

AH FOUNDATION – Helicopter Emergency Medical Services (HEMS)

Introduction

Air medical transport has become a well-established part of the emergency medical system. Through the use of helicopters, patients are moved swiftly and safely to referring hospitals. With helicopters physician-staffed, patients in critical condition receive early specialized medical care and ongoing treatment for the duration of the transfer.

However, for many reasons the use of helicopter medical transport remains controversial. One of the sources of the debate remains cost, or more precisely, the cost-effectiveness. In fact, many medico-economic studies have shown that the use of the helicopter is not more expensive than deploying a ground system with the same equipment and the same medical teams on an equivalent area. But to ensure the most favorable benefit the use of the helicopter must be optimal.

This means that medical teams should be purposely educated and trained, that there is an alarm system and efficient medical dispatching, and a suitable technical and logistical environment.

DAY 1			
Nr.	DURATION	TOPIC	CONTENTS
1.1	0,5 (A)	Local country EMS status	Explain local EMS situation
1.2	0,5 (D)	HEMS history, current and future development	Explain development of HEMS as well as future trends
1.3	0,5 (P)	HEMS missions and helicopter equipment	Primary (HEMS) & Secondary (Air Ambulance)
1.4	0,5 (A/P)	HEMS set-up	Infrastructure, operation, business model, alarming, training, regulations
1.5	0,5 (P)	Aviation helicopter knowledge	Basic helicopter systems and functioning
1.6	0,5 (A/P)	HEMS regulations	International, EASA, FAA, medical (EN13718) as well as local regulations
1.7	0,75 (D)	Physiology and pathophysiology of flight and stresses of flight	Altitude (hypoxia and barometric variation), vibrations, kinetics (sickness motion), noise, gravitational forces and thermal considerations
1.8	0,5 (D)	Medical indications and counter-indications	Trauma and medical
1.9	0,25 (A/D)	Alarming and dispatching	Criteria and models
1.10	0,25 (D)	Patient preparation prior to transport	Correct preparation of a patient
1.11	0,75 (D)	Traumatized patients	Stabilization, in flight management, hand over to hospital

DAY 2			
Nr.	DURATION	TOPIC	CONTENTS
2.1	1,0 (D)	Non-traumatized patients	Cardiac, respiratory, neurologic (stroke) and surgical emergencies
2.2	0,5 (D)	Infectious diseases	Patient management and helicopter cleaning/disinfection
2.3	0,5 (A/D/P)	Crew Resources Management (CRM)	Work share between the teams (pilot and medical crews), communication, who decides what
2.4	0,5 (P)	Safety briefing	General safety equipment (i.e. flight suits), on ground, boarding, in air, emergency (fire, sea crash) onshore/offshore, intercommunication
2.5	1,0 (P)	Pilot operation	Performance, VFR/IFR, day night, speed and range, WX minima, landing constraints, CAT A operation
2.6	1,0 (D)	Medical devices and equipment	Cardiac monitoring, ventilation, defibrillation, suction, infusion pumps, medical bags
2.7	0,75 (D/P)	Helicopter and mass casualty management	Helicopter missions and capabilities, resources management, dispatching
2.8	1,5 (A/D/P)	Q+A	Open dialogue for animated exchange between all

DAY 3 (optional)			
Nr.	DURATION	TOPIC	CONTENTS
3.1	1,0 (A/D/P)	Workshop	Operation, medical and administration workshops with small teams
3.2	1,0 (D)	Clinical case study	Present and discuss real missions constraints and time line
3.3	3 (D)	Practical workshop with HEMS helicopter on site	Safety procedures, loading/unloading and hands-on exercise of patient with helicopter
3.4	1,0 (D/P)	Maritime Operation	Special requirements for maritime/sea operations
3.5	1,0 (D/P)	Mountain Operation	Special requirements for mountain operations

A: Administration

D: Doctor

P: Pilot, operational experience

TOPIC DESCRIPTION

DAY 1

1.1 Local Country HEMS Status

Objectives : Understand the local EMS and HEMS system in order to provide best training sessions.

Items : Current EMS system, helicopter EMS operators and business models.

1.2 HEMS history, current and future development

Objectives : Register the medical help helicoptered as an evolution depending on men and on the material.

Items : First medical flights. How it change EMS. What is the future.

1.3 HEMS missions and equipment

Objectives : Explain the various HEMS missions, requirements and equipment.

Items : Primary, secondary missions as well as rescue and the associated optional and medical equipment.

1.4 HEMS Set-Up

Objectives : Explain the requirements for a HEMS newcomer, what has to be developed to achieve a successful HEMS system.

Items : Infrastructure, operation, training and regulations.

1.5 Helicopter Basic Knowledge

Objectives : Explain the various Helicopter systems and sub-systems as well as a basic understanding of how the helicopter is operating

Items : Main components such as blades, engines and gearboxes as well as performance, operation, Performance Class ½ operations and aircraft safety.

1.6 HEMS Regulations

Objectives : Explain the various aviation, medical and administration regulations for HEMS.

Items : FAA and EASA regulations, EN13718 medical norm and local norms.

1.7 PHYSIOLOGY AND PATHOPHYSIOLOGY OF HELICOPTER FLIGHT & STRESSES OF FLIGHT.

Objectives : Know the main physiological consequences of the helicopter flight. Understand the pathophysiological consequences in a severely injured patient or critically ill patient.

Items : Effects of barometric variations, hypoxia, vibration, noise, gravitational forces, motion sickness, thermal consideration.

1.8 Medical and Non-medical Indications and Counter-Indications

Objectives : Use the HEMS for the benefit of the patient, and in safety

Items : Non medical indications and counter-indications, Medical indications and counter indications : Bleeding. Coronary. Neurology. Peadiatrics, Patient stability, aggressiveness, pregnant

1.9 Alarming and Dispatching

Objectives : Know benefices and disadvantages of helicopter transport versus ground transport, know how to set up and manage a medical call dispatching.

Items : Steps in decision making, scores algorithm and decision-helping tools, guidelines.

1.10 Patient preparation prior to transport

Objectives : Master context of a cockpit. Prevent specific events

Items : ventilation, perfusion, sedation, splints and others.

1.11 Trauma Patient

Objectives : Know what main part considering the context weight and volume

Items : Cardiac monitoring, ventilation, defibrillation, suction, infusions.

DAY 2

2.1 Non-Trauma Patient

Objectives : Know the benefits of medical helicopter transport for critically ill medical or surgical patients; know how to manage a transfer of a patient with hemodynamic, neurological or respiratory distress.

Items : Acute coronary syndrome, respiratory distress, stroke, coma, shock, obstetrical emergencies, in-flight management of acute medical events.

2.2 Infectious diseases

Objectives : How to manage a helicopter transfer of a patient with infectious disease.

Items : Bacterial and viral diseases, crew protection, cleaning and disinfection of helicopter and equipment.

2.3 Crew Resources Management

Objectives : To better understand roles & responsibilities as well as proper working together in a team.

Items : work share, communication, training, decision process.

2.4 Safety Briefing

Objectives : Explain the safety precautions for any helicopter flight and how to behave in case of an emergency

Items : Approach, boarding, use of intercom, safety belts, emergency procedures & exits.

2.5 Pilot Operation

Objectives : Get familiar with the pilot basic operations in order to understand his procedures

Items : HOVE HOGE/ HIGE, Take-Off, cruise, Landing, CAT A, performance and range & emergency procedures.

2.6 Medical Devices and Equipment

Objectives : How to perform the best treatment and monitoring of patient taking into consideration weight and volume of the installed medical equipment

Items : Cardiac monitoring, artificial ventilation, chest tubes, defibrillator, suction, infusions, blood products and medical bags.

2.7 Helicopter and Mass Casualty Management

Objectives : Understand the usage of multiple helicopters and their capabilities.

Items : Missions, triage, dispatching and coordination management of the flights.

2.8 Q&A

Objectives : Provide time for Questions&Answers, fruitful exchange and common understanding.

Items : Prepare questions and animate the audience to participate.

DAY 3

3.1 Workshop

Objectives : Common exchange and discussion in small groups separated per operational, medical and administration experts.

Items : Case defined IAW with context and country.

3.2 Clinical Case Study

Objectives : Present, analyze and discuss a case report-

Items : Trauma, cardiology, neurology, etc.

3.3 Practical workshop with EMS Helicopter

Objectives : Understanding of safety procedures and boarding. Medical management of equipment in pre-flight and during the flight.

Items : Helicopter presentation, how to approach, loading and unloading, intercommunication, equipment usage in flight.

3.4 Maritime Operation

Objectives : know benefits of helicopter in maritime environment; know technical constraints of maritime helicopter mission.

Items : technical constraints (autonomy, weather conditions, security), benefits and limits of medicalization at sea, evacuation of a patient from a vessel, hoisting of a patients and rescue personnel, off shore missions.

3.5 Mountain Operation

Objectives : Gestion des acteurs du secours hélicoptéré en opération en milieu montagne, Gestion de la prise en charge médicale, du conditionnement, du treuillage de la victime lors d'une évacuation hélicoptérée en montagne.

Items :

A. Connaissance des principales pathologies spécifiques de montagne (3h)

- Mal des montagnes et complications (HAPE et HACE)
- Gelures et hypothermie

- Avalanche

B. Gestion du management et du conditionnement des victimes en montagne et intégration des aléas environnementaux (2h)

- Paramètres climatiques (froid et hypoxie)
- Verticalité, terrain et aléas météorologiques

C. Particularité de l'analgésie sédation en traumatologie de montagne (2h) et de la réanimation

- Analgésie et sédation – Abord veineux
- Intubation et alternative
- Appareil spécifique (attelle, perche, KEDD, caisson de recompression portable, planche à masser,...)

Formation médicalisation et treuillage par simulateur (ECASC) sur la base de Meythet

Scenarii – ateliers de simulation – treuillage perche (1 Journée)

Journée application, treuillage et conditionnement d'une victime en situation réelle avec EC 145 (1 journée)

3.6 Conclusion and Closing

Objectives : Sum up the training and key messages.

Items : Open final discussions, actions, next steps, improvements.

