

***STATE OF WASHINGTON***

***EMS AND TRAUMA CARE SYSTEM***

***AIR MEDICAL SERVICE PLAN***

***Revised October, 2010***



**Office of  
Community Health Systems**

## Overview

The State of Washington regulates air ambulances as separate services (WAC 246-976-320). This state-wide air-medical response plan is a component of the State EMS and Trauma Care Plan. The State air-medical response plan serves as the pre-hospital air medical support plan for each of the eight EMS and Trauma Care (EMSTC) Regions. This plan provides the basis upon which pre-hospital, air-medical services will be delivered in the State. By statute, the Department of Health (DOH) establishes the need for and distribution of air medical services providing care in the pre-hospital setting.

The basic difference existing between air ambulance vehicles that provide scene response and those providing inter-facility transport is recognized by DOH. With the exception of injuries or medical incidents occurring at an airport facility, pre-hospital scene response for air ambulance service requires rotary wing aircraft. Inter-facility transport may be accomplished by both rotary and fixed wing aircraft.

The Plan reflects the input of air medical service representatives, Regional Emergency Medical Services and Trauma System (EMSTS) representatives, as well as field EMS providers. Literature pertinent to the provision of air-medical services has also been reviewed to ensure current standards and practices have been considered during the development of this plan. Analysis of the current air medical system included evaluating how the current system covers the state. This revision includes the strengths, weaknesses, opportunities and threats (SWOT analysis) and review of local and Regional protocols found in the 2008 version that was adopted by the Governor's Steering Committee on EMS and Trauma.

### **Current System Overview and Performance**

Currently, the air medical system in the State of Washington is comprised of four provider agencies. These providers maintain base operations in Bellingham, Arlington, Seattle, Olympia, Spokane and Pasco, Washington. Additional bases are located in the Oregon cities of Gresham, Troutdale and The Dalles. The Oregon bases provide on scene and interfacility air medical services to the Southwestern portion of Washington State. Together, these services provide a 30-minute response time from base to scene for over 96% of the State's residential population and 100% of the State's population is capable of receiving air medical service in 60 minutes or less. This plan provides detailed discussion of the response time capabilities of the existing air medical services. Most interestingly, with the current distribution of air medical services, 68% of the State's land area and over 90% of the residential population is within a 30-minute response time from flight operations bases to scene and 30-minute response time from scene to a Level 1 or Level 2 designated Trauma Service. It is important to note that distribution of Level 1 and Level 2 designated trauma services has an impact on the ability to deliver patients in a timely manner to the higher-level trauma services, even by air. Obvious geographic gaps in this combined 30-minute response time coverage pattern are consistent with the lack of Level 1 or 2 designated trauma services. When scene to designated trauma center include Level 3 trauma services, the level of coverage improves to 93% of the land area of the State and 99% of the residential population.

### **System Analysis**

A SWOT analysis of the current air medical system was developed with the input of Regional EMSTC representatives, air medical representatives and pre-hospital EMS provider agency representatives. This Plan provides a detailed list of both internal and external dynamics affecting the provision of air medical service in the State. Overall, the System has many inherent

strengths in its ability to provide optimum care to the State's residents. Weaknesses and Threats to the existing system are largely economically driven. Strengths and Opportunities identified in the system analysis were largely centered on the quality-driven focus and reputation of the existing services (both in-state and out-of-state).

### **State of Washington Air Medical Plan Goals**

Based upon the assessment of the current air medical system, three broad based goals were developed to ensure continued stability and growth of the air medical response system. They include:

- ❖ A system of Air medical response providing safe and expeditious transport of critically ill or injured patients to the appropriate hospital, including designated trauma services for the critically injured.
- ❖ Patient care procedures for the response of air medical resources that optimize the benefits of an air medical response system and promote safe and expeditious transport of all patients requiring such care
- ❖ Air medical resources throughout the State of Washington provide optimal coverage while avoiding costly and inefficient duplication of resources

These three goals were developed in concert with, and in support of, the over-arching State strategic trauma care plan. Ensuring the goals support the State's overall Trauma Care Plan and promotes consistency in the provision of trauma and pre-hospital care throughout the State.

The Plan addresses the issue of utilization of the air medical response system with a focus on safety. The State's unique geographic characteristics and concentrated areas of population contribute to the need for a rational approach to the development of this Plan. The utility of the medical helicopter is apparent in remote wilderness and rural areas of the State. Without the availability of the medical helicopter, the clinical outcome of many patients would be negatively impacted. Similarly, in urban areas population centers may be as close as 20 minutes from a major medical facility but are isolated due to large bodies of water. While ground ambulance transport is feasible utilizing the State's ferry system, such transports result in significant delays. Use of the medical helicopter in these circumstances must be a consideration in the development of the Plan. Traffic patterns and congestion in major urban areas must also be considered when discussing utilization of air medical services.

Safety issues must always remain at the forefront of any discussion relating to the utilization of air medical services in the State. Consideration and inclusion of safety-related strategies must be reflected in all local, regional and state protocols relating to the use of air medical helicopters. The Plan highlights the need for air medical services to comply with all FAA regulations relating to air medical transport services. Additionally, dispatch personnel, ground EMS services, fire and law enforcement agencies will be provided guidance on the safe and efficient use of air medical services.

### **Need and Distribution of Air Medical Resources**

Current distribution of air medical bases is determined by the individual agencies based upon appropriate response time performance indicators and market distribution. State statute requires DOH to determine the minimum and maximum number of trauma services including air medical resources. Within the Plan, three principles form the basis for establishing minimum and maximum ranges of air medical services.

These principles include:

- ❖ Air-medical services are often multi-regional and/or statewide in scope

- ❖ Air-medical services are a critical component of the statewide EMS and Trauma Care System. They are essential to assuring certain patients reach the right facility in the right amount of time
- ❖ Utilization review is necessary to assure that patient transports are appropriate and accomplished in the most efficacious mode.

Currently, response time standards for pre-hospital air medical services have not been established. WAC 246-976-390(12) states: “Verified air ambulance services must meet minimum agency response times as identified in the State Plan.” Air ambulance services are subject to requirements of the State of Washington Pre-hospital Trauma Triage Destination Procedure. Rotary wing air medical services that respond to prehospital scenes must comply with the following response times. These times are calculated from the time the air medical service receives a request for service and when the helicopter arrives on scene. Air medical services that respond to prehospital EMS and Trauma scenes must arrive within 30 minutes of receiving a request for service, 80% of the time.

Safety of patients, ground EMS personnel and Air medical personnel are of primary concern. Therefore, exceptions to this response time expectation include those times when weather or other factors preclude the air service from safely flying to an EMS scene.

#### **Air Medical Standards**

The Plan provides detailed standards to which all pre-hospital air medical services are expected to comply. These include, but are not limited to, adherence/compliance with all FAA regulations, CAMTS certification, and response time standards, use of current flight technology to ensure safe and efficient air medical response and other standards as identified in Washington Administrative Code (WAC) 246-976-320.

#### **Work Plan**

To be effective, a strategic plan must be functional. Therefore, the Plan incorporates a 5-year work plan driven from the goals and objectives previously discussed. This work plan will be the responsibility of the Prehospital Technical Advisory Committee. This committee will be charged with conducting the work identified in the plan and report progress toward achieving goals and objectives throughout the course of each year.

In conclusion, the increased use of medical helicopters for emergency transport necessitates a coordinated system of air medical response. Lack of a coordinated system de-stabilizes the air medical response component of an EMS system and creates an unsafe environment. Additionally, the lack of a coordinated air medical system creates a weak link in the chain of trauma survival. Through the implementation of this Plan, the State of Washington will ensure an air medical response system that, consistent with the State EMS Vision, “reduces death, disability, human suffering and costs due to injury and medical emergencies.”

**State of Washington EMS and Trauma Care System  
Pre-Hospital Air Medical Services  
Department of Health Authorization**

The State of Washington regulates air ambulances as distinct services (WAC 246-976-320). The state-wide air-medical response plan is a component of the State EMS and Trauma Care Plan. The State air-medical response plan serves as each EMS and Trauma Care (EMSTC) Region's plan for prehospital air medical support. This plan provides the basis on how air-medical services will be delivered throughout the State of Washington.

The requirements and standards for licensure/verification of air-medical services, as defined in WAC, closely parallel current National Standards. Additionally, each licensed/verified air ambulance agency is required to be accredited through the Commission on Accreditation of Medical Transport Systems (CAMTS). The Department of Health establishes the need for and distribution of air services through this plan.

The basic difference existing between air ambulance vehicles that provide scene response and those that provide inter-facility transport is recognized by the Department. With the exception of injuries or medical incidents occurring at an airport facility, pre-hospital scene response for air ambulance services requires rotary wing aircraft. Inter-facility transport may be accomplished by both rotary and fixed wing aircraft.

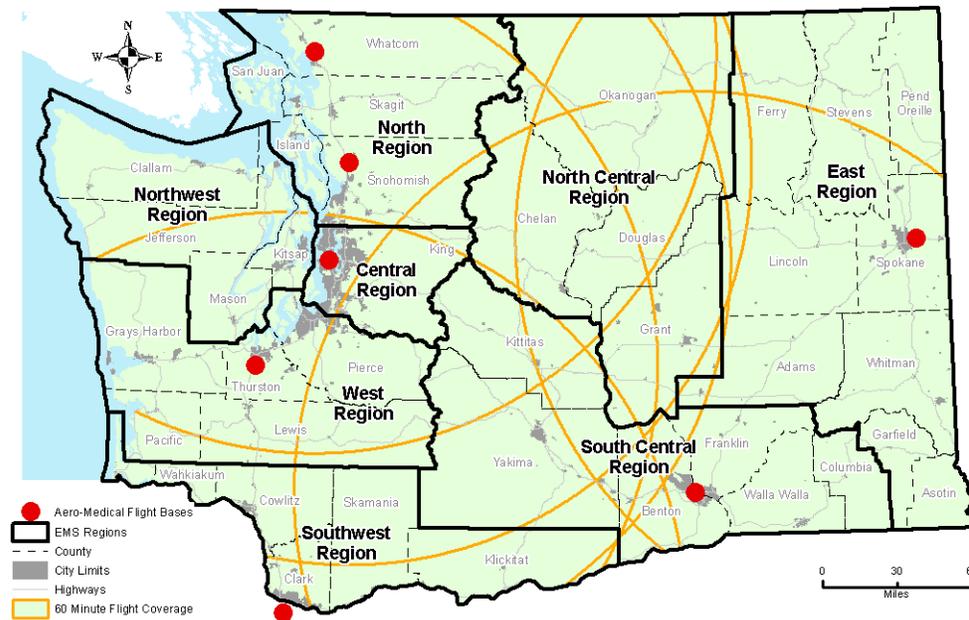
## State of Washington EMS and Trauma Care System Pre-Hospital Air Medical Services System Description

### Current Status

There are currently four providers of trauma verified pre-hospital air-medical services in the State of Washington. These providers maintain base operations in Bellingham, Arlington, Seattle, Olympia, Spokane, Moses Lake and Pasco, Washington. Additional bases are located in the Oregon cities of Gresham, Troutdale and The Dalles. Military air medical support with lift-capable aircraft is available from the Army (out of Yakima, WA), MAST from Fairchild AFB, NAS Whidbey and the U.S. Coast Guard located in the Puget Sound area. There are also several law-enforcement operated helicopters that are utilized in certain wilderness, technical search & rescue situations.

Each of the services utilizes helicopters of differing make and model. These aircraft have unique performance capabilities and all are configured to comply with state and national standards for patient transportation.

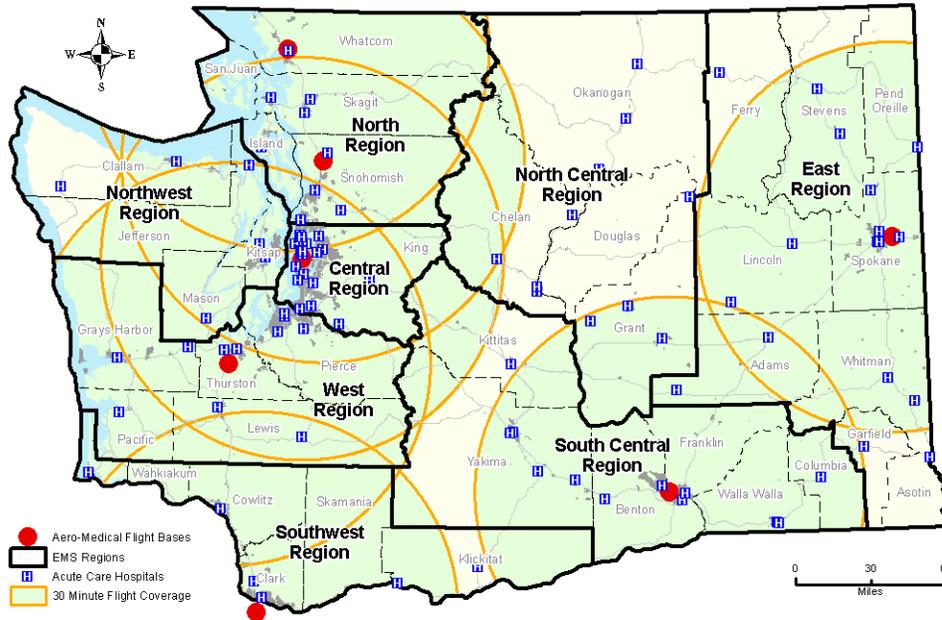
The coverage provided by these resources depends on variables such as altitude, temperature, time-of-day and weather conditions. With these factors in mind and considering the capabilities of the various aircraft, maximum flight radii for each of the medical helicopters (the greatest distance a particular helicopter can safely fly based upon fuel consumption) were identified. The graphic models built with this information demonstrate that 100 percent of the State is currently covered by rotary wing aircraft (**Figure 1**).



**Figure 1. 60 Minute Response Coverage from Helicopter Bases**

When scene to trauma center response time is 30 minutes, over 94% of the State's land area is covered. While **Figure 2** illustrates the response time capability of air-medical services to Level

1 and Level 2 Trauma Services, it is important to consider the transport time to Level III Trauma Services as well.



**Figure 2. 30 Minute Response Time Coverage around Level 1 & 2 Facilities**

While the previous discussions have focused on the response times from scene to designated trauma services, consideration of response time from flight operations bases to incident scenes must also be factored when assessing the true efficacy of the air-medical system. Lengthy response times to incident scenes consume critical minutes of the ‘Golden Hour of Trauma’. This total time on task creates a true perspective of the current capability of air-medical services in the State. The area of the State that is both within a 30-minute response time from flight operation bases to incident scenes and 30-minute response time to a designated Level 1 or Level 2 Trauma Service is nearly 68% of the State’s land area. This represents nearly 91% of the State’s population. Most, if not all, medical helicopters are unable to accommodate (in response time only) the distances that exist between incident scenes and current Level I and Level II trauma centers.

Employing a systems approach to this issue is key to identifying solutions to this issue. Not only is this an air medical issue which must be monitored and constantly evaluated, but collaboration with the Hospital Technical Advisory Committee to address the issue of distribution of Level II trauma centers is essential. In accordance with this system approach, the air medical work group will be developing a baseline early activation protocol/procedure for use throughout the State to enhance response time for air medical resources.

Overall, this discussion illustrates the coverage achieved with the existing air-medical services in the State. The system’s ability to deliver timely care and transport to appropriate Trauma Services is evident. In only the most remote areas of the State are air medical services unable to meet State standards for the delivery of trauma patients to Level One, Two or Three Designated Trauma Facilities.

### **Automatic Launch of Air Medical Services**

Current literature discusses the benefit of automatically initiating an Air Medical response in certain situations. By doing so, the time to evacuate critically ill or injured patients to the appropriate hospital or trauma center is reduced.

As reflected throughout this document and the work plan, periodic review of air medical resource utilization will be conducted. This process provides a retrospective analysis of the decisions to utilize air medical services and identifies the need for modification to the algorithm.

### **Appropriate Hospital Destination for Patients Transported by Air Medical Services**

Clinical flight crews will adhere to the State of Washington, Trauma Triage Tool when identifying the most appropriate receiving facility for trauma patients. Consistent with the Trauma Triage (Destination) tool, the intent of this portion of the State's Air Medical Plan is to ensure that major trauma patients are transported to the most appropriate hospital facility.

### **Pre-Hospital Air Medical Services System Assessment and Issues Statement**

In developing the Plan, it is important to evaluate/assess the current system's inherent strengths and weaknesses as well as external threats to its sustainability. The following information was developed from a survey sent to the Regional EMSTC offices, input from pre-hospital agencies and the existing air medical services. Results of this "SWOT" analysis included:

#### ***Internal Strengths of the Current Air-medical System***

The following internal strengths are identified in the current air-medical system in the State:

- ❖ Broad distribution of flight operation bases
- ❖ Experience of existing services in providing service in the State of Washington
- ❖ Financial commitment of existing air-medical services
- ❖ Clinical and Administrative staff of existing air-medical services
- ❖ Equipment utilized by existing air-medical services
- ❖ Integration of existing services with the EMS community
- ❖ Reputation of existing air-medical services

#### ***Internal Weaknesses of the Current Air-medical System***

The following internal weaknesses are identified in the current air-medical system:

- ❖ Current reimbursement philosophies of major payers
- ❖ Escalating cost of providing air-medical services
- ❖ No centralized air-medical response data repository
- ❖ Over flight of patients. Patients who do not meet criteria for transport to a Level I facility, fly over closer, more appropriate trauma centers. Not related to air medical marketing but more so trauma system design and patient referral patterns
- ❖ Enforcement of existing guidelines and criteria; Lack of a state-wide QI system on triage of patients as well as appropriate level of transport (air vs. ground)

#### ***Opportunities for Current Air-medical System***

The following opportunities have been identified

- ❖ Expansion of current geographic distribution of flight operation bases
- ❖ WEMSIS and ability to begin collecting EMSTC flight information
- ❖ Development of State-wide guidelines for utilization of air-medical services or field/scene EMS requests for service

***Threats to the Current Air-medical System***

The following threats to the continued efficacy of the State’s air-medical system include:

- ❖ Reimbursement is not maintaining pace with expense of providing service
- ❖ Non and Under-insured patients
- ❖ Increased scrutiny of medical necessity by third party insurers
- ❖ Third party insurers are capping air medical reimbursement levels below the actual cost of providing service and increasing patient co-pay amounts for air medical service
- ❖ Inefficient duplication of multiple air medical services in the State. Unnecessary duplication results in inefficiencies due to lack of coordination of these critically important services.
- ❖ Inefficient utilization of air medical services (i.e., over or under utilization by ground pre-hospital EMS services)

Based upon this analysis and considering the current status of the State’s air medical resources, a list of issues facing this system component was identified. From these issues, the goals and objectives were created to serve as the foundation for the work plan component of the State air medical plan. Primary or high visibility issues include:

- 1) Identify response time standards for both response to the scene and scene to hospital that are patient focused and evidenced based
- 2) Developing an early activation procedure that supports response time goals.
- 3) A need to address the economic barriers to providing optimal coverage and methods to mitigate some of the expense of “readiness” incurred by air medical services.
- 4) A need to develop state-wide patient care guidelines that address the utilization of air medical services. This would address the over and under utilization of air medical services through education of pre-hospital and hospital emergency care providers
- 5) Develop a method of data collection that will promote evidenced-based decision making as it relates to the utilization, distribution and need for air medical services.
- 6) Inclusion of air medical service calls in Regional Quality Improvement processes, including both actual and responses where air medical service/transport may have been necessary.

It should be noted that some of these issues are not easily resolved through the planning process. However, from a strategic perspective, they require in-depth discussion to ensure the continued success of the State’s air medical response system.

**State of Washington EMS and Trauma Care System  
Pre-Hospital Air Medical Services  
Need and Distribution of Air Medical Services/Minimum and Maximum Numbers**

The Trauma Care Systems Act statutorily requires the Department of Health (DOH) to determine the minimum and maximum number of prehospital services. While DOH approved, Regional EMS and Trauma Care Plans reflect minimum and maximum numbers for ground ambulances, DOH is responsible for statewide need and distribution of rotary wing air-medical services.

The following principles form the basis for establishing minimum and maximum ranges of air-medical services in the State of Washington:

- ❖ Air-medical services are often multi-regional and/or statewide in scope
- ❖ Air-medical services are a critical component of the statewide EMS and Trauma Care System. They are essential to assuring certain patients reach the right facility in the right amount of time
- ❖ Utilization review is needed to assure that patient transports are appropriate and accomplished in the most safe and expeditious manner.

Due to the expense of helicopters and airplanes, balancing access to air transport with the cost of providing air-medical services is a key consideration when establishing minimum and maximum numbers of services. The capital expense of aircraft, equipping the aircraft and staffing these services 24 hours per day, seven days per week requires substantial revenue. The cost of readiness represents another source of expense to the air medical services. Any discussion relating to the need and distribution of air-medical services must be highly sensitive to the issue of unnecessary and costly duplication of services to avoid instability within the State’s air medical resources.

**Recommendation**

For the purposes of this plan, establishing minimum/maximum numbers of air-medical flight services will be based upon projected response time models using a 30-minute response time (scene to Level I, II or III Trauma Center) metric. Additionally, 30-minute response time radii from flight base operations will be assessed to determine the ability to arrive on scene in a timely manner. Goal Three, within this plan’s goals section, addresses the capacity issues discussed in this section.

Fractile response times for base to scene and scene to designated trauma center will be utilized to evaluate performance of the air medical services that participate in the EMS and Trauma Care system.

EMSTC Region	Minimum # of Air Ambulance Services	Maximum # of Air Ambulance Services	Current Status
Washington State	2	4	4

**Table 1. Recommended Minimum/Maximum Numbers of Trauma Verified Pre-hospital Air Ambulance Services in Washington State**

A suggested regional distribution of air ambulance base operations is reflected in the following table. This information is driven by high population density found in some regions as well as large geographic areas in other regions.

EMSTC Region	Minimum # of Prehospital Air Ambulance Base Operations	Maximum # of Prehospital Air Ambulance Base Operations	Current Status
North	1	2	2
Northwest	1	1	0
Central	1	1	1
West	1	1	1
Southwest	1	1	0
North Central	1	1	1
South Central	1	1	1
East	1	2	2
<b>State Totals</b>	<b>8</b>	<b>10</b>	<b>8</b>

**Table 2. Suggested distribution of Pre-hospital Helicopter Base Operations by EMSTC Region**

The lack of range reflects the need to closely manage the costly and unnecessary duplication of prehospital air-medical services. The minimum and maximum numbers resources will be reviewed at least biannually

### **System Evaluation**

As discussed throughout this document, continuous review and assessment of the air medical component of the System is essential to its success. Implementation of such an assessment will require the Office of Community Health Systems to engage representatives from the Air Medical, Pre-Hospital, Medical Program Directors, and Hospital components of the EMS and Trauma Care System. Therefore, the plan reflects an ongoing system of evaluating the air medical system through a multi-disciplinary group that will meet on a recurrent basis to ensure an ongoing and objective assessment.

To objectively evaluate the air medical component of the state’s EMS and Trauma system, participating air medical services and the EMS and Trauma Care system will provide data relating to the provision of air medical services. This information will include, but may not be limited to, the following data:

- 1) System demand data per month (i.e., the number of requests for service)
- 2) Location of air medical responses, correlating to trauma response areas reflected in each Regional EMS and Trauma Care plan
- 3) Number of instances where air medical services were requested and not utilized
- 4) Response time data including:
  - a. Time from initial service request until launch
  - b. Time from initial service request until arrival at scene
  - c. Total time on scene
  - d. Time from scene to receiving facility (transport time)
- 5) Receiving facility data including proximity to incident scene
- 6) Reason for receiving facility choice
- 7) Agency requesting air medical service

The intent of the system evaluation is to ensure that air medical services are utilized appropriately, patients are transported to the appropriate designated trauma center and issues relating to air medical services are readily identified and strategies developed to mitigate problems. As more pre-hospital data is gathered through the WEMSIS system, further review will be conducted to identify instances where air medical service would have been beneficial to patient outcomes had they been utilized.

The air medical work group will review and modify the State's Air Medical System Plan on an ongoing basis so that the Plan will be current and reflect best practices identified by the work group and EMS and Trauma System advisory groups.

**State of Washington EMS and Trauma Care System  
Pre-Hospital Air Medical Services  
Goals and Objectives**

Consistent with the State EMS and Trauma Care Plan, several goals and associated objectives have been identified. These goals and objectives will serve as the foundation upon which the air medical work plan will be developed. They include:

---

**Goal One.** *A system of Air-medical response providing safe and expeditious transport of critically ill patients to the appropriate designated Trauma Service.*

**OBJECTIVES:**

- 1) Identify strategies that will promote coordination of resources between all air medical response agencies in Washington State
- 2) Identify strategies that promote patient destination decisions based on patient outcomes
- 3) Conduct regular meetings of air medical services and other interested stakeholders to discuss and address issues relating to the provision of emergency air medical services in the State
- 4) Adopt scene to trauma center response time criteria that promote positive patient outcomes

---

**Goal Two.** *Patient Care Procedures for the response of air-medical resources are included in the DOH-approved Regional EMSTC Plans.*

**OBJECTIVES:**

- 1) Develop, adopt and implement air medical response protocols utilizing best practices to ensure quality patient care and safety of flight and ground teams
- 2) Incorporate flight safety standards into all air medical protocols and procedures
- 3) Revise the air medical response algorithm for pre-hospital ground personnel to reflect current best practices and ensure quality patient care

---

**Goal Three.** *Air-medical resources throughout the State of Washington provide optimal coverage while avoiding costly and inefficient duplication of resources.*

**OBJECTIVES:**

- 1) Develop and continuously update response time maps for determining response and transport capabilities of the State's emergency air medical system
  - 2) Develop and maintain an emergency air response data base that tracks flight response, on scene and transport times to assess the efficacy of the emergency air medical system
  - 3) Assess current distribution of air medical flight bases throughout the State
  - 4) Utilize data to determine EMS and Trauma Care demand for air medical services in each EMSTC Region
-