs chest tube removal, only after CXR read
    - Send CXR with pt
  - Vent pts accompanied by medical attendant capable of managing vent and reintubating

# Specific Conditions

- Renal Patients
  - Reporting requirements - Type of renal disease, dialysis schedule
  - Stresses of flight - Decreased partial pressure  $O_2$  for anemic pts
  - Hemodialysis pts considered special moves
    - Movement, dialysis schedule coordinated
    - Peritoneal dialysis pts need enough supplies for minimum 3 days enroute
  - Low H/H need  $O_2$  titrated using pulsox

# Specific Conditions

- Sickle Cell
  - Reporting requirements - Trait or disease, crisis precipitating events
  - Stress of flight – Decreased partial pressure of O<sub>2</sub> (sickling)
    - Alveolar PO<sub>2</sub> at 10,000 ft low for sickling
    - Supplemental O<sub>2</sub> and hydration (oral or IV)
  - Usually no restrictions for trait

# Specific Conditions

- Spinal Cord Injuries
  - Reporting requirements - Level of injury and deficit, stability of injury, surgery
  - No specific stresses of flight but handling pt and aircraft vibration risk for neurologic compromise
  - Spinal immobilization/stabilization vital! Stryker frame pts turned after 2 hrs supine, 1 hr prone
  - Frame placed securely on carriage base resting on wooden blocks to lessen vibration
  - Secured to aircraft floor with D-rings and ratchet tie downs
  - Collins traction applied at originating facility



# Summary

- Learn the AES and your responsibilities as a referring physician or in the ASF
- Learn the appropriate reporting procedures
- Almost any patient *can* be moved through AES, but consider if it is wise
- Most stresses of flight are related to low  $PO_2$  and decreased barometric pressure
- Next slide for quiz instructions

- [Go to quiz](#)
- Enter your answers on the [answer sheet](#)
- Print only one answer sheet for entire course
- Press ESC to go back to main menu