2018

BEAR

Standard Operation Procedure for Bhutan Emergency Aeromedical Retrieval Team

Emergency Medical Services Division
Department of Medical Services
Ministry of Health

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Contents

Air ambulance

The BEAR Team will consist of two resuscitation experts, chosen from a carefully selected and trained group of doctors (team leaders), emergency nurses and emergency medical responders. The addition of BEAR will transform the helicopter service from a means of rapid transport into a true air ambulance, able to provide emergency care during patient evacuation to definitive treatment.

Rationale

The introduction of helicopter services since November 2015 has enabled the Royal Government of Bhutan to save lives through the rapid and timely transport of patients with critical illness or injury as well as those in remote and inaccessible places to definitive - and often life-saving - medical care. As of 31st May 2017, 175 patients were airlifted and 42 patients died. The most common conditions airlifted were acute injuries (36), Gyne-obstetric (33), CVA & respiratory distress (18), and the remaining cases with different medical conditions and surgical pathologies requiring immediate operations. Ngultrum 88.236 millions (November 2015 to May 2017) was spent for the evacuation of patients.

To further augment Bhutan's ability to save lives and deliver cutting-edge resuscitation and other critical medical care to patients in remote parts of Bhutan before ensuring their safe transport to definitive medical care in hospitals, the Ministry of Health (MoH) has created Bhutan Emergency Aeromedical Retrieval Team (BEAR). BEAR will consist of a doctor (as team leader), a Retrieval Nurse and a Retrieval Emergency Medical Responder. Out of 42 patients expired, 40 patients could have been saved if BEAR team has provided emergency care to the patients.

This Standard Operation Procedure (SOP) defines the purpose, training and scope of practice for the aeromedical resuscitation team as well as the procedure to initiate and activate medical helicopter evacuation/BEAR**.** SOP is intended to complement the "Guideline on Use of Helicopter for Medical Emergencies" by detailing the role of BEAR, the emergency aeromedical retrieval service.

MoH shall monitor and oversee the professionalism and training of BEAR, and shall use this guideline to ensure its proper use.

Purpose of SOP for BEAR

1. To ensure the highest quality of aeromedical resuscitation and other vital medical care.
2. To ensure consistent and reliable aeromedical team activation.
3. To detail the scope of practice of the aeromedical retrieval team.
4. To delineate physical and academic standards required of BEAR members.

Location and BEAR

The Referral Hospitals are the retrieval service's 'home base,' the site where they train, maintain their equipment and medicines, and, importantly, work clinically in emergency medicine to keep their resuscitation and emergency clinical skills expert. Initially, BEAR

shall be located at the Emergency Department (ED) of Jigme Dorji Wangchuck National Referral Hospital (JDWNRH), but shall replicate to Regional Referral Hospitals.

There shall be only one BEAR (1 Emergency Physician, 1 Nurse and 1 EMR) for each helicopter fleet location; if Royal Bhutan Helicopter Services Limited (RBHSL) stations a second helicopter fleet with pilots at a second hospital, the BEAR shall likewise duplicate to the location of the second fleet.

Activation of the BEAR Service

The process for team activation shall follow the procedure as detailed in the *Guideline on Use of Helicopter for Medical Emergencies* and then continue as detailed below.

1. Once the Emergency Specialist on-call has determined that a patient requires aeromedical retrieval due to high acuity injury or illness in consistent with Annexure 3, the Emergency Specialist shall inform BEAR members on-call and then the Health Help Center (HHC-112) to activate the helicopter as per the *Guideline on Use of Helicopter for Medical Emergencies*).

2. An ambulance or service vehicle shall be ready to transport BEAR to helipad.

3. Every day, there shall be one aeromedical-retrieval-qualified physician as well as one aeromedical-retrieval-qualified nurse or EMR on-duty at ED of the National and Regional Referral Hospitals of BEAR.

4. The team shall have one or two members, detailed in item 6, below.

5. The Emergency Specialist shall determine the level of patient priority (as described below and in *appendix 6*) and shall dispatch either a Physician and Nurse/EMR team (priority 1 and 2) or a Nurse/EMR-only team (priority 3).

6. In the event that the patient is under three months of age, the Emergency Specialist can send a neonatal intensive care physician instead of a retrieval physician. In this case, the neonatal intensive care physician shall work with the retrieval nurse or EMR on-call.

7. Essential medical equipment (detailed below, *appendices 1 and 2*) shall be kept at ED of Regional Referral Hospitals (at present, ED JDWNRH) where the on-call BEAR members will check it daily to ensure it is fully stocked, properly packed and ready for immediate use.

8. Upon activation by the emergency medicine specialist on-call, the on-call members of BEAR shall collect essential equipment and medicines and depart **within 10 minutes** to the helipad by ambulance.

Patient Eligibility

Citizens of the Kingdom of Bhutan as well as foreign guests of Bhutan, namely: tourists, invited volunteers and those with work permits and their dependents shall be eligible for aeromedical retrieval / air ambulance service with BEAR after appropriate triage and team activation as set forth in this SOP.

Priority

BEAR will use one of the following levels of priority to indicate the urgency of transport.

Priority One - Life-Threatening Emergency

Life-threatening emergencies and emergencies that is potentially life-threatening in locations without facilities for local management. These retrievals will require teams with both nurse and doctor. Examples:

1. Cardiopulmonary arrest
2. Respiratory failure or arrest
3. Upper airway obstruction
4. Premature infant birth
5. Severe asthma / COPD attack not responding to medicine
6. Septic shock
7. Trauma with high injury severity scale or hypotension or evidence of hemorrhagic shock
8. Penetrating trauma to abdomen or thorax
9. Traumatic amputation
10. Traumatic brain injury with glasgow coma scale 9 or less
11. ST elevation myocardial infarction
12. Statusepilepticus

Priority Two - Urgent Medical Transfer

An emergency where some local stabilization and treatment is possible, but where prompt transfer is needed and where the patient would benefit from continued treatment during transfer. These retrievals will require teams with both nurse and doctor. Examples:

1. Open long-bone fractures
2. Arrest of labor
3. Severe pre-eclampsia
4. Cardiac arrhythmias without loss of consciousness or dyspnea
5. Non-ST elevation myocardial infarction
6. Angioedema without stridor
7. Drug overdose
8. Possible spinal injury
9. Gastrointestinal bleeding without shock
10. Seizure without return of normal mental status
11. Suspected stroke
12. Traumatic brain injury with Glasgow coma scale 10-13

Priority Three - Routine Transfer

Elective intra-facility transfers, undertaken by retrieval service due to geographical isolation. These calls shall be staffed by a retrieval nurse or EMR only.
The following are the examples:

1. Prolonged premature rupture of membranes in term pregnancy
2. Suspected surgical abdomen (appendicitis, bowel obstruction, etc) without evidence of peritonitis or sepsis
3. TIA
4. Transfer of stable patients with isolated closed orthopedic injuries requiring specialist management at JDWNRH or referral hospital.

Coordination and Retrieval Team Scheduling

The Team Leader of BEAR shall keep a monthly schedule and duty-roster of resuscitation/retrieval physicians, nurses and Emergency Medical Responder (EMR), with one on-call physician and one on-call nurse or EMR as well as one back-up physician and nurse or EMR for each day. On-call teams will be expected to check all essential equipment and medicines at the start of their duty period and to respond to helipad within 10 minutes of activation.

Disqualification from Duty

BEAR physicians, nurses and EMRs will not be scheduled to perform and shall not undertake aeromedical retrieval under the following circumstances.

1. Within 12 hours of consuming alcohol or while impaired by its effects.
2. Within 24 hours of compressed gas diving
3. within 72 hours of donating blood
4. If taking any medicine other than topical agents, ibuprofen, paracetamol, antacids or anti-diarrheals. All other medicines require physician attestation that there is no impairment of duty.
5. If less than 8 hours rest the night prior to duty.

BEAR Orientation and Selection

BEAR shall be composed of one or two individuals as determined by the Priority Level as described above. Flights to critically-ill or injured patients will carry a resuscitation/retrieval physician and nurse/EMR. Flights transporting patients who are geographically isolated but less ill will carry one or two retrieval nurses or EMRs.

Academic & Physical Standards of BEAR

Sl. No.	BEAR Member	Standards	
		Academic	**Physical**
1	Retrieval Doctor	The retrieval doctor of BEAR will ideally be a consultant in emergency medicine or a senior emergency medicine resident with supplemental training in the skills essential to aeromedical retrieval. Initially, the retrieval doctor may be a General Duty Medical Officer (GDMO) with at least 14 months of emergency medicine experience at JDWNRH, who has interest in pursuing specialty training in emergency medicine and who has not only received extra training in the skills essential to aeromedical retrieval but who has passed a comprehensive oral examination in proof of this fact.	The administration of emergency and critical care outside of the hospital environment can be physically challenging. In addition to carrying medical equipment (defibrillators, transport ventilators), retrieval team members must also be able to assist the movement of unconscious patients into and out of a helicopter. For this reason, all physicians on the retrieval service must have a physical examination and proof that he or she is able to fly without restriction; he or she must also have a body-mass index < 25 and obtain a passing score on the fitness test (to be administered by the Team Leader of BEAR, *appendix 5*). If the physician is able to score higher than 250, the body-mass index shall be waived.
2	Retrieval Nurse	The retrieval nurse of BEAR will be an experienced emergency or ICU nurse with at least two years of experience at JDWNRH who has received supplemental training in aeromedical retrieval and flight physiology and who has passed a comprehensive oral examination in proof of this fact.	The administration of emergency and critical care outside of the hospital environment can be physically challenging. In addition to carrying medical equipment (defibrillators, transport ventilators), retrieval team members must also be able to assist the movement of unconscious patients into and out of a helicopter. For this reason, all BEAR members must have a physical examination and proof that he or she is able to fly without restriction; he or she must also have a body-mass index <28 and obtain a passing score on the fitness test (to be administered by the Team Leader of BEAR, *appendix 5*). If the nurse is able to score higher than 250, the body-mass index shall be waived.

3	Retrieval EMR	The retrieval EMR will be an experienced EMR with at least two years of experience working either in a ground ambulance or in ED, JDWNRH who has received supplemental training in aeromedical retrieval and flight physiology and who has passed a comprehensive oral examination in proof of this fact.	The administration of emergency and critical care outside of the hospital environment can be physically challenging. In addition to carrying medical equipment (defibrillators, transport ventilators), retrieval team members must also be able to assist the movement of unconscious patients into and out of a helicopter. For this reason, all EMRs on BEAR must have a physical examination and proof that he or she is able to fly without restriction; he or she must also have a body-mass index <28 and obtain a passing score on the fitness test (to be administered by the Team Leader of BEAR, *appendix 5*). If EMR is able to score higher than 250, the body-mass index shall be waived.

**Note: The SOP allows the BMI limit to be waived if the trainee obtains a very high score in the physical fitness test. This is customary in many aeromedical teams and military forces because it allows the occasional person who exceeds the BMI limit due to high muscle mass to obtain entry by proving that his or her BMI is due to strength and not body fat.*

Trainees

To ensure self-sufficiency and continued operation of BEAR, flights will often include one team-member-in-training in lieu of or in addition to the Retrieval Nurse. Trainees will have baseline qualifications to act as a Retrieval Doctor, Retrieval Nurse or Retrieval EMR (e.g. shall have the proper background and experience) and must have met required physical standards, but may be currently undergoing required aeromedical training as detailed below.

Team Selection

The Team Leader of BEAR shall hold physical fitness testing and an oral examination to qualified candidates after candidates have completed a six-hour class in aeromedical retrieval (as detailed below). After meeting academic and physical standards, a prospective BEAR member must take at least two flights as a trainee before becoming eligible to fly as an independent retrieval team physician or nurse.

All medical personnel meeting academic and physical standards shall be trained for BEAR. Initially, trainees shall be drawn from the emergency departments of JDWNRH and Paro Hospital until the headquartering hospital of BEAR changes or the MOH directs otherwise.

Patient Attendants

The MoH and BEAR recognize the importance that close family play in the lives of critically-ill and injured patients. As per bullet i & ii of the Guideline on Use of Helicopter for Medical Emergencies 2018 "Patient attendant will accompany the critical patient with or without BEAR team for all evacuation. However, patient attendant cannot accompany the critical patient if the captain declines based on technical reasons"

Aeromedical Training

Supplemental training in flight physiology and the delivery of resuscitation and critical care in flight are essential to aeromedical team performance. BEAR members shall receive a six hour course on aeromedical retrieval through the Khesar Gyalpo University of Medical Sciences of Bhutan and ED, JDWNRH. The course will be in classroom as well on-board the helicopter and during training flights. RBHSL Heli Operations Division shall conduct and direct helicopter safety training. Work with BEAR service requires course attendance and successful completion of an oral examination. Training for BEAR team members shall be considered finalized only after discussion with RBHSL.

The training content shall include:

1. Familiarization with airbus H130, or any other new aircraft employed by the Royal Government of Bhutan.

2. Crash preparedness: safety and escape training.

3. The safe loading and unloading of patients onto and off of aircraft.

4. The delivery of critical care in-flight, with attention to how flight requires subtle changes to the administration of resuscitation and emergency care.

5. Flight physiology: how the aeronautical environment changes human physiology, with specific attention to the sensory disorientation and spacial illusions caused by flight.

Retrieval Service Uniform/Clothing/Gear

1. On-call team members shall be required to wear clothing/retrieval service uniform that augments safety. The clothing /uniform (*design and approved by MoH*) will be:
    a. easily visible
    b. without loose straps or cloth that can be caught by any door or moving machine parts

2. Include close-toed shoes with non-slip tread, and PPE as appropriate

BEAR Responsibilities - Preflight

1. On-call team members shall be fit for duty. They shall not have worked overnight the prior night, shall not have given blood within the prior 72 hours and shall be free from the effects of alcohol or recreational drugs (as detailed above).

2. On-call team members shall be on-duty at the headquartering hospital emergency department (initially, ED JDWNRH).

3. Equipment.
   a. A full list of essential equipment and medicines are given in appendices 1 (equipment) and 2 (medicines).
   b. At the beginning of their On-Call time, team members shall check all essential equipment and medicines to ensure that equipment and medicines are ready for immediate use and are packaged to be ready for immediate departure.
   c. Essential equipment and medicine shall be stored in one, single location to allow for efficient collection prior to departure.
   d. Team members shall inform BEAR Leader daily once this preparation is complete. This preparation is essential to make activation efficient, fast and reliable.

BEAR Responsibilities - After Arrival at Patient Location

Upon arrival, BEAR will disembark from helicopter.

1. Once pilot gives signal, BEAR disembarks from helicopter.
   Note that BEAR disembarks *only after pilot has given clearance to do so.*

2. Scene Safety
   a. BEAR will visually check and voice to one-another that the scene appears safe.
   b. Consideration of scene safety is especially important when BEAR is to care for a patient outside of a BHU or district hospital.
   c. BEAR members should remain within visual and verbal contact of one-another whenever possible. If a special circumstance requires separation (for example, unexpected presence of multiple patients), team members should establish a time frame for reuniting and a method to communicate with one another (preferentially, VHF handsets/radio).

3. Communication
   BEAR members must be able to communicate with the pilot in addition to one another while inside and outside of the helicopter.

4. BEAR will immediately assess patient and take report from the patient's current health staff. If patient requires immediate, life-saving care (e.g. endotracheal intubation, surgical airway, transvenous or transcutaneous pacing, chest tube placement), then retrieval team shall carry out that life-saving care prior to loading patient into helicopter. **The retrieval team shall only undertake interventions necessary for immediate patient safety. Any intervention that will not change patient's later medical care or destination should be undertaken only after careful consideration.** Otherwise, BEAR shall promptly load patient into helicopter and continue emergency / resuscitation care in-flight.

5. For critically ill or injured patients, BEAR members will have clear responsibilities determined in advance by protocol.
   a. BEAR Nurse or EMR: Oxygen, Monitor, IV access, Administration of Initial Medicines.
   b. BEAR Physician: Cut Clothes, Patient Examination, Analgesia and Sedation.

c. After completion of initial responsibilities, team will work together to undertake critical tasks of resuscitation (endotracheal intubation, chest-tube placement, etc.).

6. After life-saving interventions, BEAR will undertake a **rapid** checklist prior to scene departure to ensure patient safety (also listed in *Appendix 3*). Urgency is key.
   a. Patient Airway secured or safe?
   b. Pilot aware of patient condition?
   c. Both lungs inflated? No need for chest tube prior to ascent?
   d. If intubated, end-tidal CO2 appropriate? SpO2 adequate?
   e. Hemorrhage controlled? Tranexamic Acid given?
   f. Broken Limbs splinted?
   g. Neurological exam noted? If intubated, pupils reactive?
   h. All BEAR Equipment packed? (Nothing left behind?)
   i. Names of patient family and friends taken along with their telephone numbers?
   j. Patient's general medical history noted on Standard Helicopter Trip Sheet (Annexure 2, Medical Helicopter Guideline).
   k. Receiving hospital notified if patient will require IMMEDIATE access to operating theatre upon arrival?

7. Cardiopulmonary Arrest
   a. If the patient has gone into cardiopulmonary arrest, and BEAR physician determines that the patient cannot be resuscitated or that resuscitation has failed, the team shall not transport the patient.
   b. If the patient arrests during transport, and the physician determines that resuscitation has failed, the physician can pronounce the patient during transport. Pronouncing a patient dead shall be undertaken by protocol (*appendix 4*).
   c. In both case, the case details shall be recorded by BEAR to be given to the BEAR leader for quality improvement.

8. BEAR will load patient into helicopter while thanking onlookers and clearing them from helicopter landing site if necessary. BEAR will secure gear and put on hearing protection early to allow pilot to take-off quickly.
   a. Onlookers and spectators should be kept at least 60 meters from the landing site prior to takeoff.
   b. No running within 15 meters of the helicopter.
   c. All items - especially iv poles, iv lines - should be at shoulder height or lower.
   d. Only bear members or flight crew will open or close aircraft doors.
   e. Approach to the helicopter shall be forward of the rear cabin door in crouched position with head down - bear members shall never approach the rear of the helicopter.
   f. BEAR shall take special care to avoid the tail rotor during embarking/disembarking from helicopter.
   g. If the helicopter is parked on a slope, bear shall approach and board/disembark from the downhill side (which has the greatest clearance from the helicopter blades).

BEAR Responsibilities - In-Flight

BEAR will care for the patient en-route to the Receiving Hospital (JDWNRH, Mongar Hospital or specialty hospital).

1. Pilot. Immediately before, after and during flight, the pilot is in command of all persons on board the aircraft and has the final authority on accepting patients or passengers upon the aircraft.

2. BEAR shall board helicopter, secure gear, don hearing protection and travel to patient.

3. BEAR Nurse shall be responsible for continuous patient monitoring and for recording interventions on the Standard Helicopter Trip Sheet (*Annexure 2*, Medical Helicopter Guideline). Patient care takes precedence over documentation.

4. BEAR Physician shall be responsible for the direction of medical care in-flight.

5. BEAR shall inform pilot during flight of any important changes in patient condition and any interventions to be taken by medical team.

6. Flight Dispatch shall:
   a. Communicate with the receiving hospitals on behalf of BEAR to prevent pilot distraction and unnecessary interference in the cabin.
   b. Communicate with the emergency charge nurse of the receiving hospital to give estimated time of arrival and to ensure ambulance is ready at helipad to receive team.
   c. Communicate the need for additional medicines or oxygen to be brought on the receiving ambulance as requested by BEAR.

7. If BEAR anticipates the need for more oxygen or medicines during ground transfer, it must communicate this need to ED In-charge nurse prior to take-off or landing to ensure the charge nurse can send the appropriate supplies with the ground ambulance.

BEAR Responsibilities - Arrival at Receiving Hospital

1. Upon landing, BEAR shall:
   a. Ensure the patient has adequate oxygen and medicine, if needed, for transfer from helipad to receiving hospital ED.
   b. Then transfer patient onto ground ambulance.

2. BEAR shall continue care of the patient during ground transfer from helipad to ED with the same responsibilities as in-flight.

3. Upon arrival at the receiving hospital:
   a. BEAR will transfer patient into ED, or when appropriate, directly to the operating theatre.
   b. BEAR will continue care of the patient in ED while giving report to colleagues, and shall hand over the Standard Helicopter Trip Sheet (*Annexure 2*, Medical Helicopter Guideline) to the Emergency Medicine Specialist on duty and HHC.
   c. If the receiving hospital is Mongar Hospital or a different specialty hospital, BEAR will transfer patient to ED, give report to the accepting physician.However, Standard Helicopter Trip Sheet (*Annexure 2*, Medical Helicopter Guideline) must be handed over to the HHC.

After Return to JDWNRH

1. Often, BEAR will return to its headquartering hospital (at present, JDWNRH) while providing patient care, as noted above. However, sometimes the patient will transfer a patient to a different hospital and return to its headquartering hospital alone.

2. After transfer of patient care to ED, BEAR members shall restock all supplies and prepare equipment so that it is ready for the next retrieval mission.

3. A list of all supplies and medicines shall be given to the Team Leader of BEAR.

4. The retrieval team members shall give a brief review of each transfer case to the team leader, who shall keep a log of all flights to help ensure quality improvement.

5. The BEAR team must handover the tripsheet and helicopter request form to the HHC

Quality Improvement and Equipment Procurement

The Team Leader and members of BEAR shall meet monthly with EMSD to review all transports and outcomes to ensure continual improvement. Special attention shall be given to all transported cases that die during or within 24 hours of transport. While most medical and surgical supplies shall be provided by JDWNRH while it remains the headquartering hospital, special equipment required by the retrieval team (monitors, replacement bag-valve masks, etc) shall be discussed during these meetings to allow EMSD adequate time to procure these items.

Growth and Change

These operational standards are 'alive' - meaning that they are intended to grow and change as Bhutan's needs grow and change. BEAR service shall begin at JDWNRH, but as the country grows and as other hospitals develop specialty expertise, it is possible that BEAR might be headquartered at another hospital or that there will be two teams stationed at two different hospitals (for example, one team for the western half of the country and one team for the eastern half). It is expected that EMSD and MoH will gradually adapt and improve these operational standards to meet Bhutan's growth and changing needs.

Appendix 1 - Essential and Additional Equipment for all retrievals

All on-board equipment and medicine need to be physically checked and weighed jointly by BEAR and RBHSL Heli Operations Team at Paro in order to properly configure the aircraft and to ensure that aircraft configuration is suitable for various locations. This is a key element of helicopter performance capability.

	Requirements
Respiratory Support Equipment	Portable oxygen cylinder with regulator Oxygen masks Nebulizers Bag-valve mask for manual ventilation for adult, pediatric and neonate, depending on patient Portable suction catheter and portable suction device Oropharyngeal and nasal airways for adult, pediatric and neonate, depending of patient Direct laryngoscopes for adult, neonates, depending on patient Gum-elastic bougie Scalpel with 15 blade Endotracheal tubes for all ages Pleural drainage equipment with one way valves
Circulatory Support Equipment	Sphygmomanometer and cuffs IV cannulae for peripheral IV access IV fluids - Lactated Ringers, Normal Saline, 2 Liters, pressure cuff for fluids Syringes and needles
Other Equipment	Radio for communication with charge nurse at receiving hospital; receiving hospitals will also require radio access. ECG monitor-defibrillator with non-invasive blood pressure monitor Capnography Urinary catheter and bag Suturing instruments and equipment, nylon suture 3-0 through 5-0 Splints Dressing and bandages Electronic thermometer Blood glucometer with blood glucose test strips
Neonatal Transport Equipment	Infant incubator Pediatric / neonatal capnography probes Direct laryngoscopes for neonatal intubation Endotracheal tubes

Appendix 2- List of equipment weights

Sl. No	Name of the equipment	Weight (Kg)
1	General surgical and airway equipment and medicines (in one bag)	1
2	Zoll cardiac monitor and defibrillator	6
3	Draeger oxylog helicopter mechanical ventilator and tubing	6.5
4	Two liters of normal saline / lactated ringers crystalloid	2

Appendix 3 - Essential Pharmacological Agents for Aeromedical Retrieval

Adrenaline	Calcium Gluconate	Propofol
Succinylcholine	Fentanyl	Ketamine
Diazepam	Haloperidol	Dextrose 25%
Salbutamol	Hydrocortisone	Aspirin
Nitroglycerin	Mannitol	Naloxone
Metoclopramide	Tranexamic acid	

Appendix 4 - BEAR scene departure checklist

Sl. No.	Items	Interventions
1	Patient Airway secured or safe?	
2	Pilot aware of patient condition?	
3	Both lungs inflated? No need for chest tube prior to ascent?	
4	If intubated, end-tidal CO2 appropriate? SpO2 adequate?	
5	Hemorrhage controlled? Tranexamic Acid given?	
6	Broken Limbs splinted?	
7	Neurological exam noted? If intubated, pupils reactive?	
8	All BEAR Equipment packed? (Nothing left behind?)	
9	Names of patient family and friends taken along with their telephone numbers?	
10	Patient's general medical history noted on Standard Helicopter Trip Sheet (Annexure 2, Medical Helicopter Guideline)?	
11	Receiving hospital notified if patient will require IMMEDIATE access to operating theatre upon arrival?	

Appendix 5 - Pronouncing Life Extinct

Medical Cases. The BEAR may pronounce a patient dead after cardiopulmonary arrest due to a medical cause if:		
1	There has been more than 20 minutes between arrest and team arrival to patient.	
2	There is evidence of rigor mortis or livor mortis.	
3	The patient has confirmed asystole on cardiac monitor despite 20 minutes of active resuscitation at normal body temperature.	
Trauma Cases. The BEAR may pronounce a patient dead after traumatic cardiopulmonary arrest if:		
1	The patient has injuries clearly incompatible with life (e.g. Decapitation).	
2	There has been more than 20 minutes between arrest and team arrival to patient.	
3	The patient has received complete trauma resuscitation: airway management, control of external hemorrhage, aggressive iv crystalloid challenge, bilateral tube thoracostomies and, depending on availability of time/resources/expertise, resuscitative thoracotomy.	

Appendix 6 - Bhutan Emergency Aeromedical Retrieval fitness test

A passing score is 120 points. Every member of the retrieval service must pass this test every six months.

Push-ups may be substituted for pull-ups, but male trainee must perform three times the number to score the same number of points; women may substitute push-ups for pull-ups without change in number.

For women, add two minutes to run.

Points	Pull-Ups	Crunches	1.5-Mile Run	Points	Pull-Ups	Crunches	1.5-Mile Run
100	20	100	10:00	49		49	14:15
99		99	10:05	48		48	14:20
98		98	10:10	47		47	14:25
97		97	10:15	46		46	14:30
96		96	10:20	45	9	45	14:35
95	19	95	10:25	44		44	14:40
94		94	10:30	43		43	14:45
93		93	10:35	42		42	14:50
92		92	10:40	41		41	14:55
91		91	10:45	40	8	40	15:00
90	18	90	10:50	39		x	15:05
89		89	10:55	38		x	15:10
88		88	11:00	37		x	15:15
87		87	11:05	36		x	15:20
86		86	11:10	35	7	x	15:25
85	17	85	11:15	34		x	15:30
84		84	11:20	33		x	15:35
83		83	11:25	32		x	15:40
82		82	11:30	31		x	15:45
81		81	11:35	30	6	x	15:50
80	16	80	11:40	29		x	15:55
79		79	11:45	28		x	16:00
78		78	11:50	27		x	16:05
77		77	11:55	26		x	16:10
76		76	12:00	25	5	x	16:15
75	15	75	12:05	24		x	16:20
74		74	12:10	23		x	16:25
73		73	12:15	22		x	16:30
72		72	12:20	21		x	16:35
71		71	12:25	20	4	x	16:40
70	14	70	12:30	19		x	16:45
69		69	12:35	18		x	16:50
68		68	12:40	17		x	16:55
67		67	12:45	16		x	17:00
66		66	12:50	15	3	x	17:05
65	13	65	12:55	14	x	x	17:10
64		64	13:00	13	x	x	17:15
63		63	13:05	12	x	x	17:20
62		62	13:10	11	x	x	17:25
61		61	13:15	10	x	x	17:30
60	12	60	13:20	9	x	x	x
59		59	13:25	8	x	x	x

58		58	13:30	7	x	x	x
57		57	13:35	6	x	x	x
56		56	13:40	5	x	x	x
55	11	55	13:45	4	x	x	x
54		54	13:50	3	x	x	x
53		53	13:55	2	x	x	x
52		52	14:00	<1	x	x	x
51		51	14:05				
50	10	50	14:10				

Appendix 7 - Priority

The Bhutan Emergency Aeromedical Retrieval service will use a system will be used to indicate the urgency of transport. There are three levels of urgency.		
Priority One	*Life-Threatening Emergency*	Life-threatening emergencies and emergencies that are potentially life-threatening in locations without facilities for local management. Examples: respiratory failure, cardiopulmonary arrest, upper airway obstruction, premature infant birth, severe asthma attack not responding to medicine. These retrievals will require teams with both nurse and doctor.
Priority Two	*Urgent Medical Transfer*	An emergency where some local stabilization and treatment is possible, but where prompt transfer is needed and where the patient would benefit from continued treatment during transfer. Examples: open long-bone fractures, arrest of labor, severe pre-eclampsia, cardiac arrhythmias. These retrievals will require teams with both nurse and doctor.
Priority Three	*Routine Transfer*	Elective intra-facility transfers, undertaken by retrieval service due to geographical isolation. These calls shall be staffed by a retrieval nurse only.

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