

LIFELIGHT OF MAINE
GUIDELINES FOR HELICOPTER TRANSPORT

I. GENERAL GUIDELINES

Many patients who require transport to centers with specialized or tertiary level resources are appropriate for transport by ground ambulance. A select group of patients may benefit from the advantages that helicopter transport can offer. These advantages include:

- Decreased response time and length of transport
- Availability of highly trained medical crews and specialized equipment
- Increased access to tertiary and definitive care facilities when the patient requires specific or timely treatment which is not available at the referring hospital or facility

Even though the guidelines below are useful, they are not necessarily all-inclusive and should not replace decisions about transport based on sound medical judgement. It is likely that patients appropriate for helicopter transport would have medical conditions that fulfill one or more of the general criteria listed below, and would as well include one or more of the specific criteria, which follow.

Some general criteria include:

1. The patient requires critical care life support (monitoring, personnel, medications, or specific equipment) during transport that is not available from the local ground ambulance service.
2. The patient's clinical condition requires that the time spent out of the hospital environment (in transport mode) be as short as possible.
3. The potential for delays which may be associated with ground transport is likely to worsen the patient's clinical status.
4. The patient is located in an area which is inaccessible to regular ground traffic.
5. The use of local ground transport team would leave the local area without adequate EMS coverage.

II. SPECIFIC GUIDELINES

- A. **TRAUMA** – Patient at Scene: Maine EMS Prehospital Trauma Triage Protocol (Attached Appendix A)
- B. **TRAUMA** – Patient at Hospital:

1. Central Nervous System

Spinal cord injury or major vertebral injury

Head injury with one or more of the following:

- Lateralizing signs
- Penetrating injury or open fracture (with or without CSF leak)
- Depressed skull fracture
- Glasgow Coma Scale < 12 or deterioration GCS
- For Scene Responses (please see Maine EMS Trauma Triage Protocol attached)

2. Chest

- Major chest wall injury
- Wide mediastinum or other signs suggesting great vessel injury
- Cardiac injury
- Patients who may require prolonged ventilation

3. Pelvis

- Unstable pelvic ring disruption
- Open pelvic fracture
- Unstable pelvic fracture with shock or other evidence of continuing hemorrhage

4. Major extremity injuries

- Fracture/dislocation with loss of distal pulses
- Open long-bone fractures
- Extremity ischemia

5. Multiple system injury

- Head injury combined with face, chest, abdominal or pelvic injury
- Burns
 - with associated injuries
 - greater than 20% total body surface area
 - involving the respiratory system
 - involving face, head, feet, hands, or genitalia
 - electrical burns
- Multiple long-bone fractures
- Injury to more than two body regions

6. Secondary deterioration (late sequelae of trauma)

- Respiratory failure with mechanical ventilation required
- Sepsis
- Single or multiple organ system failure (deterioration in central nervous, cardiac, pulmonary, hepatic, renal, or coagulation systems)
- Major tissue necrosis

7. Comorbid Factors

- Age <5 or >55 years
- Known cardiorespiratory or metabolic disease
- Pregnancy
- Immunosuppression

8. Evidence of high energy impact

- Death of occupant in same car

C. ADULT MEDICAL SURGICAL**1. Cardiac**

- Patients with cardiogenic shock (or requiring IABP)
- Patients with acute MI and contraindications to thrombolytic therapy who are candidates for emergent PTCA
- High risk patients with failed thrombolytic therapy (large AMI, previous MI, previous CABG, severe ongoing ischemia) who are candidates for rescue PTCA
- Life threatening medically refractory arrhythmias
- Patients with medically refractory, unstable or post-infarct angina
- Patients with suspected acute ventricular septal defects
- Patients with rapidly decompensating valvular heart disease
- Selected patients with cardiac tamponade and hemodynamic compromise
- Patients with symptoms or signs of aortic dissection
- Patients with the following conditions: acute pulmonary edema, cardiomyopathy, infectious endocarditis, severe pulmonary hypertension, hypertensive crisis, congenital heart disease or need for specialized pacemaker therapy
- Patients requiring acute intervention (i.e., IV nitroglycerin, antidysrhythmics, thrombolytics, anticoagulants, PTCA, emergent cardiac catheterization, CABG, emergency cardiac surgery, or pericardiocentesis) unavailable at referring institution.

2. Other Medical/Surgical or Critical Care

- Status post cardiopulmonary arrest with need for definitive management capabilities
- Patients requiring continuous intravenous vasoactive medications or mechanical ventricular assist to maintain a stable cardiac output
- Patients who may require mechanical ventilator support or are at risk of having an unstable airway
- Acute pulmonary failure requiring sophisticated pulmonary intensive care
- Acute ischemic event (extremities, intestinal) which requires urgent diagnostic procedures/treatment not available at referring facility
- Dissecting, leaking, or ruptured thoracic/abdominal aneurysm
- Acute cerebrovascular accident in evolution requiring therapy or diagnostic procedures not available at the referring institution
- Gastrointestinal hemorrhage leading to hypoperfusion or requiring blood transfusion, angiography or other procedures not available at the referring institution
- Unstable patient with renal failure requiring acute hemodialysis unavailable at the referring institution
- Severe poisonings or overdoses requiring intensive care
- Severe hypothermia or hyperthermia requiring immediate active therapy
- Uncontrollable seizure activity

- Decompression illness or carbon monoxide poisoning requiring hyperbaric oxygen therapy
- Significant acidosis not responsive to initial therapy
- Patients requiring emergency cardiothoracic, vascular or neurosurgical diagnostic or operative procedures unavailable at the referring institution
- Complications of cancer and chemotherapy; opportunistic infections with unstable vital signs
- Patients who have met the criteria for brain death and whose families have consented for organ donation when urgent transport is required for organ salvage
- Patients receiving organ transplantation, when time frame of donor organ viability is extremely limited (i.e., heart, lung)
- Transfer of time-sensitive transplant organ from procurement hospital to site of transplant

D. **HIGH RISK OBSTETRICS**

The majority of obstetrical patients are appropriately transported by ground ambulance; there are some, however, in whom timeliness of transport is especially important. LifeFlight of Maine is dedicated to the rapid and safe transport of high risk obstetric patients. Before consideration of air transport, there should be a very high probability that delivery will not occur during transport. If delivery is imminent or likely to occur during transport, alternate care plans should be considered.

1. **General complications**

- Medical care immediately available to the patient is not optimal for the patient's actual or predicted obstetrical, medical or surgical complications
- There is reasonable expectation that the birth of one or more infants may require obstetric or neonatal intensive care beyond the capabilities of the referring institution
- The patient's obstetrical, medical or surgical problems require continuous attendance by trained personnel not available at the referring institution

2. **Obstetrical complications**

- Active premature labor with or without rupture of membranes at less than 34 weeks, or fetal weight is estimated at less than 2,000 grams
- Severe pre-eclampsia or eclampsia
- Abruptio placentae or placenta previa
- Third trimester bleeding
- Fetal hydrop

3. **Medical Complications**

- Infections which may cause premature birth
- Severe organic heart disease
- Renal disease with deteriorating function or increasing hypertension
- Drug overdose
- Collagen vascular disease, metabolic disease (e.g. hyperthyroidism), or any disease considered to exceed the resources of the referring institution

- Miscellaneous unusual or severe illnesses
- 4. **Surgical complications**
 - Trauma requiring intensive care or surgical correction beyond the capabilities of local institutions, or trauma requiring procedures that may cause premature labor
 - Acute abdominal emergencies at less than 34 weeks gestation or with a baby whose estimated weight is less than 2,000 grams
 - Thoracic emergencies requiring intensive care or surgical correction
 - Neurosurgical emergencies such as intracranial hemorrhage, expanding pituitary tumor, or brain tumor

In general the following patients who are in labor should **NOT** be considered for air transport

- **multiparous patients:**
 - cervix dilated 3-4 cm or more with active labor and a substantially effaced cervix
 - contractions less than 5 minutes apart
 - history of rapidly progressing labor
- **primiparous patients:**
 - cervix dilated 4-5 cm or more with active labor
 - contractions less than 5 minutes apart

E. **PEDIATRICS**

1. Patient experiencing or has a high risk of developing cardiac dysrhythmias or cardiac pump failure that requires interventions not available at the referring institution.
2. Patient experiencing or has a high risk of developing acute respiratory failure or respiratory arrest and is not responsive to initial therapy
3. Patient requires invasive airway procedures (including endotracheal or nasotracheal intubation, tracheotomy or cricothyroidotomy) and assisted ventilation.
4. Patient with any of the following vital signs:
 - respiratory rate <10 or >60 breaths per minute
 - systolic blood pressure <60mm Hg in a neonate
 - systolic blood pressure <65mm Hg in an infant <2 years of age
 - systolic blood pressure <70mm Hg in a child 2-5 years of age or systolic blood pressure <80mm Hg in a child 6-12 years of age
5. Patient with any of the following clinical conditions:
 - near-drowning with signs of hypoxia or altered mental status
 - status epilepticus
 - acute bacterial meningitis
 - acute renal failure
 - poisonings and overdoses with hemodynamic or neurologic instability
 - Reye's syndrome
 - Hypothermia
 - Multiple trauma

- GCS <12 or deterioration
- Intensive care to intensive care transfer when ground transport time is >30 minutes
- Vasoactive drip required to maintain BP
- Arterial pH <7.2
- Patients within 48 hours of respiratory/cardiac arrest
- Non-trauma patient requiring cardiothoracic, neuro or pediatric surgeon for emergent care unavailable at referring institution

F. **NEONATAL**

1. Infant requiring mechanical ventilation or CPAP
2. Premature infant with gestational age <30 weeks and complications
3. Body weight <1500 grams and complications
4. Supplemental oxygen >60%
5. Neonate with extra-pulmonary air leak, interstitial emphysema, or pneumothorax
6. Need for transfer to Neonatal unit when ground transport time is >30 minutes
7. Cardiac or respiratory arrest within 24 hours
8. Temperature instability
9. Neonate requiring vasopressor drip medications or repeated volume challenges to maintain BP
10. Neonates with seizure activity, congestive heart failure, or disseminated intravascular coagulation
11. Surgical emergencies including diaphragmatic hernias, necrotizing enterocolitis, abdominal wall defect, intussusception, suspected volvulus, congenital heart defects

G. **GENERAL EXCLUSIONS TO HELICOPTER TRANSPORT**

1. Terminally ill patients, unless they have an acute correctable problem of an emergent nature
2. Patients in full arrest at the referring institution who cannot be stabilized to a perfusing circulation
3. Incessant VF or VT with severe hemodynamic compromise
4. Advance directives precluding aggressive life prolonging measures
5. Anoxic encephalopathy/coma

REFERENCES

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