

General

Lesson One

Helicopter Transport

DOMAIN: COGNITIVE

LEVEL OF LEARNING: KNOWLEDGE / APPLICATION

MATERIALS

Fire Service Search and Rescue, 7th Edition, ; NFPA 1006, Standard for Technical Rescuer Professional Qualifications; NFPA 1670, Standard on Operations and Training for Technical Rescue Incidents; North Carolina Helo Aquatic Rescue Team (NCHART) SOGs (available through North Carolina Division of Emergency Management, SAR Coordinator); Local Helicopter Provider SOGs; Brady EMT Manual, 11th edition; Copy of Landing Zone (LZ) sites for the Authority Having Jurisdiction (AHJ) where the class is taught; Landing Zone lights or suitable substitute. Appropriate horizontal rigging device, with associated hardware. Laptop computer, multimedia projector, whiteboard or flipchart, and marking pens. See additional equipment list in the Applications section for practical exercises. A helicopter is not required for completion of this lesson plan.

NFPA 1006, 2008 edition JPR

5.2.6 Perform ground support operations for helicopter operations.

Junior Member Statement:

Junior Member training activities should be supervised by qualified instructors to assure that the cognitive and psychomotor skills are completed in a safe and non-evasive manner. While it is critical that instructors be constantly aware of the capabilities of all students both mentally and physically to complete certain tasks safely and successfully, the instructor should take every opportunity to discuss with

departmental leaders and students the maturity and job awareness each participant has for the hazards associated with fire and rescue training.

TERMINAL OBJECTIVE

The Technical Rescuer candidate shall correctly identify, in writing, the considerations for the dispatching of patient packaging requirements for aero-medical and military airborne rescue units, and correctly demonstrate the landing procedures for the various airborne units available to the Authority Having Jurisdiction (AHJ).

ENABLING OBJECTIVES

1. The Technical Rescuer candidate shall correctly describe, in writing, the criteria for requesting aero-medical transportation according to local medical protocol.
2. The Technical Rescuer candidate shall correctly describe, in writing, the criteria for packaging a patient for aero-medical transport.
3. The Technical Rescuer candidate shall correctly describe, in writing, the criteria for requesting a NC National Guard hoist-equipped helicopter for rescue missions.
4. The Technical Rescuer candidate shall correctly describe, in writing, the capabilities of a NCNG winch equipped UH-60 Blackhawk helicopter, and the criteria for packaging a patient for extraction by air
5. The Technical Rescuer candidate shall correctly demonstrate setting up a safe landing zone (LZ) for day and night landings and correctly demonstrate the proper hand signaling techniques, that are used to assist the helicopter pilot with making a safe landing and take-off.

General

Lesson One

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MOTIVATION

Helicopter evacuation requires a coordinated effort between ground crews and flight crews to insure the safety of everyone involved. Safety must be the overall goal of any aero-medical transport or helicopter rescue operation. This goal can be easily obtained through teamwork and good communication.

NOTE: The information in this lesson plan is of generic origin. All the trauma centers in North Carolina have developed a set of standard operating guidelines (SOGs) for aero-medical helicopter transport. There are currently eight (8) trauma centers providing aero-medical transport across the state. All instructors teaching this lesson plan should contact the closest trauma center providing helicopter service for the AHJ where the class is being held to obtain a copy of their SOGs and/or flight protocols.

NOTE: The North Carolina National Guard, in conjunction with North Carolina Emergency Management has developed a North Carolina Helicopter and Aquatic Rescue Team (NCHART) for rescue operations across the state. NCEM/NCHART has developed a set of Standard Operating Guidelines (SOGs) and equipment criteria for utilizing a winch equipped UH-60 Blackhawk helicopter during an airborne rescue extraction. If this resource is needed you must contact your local emergency management coordinator. A copy of the SOGs may be obtained through the NCEM SAR Coordinator.

PRESENTATION

ENABLING OBJECTIVE #1

The Technical Rescuer candidate shall correctly describe, in writing, the criteria for requesting aero-medical transportation according to local medical protocol.

1. List the criteria for determining if a patient is a candidate for aero-medical transport.
 - a) Conducting a good triage.
 - b) Determine the mechanism of injury.
 - c) Is the local hospital equipped and staffed to treat major trauma?
 - d) Time and distance to a trauma center via ground transport.
 - e) Factor the time of day, current and probable traffic conditions, and the weather conditions.

2. Point out the criteria for trauma center candidates.
 - a) Is transport time greater than 20 minutes?
 - b) Consider the ratio between the number of patients and the number of emergency transport vehicles available.

3. List and discuss the importance of identifying the "mechanism of injury."
 - a) Falls from heights greater than fifteen feet.
 - b) Vehicle rollovers with unbelted passengers.
 - c) A motor vehicle accident with death of another passenger in vehicle.
 - d) Extrication time is greater than twenty minutes.
 - e) A patient is ejected from vehicle.
 - f) A pedestrian is struck by a vehicle at a speed greater than 10 MPH.
 - g) A motorcyclist or bicyclist is struck by motor vehicle.

4. List the indications for aero-medical transport candidates.
 - a) Is the patient unresponsive resulting from injury?
 - b) Does the patient have penetrating injuries with possible neurovascular compromise?
 - c) Impaled object?
 - d) Multiple fractures?
 - e) Blood pressure of less than 90 after initial volume resuscitation?
 - f) Pediatric multiple trauma?
 - g) Is there penetrating trauma to head, neck, torso, groin / pelvis or femur area?

- h) Is there blunt trauma to chest?
- i) Is there traumatic paralysis?
- j) Is there amputation near or of the upper or lower extremities?
- k) Inhalation injuries?
- l) Severe burns?
- m) Any problems that may delay transport?

NOTE: As stated previously, the aero-medical providers in North Carolina have developed SOGs for their respective response areas. The above recommendations for transport are generic in nature and local protocol should be followed. Instructors should acquaint themselves with the criteria used by the aero-medical service that serves the area in which they are teaching this lesson plan.

NOTE: There are also criteria used by the aero-medical transport services for refusing to transport a patient. These can include but are not limited to: Terminally ill patients, patients in full arrest who cannot be stabilized at the referring institution, contaminated patients, and violent or combative patients. Patients in custody are not normally transported unless they can be somehow restrained (normally handled on a case by case basis).

5. Identify the agencies that have the authority to request aero-medical transport within response boundaries of the AHJ.
 - a) Emergency communications centers.
 - b) Emergency Medical Service personnel.
 - c) Rescue Squad personnel.
 - d) Fire Department personnel.
 - e) Law Enforcement personnel.
6. Discuss information that will be requested by the flight communications center.
 - a) Name of requesting agency or personnel.
 - b) Patient's name, age and weight.
 - c) Location of incident scene and nearest landing zone (LZ). This may be given as a street intersection, a landmark or map grid coordinates.
 - d) Radio frequencies and Unit ID numbers for contact of on-scene units.
 - e) A brief description of the incident, number of patients and condition of patients.

- f) Potential scene hazards to include power lines, foul weather, elevated structures and rough terrain.
- g) Need for specialized equipment or physician.

Reference: Brady EMT Manual, 11th edition.

NOTE: The above requirements, as well as the ones for the sizes of landing zones, may vary widely with the area of the state that this program is being taught in. A lot of the requirements are dependent upon the type and size of the helicopter being used at a particular time.

PRESENTATION

ENABLING OBJECTIVE #2

The Technical Rescuer candidate shall correctly describe, in writing, the patient packaging procedures for aero-medical transportation.

1. List the procedures for packaging a patient for aero-medical transport.
 - a) Discuss stabilizing the ABCs.
 - b) Control major bleeding.
 - c) Stabilize spinal injuries.
 - d) Splint fractures.
 - e) Restrain as needed.
 - f) Maintain body temperature.
 - g) Discuss the use of MAST trousers and the protocols of the aero-medical units reference their use.

Reference: Fire Service Search and Rescue, 7th Edition, Pages 42 and 43; A copy of the SOGs for the AHJ's local aero-medical helicopter provider.

PRESENTATION

ENABLING OBJECTIVE #3

The Technical Rescuer candidate shall correctly describe, in writing, the criteria for requesting deployment of a North Carolina National Guard Helicopter for rescue missions.

1. Point out the following requirements must be met for deployment of a NCNG Helicopter.
 - a) Resources are not available locally.
 - b) Mission is for rescue and not recovery.
 - c) Longer than 4 hours for other type of access and recovery.
 - d) Patient has life-threatening injuries.
 - e) There are excessive risks to rescue personnel.
 - f) The situation is included in a declared state of emergency.
2. Point out that if the above criterion is met, the local Emergency Management Coordinator for that jurisdiction should be contacted and a request for the resource would then be made to State EOC.

NOTE: NCHART can respond at the request of a local emergency management coordinator or NCEM Area Coordinator upon approval by the NCEM Duty Officer.

Reference: North Carolina Helicopter and Aquatic Rescue Team SOGs (NCHART)

PRESENTATION

ENABLING OBJECTIVE #4

The Technical Rescuer candidate shall correctly describe, in writing, the capabilities of a NCNG winch equipped UH-60 Blackhawk helicopter, and the criteria for packaging a patient for extraction by air.

1. Identify and discuss capabilities of the winch equipped helicopter.
 - a) Response time for a NCNG helicopter is four hours prep time plus actual flight time.
 - b) Flight time before needing to refuel is 2.25 hours.
 - c) The NCNG crew will usually not provide in-flight patient care; an on-scene medical technician will be needed.

- d) The NCNG helicopter will fly patients to the nearest LZ where the patient can be transferred to an ambulance or aero-medical unit.
2. Identify and discuss the capabilities of the winch used on the UH-60 Blackhawk helicopter.
 - a) The lifting capacity is 600 pounds.
 - b) The usable cable spooled on the drum is 250 feet.
 - c) The cut-away or shear strength of the cable is 2000 pounds.
 3. Identify and discuss the proper procedures to be followed when packaging a patient for extraction by air using the NCNG UH-60 Blackhawk helicopters.
 - a) The patient will be packaged in accordance with guidelines established by the responding agency.
 4. Demonstrate rigging procedures for helicopter extraction using an appropriate horizontal lifting device. Point out that this device may be manufactured or made by the agency. All pre-rigged slings approved and used by the AHJ are acceptable alternatives providing the NCNG crew gives final approval.

Reference: North Carolina Helicopter and Aquatic Rescue Team SOGs (NCHART)

PRESENTATION

ENABLING OBJECTIVE #5

The Technical Rescuer candidate shall correctly demonstrate setting up a safe landing zone (LZ) for either day or night landings (Candidate should inform the instructor his/her intentions as to day or night operations) and correctly demonstrate the proper hand signaling techniques, that are used to assist the helicopter pilot with making a safe landing.

1. Discuss landing zone requirements.
 - a) Location of LZ.
 - b) Size for day and night operations.
 - c) Surface conditions of LZ.
 - d) Type of terrain.
 - e) Lighting requirements.
 - f) Degree of slope for type of helicopter.
 - g) Proper clearance for approach and departure routes.

2. Discuss the approach zones and safety rules for working around a helicopter.
 - a) Always remain in the pilots view.
 - b) Never approach a helicopter from the rear.
 - c) No hats or ball caps unless secured by strap.
 - d) Never hold IV bags above head with rotors turning.
 - e) Always approach and depart from the downhill side.
 - f) No smoking within 100 feet of the helicopter.
 - g) Always provide victim's face with cover when rotors are turning.

3. List the safety rules for helicopter landings.
 - a) Proper placement of lighting for nighttime operations.
 - b) Proper placement of emergency equipment and personnel.
 - c) Establish communications with helicopter by hand or radio if possible.

4. Emphasize a word of caution for anyone working at a nighttime LZ: NEVER ALLOW ANY LIGHTS TO SHINE TOWARD AN OPERATING HELICOPTER, on the ground or in the air.

5. Point out that the size of a landing zone will be dependent upon the size and type of helicopter that will be using it. This makes it imperative that the local aero-medical and NCHART units are consulted to see what the minimums are for their craft.

Reference: Fire Service Search and Rescue, 7th Edition, Pages 42 and 43; NC Aero-Medical Transport Services SOGs; North Carolina Helicopter and Aquatic Rescue Team SOGs (NCHART).

6. Discuss and demonstrate the generic hand signals used for assisting helicopters to land.
 - a) Land here, my back is into the wind.
 - b) Wave off, do not land.

Reference: U.S. Army FM 21-60, Chapter 5.

7. Point out that in North Carolina most of the pilots flying hospital-based helicopters prefer not to depend on hand signals for landings and take-offs. Instead they depend on radio communications. There are times when hand signals may be the only alternative. This lesson plan discusses a series of generic hand signals taken from the U.S. Army Field Manual for Helicopter Operations. During military aircraft use, hand signals should be discussed with the aircrew during a pre-incident briefing.
8. Point out military helicopters may or may not have communications capabilities based on established EMS and Rescue frequencies. The instructor should check with the local EM Coordinator and find out if this is the case for the area that they are teaching this class in. Some military aircraft have the "Wolfsburg" radio systems and are able to communicate through civilian channels.

APPLICATION

Upon completing the classroom portion of this Lesson Plan, take the students to a suitable landing zone area and demonstrate setting up an LZ for day and night landings.

Demonstrate the use of hand signals for landings and take-offs.

Equipment needs for this exercise should include but are not limited to:

- A flat, preferably paved surface.
- Four vehicles equipped with emergency beacons positioned at each corner of the LZ.
- The use of low-beam headlights by two of the vehicles on the downwind side of the LZ, positioned so that the beams intersect in the middle of the LZ.
- Landing lights positioned at each corner of the LZ.
- Road flares positioned at each corner of the LZ. This is not a recommended practice and should only be considered as a last resort, due to the possibility of fire in brushy terrain.

SUMMARY

This lesson plan is designed to point out general operating and safety guidelines when working with helicopters and emergency scenes. It is imperative that each responding agency have a good working knowledge of the procedures that need to be implemented to ensure the safety of emergency responders, flight crews and the on-scene civilian population. Review the enabling objectives while completing the last application and allow for a question and answer session. This is a geographic specific subject and needs to be taught for the types of equipment that will be operating within the AHJ for the class.