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PREHOSPITAL EMS AIRCRAFT GUIDELINES



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Prehospital EMS Aircraft Guidelines

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I. Introduction

In 2007, the California Emergency Medical Services (EMS) Authority held an Aeromedical Summit. The purpose of this summit was to bring the parties interested in aeromedical services in California together to discuss the overall EMS air response in our State. This event was attended by representatives from all aspects of EMS and the aeromedical industries including clinicians, private and public providers and local EMS agency (LEMSA) representatives.

During the Aeromedical Summit, several areas of concern with respect to aeromedical services in California were identified that those in attendance felt were of significance to warrant closer evaluation. The areas listed as being significant by the Aeromedical Summit attendees included safety, communication, skill and training, fiscal issues including reimbursement, utilization and quality assurance standards within LEMSA, and oversight of registered nurses.

Based on the concerns stated by attendees of the Aeromedical Summit, EMS Authority decided to develop a statewide multi-jurisdictional task force to create statewide guidelines for use by providers and LEMSAs for air medical EMS. These new guidelines would be developed for the 9-1-1 and emergency call level of service applicable to both rotor and fixed wing aircraft. As the task force was developed, the issues to be considered grew in complexity. The task force decided to separate its resources and develop two working groups to address items that fell into either the medical or operational component of aeromedical services. Once the group assignments were established, the groups began meeting independently approximately once a month. The overall task force met approximately every other month to go over the status of the various projects each group was working on.

The meetings continued over a two year period of time with many documents being created to cover the areas of concern first brought up during the Aeromedical Summit. In 2009, the two working groups were combined back into a single task force to complete the process of placing the various individual group work pieces into one single guideline.

Once the single guideline draft was completed, EMS Authority administration reviewed it prior to a public comment period. Upon completion of the public comment period, the Prehospital EMS Aircraft Guidelines was presented to the Commission on EMS for approval.

The Prehospital EMS Aircraft Guideline demonstrates what can be accomplished when the EMS constituents work together collaboratively to achieve a common goal.

II. Purpose

The use of prehospital EMS aircraft within the EMS system is multifaceted. The integration of prehospital EMS aircraft into an EMS system must be considered within the context of the specific geographical area, patient physiology and needs, operational and fiscal factors and safety. The LEMSA prehospital EMS aircraft criteria must be developed considering evidence based literature, the scope of existing EMS law and regulatory framework. This document is provided to offer guidance in the development of LEMSA policies for prehospital EMS aircraft utilization, dispatch, scene and hospital safety, patient destination, optional multi-jurisdictional air services and quality improvement processes.

LEMAs should engage in an inclusive policy development process with the EMS community that thoroughly examines and qualifies the expected clinical benefits that a patient may receive from transport by prehospital EMS aircraft. This document is not intended to address every circumstance or condition in which prehospital EMS aircraft may be utilized.

III. Definitions

Air Operations Branch Director: A position within the Incident Command System (ICS) system that, when assigned, is designated with responsibility for incident-related air operations. This position may be the designated ground contact. The radio designator would be: ***(Incident name) Air Ops.***

Air Ambulance: Any aircraft specifically constructed, modified or equipped, and used for the primary purpose of responding to emergency calls and transporting critically ill or injured patients whose medical flight crew has a minimum of two (2) attendants licensed in advanced life support.

Air Medical Resource Management: A management system which makes optimum use of all resources, including but not limited to equipment, procedures and people to promote safety and enhance the efficiency of flight operations.

Authorizing Agency: Local EMS agency which approves utilization of specific prehospital EMS aircraft within its jurisdiction.

Auxiliary Rescue Aircraft: Rescue aircraft which does not have a medical flight crew or whose medical flight crew does not meet the minimum requirements established in regulations.

BRN: Board of Registered Nursing.

CAMTS: Commission on Accreditation of Medical Transport Services.

CEMSIS: California EMS Information System.

Classifying Agency: Entity which categorizes the prehospital EMS aircraft into the groups identified in California Code of Regulations Section 100300 (c)(3). This shall be the local EMS agency in the jurisdiction of origin except for aircraft operated by the California Highway Patrol, the California Department of Forestry (Cal Fire) or the California National Guard which shall be classified by the EMS Authority.

Cold Load/Fuel: Loading or fueling of aircraft with rotor blades stopped.

Emergency Landing Zone: the term used to designate an “emergency landing site” of an EMS aircraft by a public safety official.

Emergency Landing Zone Coordinator: A position consistent with ICS protocol, when assigned, is designated with responsibility for securing an emergency landing zone (ELZ), and conducting landing, patient transfer and take-off operations. This position may be the designated ground contact. The radio designator would be: ***(Incident Name) LZ Coordinator.***

EMD: Emergency Medical Dispatch

EMS Aircraft: Any aircraft utilized for the purpose of prehospital emergency patient response and transport. EMS aircraft includes air ambulances and all categories of rescue aircraft.

Flight Following: Monitoring movements of aircraft while in the air.

FOG : Firescope Field Operations Guide, ICS 420-1, June 2004

Helipad Control: The person or division of a receiving facility charged by the facility with control of access of aircraft to the helipad.

Helicopter Coordinator: A position within the ICS that, when assigned, is designated with responsibility to coordinate tactical or logistical air operations. For the purpose of this policy, the Helicopter Coordinator would typically coordinate with the Incident Medical Branch during a major Mass Casualty Incident (MCI). The Helicopter Coordinator fulfills the same function as the Ground Ambulance Coordinator. This position may also be the designated ground contact. The radio designator would be: **(Incident name) Helicopter Coordinator** (HLCO).

Hot Load/Fuel: Loading or refueling of aircraft with rotor blades turning.

ICS: Incident Command System.

Incident Commander: A position within the ICS system that is designated with overall incident management responsibility. The Incident Commander (or Unified Command in multi-jurisdiction operations) is responsible for ensuring the assignment of a **designated ground contact** for EMS helicopter operations under these Guidelines. In some circumstances, the IC position may be the designated ground contact. The radio designator would be: **(Incident name) IC**.

Jurisdiction of Origin: “Jurisdiction of Origin” for the Multi-Jurisdictional Air Provider (M-JAP) means the local EMS agency where the M-JAP headquarters is located in California or if a M-JAP is located outside the state of California, if possible, the local EMS agency where the initial base of operations was established.

LEMSA: Local emergency medical services agency.

Multi-Jurisdictional Air Provider (M-JAP): “Multi-Jurisdictional Air Service Provider”, as used in these Guidelines, means an Air Medical Service Provider that operates EMS air bases located in more than one LEMSAs jurisdiction within California or an Air Service Provider that is based outside of California but transports patients to or from multiple authorizing EMS agency jurisdictions within California on a routine basis. This definition is exclusive of mutual aid provider agreements.

NEMSIS: National EMS Information System.

Private Provider: Entity that is not owned by a public safety agency.

Public Provider: Entity that is operated by a public safety or other governmental agency.

Rescue Aircraft: An aircraft whose usual function is not prehospital emergency patient transport but which may be utilized, in compliance with local EMS policy, for prehospital emergency patient transport when use of an air or ground ambulance is inappropriate or unavailable. Rescue aircraft includes Advanced Life Support (ALS) rescue aircraft, Basic Life Support (BLS) rescue aircraft and auxiliary rescue aircraft.

Time Considerations: Time related to EMS aircraft response should be consistently documented for accurate recording of all aspects of flights. The following items are recommended for inclusion in any system that includes EMS aircraft utilization:

1. Patient arrived at destination date / time: The date / time the responding unit arrived with the patient at the destination or transfer point.
2. Type of response delay: The response delay, if any, of the unit associated with the patient encounter.
3. Type of scene delay: The scene delay, if any, of the unit associated with the patient encounter.
4. Type of transport delay: The transport delay, if any, of the unit associated with the patient encounter.
5. Type of turn-around delay: The turn-around delay, if any, associated with the EMS unit associated with the patient encounter.
6. Ready for departure date / time: The date / time the EMS provider unit is ready to depart from the scene towards its destination.
7. Arrived at care unit date / time: The date / time of arrival at specific facility care unit.
8. Transfer of care at destination facility date / time: The date / time the EMS provider unit transfers care to a health professional at the destination facility.

IV. Utilization

The decision to use prehospital EMS aircraft is complex and a number of important geographical, physiological, and operational factors need to be considered. Utilization is the decision to dispatch air resources and whether to use those resources to transport. It is important that EMS personnel utilize consistent and appropriate criteria when requesting a prehospital EMS aircraft for assistance with patient care and transport. Prehospital EMS aircraft utilization criteria shall be developed and approved by the LEMSA medical director consistent with Health and Safety Code Section 1797.220. Review of appropriate prehospital EMS aircraft utilization should be a part of EMS training, as well as a component of the LEMSA and regional level quality improvement process.

General:

The purpose of this section is to encourage the EMS community to actively participate with the LEMSA to develop and review prehospital EMS aircraft utilization policies using this document as guidance. This review should include dispatch, utilization and destination policies. LEMSAs should engage in an inclusive policy development process with the EMS community that thoroughly examines and qualifies the expected clinical benefits. This document encourages multi-jurisdictional air resource management and is not intended to cover every circumstance or condition in which prehospital EMS aircraft may be utilized.

Operational Guidelines:

When utilizing prehospital EMS aircraft, a patient being transported by EMS aircraft should be critically ill and/or injured (life or limb) and the use of EMS aircraft will get the patient to definitive care with a transport time savings. At times, special circumstances related to a particular area will drive decisions related to prehospital EMS aircraft utilization. The following is an outline of suggested appropriate prehospital EMS aircraft utilization:

1. LEMSA policies and procedures should direct the following activities when an air medical resource may be dispatched in any of the following situations:
 - A. The patient(s) meets LEMSA prehospital EMS aircraft triage criteria for trauma and medical incidents. LEMSAs are encouraged to use triage criteria based upon nationally recognized standards and developed by organizations such as the American College of Surgeons, American College of Emergency Physicians, Air Medical Physician's Association and Centers for Disease Control and Prevention. These triage criteria

should encompass specialty care centers based on resources available in their areas;

- B. An agency that responds or an agency that is dispatched to the scene requests the air medical resource;
 - C. A dispatch center following expedited / simultaneous launch protocols or has information given by the reporting party that would indicate a need; or
 - D. Multi-casualty Incidents (MCI).
2. Utilization of prehospital EMS aircraft should be considered in the following situations where:
- A. The use of the prehospital EMS aircraft will provide a significant reduction in transport time to a receiving facility capable of providing definitive care. Critical time intervals must be understood to select the most expedient means of patient transport. This requires an understanding of the total time to definitive care by both air and ground transport methods. Transport resource response time (estimated time of arrival) to the scene (wheels down or stopped), scene time (including transport to the landing zone (LZ) if the patient cannot be carried to the aircraft) and transport time to definitive care must all be rapidly evaluated to estimate the total time to definitive care. If the total estimated transport time for prehospital EMS aircraft use exceeds the ground ambulance use, air transport should not be used unless specific exception criteria are present (i.e.: rescue, MCI, inaccessible location by ground). Additional consideration when estimating time intervals include but not limited to, the patient's condition, the type of aircraft and current environmental conditions. LEMSA policies and procedures should include standardized definitions and measurements for critical time intervals including following California EMS Information System (CEMSIS) time standards.
 - B. The patient is inaccessible by other means.
 - C. Utilization of existing ground transport services threatens to overwhelm the local EMS system.
 - D. Patient whose condition may benefit by a higher level of care offered by the prehospital EMS aircraft otherwise not available from ground EMS providers on scene.

- E. LEMSA policies and procedures for the use of prehospital EMS aircraft should take into consideration patient and EMS personnel safety, medical appropriateness, evidence based literature and standards/ definitions for time interval estimates (response, scene and transport), field resource management, radio / data communications, continuous quality improvement, data collection / reporting and medical oversight and utilization of the closest / most appropriate resource in accordance with California Code of Regulations (CCR) Title 22, Division 9, Chapter 8.

3. Type of air resource:

- A. The preferred prehospital EMS aircraft should be an air ambulance in compliance with LEMSA policy.
- B. ALS and BLS air rescue aircraft may be used based on LEMSA policy in accordance with CCR Title 22, Chapter 8, Section 100281.
- C. Auxiliary Rescue Aircraft are primarily utilized for rescue / rendezvous purposes only and should not be used routinely for transportation to a medical facility.
- D. ALS or BLS ground providers should not be used routinely for patient care or transport in the aircraft. If the need for ground providers to act as flight crew is anticipated, they should be pre-trained and / or provided a pre-flight briefing prior to functioning in the aircraft.

4. Destination / Cancellation:

- A. Prehospital EMS aircraft personnel will comply with LEMSA patient destination policy for transporting patients to the closest and / or most appropriate facility.
- B. The decision to cancel a responding air medical resource is at the discretion of the incident commander based on the management objectives of the incident and LEMSA policy / procedure. The decision should be made collaboratively with the on scene medical personnel, after assessing the scene location, safety considerations and patient needs in accordance with Health and Safety Code Section 1798.6.
- C. If the air medical resource pilot questions safety, they shall have the final authority in the decisions to continue or cancel the response. Air medical crew resource management and / or the pilot in command may dictate the need to deviate from destination policy based on safety concerns.

V. Dispatch

General:

The utilization of EMS aircraft within EMS systems is widespread. The LEMSA should integrate EMS aircraft into their local systems by implementing standards consistent with California Code of Regulations, Title 22, Division 9, Chapter 8, Prehospital EMS Air Regulations, Section 100300 and Health and Safety Code Sections 1797.6, 1797.85 and 1797.224. A benefit from the utilization of EMS aircraft may be the time saved during air transport as compared to ground transport.

Prehospital EMS aircraft provide a mechanism to potentially reduce the amount of time that it takes to deliver a patient to an appropriate medical facility. Additionally, in specific settings and conditions patients may also benefit when Prehospital EMS aircraft are utilized to perform rescue activities or flight crews perform specialized medical procedures that are otherwise unavailable in the field. Given that saving time is a key component of prehospital EMS aircraft use, it is imperative that all facets of the incident be managed in a way that attempts to accomplish this goal.

Several time elements are created when a request is placed for a prehospital EMS aircraft. These time elements are similar to those that exist for ground ambulances. The request for a prehospital EMS aircraft from a dispatch center or hospital is not unlike a 9-1-1 call placed by a person in need of medical attention. As soon as the request for assistance is made, there is an expectation on the part of the caller that every conceivable effort is being made to deliver the requested response in the most expeditious manner possible.

On-scene providers tasked with patient medical management should carefully consider all time related factors before requesting EMS aircraft. These factors can include but may not be limited to proximity of the incident to the receiving facility; ground versus air response, scene and transport time estimates and patient treatment needs during transport. Incident commanders should consult with the person charged with medical health management at the scene to determine appropriateness of transportation resource needs in accordance with Health and Safety Code Section 1798.6.

Operational Guidelines:

In an effort to accomplish the aforementioned goals, the following recommendations for prehospital EMS aircraft dispatch are made:

1. Prehospital EMS aircraft should initiate and maintain their status with the communications center or emergency command center until such time that their mission is complete.
2. Prehospital EMS aircraft requests from all entities, including incident commanders, local agencies, primary Public Safety Answering Points (PSAPs) and secondary PSAPs should be directed to a single ordering point within a region / area, whenever possible.
3. The ordering point, communications center or emergency command center, is responsible for requesting the appropriate air resources based upon all available technologies and in coordination with local polices and procedures.
4. If a prehospital EMS aircraft provider cannot respond to a request for service (i.e.: weather) the ordering point, communications center or emergency command center should immediately make a request for service to an alternate provider if available. If a request for service is refused by a given provider, the reason for the flight refusal will be conveyed to any subsequent recipient of the request for service. If no prehospital EMS aircraft provider is available, the information must be conveyed to the original requestor in the field as soon as possible so that other transportation arrangements can be made.
5. Aircraft dispatch and use policies should be to dispatch the closest / most appropriate level of care as defined by the LEMSA in accordance with California Code of Regulations (CCR) Title 22, Division 9, Chapter 8.
6. For incidents with an expectation that prehospital EMS aircraft will be necessary (based on information secured by the call taker), it is acceptable to dispatch the appropriate aircraft as soon as possible. Known as "simultaneous dispatch", this practice obviates the need for first responders to arrive at the scene and initiate the request.

7. For incidents that meet certain emergency medical dispatch (EMD) criteria and where the expected ground transport time to the appropriate facility would exceed the total time to deliver the patient to the Emergency Department (ED) via air, the simultaneous dispatch of prehospital EMS aircraft should be considered. Simultaneous dispatch should also be considered whenever incidents meet certain EMD criteria as determined by the LEMSA for rural areas where use of EMS aircraft provides the most rapid transport time to definitive care and that time savings presents a clinically significant benefit to the patient or in situations where multiple patients are confirmed and exceed the capacity of ground resources. In the event air resources are not dispatched with ground resources, air may be requested by the responding ground units or Incident Commander (IC).

8. The use of simultaneous dispatch requires a robust continuous quality improvement (CQI) process with the appropriate medical and operational oversight. LEMSA oversight should include representation from EMS providers and the medical community. It is imperative that the availability of air resources does not lead to the overuse of these resources when ground transportation is the most medically appropriate means of transport.

VI. Helicopter Landing Zone

This section has been developed to provide a consistent, efficient and coordinated approach within California for the setup and security of all EMS aircraft landing zones.

General:

Nothing in this section is intended to limit the statutory authority of a public safety aircraft pilot from an “off-site” landing for the purposes of law enforcement, fire, medical, or rescue operations; “off-site” landings remain under the oversight authority of the Federal Aviation Administration.

This is not intended to apply to designated Helispot or Heliport facilities or EMS helicopter operations from designated/approved airport facilities under the authority of Caltrans Division of Aeronautics and / or Federal Aviation Administration (FAA).

Within the Incident Command System (ICS), incident management rests with the Incident Commander (I/C), unless the IC designates subordinate positions.

The typical designated ground contact for EMS aircraft operations in the field will be either the Incident Commander (*incident name* I/C) or Incident Air Operations (*incident name* Air Ops).

Operational Guidelines:

1. Emergency Landing Zone (ELZ) Setup: The designated ground contact (referred to here as the “ELZ Coordinator”) is responsible for the identification, selection, preparation and security of the EMS helicopter ELZ to minimize the risk of scene response hazards.
2. Preparation for Arrival – ELZ selection should be guided by the following considerations:
 - A. Size - During both day and night operations select an area of at least 100 ft x 100 ft or 100 ft in diameter.

- B. Hazards – The ELZ area should be walked by the ELZ Coordinator to identify any obvious and hidden hazards. This will include any loose debris, large rocks, tree stumps, etc. Many ground hazards can be covered by tall grass. Ask yourself the following question: Will the rotor wash cause debris (trash, plywood, garbage cans, shopping carts, etc.) to be blown around by the high velocity winds? Some items can be picked up by the rotor wash and be blown into the rotor system causing damage to the EMS aircraft or could be blown away from the EMS aircraft potentially causing harm to onlookers or scene personnel.

- C. Obstructions - Tall obstructions / hazards can be determined by standing in the center of the ELZ and with one arm raised to a forty-five (45)-degree angle. Anything that is noted to be in the proximity of the ELZ and above the individual's arm would be identified as a hazard and should be communicated to the flight crew prior to landing. Wires and poles are the most common hazards along with trees. The perimeter of the ELZ should be walked entirely and searched for overhead wires and or poles that may indicate the presence of wires. If able, park vehicles under and parallel to the direction of the wires.

- D. Surface – The surface should be as firm and level as possible. Sand, loose dirt or snow is acceptable but could cause visibility problems (brown out or white out) during landing. Be aware that tall grass can be okay but the underlying surface may not be flat, or have hidden obstacles (tree stumps, fence posts). A soggy wet field may cause the EMS aircraft wheels or skids to sink beyond a safe point. The practice of wetting down a dusty ELZ is acceptable in most situations and may be requested by the flight crew. Particular attention should be made to wetting down the perimeter of the ELZ and working toward the center. As the EMS aircraft is making its final approach most debris / dust will initially be blown beginning at the leeward perimeter of the ELZ.

- E. Slope – The slope of the ELZ should be no greater than ten (10)-degrees. Always approach a helicopter from the downhill side, never approach from the uphill side.

- F. Location - Proximity and accessibility are two important aspects of every ELZ. Try to get the ELZ setup as close to the scene as practical and 100 ft – 200 ft downwind. Avoid having the EMS helicopter approach over the incident to minimize rotor wash on scene operations. Be cognizant of areas for physical access from the scene to the EMS aircraft, i.e. fences, ditches, guard rails etc. The patient will have to be carried over these obstacles, so choose a clear path if available.
- G. ELZ operations on roadways and highways – ELZ operations on roadways and highways, or immediately adjacent thereto, must be coordinated with on-scene law enforcement. Avoid blocking traffic if possible, but if landing on a road, stop all traffic in both directions without exception. Where law enforcement is on-scene prior to designating the ELZ, the designation of the ELZ should be in conjunction with the on-scene officer in charge.
- H. Wind Direction – In most cases the EMS aircraft will land '*into the wind*' or with the wind to its nose. All reference to wind direction should be made with indication of where the winds are coming from.
- I. Smoke Signaling Devices - If you have smoke devices available ask the flight crew if they would like you to use it. Never use smoke devices unless this action is coordinated with the pilot. When using smoke, it must be at a non-flammable location because the canister may put out a great deal of heat and can be blown away by the EMS aircraft rotor wash if not properly positioned or secured.
- J. Night Time Landing Operations – The following apply to nighttime operations:
- 1) Do not direct any light directly towards the EMS aircraft pilot position.
 - 2) Do not use flares to mark an ELZ unless specifically requested by the pilot.
 - 3) A helicopter should be directed into the wind for final approach.
- K. Night Time ELZ Marking –Care should be taken to ensure that the incoming EMS aircraft is familiar with local practices regarding the meaning of any colored lights being used. The ELZ Coordinator should convey the meaning (red for hazard, amber for perimeter, etc.) of any colored lights to the pilot prior to the EMS aircraft's final approach.

- 1) If an ELZ kit is used, place the four (4) similarly colored lights around the perimeter of the ELZ. A fifth (5th) contrasting light should be placed along the perimeter of the ELZ to indicate wind direction as it enters the ELZ. Signaling lights should be secured as well as possible given the terrain.
 - 2) Without an ELZ Kit - If vehicles are available, vehicles may be positioned at the perimeter of the ELZ with the headlights shining toward the center of the ELZ to form an "X."
 - 3) NOTE: The use of colored ELZ lighting systems to designate "hazard" and/or "ELZ" locations must be carefully coordinated; extreme care must be taken to ensure that lighting systems designating "hazard" locations and "ELZ boundaries" do not conflict from jurisdiction to jurisdiction.
- L. Once the EMS aircraft is in sight – When ready, the flight crew will request ELZ info. The ELZ Coordinator should report current information on wind speed and direction, hazards, obstructions / obstacles, terrain surface conditions and other special landing considerations. Hand-signals are not normally used during ELZ operations; however, within some interagency operations hand signals maybe standard practice.
- M. Information to be provided to the flight crew while inbound - the ELZ Coordinator should provide:
- 1) Notification of any chemical hazards both in the area and or patient contamination issues.
 - 2) Notification of multiple EMS aircraft overhead and or inbound.
3. Arrival / Ground Operations – the following should be considered during the arrival and ground operations:
- A. Traffic / Crowd Control – All vehicular and pedestrian traffic must be prevented from entering the ELZ. No scene personnel should get closer than 50 ft to the perimeter of the ELZ unless approved and directed by a flight crew member. Vehicular traffic includes all scene response, police and civilian vehicles. Keep all bystanders at least 100 ft – 200 ft from the ELZ perimeter. A fenced in area will be helpful in keeping people away but, on the other hand there may be livestock that could pose a similar problem.

- B. The ELZ Coordinator should stand at the upwind edge of the ELZ (in proximity of the white wind direction light at night). This will place the ELZ Coordinator at the far edge of the ELZ with the wind at his / her back. This will also place the designated ground contact away from the EMS aircraft as it makes its final approach into the wind.
- C. All other personnel or bystanders should be kept to the extreme edge of the ELZ to protect them from objects that could be blown by the rotor wash or downdraft.
- D. The pilot is the final authority to accept or reject any landing zone and may elect to coordinate with the ELZ Coordinator to select a more suitable location if necessary.
- E. As the EMS aircraft approaches make sure that necessary precautions have been taken to ensure no unauthorized entry into the ELZ during final approach.
- F. Once the EMS aircraft has made its approach to the ELZ it may hover and maneuver to provide the best accessibility for patient loading.
- G. After landing:
 - 1) At no time should any ground personnel approach or return to the EMS aircraft without crew approval.
 - 2) When approaching any helicopter, approach in the crouched position when entering the tip path plane and remain crouched until well under the rotor disc and close to the helicopters fuselage.
 - 3) At no time should personnel be behind the horizontal tail fins on a rear loading helicopter or behind the fuselage where the tail booms begin on a side loading aircraft.
 - 4) Ground personnel should have appropriate head, hearing, and eye protection if operating near the EMS aircraft and have no loose objects on their person.
 - 5) Do not carry equipment above mid chest level when approaching a running helicopter (i.e. IV poles, bags, etc.).
 - 6) Only EMS aircraft personnel should operate aircraft devices and parts (aircraft doors, baggage compartments, cowlings, litter locking devices, etc.).

H. Some patients may be declined due to:

- 1) Radioactive or chemical contamination unless proper decontamination steps have been taken.
- 2) Patients that are violent or combative unless they are physically or chemically restrained.
- 3) Patients who do not meet the weight limitations (pounds and girth) of the EMS helicopter loading system/sled/gurney.

4. Departure Operations - the following should be considered during departure operations:

A. During ground operations the pilot is responsible to formulate a departure path/plan.

B. Depending on situation the departure path may be into the wind passing over the windward side of the ELZ perimeter. Other times the departure may mimic the approach. In any case when the EMS aircraft is preparing to depart be aware of any equipment or compartment doors that may be open and immediately notify the crew.

C. Prior to the EMS aircraft departing:

- 1) When the pilot begins to depart be aware of flying debris (ground personnel should briefly turn their back to the EMS aircraft until the debris subsides).
- 2) The ELZ Coordinator should look for overhead traffic (other air ambulances, news helicopters, airplanes) since visibility is limited above the departing EMS aircraft. The ELZ Coordinator should report that the "OVERHEAD IS CLEAR OF TRAFFIC" or "I HAVE TRAFFIC OVERHEAD YOUR POSITION."
- 3) It is recommended that the designated ground contact be positioned at a 45 degree angle to the windward side of the ELZ. This will prevent the potential situation of the EMS aircraft departing into the wind and directly over the designated ground contact's position.
- 4) After the EMS aircraft departs the ELZ, the security of the ELZ should be maintained until the pilot "clears the aircraft of the ELZ." This is necessary in case the departing EMS aircraft must emergently return due to mechanical or other safety issues.

Communications – unless otherwise designated by the requesting agency, the following VHF communications assignments are recommended:

A. Air-to-Ground VHF Frequencies:

- 1) Primary CALCORD (156.075).
- 2) Secondary: locally designated.
- 3) Alternate: locally designated.

B. Air-to-Ground 800 Talk Groups- the following 800 MHz talk groups are common to every 800 MHz system. These national interoperability talk groups should be considered in the absence of a designated 800 MHz air-to-ground talk group assignment. These talk groups are generally line-of-sight and are useful after the EMS aircraft arrives in the area:

- 1) Primary: I-CALL Direct.
- 2) Secondary: locally designated.
- 3) Alternate locally designated.

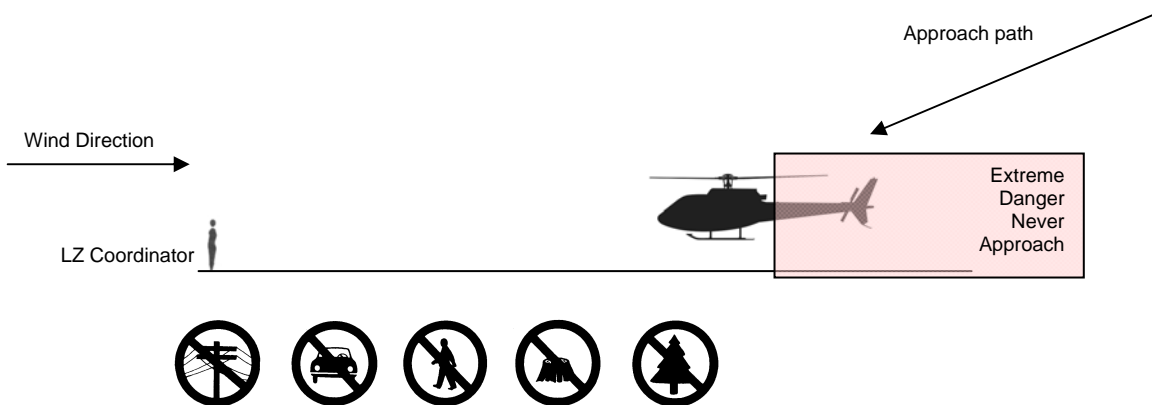
C. Air-to-Ground Communication Protocols- the following air-to-ground communication protocols are recommended:

- 1) Designated air-to-ground frequencies should only be used for EMS helicopter-to-ELZ operations whenever possible. Dual usage of frequency assignments may lead to missing critical information.
- 2) Maintain “radio silence” on final approach and takeoff unless a safety issue arises.
- 3) Use the words “ABORT ABORT ABORT” or “STOP STOP STOP” to alert the pilot that an imminent safety condition or unforeseen hazard exists during landing.
- 4) The priority of the designated ground contact during EMS helicopter take-off and landing operations is ELZ safety and security.

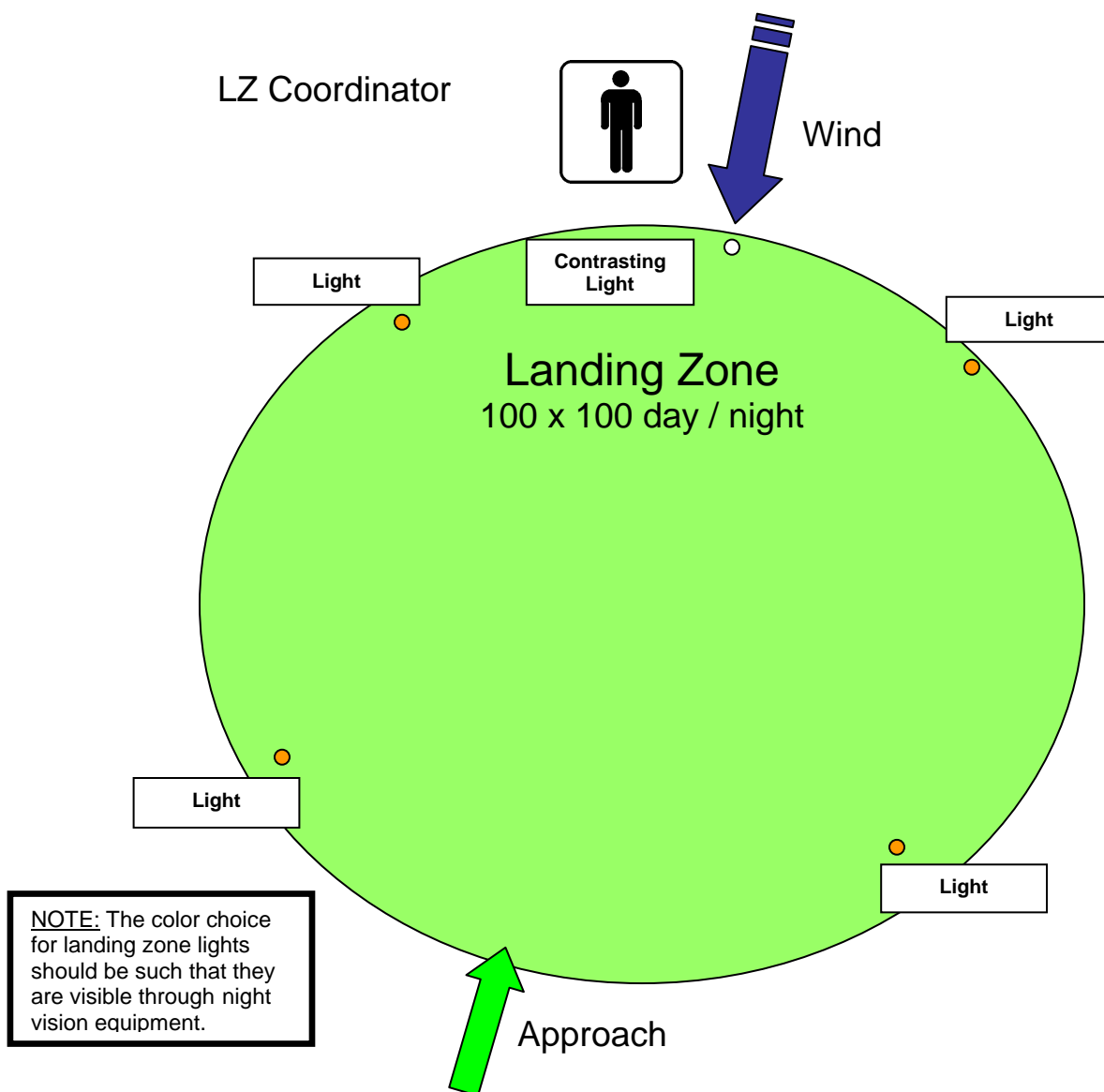
D. Air-to-Air Frequencies – unless otherwise designated by the requesting agency, the following “air-to-air” frequency is recommended:

- 1) Primary: 123.025 MHz

Helicopter Approach Diagram



Night Time Lighting Diagram



VII. Hospital Helipad Safety

General:

It is recommended that each LEMSA develop policies related to helipad safety. The California Department of Transportation (Caltrans) Aeronautics Division is the approving authority for helipads in California. As part of establishing integration into their EMS system, LEMSAs shall maintain an inventory of landing sites approved by Caltrans.

Operational Guideline:

Each LEMSA should tailor the criteria listed below for implementation into their system.

1. Approach and departure routes should be established in such a manner that the aircraft flies safely into and out of the helipad and provides noise abatement within the community.
2. Each helipad should have a contact frequency and phone number published.
3. Inbound and outbound EMS aircraft considerations:
 - A. Public safety or security personnel should be present anytime an aircraft is arriving, departing or blades are turning on any unsecured helipad.
 - B. Communication between the aircraft and the hospital is required for all inbound and outbound aircraft. Hospitals should have specific policies outlining helipad and provider communications.
 - C. When arriving or departing from a hospital helipad it is essential that pilots and crews remain alert, look for other traffic, and exchange traffic information when approaching or departing any landing site. To achieve the greatest degree of safety, it is essential that all aircraft transmit / receive on a common frequency identified for the purpose of LZ advisories. Use of the appropriate common frequency, combined with visual alertness and application of the following operating practices, will enhance safety of flight into and out of all such LZs. 123.025 MHz is the accepted common frequency unless the LZ is located within the boundaries of Class B, C, or D airspace, or whenever a facility specific frequency is required.

- D. For air to air communications: No less than 5 miles out from hospital; report name of LZ, altitude, location relative to the LZ, landing or over flight intentions, and the name of the LZ.
 - E. Inbound aircraft should notify the helipad control 15 minutes prior to arrival when possible. If during the inbound leg for ***that aircraft*** another aircraft comes up on the radio as inbound this traffic information needs to be sent back out by the helipad control as a radio call to the first and second aircraft.
 - F. Outbound aircraft should notify hospital 10 minutes prior to departure, asking: **Are you showing any other traffic to the helipad?**
 - G. All Helipad traffic should be documented on a helipad log. This will allow accurate traffic information given to all aircraft in the event that several people may be charged with the responsibility of answering the radio. A helipad log should be kept by the helipad control radio and in an area where the radio can be heard and monitored at all times. A Mobile Intensive Care Nurse (MICN) is not required to answer the radio when communicating with aircraft traffic.
 - H. Helipad control should advise all aircraft of other expected traffic to or from the helipad by referencing the Helipad Log.
 - I. If not advised by helipad control the aircraft should ask if there is any other expected traffic.
 - J. While a helicopter is landing or taking off, the use of artificial light is not permitted for filming or photography; i.e., photo flash bulbs or flood lights.
 - K. All lights on the helipad should be checked routinely and replaced as needed.
 - L. Helipad windsock should be checked semi-annually and replaced as needed.
4. If more than one aircraft is inbound to a single helipad, priority should be given to the more critical patient. This decision should be made in conjunction with the emergency department physician.
 5. All personnel responding to the helipad should have initial helipad orientation training and participate in annual helipad safety training.

6. The following items should be considered for general safety on all helipads:
 - A. All personnel responding to the helipad should wait outside the marked safety lines until instructed to enter by the flight crew.
 - B. IV poles and gurneys should remain outside the marked safety zone until advised to bring them forward by a crew member. Ensure that the mattress pads, sheets, blankets and any other loose item is secured and will not be displaced by the rotor wash.
 - C. IVs and medical equipment should never be lifted over head height.
 - D. Approaching the helicopter to obtain visual recognition from the pilot should be from the front and within the field of vision of the pilot. Remain well outside the rotor disc. Closer approach to the aircraft should be under the direction and supervision of the flight crew.
 - E. Assume a crouching position when approaching the helicopter when the blades are turning.
 - F. At no time should anyone be permitted near the tail of the aircraft. A crew member or trained public safety officer should stand guard to avert anyone walking toward an open tail rotor.
 - G. Smoking is prohibited by all personnel on the helipad.
 - H. All personnel responding to the helipad to assist with patient loading and offloading should use appropriate hearing and eye protection.
 - I. In the event of compromised vision of anyone of the helipad due to foreign body in the eyes, that person should kneel on the ground in a stationary position until assisted away from the aircraft by a member of the flight crews or public safety.
 - J. No vehicle should be driven within 50 feet of the helicopter unless under the direct supervision of a flight crew member and only when the blades have come to a stop.

VIII. Quality Improvement

This section provides LEMSAs and air medical providers with guidelines for specific considerations for Quality Improvement Programs (QIP) for Air Medical Resources. Because EMS aircraft provide specialized services within an organized EMS system, LEMSAs and air providers should ensure that their QIPs give consideration for the level of service provided by Air Medical Providers. All EMS system constituents should work together at all levels and research and evaluate use of prehospital EMS aircraft.

General:

Consistent with Chapter 12 of Title 22 of the California Code of Regulations, EMS air providers are to develop and implement a QIP in cooperation with other EMS system participants as defined in California Code of Regulations, Chapter 12, Section 100400.

Operational Guideline:

1. The provider QIP should be designed to objectively, systemically and continuously monitor, access, and improve the quality and appropriateness of patient care and safety of the transport service provided. The QIP should be a written document that is approved by the provider's medical director and outlines the responsibility and accountability of the quality improvement plan.
2. A quality improvement flow chart diagram or comparable tool should be developed and utilized demonstrating organizational structure in the quality improvement plan and linkage to the Safety and Risk Management Committees and facilitation of loop closure with field personnel to include a process for addressing complaints from the public and professional entities.
3. QIPs should include indicators, covering the areas listed in CCR Title 22, Chapter 12 of the Emergency Medical Services System QIP, which address, but are not limited to, the following:
 - A. Personnel
 - B. Equipment and Supplies
 - C. Documentation and Communication
 - D. Clinical Care and Patient Outcome
 - E. Skills Maintenance/Competency
 - F. Transportation/Facilities
 - G. Public Education and Prevention
 - H. Risk Management

4. The QIPs should be developed in accordance with the Emergency Medical Services System QIP Model Guidelines (Rev. 3/04), incorporated herein by reference, and shall be approved by the authorizing agency / LEMSA. This is a model program which will develop over time and is to be tailored to the individual organization's quality improvements needs and is to be based on available resources for the EMS QIP.
5. Quality improvement indicators should be tracked and trended to determine compliance with their established thresholds as well as reviewed for potential issues.
6. The QIP should be reviewed annually for appropriateness to the operation of the prehospital EMS aircraft provider. The review should be conducted by, at minimum, an internal Quality Improvement committee established by the provider and the provider's medical director.
7. The prehospital EMS aircraft provider shall implement a comprehensive QIP approved by the classifying agency in accordance with Title 22, Chapter 12.
8. The prehospital EMS aircraft provider's QIP shall integrate into the system wide QIP as approved by the classifying LEMSA. This may include, but not be limited to, making available records for program monitoring or classifying LEMSA. Participation in the authorizing or classifying LEMSA's system wide EMS QIP may include but not be limited to committee membership, policy review and trauma center quality improvement.
9. Provide the authorizing entity / LEMSA with an annual update, following approval of the EMS QIP. The update should include, but not be limited to; a summary of how the air medical provider's EMS QIP addressed the program indicators.
10. QIPs should include indicators that are reviewed for appropriateness on a quarterly basis with an annual summary of the local quality improvement indicators performance. Quality improvement data should be considered when quality improvement indicators are developed to monitor issues found in current practices or processes. Air Medical Providers may reference Commission on Accreditation of Medical Transport Services (CAMTS) to identify potential indicators they may wish to implement in their system. Indicators should address, but are not limited to, the following triggers:
 - A. Personnel - Continuing education/staff development should be completed and documented for all Critical Care and ALS Providers. These should be specific and appropriate for the mission statement and scope of care of the medical transport service. Didactic continuing education should include an annual review of:

- 1) Hazardous materials recognition and response.
 - 2) Crew Resource Management – Air Medical Resource Management (AMRM).
 - 3) Clinical and laboratory continuing education should be developed and monitored on an annual basis and tailored to the provider’s mission to include:
 - a. Critical care (Adult, pediatric, neonatal);
 - b. Emergency / trauma care;
 - c. Invasive procedure labs; and
 - d. Labor and delivery.
- B. Equipment and Supplies - EMS aircraft personnel must ensure that all medical equipment is in working order and all equipment/supplies are validated through documented checklists for both the primary and secondary aircraft, if applicable. All patient equipment failures are monitored through the Quality Assurance (QA) process.
- 1) Equipment must be periodically tested and inspected by a certified clinical engineer at the manufacturer’s suggested intervals.
 - 2) Equipment inspections and records of inspections are maintained according to the program’s guidelines.
- C. Documentation and Communication - A mechanism should be in place to ensure accurate, appropriate and complete documentation of, but not limited to, the following items:
- 1) Time of call (Time of request / inquiry received).
 - 2) Name of requesting agency.
 - 3) Age, diagnosis or mechanism of injury.
 - 4) Destination airport, refueling stops (if necessary), location of transportation exchange and hours of operation.
 - 5) Weather checks prior to departure and during mission as needed.
 - 6) Previous turn-downs of the mission (e.g. EMS aircraft shopping)
 - 7) Ground transportation coordination at sending and receiving areas.
 - 8) Time of dispatch (time medical personnel notified flight is a go, post pilot OKs flight).
 - 9) Time depart base (time of lift-off from base or other site).
 - 10) Number and names of persons on board.
 - 11) Estimated time of arrival (ETA).
 - 12) Pertinent LZ information.
 - 13) All times (and intervals) associated with the call.

D. Clinical Care and Patient Outcome.

- 1) Patient outcome (morbidity and mortality) at the time of arrival at destination.
- 2) Patient change in condition during transport.
- 3) Discharge summary, including date of discharge and patient condition. The air medical provider should work with the LEMSA to obtain necessary outcome information when it is not readily available to the provider, including:
 - a. Patients that are discharged home directly from the ED or discharged within 24 hours of admission.
 - b. Patients who are transported without an intravenous (IV) line or Oxygen.
 - c. When Cardio-Pulmonary Resuscitation (CPR) is being performed at the referring location.
 - d. A patient who is transported more than once for the same illness or injury in a 24 hour period.
 - e. Patients who are transported from the scene of injury with a trauma score of 15 or greater or fails to meet area-specific triage criteria for a critically injured trauma patient.
 - f. Patients who are treated at the scene but not transported.
 - g. Patients who are not transferred bedside to bedside by the flight team.
 - h. Patients who are transported for continuation of care and the receiving facility is not a higher level of care than the referring facility.

E. Skills Maintenance/Competency.

- 1) At minimum, annual evaluations ensuring all required skills and operations are conducted in compliance with existing provider and LEMSA standards should be done by each discipline.
- 2) High risk, low frequency skills should be monitored through the quality improvement process. Each air medical provider should have a policy in place for assuring competency in performance of high risk skills and procedures consistent with LEMSA standards.

F. Transportation/Facilities.

- 1) Hot / cold (rotors turning / stopped) patient load / unload policy including equipment and weight considerations.
- 2) Unusual / unanticipated helipad incidents.
- 3) Situations where non-assigned medical personnel are placed in aircraft to provide primary patient care during air medical transport.
- 4) Appropriate transport destination based on LEMSA policy for the patient pick-up location.
- 5) Appropriate utilization of air medical resources based on patient condition in the field.
- 6) Fixed wing transport monitoring, if applicable.
- 7) Fuel issues, including situations where hot fueling (rotors turning) or topping off fuel is required prior to response or during patient transport.
- 8) LEMSA policies should include provisions to ensure retrospective review of situations where prehospital EMS aircraft deviate from destination policy / protocol.

G. Public Education and Prevention - Integration into local system

H. Risk Management - Air providers should have a policy that addresses the following:

- 1) An annual drill is conducted to exercise the post incident / accident plan (PIAP). This drill should include pilots, medical personnel, communications personnel, mechanics and administrative personnel. Written debriefing and critique of PIAP drills should be shared with all staff members.
- 2) Fatigue.
- 3) A non-punitive system for employees to report hazards and safety concerns.
- 4) A system to document, track, trend and mitigate errors or hazards.
- 5) A system to audit and review organizational policy and procedures, on going safety training for all personnel (including managers), a system of pro-active and reactive procedures to insure compliance.
- 6) Track and trend weather related previous turn downs.

11. Medical Flight Crew Training:

Personnel who function on a prehospital EMS aircraft shall have training in air medical transportation. Medical flight crew training programs shall be approved by the authorizing EMS agency consistent with CCR Title 22, Division 9, Chapter 8, Section 100302, Medical Flight Crew.

12. LEMSA system wide QIPs should include review of prehospital EMS aircraft utilization. Qualitative results of prehospital EMS aircraft utilization should be included in the LEMSA review of the effectiveness of the quality improvement program.

IX. Multi-Jurisdictional Air Provider

General:

The Multi-Jurisdictional Air Provider (M-JAP) section outlines a recommended process for accrediting M-JAP within a local, regional, statewide, or interstate service area. The end goal is to support safety and excellence in patient care while working to minimize regulatory barriers to getting the right resource to the right patient in the right amount of time. This recommended process guideline states M-JAPs who have multiple bases throughout California to standardize their program in all aspects of medical control and patient care. The LEMSA may elect to designate a single classifying EMS agency, with the end goal of minimizing regulatory barriers. This section will also address standard medical control issues and keep air operational issues, such as destination policies, “as is” within each authorizing LEMSA’s jurisdiction.

Operational Guideline:

1. Medical control decisions for M-JAPs should be a collaborative effort of all stakeholder medical directors involved (i.e., the medical directors of the classifying EMS agency, the authorizing EMS agency, and the M-JAP). (reference H&S 1797.202).
2. If at any point in time an authorizing EMS agency determines a change is needed in policies, procedures, or protocols, provider agency medical directors should have access to the revision process to provide input to the LEMSA medical director.
3. When a new M-JAP is established, it is required that the new air service provider undergo the classifying and authorizing process with all LEMSAs served by the M-JAP Provider.
4. All collaboration may be established between the classifying EMS agencies through an inter-agency agreement, a memorandum of understanding (MOU), etc. with each authorizing LEMSA where the M-JAP has a base of operations in California.
5. Multi-Jurisdictional Air Provider:
 - A. Establishes and maintains classification for all air bases in California with a LEMSA.

- B. Establishes and maintains a provider agreement with each authorizing LEMSA where an air base is located or where the provider is assigned primary response to a designated area within an authorizing LEMSA jurisdiction.
 - C. Maintains at a minimum a physician approved by the coordinating LEMSA who functions as the M-JAP medical director.
 - D. Works in collaboration with the authorizing local medical directors to:
 - 1) Establish accreditation and authorization standards for the medical flight crew.
 - 2) Scope of practice for the paramedic flight crew member; may include expanded scope.
 - 3) Medical protocols for medical flight crew.
 - 4) Standardized procedures for the authorized registered nurse flight crew member (H&S 1797.56).
 - E. Provides data to the classifying EMS agency in universal format consistent with California EMS Information System (CEMSIS).
6. Classifying LEMSA:
- A. Should verify that an appropriate licensed physician functions as the medical director for the M-JAP.
 - B. Shall establish and maintain:
 - 1) A medical flight crew accreditation and authorization process.
 - 2) A standardized drug and equipment list, based upon the scope of practice pre-determined by all the stakeholder medical directors involved.
 - 3) An approved data collection process in a universal format as identified by CEMSIS.
 - 4) Primary coordination of incident review.
 - 5) Should approve the M-JAP's Quality Improvement Plan.
 - C. Should collaborate with the M-JAP to establish the following:
 - 1) Accreditation and authorization standards for the medical flight crew.
 - 2) Scope of practice for the paramedic flight crew member
 - 3) Standardized procedures for the authorized registered nurse flight crew member (H&S 1797.56).

- 4) Medical protocols for the medical flight crew.
- 5) A quality improvement process.
- 6) A data collection and submission process.
- 7) An incident review process.
- 8) Schedule for site visits and inspections of EMS aircraft.

*It is strongly recommended that the LEMSA establish and host a data collection point for M-JAP data based on CEMSIS. Data received from this collection shall be made available to the EMS Authority for review.

7. Authorizing EMS Agency:

A. Establishes and maintains the following:

- 1) A provider agreement with all M-JAP who have a base of operations within their jurisdiction or who routinely provide service from or within their jurisdiction.
- 2) Control of LEMSA approved operational decisions for any EMS aircraft within its jurisdiction, e.g. dispatch, destination decision and policies and prehospital EMS Aircraft Utilization policies.

B. Receives or is provided access to data for all M-JAP within their jurisdiction.

C. Collaborates with classifying LEMSA to establish the following:

- 1) Accreditation and authorization standards for the medical flight crew. Shall grant reciprocity to multi-jurisdictional medical flight crew accredited or authorized by the classifying agency.
- 2) Scope of practice for the paramedic flight crew member; may include expanded scope when approved by the authorizing LEMSA medical director within the M-JAP.
- 3) Medical protocols for medical flight crew.
- 4) Standardized procedures for the authorized registered nurse flight crew member (H&S 1797.56).
- 5) A quality improvement process.
- 6) A data collection and submission process.
- 7) An incident review process.
- 8) Schedule for site visits and inspections of EMS aircraft.

X. Temporary Flight Crew Authorization

General:

This section provides LEMSAs with guidelines for the temporary authorization or accreditation for medical flight crew personnel in the event that a provider is temporarily unable to staff an aircraft with permanently assigned authorized or accredited flight crew member. The LEMSA has authority to determine any specific criteria in their area for the temporary authorization of flight crew members consistent with CCR Title 22, Division 9, Chapter 8, Section 100300, Application of Chapter.

Operational Guideline:

1. This is an emergency temporary process by which a LEMSA may authorize or accredit a medical flight crew member who is coming from another authorizing LEMSA for no more than a 90-day period of time. The emergency authorization or accreditation time period may be reduced by the LEMSA based on system needs.
2. When a medical flight crew member is approved to work in another local EMS region on a temporary basis, they shall:
 - A. Not administer medications or perform skills outside the scope of practice from where they are permanently accredited or authorized. The medical flight crew's scope of practice may be limited due to the medications and equipment routinely stocked on the aircraft where they are temporarily working.
 - B. Be scheduled with another medical flight crew member who is permanently authorized or accredited by the authorizing EMS agency. Air transport providers normally staffed with one ALS provider shall ensure any temporary flight crew members are knowledgeable of the policies of the LEMSA in which they are providing service.

Procedure:

1. In order to receive temporary authorization under this policy, the EMS aircraft provider agency shall submit all of the following to the medical director of the LEMSA:

- A. A letter requesting the implementation of this emergency temporary process for the medical flight crew member for approval to work in that EMS region. The request shall outline the need to implement this process and be signed by the EMS aircraft provider's medical director or authorized management representative and administration substantiating the necessity for temporary accreditation / authorization.
 - B. Documentation of the following:
 - 1) Registered nurses: verification of a current California nursing license. The Board of Registered Nurses (BRN) does not recognize any form of mutual aid for nurses, except in the time of a declared state of emergency by the Governor or his / her designee consistent with Business and Professions Code Section 2757.
 - 2) EMT-Paramedics: verification of a current California paramedic license.
 - C. Documentation demonstrating "in good standing" status within another California local EMS agency LEMSA; the following may be used to validate this requirement where applicable:
 - 1) Authorized registered nurses: verification of current authorization.
 - 2) EMT-Paramedics: verification of a current paramedic accreditation card.
 - D. In emergency circumstances, an EMS aircraft provider can temporarily fulfill requirements "1A – 1C" of this paragraph by making a notification (verbal / electronic) to the LEMSA during weekends / nights / holidays. The EMS aircraft provider must ensure that a confirmation is received from the authorized LEMSA duty officer who the request is being made to that a temporary flight crew request has been received and approved within 24 hours of submission. The request may be made verbally or electronically. If the request is made verbally, the LEMSA taking the request shall document the date/time of the request and person/provider making the request.
2. This temporary authorization or accreditation shall not be routinely renewed, but may be converted to a permanent authorization / accreditation by completing remaining authorization or accreditation requirements by the authorizing LEMSA. The authorizing LEMSA may consider renewal of this process on a case by case basis.

XII. References

1. California Code of Regulations, Title 22, Chapter 9, EMS Quality Improvement Regulations
2. California Code of Regulations, Title 22, Chapter 8, Prehospital EMS Air Regulations
3. Health and Safety Code Section 1797.202, 1797.56, 1797.224, 1797.201
4. Commission on Accreditation of Medical Transport Systems (CAMTS); Accreditation Standards Version 7
5. Purtil M, Benedict K, Hernandez-Boussard T, Brundage S, Sherck J, Garland A, Spain D. Validation of a Prehospital Trauma Triage Tool: A 10-year Perspective. *The Journal of Trauma Injury, Infection and Critical Care*. 2008;65(6):1253-1257.
6. Guidelines from the American College of Surgeons.
7. Air Medical Physicians Association
8. National Association of EMS Physicians
9. Association of Air Medical Services
10. FAA Federal Aviation Regulations 2009
11. Field Operations Guide-FOG