Guideline on Use of Helicopter for Medical Emergencies, 2018

2nd EDITION
2018

Emergency Medical Services Division
Department of Medical Services
Ministry of Health

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FOREWORD

Establishment of Health Help Center (HHC) in May 2011 has greatly enabled Ministry of Health to save lives of patients during emergencies through toll free number 112 and ambulance services. To further augment Bhutan's ability to save lives and deliver critical medical care to patients in remote parts of Bhutan, helicopter service was introduced in November 2015. Though helicopter services are critical in saving lives, it is expensive and a systematic procedure has to be followed to avail the helicopter services.

Thus, this guideline shall guide health professionals for judicious use of helicopter during emergencies. This is also aimed to minimize delays in availing services from the Royal Bhutan Helicopter Services Limited (RBHSL). It shall also provide adequate information on process and norms for acquiring the services.

(Dr. Ugen Dophu)
Secretary
Ministry of Health

CONTENTS

A. Rationale

Introduction of helicopter services for evacuation of patients has helped to minimize the challenges of distance, terrain and time for the most critical patients. The air evacuation is necessary to reach the remote and inaccessible areas where land ambulances cannot reach. In order to ensure the judicious use of resources, there is a need of guideline defining the procedures for availing the helicopter services.

The Ministry of Health (MoH) shall monitor and ensure proper use of services using this guideline.

B. Purpose and Objective

i. Provide guiding principles to health professionals in requesting air evacuation services.

ii. Ensure necessary processes and procedures are followed for safety of patients and health personnel.

C. Scope

The services shall be made available on request for emergency evacuation for all Bhutanese citizens and regular Royal Government of Bhutan (RGoB) non-Bhutanese employee as per the guideline.

The MoH and health facilities will facilitate the emergency evacuation of private individual and the payment shall be made directly to the RBHSL.

D. Criteria

1. Criteria on Medical Conditions

Helicopter shall be requested for emergency evacuations by the health professionals after assessing the health conditions of the patients based on the following criteria:

i. Severe Trauma
ii. Surgical Emergency
iii. Medical Emergency
iv. Pediatric Emergency
v. Obstetric Gynecological Emergency
vi. Any other life threatening medical conditions as decided by the health professionals in consultation with the Emergency specialists.

Note: The health professionals, both at site and referral health facilities, should refer and follow the emergency criteria mentioned in the *Annexure 3*, for assessment of patients with injury/illness.

2. Other key considerations

i. Isolated Place

Helicopter services may be considered where there is no road accessibility and where patient cannot be reasonably reached by land ambulance or any other means e.g cutoff due to earthquake, roadblock, etc.

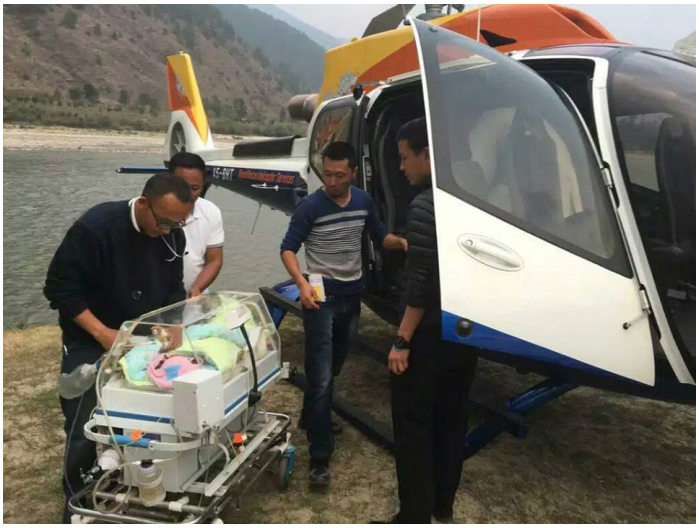

Figure 1. Loading the patient

ii. Facility to Facility Transfer

Facility to facility transfer services may be provided in the following situations:

a) where patients admitted in lower health facilities (BHUs, District Hospitals) need to be referred to higher health facilities due to development of life threatening conditions

b) where there are no adequate facilities, when land ambulance transport can deteriorate the condition of the patient due to movement or inadequate time for preventing death

c) or both the conditions combined

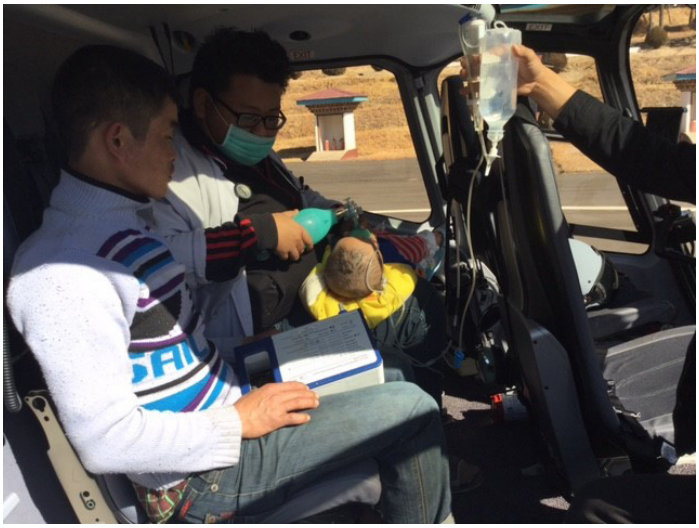

Figure 2. Inside the helicopter

iii. Transportation of Medical Supplies
The helicopter service will be also used to reach emergency medicines and other provisions during the times of disaster and health emergencies.

iv. Patient in Far Flung or Isolated Location
Helicopter services may be considered to evacuate a patient where they cannot contact health workers or health facilities. In this remote setting

where consultation with a health professional is impossible, the patient or patient attendant shall directly contact HHC (112). HHC/112 shall activate the helicopter service and inform Department of Medical Service (DMS) according to the aforementioned activation protocol.

E. Processes and Procedures

The procedures for availing helicopter services are as illustrated in the Figure No. 1.

i. The request for helicopter for emergency evacuation shall be made from the site by a health professional upon assessment of the patient based on the medical emergency criteria as specified above under section D1.

ii. All health professionals at the point of care/incidence shall call HHC (112). HHC personnel shall then directly consult with the Emergency Specialist of Regional Referral Hospitals or JDWNRH. The need for helicopter evacuation will be determined by the Emergency Specialist of JDWNRH and/or HHC personnel based upon the severity of patient injury or illness and the priority criteria set forth in this guideline and in the SOP for BEAR.

iii. Upon confirmation from the Emergency Specialist (ES) or concerned specialist of JDWNRH, HHC will activate the Bhutan Emergency Aeromedical Retrieval (BEAR) team and call RBHSL for helicopter evacuation.

iv. The number of BEAR team member (one or two personnel) for each evacuation will be decided by Emergency Specialist as determined by BEAR protocol detailed in its SOP.

v. The receiving health facility for evacuated patient shall be determined by the Emergency Specialist, JDWNRH in collaboration with the BEAR team.

vi. If the helicopter service is delayed due to weather or any other reasons, the concerned health professional shall refer the patient by other means of transport and inform HHC (112).

vii. The referring health facility must inform HHC (112) if the patient has expired prior to helicopter dispatch.

viii. The requesting/referring medical team shall fill up the Helicopter Request Form (Annexure 1) and hand over to the BEAR team at time of patient transfer. BEAR team will then submit it to HHC.

ix. If the patient expires during the evacuation, the dead body shall be brought to the referred health facility. The receiving health facility shall certify and issue the death certificate and keep in the mortuary. The concerned patient attendant shall manage the dead body thereafter.

Figure 1: Operational proceedure for medical evacuation by helicopter service

F. Emergency Evacuation Personnel

The health personnel providing critical emergency and resuscitation care to patients during helicopter evacuation are known as the Bhutan Emergency Aeromedical Retrieval (BEAR) team. BEAR has its own SOP, which complements this document.

G. Patient Attendant

i. Patient attendant shall accompany the critical patient with or without BEAR team for all evacuation

ii. Patient attendant cannot accompany the critical patient if the captain declines based on technical reasons

H. Responsibilities

I. Pilot
As determined by RBHSL

II. Bhutan Emergency Aero-medical Retrieval Team
As detailed in the BEAR SOP

III. Health Help Center
The HHC shall:

i. Call the Emergency Department at 02- 324817 or on call Emergency Physician and seek the approval for helicopter activation

ii. Make a request call to RBHSL for helicopter evacuation simultaneously

iii. Activate BEAR team

iv. Inform Director General of DMS immediately after receiving approval from the Emergency Specialist, JDWNRH

v. Facilitate to provide land ambulance to receive the patient at the helipad

vi. Collect and document Helicopter Trip Sheet, Helicopter Request Form and Patient Status Report received from JDWNRH and Regional Referral Hospitals and submit a copy to the Emergency Medical Services Division, DMS monthly

vii. Undertake a joint review of BEAR cases with the EMSD quarterly

viii. Maintain record of all patients evacuated by helicopter in the standard format and submit to MoH monthly

IV. Emergency Department, JDWNRH

i. The Emergency Specialist shall respond to emergency calls and review, verify and recommend BEAR team retrieval promptly or no later than 30 minutes of first request call

ii. Prepare in advance for receiving the patient from the helipad

iii. Document care given by BEAR team to patient in the trip sheet

iv. BEAR team shall submit a copy of Helicopter Trip Sheet and Helicopter Request Sheet to the HHC

V. Referring Health Facilities

i. When a health professional transfers a patient, he or she must communicate all patient-related information, history, findings, assessment and treatment to BEAR personnel at the time of patient hand-over

ii. The referring health professionals shall complete the Referral Sheet and Helicopter Request Form and hand them over to the BEAR team at time of patient hand-over

iii. Maintain a record of all patients referred and transferred by helicopter

iv. If the patient expires prior to helicopter dispatch or arrival, the referring health professional must notify HHC/112

VI. Patient Attendant

The patient and the patient attendant (when present) shall:

i. Abide by all requirements of RBHSL and BEAR team during medical evacuation

ii. Carry only essential things such as clothing and money

iii. HHC/referring health worker shall not be responsible for transportation of any restricted items by patient or patient party

VII. Emergency Medical Services Division (EMSD)

i. Monitor the use of helicopter guideline and BEAR SOP quarterly or as and when required.

ii. Review helicopter utilization, treatment and transportation of patients as a part of a quality assurance process.

iii. Process for bill payment to RBHSL upon receiving the verified bill from HHC. The payment shall be determined based on the price defined or developed by the RBHSL or any other operators.

I. Acknowledgement

The Ministry of Health acknowledges following officials who were involved in the development of this helicopter guideline:

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Form No. I: HELICOPTER REQUEST FORM FOR MEDICAL EVACUATION *(to be filled by referring centre)*

REQUESTING HEALTH FACILITY DETAILS	
Hospital/BHU name:	Date:
Dzongkhag:	
Name of the Staff:	
Designation:	
Contact Number:	
PATIENT DETAILS	
Name:	Brief medical care provided at site by Health workers
Age/sex:	
Village:	
Gewog:	
CID Number:	
Provisional diagnosis:	
Guardian contact Number:	
INITIAL VITALS OF PATIENTS	
Alert/verbal/pain/unresponsive	
PR/min:	
BP (mmHg):	
RR/min:	
Temperature:	
SPO2(%):	
RBS(mg/dl):	
GCS (Glasgow Coma Scale):	
Please mention the name, CID No, weight of the pt.attendants if accompanied	

VERIFIED AND RECOMMENDED BY
Name of Emergency Physician:
Date & time recommended:
Assessment & management by BEAR team:

FORM No. II: STANDARD HELICOPTER TRIP SHEET

(to be filled by BEAR team)

TRANSFERRING from: _____ to: _____	**PATIENT DETAILS**	
	Patient Name:	Age/ sex
BEAR Team MD: RN:	Address & Phone No:	
Contact Number	Incident location:	

TRIP DETAILS		**PATIENT ASSESSMENT DETAILS**			
Event Date		Alert/Verbal/Pain/Unresponsive			
Priority of Emergency (1-2-3)		Time	On scene	2nd Time	3rd Time
Departure from helipad (Thimphu)		PR/min			
Scene Arrival Time		BP (mmHg)			
Scene Departure Time		RR/min			
Helipad Reach Time		Temp			
Hospital Reach Time		SPO2 (%)			
		RBS(mg/dl)			
		GCS			

CASE SUMMARY:

Details of Medical Care Given *en route*	
Handed over by (BEAR):	**Taken over by (Referred Hospital):**
Signature:	
Name & Designation:	
Date/Time	
Contact No.	
Details of the patient attendant if accompanied, Name: Age/Sex: Contact No:	

Annexure 3: Medical Emergency Criteria and Definition to be used by Health Professionals

I. Trauma and Surgical Emergencies

The health professional shall follow the steps below when conducting field triage of patients with injury and illness. These steps will also be used to assess the clinical criteria (i.e. to determine if the patient meets the clinical criteria) as required.

Steps 1 and 2 have been designed to identify the most seriously injured patients.

The criteria in Step 3 and 4 are indicators of the potential for significant injury or indicate the patient may require other supports services at the trauma center or referral hospital. Not all patients in these two categories require transport to a trauma center or referral hospital and the health professional must use their judgment in these two categories coupled with these criteria to determine the need for transport to a trauma center or nearest referral hospital.

The patients may be transported to the referral hospital or trauma center if any of the following criteria have been met in the following steps:

Step 1: Physiological

1. GCS<14 with evidence of trauma or a traumatic mechanism
2. Systolic blood pressure <90mmHg
3. Respiratory rate <10 or >30 breaths per minute or need for ventilator support (<20 in infant aged <1 year)

These patients should be transported preferentially to a referral hospital or trauma center. If an EMT/physician is unable to successfully manage the

airway or the patient is unlikely to survive transport to the trauma center/ referral hospital, the patient must be transported to the closest local hospital.

If these criteria have not been met, proceed to step 2.

Step 2: Anatomical

1. All penetrating injuries to head, neck, torso and extremities proximal to elbow or knee. Note: Patients with penetrating trauma to the torso or head/neck are to be transported to a trauma center or referral hospital with the 30 minute rule independent of lack of vital signs.
2. Chest wall instability or deformity (e.g. flail chest)
3. Open or depressed skull fracture
4. Two or more proximal long-bone fractures
5. Open Grade III long bone fracture
6. Crushed, de-gloved, mangled or pulseless extremity
7. Amputation proximal to wrist or ankle
8. Suspected pelvic ring fracture with hymodynamic instability (shock)
9. Suspected spine fractures with incomplete cord injury and caudaequina syndrome
10. Any other trauma emergencies that the consultant feels the need for the helicopter evacuation.
    a. If these criteria have not been met, proceed to step 3

Step 3: Mechanism

1. Falls
    a. Adults >6 meters (one story is equal to 3 meters)
    b. Children (age <15) >3 meters or two to three times the height of the child

2. High Risk Auto Crash
    a. Intrusion >0.3 meters occupant site; >0.5 meters any site, including the roof
    b. Ejection (partial or complete) from automobile.
    c. Death in the same passenger compartment
    d. Vehicle telemetry data consistent with high risk injury (if available)

3. Auto vs. pedestrian/bicyclist thrown, run over or with significant (>30km/h) impact

4. Motorcycle crash >30 km/h

If these criteria have not been met, proceed to step 4.

Step 4: Special consideration

1. Age

o Older adults
    a) Risk of injury/death increases after age 55
    b) SBP <110 may represent shock after age 65

o Children
    a) Should be triaged preferentially to a pediatric-capable trauma center

2. Anticoagulation and bleeding disorders

3. Burns

o With trauma mechanism: triage to trauma center or referral hospital

If these criteria have not been met, transport the patient to the closest most appropriate local hospital.

The trauma triage algorithm is given in annexure I for reference.

- Surgical Emergencies will depend on the condition of the patients and the distance from the surgical services
- Any other surgical emergencies that the consultant feels the need for the helicopter evacuation.

II. Medical Emergency

- Acute coronary syndromes with critical need for urgent therapy.
- Cardiogenic shock
- Cardiac tamponade
- Pre-transport cardiac arrest
- Pre-transport respiratory arrest
- Acute respiratory failure requiring intensive care
- Gastrointestinal hemorrhage with hemodynamic compromise
- Critically ill patients who require intensive care
- Patient requiring urgent dialysis
- Suspected acute stroke < 2 hours
- Acute neurological emergencies requiring urgent intervention
- Suspected acute MI
- Chest pain, SOB or other symptoms typical of cardiac event
- Any other medical emergencies that the consultant feels the need for the helicopter evacuation.

III. Pediatric and neonate Emergency

- Shock
- Respiratory distress with impending respiratory failure

- Altered mental status
- AKI (Acute Kidney Injury)
- Refractory Seizure
- Extreme prematurity
- Extreme low birth weight
- Severe hyperbilirubinemia
- Major birth defect requiring emergency surgeries
- Any other medical conditions as decided by the peripheral health professionals in consultation with the specialists.

IV. Obstetric Gynecological Emergency

- Active labour with abnormal presentation
- Multiple gestation in active labor
- Umbilical cord prolapsed
- Significant vaginal bleeding (suspected abruption placenta or placenta previa or ectopic)
- Postpartum hemorrhage (PPH) with unstable vitals
- Eclampsia/ impending eclampsia

V. Ear Nose and Throat (ENT)

- Acute airway injury with severe respiratory distress
- Foreign bodies in the upper airway with severe respiratory distress
- Any other ENT emergencies that the consultant feels the need for the helicopterevacuation

VI. Eye

- Suspected retinal detachment with good prognosis for recovery
- Acute central retinal artery occlusion
- Perforating eye injury
- Any other eye emergencies that the consultant feels the need for the helicopter evacuation.

Trauma Triage Algorithm

STEP ONE
Physiological

Field Trauma Triage Standard

Measure vital signs and level of consciousness

Glasgow Coma Scale	<14 with evidence of trauma or a traumatic mechanism
Systolic blood pressure	<90 mmHg
Respiratory rate	<10 or ≥30 breaths per minute or need for ventilatory support (<20 in infant aged <1 year)

YES

Take directly to a LTH if it is <30 minutes land ambulance transport time[1]. Steps 1 and 2 attempt to identify the most seriously injured patients. These patients should be transported preferentially to a LTH[2].

NO

Assess anatomy of injury.

STEP TWO
Anatomical

- All penetrating injuries[3] to head, neck, torso and extremities proximal to elbow or knee
- Chest wall instability or deformity (e.g. flail chest)
- Two or more proximal long-bone fractures
- Crushed, de-gloved, mangled or pulseless extremity
- Amputation proximal to wrist or ankle
- Pelvic fractures
- Open or depressed skull fracture
- Paralysis

YES

Take directly to a LTH if it is <30 minutes land ambulance transport time. Steps 1 and 2 attempt to identify the most seriously injured patients. These patients should be transported preferentially to a LTH[4].

NO

Assess mechanism of injury and evidence of high energy impact.

See page 2

1. Transport time is defined as time from depart scene to time arrive at destination.
2. If a paramedic is unable to successfully manage the airway or the patient is unlikely to survive transport to the LTH, the patient must be transported to the closest Emergency Department.
3. Patients with penetrating trauma to the torso or head/neck are to be transported to a LTH with the 30 minute transport rule independent of lack of vital signs.
4. The paramedic will consider using the Trauma Termination of Resuscitation (TOR) contained in the *Trauma Cardiac Arrest Medical Directive* when appropriate.

Field Trauma Triage Standard

STEP THREE
Mechanism[5]

1) Falls
   - a) Adults ≥6 metres (one story is equal to 3 metres)
   - b) Children (age<15) ≥3 metres or two or three times the height of the child
2) High Risk Auto Crash
   - a) Intrusion ≥0.3 metres occupant site; ≥0.5 metres any site, including the roof
   - b) Ejection (partial or complete) from automobile
   - c) Death in same passenger compartment
   - d) Vehicle telemetry data consistent with high risk injury (if available)
3) Auto vs. pedestrian/bicyclist thrown, run over, or with significant (≥30 Km/h) impact
4) Motorcycle crash ≥30 Km/h

YES → Transport to a LTH. Patching with the base hospital physician is an option.

NO → Assess special patient or system considerations.

STEP FOUR
Special Consideration[5]

1) Age
   - Older Adults
     - a) Risk of injury/death increases after age 55
     - b) SBP <110 may represent shock after age 65
   - Children
     - a) Should be triaged preferentially to pediatric-capable trauma centre
2) Anticoagulation and bleeding disorders
3) Burns
   - a) With trauma mechanism: triage to LTH
4) Pregnancy ≥20 weeks

YES → Transport to a LTH. Paramedic judgement and local Patient Priority Systems Bypass agreements[6] can be used to help determine transport destination. Patching with the base hospital physician is an option.

NO → Transport to the closest most appropriate ED.

5. The criteria used for bypass to a LTH in Steps 3 and 4 are not absolute; rather are indicators of the potential for significant injury or indicate the patient may require other support services at the LTH. Not all patients in these two categories require transport to a LTH and the paramedic must use their judgement coupled with these criteria to determine the need for transport to a LTH.

6. Local variances in transport time may occur based upon appropriate Patient Priority Bypass Agreements.

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