Landing Zone Safety Course for Scene Calls

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To coordinate, develop, improve and maintain a comprehensive and dynamic emergency medical services system to prevent and reduce premature death and disability. This system shall be integrated within the entire health care network. The emergency medical services system will ensure prompt, effective and unimpeded service to all residents and visitors of the Commonwealth.
The most important part of any EMS system, regardless of its size, location or other attributes, is the patient. Our patients remain the focus and the center of our system in Pennsylvania. All decisions are measured against one important question:

Is this the best decision for patient care?

Regardless of where our development plan takes us, always at the center of it you will find the patient and the patient’s family.
Objectives

- Life Lion Air Medical Service
- Types of Missions
- Landing Zone Set Up
- Landing Zone Officer Duties
- Landing Zone Security
- Types of Aircraft in Pa
- Patient Loading
- Helicopter Rescue
Objectives cont...

- Trauma Patient Destination
- Statewide BLS Protocol
- Trauma Triage Criteria
- Trauma Triage Flow Chart
- Air Ambulance Safety Considerations
- Cardiac Arrest – Traumatic
- Trauma Patient Destination
- Statewide Air Protocol
LIFE LION

Air Medical Service
Penn State Milton S. Hershey Medical Center
Penn State Milton S. Hershey Medical Center
Program Overview

- Program started in 1986 with one helicopter
- Second helicopter added 1996
- Third Aircraft in 2000
- Sold Third Aircraft in 2002
- Currently transport 1400-1500 patients a year
- Average 4-5 patient flights in a 24 hour period
- Log an average of 1200-1300 flight hours per year
- VFR and IFR operations
- FAA Part 135
Life Lion Critical Care
Ground Unit Transport Service
2005
Program Statistics

- Flights by category
  - 5% - Other
  - 10% - NICU
  - 13% - Pediatric
  - 18% - Medical
  - 18% - Toxicology
  - 46% - Trauma
Aircraft

- Two AEC 365 N3 Dauphin Helicopters
- Twin turbine engines
- Enclosed tail rotor design
- Capable of flying two patients
- Fuel consumption: 90-100 gallons of Jet A an hour
- Cruise speed: 180 MPH
- Maximum fuel load: 3 hours or about 300 gallons
Aircraft Interior
LIFE LION Team

- Administrative personnel
- Maintenance personnel
- Communications specialists
- Pilots
- Medical Crew
- Hospital Personnel
- Emergency Services Personnel
You are part of our Team

Remember a chain is only as strong as its weakest link

- Dispatch Centers / PSAPs
  - County
  - Flight Follow
- Fire / Rescue Services
- EMS Services
- Law Enforcement / Police Departments
- Specialized Teams
- Air-medical Services
- Trauma Centers / Trauma Services
- Rehabilitations Centers
Communications Center

1-800-225-4837
Communication Specialist

- Aircraft dispatching and flight following
- Coordination of aircraft activities with referring and receiving facilities/units
- Coordination of on scene flight operations with local EOC’s
- Trauma system alerting
- Medical command and BLS notification
Crew Configuration

- Pilot
- Registered Nurse
- Paramedic
- Specialty Teams
Types of Air Medical Services

- Hospital-based Services
- Nonhospital-based Services
- Law Enforcement Agencies
- Military-based Services
Types of Missions

Scene Flight

Trauma Patient

Medical Patient
Types of Missions

SAR

Search & Rescue
Types of Missions

Organ Transport

GIFT of LIFE
DONOR PROGRAM
1-800-DONORS-1
Air Transport Considerations

When do you call for an aircraft?

Is this the best decision for patient care?

When the patients outcome can be improved with the use of an air-medical service.
Air Transport Considerations

Patient Severity

Time/Distance
Who Can Request Air Medical Services?

- Fire Chief
- First Responder
- EMT
- EMT-Paramedic
- Prehospital Health Professional or Prehospital RN
- Police Officer
Request Procedures

- Stand-by
- Response
Helicopter may be unavailable due to:

- Another call
- Weather
- Maintenance
Weather
Maintenance
A helicopter may never make it to the scene

Do not wait on scene with a patient if you do not have radio contact with the aircraft

Start the patient enroute to the Hospital
Goose Strike

Failed Mission
Information to Dispatch

- **Scene**
  - Level of request
    - Stand-by, response, etc.
  - Type of incident
    - MVC, Fall, GSW
  - Location
    - Address, Intersection
  - Landmarks
    - Lakes, River, Ballfield
    - Water/Cell Tower
    - Mountains
    - Town

- **LZ officer/contact**
  - Ie: Engine 31

- **LZ operations frequency**
  - Freq
  - Tone

- **Any patient information**
  - 1 or 2 Patients
  - Adult or Pediatric
  - Level of consciousness
How to set up a Landing Zone
The Landing Zone Should be Level

- FLAT OPEN AREA

- Though the exact slope allowed varies slightly for different types of helicopters

- No more than 10 DEGREES is recommended
Obstructions in the Landing Zone

- Stumps
- Bushes
- Tall grass
- Hidden holes & ditches
- Rocks & logs
- Fence posts
- Mile markers
- Loose wire
- Road signs
Problematic Landing Zone Surfaces

- Dust / Dirt
- Loose gravel
- Mud
- Snow / Ice
- Fresh cut grass / Hay
100 Ft X 100 Ft
- A thorough check of the area is required
- Obstructions can be marked, avoided and brought to the attention of the pilot or pick a new LZ
- Sometimes the least obvious obstruction can be the most dangerous
Remove and/or Secure all Loose Objects from the LZ

- Trash, Debris
- Signs
- Mailboxes
- Vehicles
- Ambulance doors
- Farm Animals… (Horses can be a real problems---$$ )
A Fully loaded helicopter can create GALE and even HURRICANE force winds in a small area!!
Wind Direction and Helicopter Approach Path

- Consider the wind
- Helicopters land and take off into the wind, when possible
- Pilots must "BALANCE" wind direction and approach path obstacles
The Approach Path Should be Free of Obstructions

- Wires
- Poles
- Antennas
- Trees
THE #1 THREAT TO A LANDING EMS HELICOPTER WIRE
Wires may be obvious from the ground.....but invisible to the helicopter crew (especially at night)
VIEW FROM THE GROUND

WIRES WITH POLES HIDDEN IN TREES

ROAD
WIRES AS SEEN FROM THE AIR
Can you see the wires??
Marking the Landing Zone

- Day and Night procedures
- There are a large variety of ways to mark the Landing Zone
- This class will use guidelines as developed by the NEMSPA and published in FAA advisory circular 135-14A
- Your procedures may be slightly different
Day Procedures for Marking the LZ

- Traffic cones (may blow away)

- Never use loose objects such as air panels, sheets, fire coats
MARK THE TOUCH DOWN
AREA WITH 5 TRAFFIC CONES, ONE IN EACH CORNER AND ONE INDICATING WIND DIRECTION
Landing Zone Setup

- FLARE to FLARE: 100 FEET
- WIND: FLARE to FLARE
Night procedures marking the LZ

- Use of lights inside of cones
- LZ light kits are available
- Use of spotlights and flares
Use of Road Flares

- Commonly used, very effective, easily seen from the air
- **CAUTION:** Road flares are a source of ignition and must be closely managed. They can blow away in rotor wash
- Other light sources should be used if available
ADDITIONAL LIGHTS CAN BE USED TO MARK LZ OBSTRUCTION
Approach Obstacles

LANDING ZONE
Safe Distance Requirements

- Minimum distance: 75 ft. x 75 ft. Daytime
- Minimum distance: 100 ft. x 100 ft. At Night
Minimum: 60 x 60 ft

Preferred: 100 x 100 ft
Fire equipment

- SCBA and a charged attack line **NOT** required *(must be ready to move quickly in case crash happens away from LZ)*

- Follow SOP’S/Guidelines
LZ Security
Fire Police

- All pedestrian and auto traffic
- Keep public back 200 feet Plus
- Keep Fire/Rescue back 100 feet
Landing Zone Considerations

- Flat open area
- 100 X 100 feet wide
- Minimum number of obstructions
- Not too soft, muddy, or dusty
- Properly marked during daytime
- Appropriate lighting during nighttime
- Constant steady lights (ex. Flares, NO strobes)
- Secure from crowds/onlookers
Communicating with the Aircraft

- When directing the Helicopter to your location use the Clock Code based on the "NOSE OF THE AIRCRAFT"

- Never base the clock code on YOUR position
The Landing Zone brief

Who gives the brief?

What needs to be included?
LZ Brief

- General description
- Size
- Topography (Surface features)
- Obstacles
- Wind
- LZ Markings
- Location in relation to incident site
- Any other pertinent information
SAMPLE LZ BRIEF

- **HELICOPTER:** “ENGINE 27-1, LIFELION -1 IS 6 MINUTES OUT, REQUEST AN LZ BRIEF”
ENGINE 27-1: “LIFELION-1, YOU WILL BE LANDING IN A ELEMENTARY SCHOOL PARKING LOT LOCATED JUST WEST OF THE ACCIDENT SCENE. THE ZONE IS A FLAT, PAVED SURFACE, 300 FT X 300 FT. THERE ARE POWER LINES, 75 FEET HIGH, ALONG THE EAST SIDE OF THE LZ.....
ENGINE 27-1 (cont): “THERE IS ALSO A FLAGPOLE 100 FEET NORTH OF THE LZ. THE ZONE WILL BE MARKED WITH 4 AMBER LIGHTS. THERE IS A STRONG WIND FROM THE NORTHEAST”

LIFELION-1: “LIFELION -1 GOOD COPY, POWERLINES ON THE EAST SIDE AND FLAG POLE TO THE NORTH. WE WILL BE ON FINAL IN 2 MINUTES”
LAND IN FRONT OF THE ENGINE ?????
Safety

- Never approach the aircraft without a Flight Crew member.
- Always approach from a point which provides minimum exposure to turning blades and in view of pilot.
- Do not approach aircraft until rotors come to a complete stop.
Wait till the blades stop

Full RPM

Blades slowing down
NO LOOSE CLOTHING IN THE LZ AREA

Hats, etc...
ALWAYS MAINTAIN CONTROL OF STRETCHERS AROUND THE HELICOPTER

Stretchers and/or sheets may be blown away by rotor wash
Loading and Unloading of the helicopter will be at the direction of the flight crew.

Your assistance will be required and appreciated.
FLIGHT CREW WILL OPEN AND CLOSE HELICOPTER DOORS
Types of Stretchers

Model 1400 Series
Hot Load
Follow the flight crew in
Hot Load
Exit the same path
Landing Zone Officer Responsibility

- Secure the landing zone
- If on a highway, physically block off highway to **ALL** traffic, including emergency vehicles
- Establish communication with helicopter
- Provide the pilot with a landing zone briefing
HAZARDOUS MATERIALS

- FAA Prohibits transportation of Hazard Material (no contaminated clothing)
- PATIENTS MUST BE DECONTAMINATED PRIOR TO TRANSPORT BY HELICOPTER
  - Helicopter crews do not have protective gear or breathing apparatus
HAZ MAT Incident LZ’s

LZ Should be located at least 1 Mile UPWIND of explosives, poisonous gases or chemicals in danger of exploding
Weapons

- Guns, Knives and Chemical Mace (Mace / Pepper Spray) are not allowed in the passenger compartment

- Flight Crew will store them in tail baggage compartment
BREAK
He talks to much
To understand safe landing and operations around a helicopter you need some understanding of the type’s of helicopters.
Types of Aircraft

EMS Helicopters
9-Types of Medical Aircraft in Pa

Dauphin

Side Load
Wheels
Fenestron
9-Types of Medical Aircraft in Pa

Sikorsky S76

Side Load Wheels
AGUSTA

Side Load Wheels

9-Types of Medical Aircraft in Pa
9-Types of Medical Aircraft in Pa

EC 135

Skids

Rear Load
9-Types of Medical Aircraft in Pa

EC 145

Skids

Rearload
9-Types of Medical Aircraft in Pa

Skids
Side Load
No Tail Rotor
9-Types of Medical Aircraft in Pa

Twin Star

Skids
Side Load
9-Types of Medical Aircraft in Pa

Bo 105

Skids
Read Load
Air Medical Services in Pa
Air Medical Services in Pa

- Life Lion
- STAT MedEvac
- Geisinger Life Flight
- University MedEvac
- PennSTAR
- Sky Care
- JeffSTAT
- MedStar
- AGH Life Flight
- Life Star
Air Medical Services in Md

- Maryland State Police (Trooper)
- STAT MedEvac
Life Lion

Bases:

Life Lion 1 - Hershey

Life Lion 3 - Carlisle
Life Lion

Aircraft

Dauphin
AS 365 N3

AS 365 N3
STAT MedEvac

Bases:

MedEvac - 1 Washington    MedEvac - 7 Greenville
MedEvac - 2 Westmoreland   MedEvac - 9 Clearfield
MedEvac - 3 Butler Co.     MedEvac - 11 Altoona
MedEvac - 5 Fayette Co.    MedEvac - 15 Sayer
MedEvac - 6 Clarion        MedEvac - 16 Ford City
STAT MedEvac

Aircraft

- EC 135
- EC145
- BK 117
- Twin Star
- Dauphin AS 365 N
Geisinger Life Flight

Bases:
Life Flight-1  Danville
Life Flight-2  State College
Life Flight-3  Wilkes-Barre
Life Flight-4  Williamsport
Geisinger Life Flight
Aircraft

BK 117

Sikorsky S-76
University MedEvac

Bases

MedEvac – 1 Allentown
MedEvac – 2 Stroudsburg
MedEvac – 3 Limerick
MedEvac – 4 Kutztown
MedEvac – 6 West Chester / Keystone
PennSTAR

Bases

PennSTAR – 1 Blue Bell
PennSTAR – 2 West Chester / Brandywine
PennSTAR – 3 Nazareth
PennSTAR – 4 Reading
PennSTAR

Aircraft

Agusta 109

BK 177
JeffSTAT

- Philadelphia - Jefferson Hospital
Sky FlightCare

Bases

Sky Care – 1 Coatesville
Sky Care – 2 Coatesville
Sky FlightCare

Aircraft

MD 902

BO 105
Conemaugh MedStar

Bases

MedStar – 1 Somerset
MedStar – 2 Hastings
AGH Life Flight

Bases

Life Flight – 1 Pittsburgh
Life Flight – 3 Indiana
Life Flight – 4 Butler
Life Flight – 5 Rostraver
Life Flight – 6 Westmoreland Co,
AGH Life Flight
Aircraft

Sikorsky S-76

MD Explorer
Life Star

Bases

- Life Star – Erie
Life Star
Aircraft

Agusta

BK 177
Maryland State Police
Bases

Helicopter Section Locations
Maryland State Police

Aircraft
STAT MedEvac - Maryland

- Stat 10 - Baltimore
- Stat 12 - Hagerstown
Aircraft
Patient loading

**Side Loading**
(sliding door / hinged door)
- Dauphin
- Sikorsky S76
- TwinStar
- Agusta 109
- MD Explorer

**Rear Loading**
(Clamshell door)
- BK 117
- EC 135
- EC 145
- BO 105
Aircraft Safety
Aircraft Safety

S-76

Loading and exit path

DANGER

DANGER

DANGER

Loading and exit path
Aircraft Safety

Diagram showing:
- Loading only area
- Stay clear area
- Caution area
- Danger area

Legend:
- Green: Approach
- Red: Danger
- Yellow: Caution
Aircraft Safety
Aircraft Safety
Aircraft Safety
DANGER AREA
DO NOT APPROACH

APPROACH FROM THIS SIDE
Hot Load
Follow the flight crew in
Hot Load

Exit the same path
Why worry about LZ Safety?
EMS Accidents: 1990 - 2005

- All EMS Accidents
- Fatal Accidents

Data representation from 1990 to 2005.
Risky rescues

There have been 61 reported medical helicopter crashes in the United States since 2000. Here is a summary of crash locations and severity.
Thank You