

# The 2003 Air Medical Leadership Congress: Findings and Recommendations

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## **ABSTRACT**

To address important concerns facing the air medical community, 149 air medical transport leaders, providers, consultants, and experts met September 4-6, 2003, in Salt Lake City, Utah, for a 3-day summit—the *Air Medical Leadership Congress: Setting the Health Care Agenda for the Air Medical Community*. Using data from a Web-based survey, top air medical transport issues were identified in four core areas: safety, medical care, cost/benefit, and regulatory/compliance. This report reviews the findings of previous congresses and summarizes the discussions, findings, recommendations, and proposed industry actions to address these issues as set forth by the 2003 congress participants.

## **Introduction**

A variety of concerns and issues are plaguing the air medical transport (AMT) community. Finding solutions to these problems has been difficult, and at times efforts have appeared disjointed, ineffective, and inefficient. Developing new and unified approaches to solve these important issues is critical if the AMT community is to maximize the safe and cost-effective delivery of these life-saving services.

The opportunity to discuss common concerns nationally among air medical providers, leaders, and experts is often limited to three major annual meetings: the Air Medical Transport Conference (AMTC), the Critical Care Transport Medicine Conference (CCTMC), and the Association of Air Medical Services (AAMS) Mid-Year Conference. During these conferences, identified speakers present or address topics of interest in a *lecture-based* format. Although this format has high educational value, it tends to make the audience passive learners and leaves little time to discuss formative solutions.

On the other hand, the *dialogue-based* format uses discussion and debate as a means to actively engage all participants. This enables the possibility of breakthrough thinking as ideas are exchanged and examined by the participants from their own unique perspectives. It also creates shareholder investment or buy-in to solutions seeking consensus strategies.

## Prior Air Medical Community Summits

To our knowledge, five safety,<sup>1,4</sup> one reimbursement,<sup>5,6</sup> and one research<sup>7</sup> AMT community summits have been previously convened. During each of these meetings, few lectures were delivered. Rather, the format was an open exchange of ideas and information with a mandate to develop and implement action items to address specific issues facing the AMT industry.

The first safety summit occurred in 1985 in Dallas, Texas, in response to Federal Aviation Administration (FAA) concerns about escalating helicopter emergency medical service (HEMS) accidents. Pilot fatigue was identified as one of the major causes for the rising accident rates. The summit surmised that routine use of 24-hour and 48-hour pilot duty times should be discouraged and replaced by an industry standard that would promote 12-hour HEMS duty times.<sup>8</sup> Although Federal Aviation Regulations (FAR) Parts 135.261-135.269 and 135.273 address crew member flight time, duty period limitations, and rest requirements,<sup>9-13</sup> the FAA soon followed with the enactment of FAR Part 135.271, specific to helicopter hospital emergency medical evacuation services (Figure 1).<sup>14-16</sup>

The most recent safety summit was convened in Dallas on April 7, 2000, in response to a significant increase in the number of AMT helicopter accidents from 1998 through 2000. This summit produced five initiatives:<sup>4</sup>

1. Improve and promote (safety) training
2. Establish an Air Medical Safety Advisory Council (AMSAC)
3. Fill in the data gaps to identify root causes of accidents
4. Raise leadership safety awareness in health care, aviation, etc.
5. Define recommended aircraft standards and explore new technology

While all of the initiatives were accomplished to some degree, the AMSAC is perhaps the best known due to the public nature of its efforts and the inclusion of all disciplines of the AMT community.<sup>17</sup> It also marked the first opportunity for competing operators to conduct safety-oriented discussions in a collegial, noncompetitive atmosphere. Using medical aviation experts, AMSAC provides resources and seeks to promote an AMT safety culture.

The third initiative was to gather a multidisciplinary group of medical aviation experts to conduct and publish a root cause analysis of AMT accidents.<sup>18</sup> Six recommended interventions ranked high in both effectiveness and feasibility for enhancing future AMT safety:

1. Improve training for night flying operations
2. Improve training for mountain flying operations
3. Equip AMT aircraft with terrain avoidance warning systems
4. Equip AMT aircraft with radar altimeters
5. Provide AMT aircraft with mission-essential equipment
6. Improve the content of weather briefings

In 1991, the AAMS Air Medical Reimbursement Congress, consisting of 42 invited participants and more than 75 observers, met to discuss AMT financial concerns.<sup>6,7</sup> This meeting concentrated on four major areas: coverage, reimbursement, billing, and cost-effectiveness. Thirteen actions were recommended:

1. Educate payers and intermediaries
2. Develop documentation regarding the efficacy of air medical services
3. Develop a position paper to address the issues related to determining the nearest appropriate facility
4. Actively seek opportunities to cooperate with regional and state coalitions of AAMS members to provide educational programs on finance and reimbursement issues to more of the membership
5. Monitor federal legislation and regulations that could impact AAMS members
6. Conduct a broad strategic planning process to specifically review member needs and to identify strategies for meeting those needs
7. Develop a central database of member information that is regularly updated and reported
8. Develop a utilization review program based on guidelines provided by AAMS
9. Develop a position paper on criteria for selecting aircraft and crew
10. Assemble a library of printed material that could be accessed by the AAMS membership
11. Develop a common approach and criteria for assessing aircraft productivity
12. Develop a description of the mission profile for each of its members as a part of the central database
13. Develop mechanisms to assess and demonstrate the financial cost/benefit of AMT programs to their service area and the individual hospitals

In 1996, the industry held its only research meeting in Fort Worth, Texas. Specifically, the intent of this meeting was to “determine whether adequate objective information currently exists to justify present levels of utilization of air medical services, and, if not, what studies should be done to obtain such information.”<sup>7</sup> This research congress concluded that research was needed in several critical areas. The dialogue generated during this meeting was useful in identifying the barriers to research and helped set a future agenda for AMT research.

## The 2003 Air Medical Leadership Congress

In recent years, a variety of air medical transport issues have come to the forefront: a surge in AMT accidents, Health Insurance Portability and Accountability Act (HIPAA) and other regulatory requirements, declining reimbursements, crew fatigue factors, increasing complexity of medical care, and others. An industry summit was developed in an attempt to understand and gain consensus on how to address these important issues. After extensive preparation—including the tabulation of 508 survey responses from members of the AMT community—149 air medical experts, leaders, and providers met for a 3-day summit in Salt Lake City, Utah. *The Air Medical Leadership Congress: Setting the Health Care Agenda for the Air Medical Community* was held on September 4-6, 2003.<sup>19</sup> Using a dialogue-based format, participants discussed the top three issues identified by the AMT community in each of four categories: safety, medical care, cost/benefit, and regulatory/compliance (Table).

The congress format afforded participants an opportunity to

**Figure 1. FAR 135.271 Helicopter Hospital Emergency Medical Evacuation Service (HEMES)**

- a) No certificate holder may assign any flight crew member, and no flight crew member may accept an assignment for flight time if that crew member's total flight time in all commercial flight will exceed-
  - 1) 500 hours in a calendar quarter.
  - 2) 800 hours in any two consecutive calendar quarters.
  - 3) 1400 hours in any calendar year.
- b) No certificate holder may assign a helicopter flight crew member, and no flight crew member may accept an assignment, for hospital emergency medical evaluations service helicopter operations unless that assignment provides for at least 10 consecutive hours of rest immediately preceding reporting to the hospital for availability for flight time.
- c) No flight crew member may accrue more than 8 hours of flight time during any 24-consecutive hour period of a HEMES assignment, unless an emergency medical evacuation operation is prolonged. Each flight crew member who exceeds the daily 8 hour flight time limitation in this paragraph must, upon the completion of that emergency evacuation operation, be given a rest period in compliance with paragraph (h) of this section.
- d) Each flight crew member must receive at least 8 consecutive hours of rest time during any 24 consecutive hour period of a HEMES assignment. A flight crew member must be relieved of the HEMES assignment if he or she has not or cannot receive at least 8 consecutive hours of rest during any 24 consecutive hour period of a HEMES assignment.
- e) A HEMES assignment may not exceed 72 consecutive hours at the hospital.
- f) An adequate place of rest must be provided at, or in close proximity to, the hospital at which the HEMES assignment is being performed.
- g) No certificate holder may assign any other duties to a flight crew member during a HEMES assignment.
- h) Each pilot must be given a rest period upon completion of the HEMES assignment and prior to being assigned any further duty with the certificate holder of-
  - 1) At least 12 consecutive hours for an assignment of less than 48 hours.
  - 2) At least 16 consecutive hours for an assignment of more than 48 hours.
- i) The certificate holder must provide each flight crew member at least 13 rest periods of at least 24 consecutive hours each in each calendar quarter.

*Crew member flight time and duty period limitations and rest requirements. FAR 135.271 Helicopter hospital emergency medical evacuation service (HEMES). Federal aviation regulations aeronautical information manual. Newcastle (WA): Aviation Supplies and Academics; 2003. p. 294-5.*

**Table.**

**AIR MEDICAL TRANSPORT ISSUES BY CATEGORY**

<b>Issue ranking*</b>	<b>Safety</b>	<b>Medical care</b>	<b>Cost/benefit</b>	<b>Regulatory/compliance</b>
#1	Crew health	Clinical practice	Funding sources	Accreditation
#2	Competition	Critical care transport	Program models	Access to care
#3	Job satisfaction	Skill training and retention	Patient demographics	FAA regulations

*\*Ranking determined from the responses of 508 air medical transport program members.*

extensively discuss and develop a brainstorming list of breakthrough strategies for each issue threatening the AMT community. An expert panel subsequently arranged all breakthrough strategies into related groupings. The participants then prioritized the groupings as most likely to solve each issue. The following is an outline of the discussions, findings, and recommendations put forth by the congress participants.

**Safety Work Goup**

**Statement of the Problem and Background**

Fatal AMT accidents not only result in the loss of human life; they can cause physical, mental, and financial harm to

those who provide or are served by these lifesaving services. All too often AMT accidents are ultimately attributed to human error<sup>20,21</sup>—irreversible mistakes made by smart, dedicated, well-intentioned, and hardworking professionals. Although re-engineering to provide better weather reporting, pilot proficiency under instrument meteorological conditions (IMC), and obstacle avoidance systems can reduce accidents, they can never substitute for good decision-making.

The primary goal of the Safety Work Group (SWG) was to make recommendations designed to reduce human error and enhance the future safety of AMT. In developing the final recommendations for the three main safety topics, the group identified a number of issues that contribute to both safe and

unsafe AMT. Discussions focused on the following concerns.

**Realize that the safety attitude starts with “I”.** No matter what, one thing is certain—there will be a next accident. Maybe not today, maybe not this month, or even this year, but another accident is bound to occur. True safety experts are individuals who approach each flight with a vigilant safety-first attitude. This attitude openly states, “I *must* be safe, and I *must* assure the safety of my fellow crew members and the patients I serve. In this I will not compromise.”<sup>22</sup> Policies that openly encourage and support the individual and collective practice of safe behaviors are to be fostered in AMT programs.

**Reduce complacency.** Unfortunately, AMT personnel—whether they are pilots, mechanics, medical crew, communicators, or administrators—often fail to see the next accident as a personal threat. Rather, they adopt an “it can’t happen here” mentality and assume the next accident will occur elsewhere. This attitude creates an imperceptible level of complacency that can result in smart people doing dumb things.

Paradoxically, lengthy work experiences may result in overconfidence and eventually in errors in performance.<sup>23</sup> In the mid-1990s, Michelle North (a former pilot and current consultant on crew resource management [CRM]) conducted an unpublished survey of pilot work time spent on aviation tasks. More than 250 responses were obtained. In her survey, she found that recently hired low-time (< 2000 hours) pilots had fewer accidents than high time (>10,000 hours) senior program pilots. These results seem to suggest that complacency, inattention to detail, distraction, ambiguity, or the conscious or unconscious relaxation of safety standards born of familiarity were a significant contributor to AMT accidents. Never having an accident or incident does not ensure continued safety if it leads to complacent attitudes and mistakes.

**Hire “safe trait” personalities.** The hiring of proper aviation AMT personnel is important to a strong safety program. Often AMT personnel are hired based merely on flight time and AMT experience. Although these qualifications are important, the presence of certain personality traits can be critical in optimizing the selection of safety-minded individuals. These safe traits include good decision-making skills, interpersonal skills expertise, communication capabilities, and complex versus linear one-dimensional thinking. The development and listing of assessment tools useful in differentiating safe versus unsafe characteristics would be helpful to programs seeking to hire safety-minded AMT personnel.

**Develop a strong safety culture.** Egregious safety violators often are labeled as individuals suffering from “white knight syndrome” or just plain “unsafe.” Many AMT programs are quick to remove these problem individuals from their programs once identified. However, others counter that this quick firing of a safety violator removes an individual who may have just learned from a mistake.

Interestingly, as quickly as one program fires a safety violator, another rehires this same individual because of the current pilot shortage. A concern exists that such “fire and then rehire” practices may be merely shifting unsafe individuals from one program to another. The problem is more complex.

Although willful disregard of company policies, regulations, or procedures is grounds for termination, seldom are

safety errors due to intentional misconduct. Few, if any, safety violators purposefully place themselves or others at risk of bodily injury or death. Rather, while operating from a personal paradigm of trying to “save a life,” they unintentionally push the safety envelope.

More often than not, the problem is not that a program has hired unsafe individuals but rather that it has failed to develop a strong safety culture. Programs with strong safety cultures recognize that the burden of safety lies not just with the “captain of the ship” but with the entire program—pilots, flight crew members, mechanics, communication specialists, physicians, and administrators.

They further believe that the team concept of CRM is an essential practice of a safe culture.<sup>24</sup> Strong safety cultures see safety violations as an opportunity for everyone to learn and provide corrective actions to further reduce unsafe practices. All team members are held accountable not only for their personal safety but also for the safety of their AMT colleagues. These safety cultures instill daily and personal safety vigilance. To practice a truly strong safety culture, everyone in the program must be expected to embrace safety as the program’s number 1 priority.

**Ensure adequate rest.** For some personnel, AMT is a second job that can be sandwiched into the staff’s real life. While pilot duty time is highly regulated, all too often clinical, administrative, or aviation staff arrive at work just in time to change from their “primary” job uniform into their AMT flight gear. Crew members may count on being able to sleep at work to make up for fatigue caused by other job or family-related activities. Duty shifts longer than 12 hours also contribute to the development of fatigue if protective policies are not in place. Inadequate rest cycles have been shown to reduce concentration levels, thereby increasing the likelihood of both medical and aviation errors.<sup>25-28</sup>

Although FAR policies have been established to reduce pilot fatigue, there are no federal or state regulations protecting other non-pilot AMT members from excessive fatigue. It is the responsibility of each program to establish scheduling expectations promoting adequate rest and policies that protect against excessive medical crew member, dispatcher, and mechanic fatigue.

**Send clear safety messages.** The program’s expectations of employees are often ambiguous. The expectation that safety cannot be compromised must be made clear and reiterated continuously. It is essential that safety performance standards be established within each program and that compliance with these standards is incorporated into personnel evaluations. Performance criteria then are measured, rewarded, or corrected as required to reinforce safe behaviors.

**Encourage educational opportunities that enhance safety practices.** Selecting “safe trait” personnel is a good beginning, but continuous safety education needs to be implemented and promoted. Attendance at internal and external safety courses is to be encouraged and expected. Identified safety violations are to be examined through program continuous quality improvement and external audits. Lessons learned and proactive corrective strategies then must be shared with program personnel.

It is imperative that all AMT personnel, including support personnel, have ongoing human factors training. This training should include but not be limited to annual mandatory courses on air medical resource management (AMRM) training, flight physiology, fatigue management, personal health and welfare, and stress management. In general, adult learners can retain newly processed concepts for approximately 18 months. Therefore, ongoing annual refresher training is important to reinforce previously learned concepts and practices.

Providing realistic practice opportunities requires the development of simulators that are less expensive, more realistic, aircraft specific, and readily accessible. Simulators can be instrumental in training to avoid controlled flight into terrain (CFIT) accidents. The implementation of high tech warning measures also will play an important role in averting CFIT accidents.

Other safety enhancement techniques, such as the pursuit of nonaviation educational opportunities, can improve safety programs. An example of enhancement would be rewarding individuals for personal advancement through the pursuit of a degree in the human skill set curriculum (eg, communication skills building, listening skills, team building, situational awareness training, and stress management).

Studies have found that any form of education will boost critical thinking capabilities. In an unpublished survey by Michelle North, the average on-task time for HEMS pilots was 2.7 hours per 12-hour shift. This time included pre-flights, weather checks, flight time, postflight, refuels, and any other item that could be referred to as an aviation-related task. The remaining 9.3 hours of the basic shift gives pilots a wonderful opportunity to pursue other educational endeavors. AMT programs should promote, encourage, and support educational pursuits, especially those directed at understanding human factors.

**Standardize weather minimums.** Despite the increasing use of faster aircraft, weather minimums remain the same or, in some cases, actually have been lowered. Paradoxically, faster-traveling aircraft reduce the availability of human reaction times to counter unexpected events (eg, IMC). Many AMT programs operate with local minimums of at least 500-foot ceilings and 1-mile visibility. One-mile visibility while traveling at 150 mph allows the human mind only 19.5 seconds to acquire an object (be it a mountain, wire, or fog bank), feed the physical information into the receptors, transfer to mental capacity and short-term memory storage, decide if a corrective action is necessary, physically initiate action to turn the aircraft in the direction of the decision, and then wait for the aircraft to respond. This a difficult task when suddenly encountering IMC.

The AMT community also needs to standardize weather reporting and flight refusal for set weather minimums. Establishment of standardized AMT community launch or “no go” criteria would greatly contribute to alleviating the pressure to fly caused by referral, individual, and program expectations. Standardized launch weather criteria would reduce pressure on pilots to fly when weather minimums are just too low, diminish the ability of first responders and referral hospitals to shop for other air medical programs willing to fly in adverse weather conditions, and lessen the “take a peek” or “fly until

we encounter bad weather” behaviors.

**Lower interprogram competition as it relates to unsafe behaviors.** The AMT community should encourage the practice of engaging in local interprogram and interagency roundtables directed at promoting safe behaviors. By law, competing AMT programs cannot engage in discussions considered to be price-fixing. However, this rule does not preclude these same programs from engaging in activities directed at improving safety. Joint exercises can greatly facilitate cooperation between competitive programs and referral agencies in establishing safe behavior.

Open safety discussion between managers and employees of competing AMT services is to be encouraged and fostered. Recognized unsafe behaviors can be addressed with the establishment of common safe practices between competitive services. Programs should adopt an attitude that states, “We recognize that we have competitors. However, we will not engage in activities that promote unsafe behaviors for ourselves or our competitors.”<sup>22</sup>

**Encourage referral agency safe behaviors.** Promoting safe behaviors by referral EMS agencies and hospitals means more than just reducing unsafe “shopping” behaviors during marginal weather conditions. It provides opportunities to recognize and use other ways to enhance safe practices. For example, there are hospital helipads that would routinely be judged unacceptable. The AMT community could do much to promote safe helipads by establishing criteria that outline minimal standards for AMT. Hospitals seeking to transport patients by air would be mandated to take the corrective actions necessary to ensure safe helipads.

AMT programs currently appear to be less diligent in offering safety training programs to referral EMS agencies and hospitals than in the past. Programs are encouraged to rejuvenate these important training programs. This training would include but not be limited to topics on landing zone preparation, loading and unloading patients, weather minimums, and AMT shopping.

**Develop common AMT definitions and data sets.** There are numerous ATM terms that have multiple interpretations. This confusion has arisen because of inconsistent definitions. Accident rate is a good example; the term can mean accidents per year or accidents per flight hours. Ira Blumen and colleagues attempted to address this problem in the 2002 Air Medical Physician Association (AMPA) publication, *A Safety Review and Risk Assessment in Air Medical Transport*.<sup>23</sup> Accident rates were compared with exposure (eg, number of patient and nonpatient flight hours, number of patient transports, aircraft types [helicopter and fixed-wing] and models, and number of air medical programs). The challenge to the AMT community remains to routinely collect, collate, and compare uniformly defined AMT program exposure data for calculating consistent accident rate trends.

**Promote the benefits and positive aspects of AMT to the public.** Now that AMT has become an accepted practice for EMS transfers, media coverage has declined. This decline in media coverage lessens public exposure to the benefits of these daily life-saving services. It is the AMT crash that becomes the big story as media attention focuses on memorial services and

lost lives. It is important that the AMT community develop media strategies publicly touting the benefits of services.

## SWG Recommendations

The SWG discussed 3 main topics: crew health, competition, and job satisfaction. The main topics were expanded into subcategories of specific action items that should be addressed by the AMT community over the next 2 years. The following is a summary of the group's recommendations.

### Issue #1: Crew Health

#### A. Crew Fatigue

- Research the effects that various duty times and shift types have on crew fatigue
- Develop a core curriculum that recognizes, prevents, and treats fatigue
- Develop a policy regarding mechanic fatigue to include the optimum number of mechanics, duty times, scheduling, and procedures for calling in relief mechanics
- Develop a policy for managing crew rest and off-duty time
- Develop a culture mindset for prior planning and for developing fatigue policies

#### B. Safety Culture

- Create guidelines for program self-audits of safety culture for both air and ground transport systems
- Educate management on how culture affects safety and how to change each program's safety culture:
  - Identify an accountable individual/manager to work on improving the safety culture
  - Manage economic pressures that hinder improvements
- Develop an ongoing safety program:
  - Identify the desired safety culture
  - Expand the role of the safety committee
  - Require individual/personal accountability
  - Promote healthy lifestyles
  - Include specialty teams in safety audits and processes required to achieve the desired safety culture
- Implement changes to achieve the desired safety culture:
  - Use change management strategies
  - Evaluate the progress of culture changes and continue to implement further changes to reach the desired results

#### C. Training

- Improve crew training:
  - Discuss stress management techniques and how to implement them
  - Discuss conflict management techniques
  - Implement infectious disease control for all program and contracted employees
  - Expand training in landing hazards
  - Develop helicopter, fixed-wing, and ground safety courses
  - Practice extrication techniques as applicable

#### D. Standards for Crew Health

- Develop crew health standards and enforcement policies:
  - Educate employees on standards and expectations for personal health
  - Develop exportable packaged courses
- Develop air medical operational standards based on oc-

cupational medicine and Aerospace Medical Association air medical expertise

- Develop industry-wide Occupational Safety and Health Administration compliance education

### Issue #2: Competition

#### A. Culture

- Develop a written plan and policy to address competition:
  - Develop a tool to measure self-induced pressure
  - Develop an educational training program for management and crew pressure
  - Write an internal competition statement
  - Develop a reward and recognition plan for safe behavior
  - Emphasize safety over competition and placing patient outcomes before profits
- Develop a plan for interagency cooperation:
  - Define "shopping" for an AMT program and identify common shopping practices
  - Develop an education plan to stop shopping
  - Address consequences of scene jumping
  - Grant immunity for turning down or aborting transports

#### B. Partnerships and Relationships

- Develop a regional plan with other transport services that includes:
  - Encourage development of regional agreements on mutual aid and compensation
  - Develop a regional safety council
  - Use roundtable model for meetings
  - Develop joint training programs for safety
  - Develop regional weather minimums
  - Standardize and endorse downtime procedures
- Promote internal team cooperation:
  - Develop a policy for each program that addresses briefings and debriefings
  - Teach AMRM at each program
  - Discourage internal team competition

#### C. Standards

- Data collection and reporting:
  - Make data reporting and collection mandatory
  - Develop standardized data collection tools
  - Create operational definitions for the data set
  - Define accident and incident events that should be reported
- Develop state regulations for air ambulances and require compliance
- Update and revise minimum standards for fixed-wing ambulances
- Standardize approval by the FAA for the use of night vision goggles
- Promote specialty team standards

#### D. Training

- Improve management education:
  - Educate decision makers on Request For Proposal (RFP) process
  - Educate managers/administration on appropriate competition
- Improve crew training:

- Enhance stress management training
  - Enhance joint landing zone training
  - Enhance human factors training
  - Encourage implementation/application of AMRM practices
- Educate the users and public on the effects of competition on safety

### Issue #3: Job Satisfaction

#### A. Staffing, Schedules, and Inclusiveness

- Create a standard for appropriate crew staffing:
  - Evaluate work schedules against the standards to be developed
- Create intrinsic motivators for professional and personal pride
- Create job descriptions, contracts, and agreements for all employees that include job expectations from the program perspective
- Promote proactive planning for future staffing needs to include training needs for hiring

#### B. Secure Work Environment

- Create an internal task force to review compensation and benefits periodically:
  - Develop retention strategies
  - Create retirement assistance programs
- Establish hiring standards for all crew with reasonable expectations
- Apply human resources policies fairly and appropriately to all program personnel

#### C. Recognition

- Develop recognition and reward programs for individuals and programs:
  - Develop career ladders and opportunities for advancement
  - Develop a quality orientation program
  - Implement merit systems
  - Encourage training for facilitative management
  - Encourage and support industry involvement in continued recognition efforts
- Create a value-based culture:
  - Give personal and timely feedback

## Medical Care Work Group

### Statement of the Problem and Background

Recent evidence supports the core hypothesis that AMT improves access and care for the critically ill or injured within a rural community and that the loss of these services leads to increased mortality and morbidity.<sup>29</sup> While a variety of papers point out the medical value of AMT,<sup>30-40</sup> other publications have observed little or no benefit.<sup>41-47</sup> These differences are likely related to confounding variables, such as patient acuity, geographical setting, prehospital level of care, and accessibility to major medical centers. In spite of these disparities, published systematic reviews suggest that the preponderance of the evidence favors AMT as an important variable in reducing mortality.<sup>48,49</sup>

The Medical Care Work Group (MCWG) addressed 3 main

topics: clinical practice, critical care transport, and training and skill retention. Various points were discussed within these 3 subject areas, and relative consensus was achieved on each topic's relevant issues and future directions. As an important caveat, members of the MCWG, like those of the congress as a whole, were predominantly from helicopter critical care programs and thus the MCWG's recommendations may have been subject to this bias.

### Clinical Practice

Clinical practice was the first topic discussed by the MCWG. During discussions on clinical practice, several important AMT points were made.

**Emphasize education and training.** Clinical practice is directly influenced by education, training, and experience. Program educational goals are best achieved by defining AMT program mission profiles, establishing clinical care goals and scopes of practice, creating educational standards and specific educational opportunities, using objective assessment tools to measure how crew members are progressing and maintaining adequate competence, and streamlining quality improvement processes to provide timely and effective feedback. The industry could greatly assist AMT programs by developing a template for assessing educational goals.

**Establish standards of care.** Program educational goals establish a foundation for generating program-specific standards of care. But other nationally accepted resources should be used. Position statements from the various professional AMT medical organizations can be drawn on as expert opinion on standards of care. Standards handbooks, like Arndt's *ASTNA (Air and Surface Transport Nurses Association) Standards for Critical Care and Specialty Rotor Wing Transport*,<sup>50</sup> that address qualifications, competencies, and continuing education are useful and should be similarly developed by other associations. Combined, these position statements and standards handbooks could be used to develop nationally recognized guidelines for medical care, training, and oversight. By allowing AMT programs to adjust for their own characteristics (eg, mission profile, geographic setting), recommended national standards would provide common expectations of care while preserving the flexibility of specific program needs. Setting these guidelines and standards is sufficiently important and resource-intensive to necessitate extramural funding.

**Conduct research.** The appropriate direction for the industry is to establish uniform and reliable medical data sets designed to allow easier interpretation of outcome-based clinical studies. Multicenter studies are necessary in evaluating which factors (eg, team configurations, types of helicopters, rural vs urban basing) enhance AMT outcomes. Studies that incorporate existing data sets to investigate nonmortality endpoints (eg, time to surgery or cardiac cauterization, hospital length of stay, frequency of medical errors) can be used to examine the positive and negative effects of AMT on clinical outcomes. Lastly, frequent, systematic, and state-of-the-art AMT assessments will become essential in advising policymakers and payers on the medical benefits of AMT.

**Pursue certification and guidelines (eg, for scope of care**

**and crew qualifications**). Certification, like the Flight Nurse's Certification Examination and the National Association of Air Medical Communication Specialists (NAACS) training course, are useful in measuring and establishing national standards of competency. Development of tools for certifying membership competency at a national level is a responsibility of each AMT association.

Local or state certification is often a licensee requirement. However, all civilian AMT services are encouraged to seek and establish national competency through certification (eg, from the Commission on Accreditation of Medical Transport Systems [CAMTS]). Lastly, program administrators have a responsibility to support crew membership in professional societies. Participation in national organizations creates a portal of information useful in advancing program development.

## Critical Care Transport

Critical care transport was the second topic discussed by the MCWG. This topic will become increasingly important as ground units enter this market in an attempt to enhance revenues by transporting "critical care" patients. A consensus statement from the air medical community regarding the following key points would be helpful to AMT programs seeking to provide critical care services.

**Define critical care transport.** The initial task in this area is for the air medical community, in conjunction with third party payers, to develop an agreed-upon definition of what constitutes critical care. A starting point may be to define critical care based on the patient's clinical condition as it relates to type and severity of illness or injury and the required level of care (eg, the need for specialty trained crew members, medical equipment, or medications) necessary to safely transport the patient to an appropriate treatment center.

**Determine crew configuration.** Crew member configuration is a crucial component in successfully providing critical care. Credentialing pathways (ie, training vs challenging exams), scope of practice, mission profile, transport mode (ground, fixed, or rotor-wing), and cross-training performance are all-important elements when selecting critical care crew members. The industry should establish recommended minimal crew member requirements based on these elements.

**Establish medical direction.** Appropriate medical direction is vital for ensuring that the proper team and equipment are available during critical care transports. Key to providing appropriate levels of critical care is a medical director who is an integrally involved member of the AMT program.<sup>51</sup> The medical director's tasks and performance expectations should be objectively outlined so that he or she can be evaluated appropriately.

Working with others in the AMT program is helpful to the medical director in developing triage, dispatch, and consultation criteria for optimizing patient outcome and resource utilization. In addition, establishing which medical interventions are best done at various points (eg, before AMT crew arrival or after AMT crew arrival but before patient loading) in the patient transport chronology is best accomplished when the medical director consults with the flight crew and referring entities. The AMT program should provide access to any needed specialty consultation. Organizations like AMPA

in conjunction with ASTNA, NAACS, the National Flight Paramedics Association (NFPA), and others should develop medical director and direction criteria useful in governing medical supervision of AMT.

## Training and Skill Retention

Training and skill retention represented the third and last topic discussed by this group. Several key points were identified and discussed during this session.

**Train the trainers.** The first priority is to train the trainers. This can be achieved best by maximizing electronic educational platforms, standardizing educator training, and the generating a national curriculum that emphasizes decision making and other cognitive abilities. The industry should assess the advantages and disadvantages of moving away from "merit badge" certification courses, while simultaneously developing a curriculum that teaches skills unique to AMT.

**Expand the target audience.** Education should extend beyond the AMT crew. Regulators, referring hospital and out-of-hospital health care providers, and even receiving hospital personnel would benefit from an efficient information exchange and awareness of AMT capabilities and limitations.

**Expand medical oversight.** Because of the vital role of the medical director (see above section), the industry should increase both the level of medical oversight and the guidelines/standards governing its provision. Medical directors should have direct experience in AMT. This experience will enhance their ability to understand the provision of care in the transport setting and allow "no-fault" discussion of transport care errors.

**Enhance training methods.** The industry should promote a better understanding of adult learning. Additionally, efforts should be made to improve the understanding of the association between patient volume and skills retention and the usefulness of simulator technology in maintaining procedural and cognitive skills.

In conclusion, the air medical community needs to:

- Gather data to determine minimum baseline qualifications and scope of practice for common mission profiles as they relate to HEMS
- Gather data to support development of medical director best practices guidelines
- Design and gather valid collaborative research data

## MCWG Recommendations

To optimize the AMT industry's ability to meet these goals and address the issues discussed above, the MCWG suggests that the following actions be undertaken and implemented by the industry over the next 2 years.

### Issue #1: Clinical Practice

#### A. Education

- Define the term mission profile
- Establish expectations of care and scope of practice (flight crew, EMS personnel, and referring facilities)
- Create educational opportunities relevant to goal-directed therapy
- Establish standards of education competency

- Develop assessment tools in determining competency
- Streamline QA/QI data systems to provide timely and effective feedback
- Establish a curriculum designed for new and experienced flight personnel

#### **B. Standards of Care**

- Convene a group to define standards of care and develop guidelines that may be implemented on a large scale. These guidelines will necessarily vary by mission profile, geography, local laws, and regulations.
- Identify and implement position statements created by various AMT associations
- Create a national adoption of guidelines for:
  - Clinical practice
  - Training and education
  - Medical director oversight and qualifications for medical directors
  - Patient care priorities
- Identify funding sources for curriculum and education development
- Establish an ongoing training, selection, and skill maintenance system

#### **C. Research**

- Establish uniform data sets to support collaborative research in quality of care and scope of practice:
  - Research should be outcome-based.
  - Uniform data definitions need to be developed and disseminated to researchers.
- Establish research groups to encourage data sharing and collaborative studies
- Establish AMT database:
  - Link with existing databases/studies when possible. Develop and encourage use of outcome measures other than mortality.
  - Surrogate endpoints such as time maybe useful.
  - Novel endpoints such as level of care, analgesia, and lives saved should be explored.
- Work toward:
  - Second order outcomes and soft endpoints. Specifically, differentiate clinical, nonmortality endpoints (eg, Glasgow coma scale score) from nonclinical, surrogate endpoints (eg, time from referring hospital presentation to neurologist for stroke patients).
  - Evidenced-based HEMS
  - Steady funding stream to provide for continuous research
  - Propagation of results to publications with a wider readership.<sup>48,49</sup> Specifically improve performance of systematic reviews of the outcomes-related literature and bring these results to readers who are interested in the data but don't have access to all the journals.
  - Political and regulatory knowledge of research results. Specifically, publish reviews of research results in recognized peer review journals and forward these findings to interested governmental and nongovernmental agencies.
  - Develop, set, then advance an AMT political agenda through the formation of a legislative network

- Develop local and national process improvement systems though medical error reporting
- Support and increase research efforts

#### **D. Certification and Guidelines**

- Ensure appropriate clinical guidelines for scope of care
- Establish crew certification/qualifications
- Encourage 100% membership in professional societies
- Encourage 100% CAMTS accreditation.
- Define expectations in both directions (HEMS, referral institutions, EMS agencies)
- Organize into a single voice
- Design vehicles to improve:
  - Clinical care
  - Safety
  - Patient access and care

### **Issue #2: Critical Care Transport**

#### **A. Critical Care Definitions**

- Define spectrum of care
- Define critical care as it relates to:
  - Minimum number of crew members
  - Industry definition of what constitutes critical care
  - Years and type of experience (neonatal, cardiac, burn, respiratory, obstetric, trauma, etc.)
  - EMS versus inter- or intrahospital versus other types of transports
  - Potential for patient to decompensate during transport
  - Required provider level (RN, MD, PM, EMT, RT)
- Define required scope of practice based on patients':
  - Level of illness
  - Type of illness
  - Time dependency
  - Needed equipment or vehicle

#### **B. Crew Mix**

- Define credentialing (paper vs experience)
- Define necessary education and experience of crew members as guided by the program medical direction and professional AMT organizations
- Develop techniques to match level of care with mission profile and scope of care
- Develop methods for ensuring proper cross training
- Perform research to determine a minimal "standard" crew team based on mission profile and scope of practice
- Establish criteria for the use of specialty care teams. Specifically determine when the needs of a given patient exceed the capabilities of the "regular crew" and therefore require the use of additional specialized crew members and/or equipment.
- Set expectations, track performance, and encourage commitment and involvement of the medical director and/or his/her designee in every aspect of program operations related to medical care

#### **C. Training for Crew and Others**

- Determine cross training needs
- Define and determine required skill sets
- Determine minimum licensure requirements (MD, RN, PM, RT, etc.)
- Determine minimum level of experience

- Determine cost of training versus optimization for mission profile
- Determine differences in training needs for ground versus helicopter versus fixed wing

#### **D. Chronology of Care**

- Determine what prevention activities must be performed to reduce patient morbidity and mortality
- Determine risks and benefits of “load and go” versus “stay and play” on patient populations
- Develop triage, dispatch, and consultation criteria to enhance care
- Determine when to apply consultation versus medical direction:
  - It is recommended that the flight service provide specialist physician consultation to the referring facility in preparing the patient and for providing patient care management prior to the team’s arrival.
- Develop methods to train referral personnel in caring for patients prior to transport team arrival
- Encourage the use of bedside information technology that has been shown to improve patient care decision-making and outcomes
- Define a standard for the flow of “call to transport”
- Establish criteria as to when to perform skills versus the need for rapid transport

### **Issue #3: Training and Skill Retention**

#### **A. Train the Trainer**

- Consider the development of common electronic platforms
- Develop educator training for trainers
- Develop staff development programs to foster:
  - New staff
  - Management
  - Public Speaking

#### **B. Curriculum Development**

- Develop national standardized training programs
- Develop a curriculum that enhances decision making and cognitive training
- Provide training beyond the “merit badges”:
  - Investigate the legal ramifications of “merit badge” substitutes
  - Compare alternative training to the “merit badges”
  - Develop the role of comprehensive critical care and advanced life support courses
- Develop a curriculum that teaches specialty skills
- Develop orientation standards

#### **C. Audience for Education**

- Diversify target audience receiving education about air medical transport to include:
  - Regulators and payers
  - Referral staff and EMS providers
  - Internal hospital professionals
- Establish methods for the dissemination of information
- Collaborate with other programs and facilities to enhance education

#### **D. Medical Oversight**

- Increase medical director involvement

- Develop medical oversight guidelines/standards
- Develop electronic flight records:
  - Passive and automatic data generation
  - Advantages and disadvantages of audio and video recording as documentation methods
- Encourage direct observation
- Develop a method for blameless error discussions
- Develop a tool that measures accountability for medical oversight of the flight program

#### **E. Methods and Parameters**

- Develop training and/or methods for:
  - Adult learning
  - Self-reporting and individual tracking
  - Tracking volume and success rates of skills performance (full- and parttime employees)
  - Simulation to teach and maintain competency in the full range of provider skills
  - Validating competency
  - Decision making
  - Hybrid training
  - Documenting decision-making
  - Redundancy and cross training
  - Modular skill set and minimal skill set

### **Cost/Benefit Work Group**

#### **Statement of the Problem and Background**

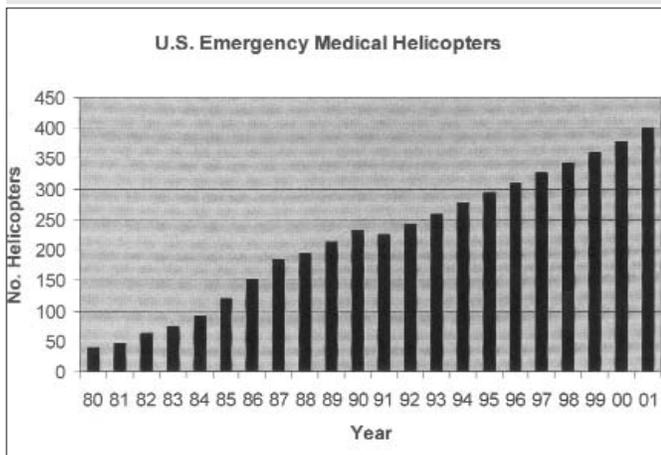
The Cost/Benefit Work Group (CBWG) began by reviewing AMT’s history. The early development of helicopter programs in the United States was generally coupled with trauma center mission statements and the need for rapid emergency care transport.<sup>33-37</sup> Implementation of these hospital-owned or publicly owned (ie, Maryland State Police<sup>52</sup>) high-profile AMT services was tied to the outreach efforts of major tertiary centers in evolving trauma systems.

In the 1970s, hospital AMT costs were easily bundled into overall hospital charges as cost-plus charges, while public AMT costs were supported by state or local taxes. These all-inclusive payments for incurred AMT charges spurred a rapid proliferation of programs. Surprisingly, the implementation of prospective payment systems has done little to slow this growth, and the number of AMT services continues to increase with each succeeding decade (Figure 2).<sup>23,53</sup>

Despite the increasing number of AMT services, demand and costs continue to escalate as debate focuses on whether or not the U.S. health care system can continue to afford expensive, high-tech modes of emergency helicopter transportation. Several variables appear to be driving the rise in AMT costs:

- Significant and escalating fixed aviation and staffing costs
- Increasing demand for aviation and medical professionals in the face of pilot and nursing shortages
- Increasing aviation and medical care regulatory requirements
- Increasing malpractice and aircraft insurance costs
- Increasing costs of aircraft acquisition and parts due to demand for aircraft and aging fleets
- A fragmented design model for EMS transport with vari-

**Figure 2.**



Adapted from Blumen IJ, et al. A safety review and risk assessment in air medical transport. *Air Medical Physician Association handbook. Special supplement.* Salt Lake City: Air Medical Physician Association; 2002. p. 20-1.

ability in provider concentration and capability between urban and rural areas

- Incurred transport costs with little or no likelihood of reimbursement from increasing numbers of uninsured and underinsured patients
- A reduction in ability to cost shift transport charges from patients with poor reimbursement profiles to those insured in order to cover expenses
- Aging aviation and communications infrastructure coupled with a poor public understanding of the costs required to maintain emergency care infrastructure, facilities, and services

Although AMT is an essential component of a contemporary trauma system, the small numbers of patients served by HEMS make the unit costs extremely high. AMT unit costs are predicted to continue to climb. To date, there have been limited published cost/benefit AMT reports that evaluate these additional incurred costs.<sup>54-57</sup>

In recent years, the value debate coupled with the need to contain increasing health care costs and limit tax growth has led to a reappraisal of the deployment of expensive technology. Hospitals and independent providers of AMT are observing declining reimbursements for similarly delivered services. Several factors seem to be involved. To control insurance costs, third-party payers are reducing or capping AMT payments. In addition, the numbers of patients being covered by Medicare or Medicaid, which reimburse at lower rates than commercial payers, are increasing.<sup>58</sup> Greater numbers of uninsured or underinsured patients are entering into the health care payer mix, thereby increasing utilization costs without corresponding reimbursement. This is especially true for young adults who bet on continued good health while incurring higher than normal rates of catastrophic accidents.

Reimbursements are further being hampered as new requirements by the Centers for Medicare and Medicaid Services (CMS) stipulate that all medical transport providers unbundle charges to prevent cost shifting from underpayers to

full payer services.<sup>59</sup>

This mixture of increased costs of service versus inadequate reimbursement has created an increasing cost-to-reimbursement mismatch. These new costs and reimbursement constraints have led some hospital-operated programs to either move to stand-alone status or spin off to independent providers. In the public sector, political goals of limiting or cutting taxes are placing the public provider agencies under similar pressures to reduce costs. Although AMT costs are generally perceived as high in relation to numbers of patients served, the value of these costs has been previously supported in the public policy arena.<sup>60-63</sup> However, in the future, as payers attempt to optimize the delivery of health care services, choices for health care reimbursement will be guided by cost/benefit studies.

Regionalization of resources and decreases in services provided by smaller hospitals is further increasing the demand and therefore cost for AMT services. Unfortunately, there is little or no analysis of cost reductions incurred by avoiding additional services due to the presence of AMT services (ie, the avoided costs of duplicative medical specialty services in multiple hospitals). Although there is a concern for AMT overutilization and overtriage based on retrospective evaluations (ie, discharge in < 24 hours from acute care), little information exists as to adverse effects that undertriage may have for patients requiring early access to critical care. Increasing evidence points out that AMT may not only be clinically beneficial but also prove to be cost effective by avoiding the replication of costly services.

To effectively address these AMT financial challenges, the CBWG identified several actions items for the AMT community to address over the next 2 to 5 years.

**Perform cost-effective AMT studies.** AMT costs have traditionally been defended based on the ability to deliver sophisticated medical teams and rapidly transfer patients to tertiary care facilities. In the past, most research has measured the benefits of AMT for particular clinical conditions without providing associated health care costs or system evaluation. The initiation of prospective cost-effectiveness research and outcome studies could greatly benefit the optimal triage and appropriate utilization of high unit cost AMT services. Further, there is no published research on the cost relationships associated with critical shortages of services and the replacement costs within health care systems (ie, substituting the cost of AMT services versus creating critical care services at smaller hospitals). Lastly, little research exists in determining optimal cost-effective AMT models.

**Initiate cost-reduction strategies.** The cost of U.S. air medical systems is primarily based on individual patient transport charges, and the unit costs of AMT appear high when compared to ground transport charges. The reluctance by employer-based insurance companies to agree to cost shifting for underinsured populations and the pressure on public purchasers to reduce tax-supported health care costs require new efforts to identify and reduce AMT costs.

The initiation of economies of scale (ie, combined flight programs with a common dispatch center and management) is one strategy for demonstrating to the public that

AMT services are serious about reducing costs.<sup>64,65</sup> On the other hand, the proliferation of new and competing programs and additional helicopters in geographic areas previously well served by AMT may send an entirely different message to the public. Public awareness and trust of AMT cost control is necessary if the public is to support AMT services in the future.

**Develop a data acquisition system and a universal dictionary.** The ability to precisely describe and quantify charges, costs, and benefits of AMT programs is vitally important. An operational national database with common definitions and measured elements is critical in securing the information necessary for evaluating cost-effectiveness strategies for the EMS and air medical community. Quantifiable costs associated with various mission metrics are lacking. The American Hospital Association and others, such as the Healthcare Financial Management Association, are potential partners in helping to define costs for appropriate reimbursement. Collaborating with other organizations is essential in accurately creating a common definition dictionary. Without standard terms, the interpretation of costs and payments by payers will vary.

**Increase public awareness and education.** As mentioned previously, the high cost and value of AMT continues to be debated. On the other hand, the benefits of having AMT available to rural communities may be priceless<sup>29</sup> because some of the highest rates of industrial injury occur in rural areas as a result of agriculture, mining, forestry, and fishing. AMT services enable those preferring rural lifestyles to have rapid access to major health care services typically located in urban communities. A public understanding of both the costs and the benefits of AMT in supporting rural America is necessary. The more the public and the policy makers understand and appreciate the benefits of AMT operations, the greater the likelihood of public support for these services.

An efficient method of public education can be an active relationship with government officials. This requires the identification of government advocates and the implementation of successful strategies. One identified opportunity is to educate local and state policy makers (eg, legislatures, state EMS directors, etc). Another is to attend national meetings of policy makers such as the annual National Association of State EMS Directors (NASEMSD). During these meetings, large groups of policy makers can be captured to generate intra- and interagency policy statements. Other efforts that may enhance public awareness and education include a user survey and the utilization of program models that share staff with other hospitals or organizations.

**Develop acceptable preutilization criteria.** Development, coordination, and endorsement by the various AMT associations of supportive “white papers” is an important initial step in addressing the costs and benefits associated with these lifesaving services. Once the necessary supporting documents are complete, “white paper” findings and recommendations can be used to initiate an aggressive provider and public education campaign. Using a series of defined tool sets,<sup>66-68</sup> AMT providers, users, and payers could establish preutilization criteria for AMT, thereby avoiding posttrans-

port conflicts arising from payment denials.

**Reduce intrapayer and interpayer payment variability for similarly delivered services.** Maximizing AMT reimbursement for services is hampered for 2 reasons. The first is intrapayer variability. For example, both Medicare and Medicaid are managed by a multitude of intermediaries nationwide. Although these intermediaries are supposed to operate with a uniform set of rules, the interpretation of CMS rules varies greatly. Second is interpayer variability. Here again each payer has its own set of payment rules. This great variability in payment for the same delivered AMT services confounds timely and fair reimbursement.

The establishment of preguaranteed reimbursement criteria by the AMT community in conjunction with government and private payers could enhance the fairness and speed of payment for delivered services. Lastly, to further assist AMT providers, air medical community leadership needs to collaborate with CMS and other payers to standardize medical necessity provisions, billing forms, and reimbursement.

**Develop additional funding sources.** Alternative funding (memberships, state grants, etc.) is a method used by AMT to enhance revenues.<sup>69,70</sup> Securing alternative funding will become more important as reimbursement for AMT decreases. The sources of such funding may be private or public; local, state, or federal. By polling the members of the AMT community, a catalog of shared experiences (tax breaks, levies, legislation, sponsorship, etc.) could be created to help providers develop strategies to maximize alternative funding.

It is very difficult for one program to receive the maximum allowable reimbursement from every source. Membership and subscription programs can be beneficial to the economic well-being of transport services. However, discrepancies among state insurance laws prevent some AMT services from initiating membership programs. An AMT community position paper could provide services with recommendations on how to remove barriers to subscription or membership in averse states. Few if any states provide funds to support privately owned AMT services. At the same time, there are some state, county, and municipally funded agencies that fly medical evacuation missions. A community strategy to address this issue could be beneficial in helping certain AMT services receive state-subsidized funds.

There currently exist large federal and state budgets for homeland security. Because AMT will always play an important role in homeland security, the community development of a unified strategy by which to apply for or access these funds would provide another funding source. In a similar manner, a unified community strategy to access rural health care dollars could provide an additional funding source. A tool set created by members of the AMT community who have successfully secured alternative funding would be of great assistance to other providers seeking corporate or public funding.

**Create guidelines for system integration and policy.** When considering the cost/benefit equation, the argument in favor of benefit is most powerful when the entire AMT community

provides similar benefits. For this to be true, there must be national standards for access to medical care. The development of several AMT national projects—such as a statement on appropriately accessing AMT, a common template of national regulations, guidelines on standard medical care, and guidelines for appropriate utilization of AMT—would help achieve this goal. Another method by which to demonstrate the benefit of AMT is to globally define its role in the delivery of health care. A revision of the AAMS health care integrator paper would achieve this goal.<sup>71</sup>

The balance of cost and benefit will always be an issue in AMT. To be most successful in the future, the AMT community must strive to control costs and widely measure and then publicize the benefits. The most important initiatives are the development of a national AMT database, community-wide endorsement of the appropriate utilization paper, development of an aggressive public education/ public awareness campaign, development of a catalog of alternative funding resources, and recommendations on the most effective means by which to sell AMT services. Attention to these recommendations will go a long way in ensuring a viable future for the AMT community.

In summary, the top five cost/benefit priorities are:

- Operationalize a national database for the AMT community with common metrics and taxonomy
- Update white papers on equity, access, and appropriate utilization
- Develop an aggressive public education campaign
- Develop a catalog of alternate funding strategies
- Develop a tool chest of the most effective ways to promote the use of AMT services

A more comprehensive outline of the CBWG recommendations is provided below:

## CBWG Recommendations

### Issue #1: Costs

- Develop an alternate model to fund AMT services that focuses on covering the fixed costs (spread cost optimally)
- Identify and pursue economies of scale that support advancement in the industry and ongoing operations
- Generate and support research that defines critical resource shortages faced by the AMT community
- Generate and support research that provides information about the cost/benefit of different program models
- Generate and support research that quantifies cost-effective triage mechanisms (over/under)
- Develop a list of cost drivers that impact the industry
- Generate research that quantifies how AMT services impact and avoid replacement costs in health care

### Issue #2: Data

- Participate in ongoing efforts to establish and operationalize a national database for the AMT community
- Develop a method to quantify costs associated with various mission metrics for the purpose of supporting appropriate reimbursement
- Develop tool sets to capture cost and reimbursement;

work with key constituency groups such as the American Hospital Association and the Healthcare Financial Management Association

- Participate in development of a data dictionary for the community

### Issue #3: Public Awareness and Education

- Develop a white paper on the cost/benefits of AMT
- Develop an aggressive public education campaign in concert with other organizations or associations
- Develop tools that define what consumers and other shareholders need and the most effective way to sell AMT services
- Remain actively involved in government and public relations:
  - Identify advocates
  - Define strategies
- Participate in NASEMSD conferences
- Develop a user survey as an industry tool
- Develop an educational effort to define options or models in the community (ie, shared staff with other hospital areas)
- Educate employees to prevent their insurance plans from removing air medical coverage

### Issue #4: Reimbursement

- Develop a position paper on membership programs
- Develop tool sets to assist the community in obtaining optimal reimbursement from insurance companies
- Standardize documentation forms

### Issue #5: Alternative Funding

- Develop a catalog of alternate funding strategies currently used within the AMT community (eg, legislature, taxes, etc)
- Develop a unified strategy to access homeland security resources for the community
- Develop a unified strategy to access rural health dollars for the community
- Develop a tool set to assist community in obtaining public funding (trauma, etc.):
  - Work with state and national legislators
- Develop a tool set to assist community in obtaining corporate support
- Secure funding for action items

### Issue #6: System Integration

- Advocate for defined benefit and adequate reimbursement levels through development of a white paper on equity of access to AMT
- Update or endorse white paper on appropriate utilization
- Provide research to support service
- Develop template for state regulations and national standards
- Update Mini-National Standards (AAMS and CAMTS)
- Update the “Air Medical Transport Systems as a Health-Care Integrator” paper<sup>71</sup>
- Develop national licensing

## Regulatory/Compliance Work Group

### Statement of the Problem and Background

The Regulatory/Compliance Work Group (RCWG) focused on three main topics: standards, accreditation, and state regulations, compliance and access to care issues (HIPAA/EMTALA) that affect air medical transport, and FAA regulations and their impact on AMT. General conclusions and recommendations were as follows.

#### **Create uniform standards, accreditation, and regulations.**

There is no single entity that regulates AMT, but there are several agencies on federal, state, and local levels that regulate various aspects of air medical transport. There are also voluntary standards created by several organizations. Although not enforceable, voluntary standards are effective in setting the tone for professional practice.

CAMTS was initiated in 1990 to set the standards for AMT and offer a process to verify compliance with nationally accepted standards through accreditation. Opinions range from not needing accreditation to mandatory CAMTS accreditation for all AMT services. The CAMTS standards are accepted worldwide as the only comprehensive set of standards for AMT and were recently used by the European Aeromedical Institute (EURAMI) as the basis for its evolving accreditation program.

Several federal agencies require CAMTS accreditation. The Indian Health Services requires it for air medical services applying for a business operating agreement with their agency. The Department of Defense requires CAMTS accreditation as a prerequisite to apply for a contract to transport patients.

CAMTS standards have been used in part or in total by many state EMS agencies for air ambulance licensing regulations. All states have ground ambulance license regulations, but there are still five states (Georgia, Alabama, North Dakota, New Hampshire, and Ohio) that do not require an air ambulance license. On the other hand, the states of Rhode Island, Utah, Washington, Michigan, and Maryland, along with several counties in California and Clark County, Nevada, all require CAMTS accreditation to obtain an air ambulance license. Several other states such as Colorado, Oklahoma, and New Mexico are working on passing similar legislation.

The air medical profession should work closely with associations such as NAEMSD to standardize the air ambulance requirements for each state. State licensing criteria are often looked on as minimal standards, whereas CAMTS standards are more comprehensive. In fact, the states that require CAMTS accreditation feel that they have fewer problems with unsafe or poorly funded providers setting up business in their state by requiring this higher level of compliance.

Currently, some states address only rotor-wing and not fixed-wing services. Fixed-wing services travel over many states and thereby need to comply with no standards or several different sets of standards, depending on the state. This leads to complications and legal implications.

The fixed-wing entity is also fraught with brokers that do not have a service but charge a fee to arrange medical transport. Since there are no federal mandates on governing appropriate levels of care for interstate air ambulance travel,

brokers compete by providing the lowest prices. This often shortchanges the patient with untrained medical crews and poorly maintained aircraft. Efforts should be made to prevent brokers from advertising on the same page as air medical services. At the present time it is difficult for the public to identify whether an advertised service is a broker or an actual AMT service.

**Remove access to care and compliance barriers.** Several federal acts affect AMT directly or indirectly. CMS not only affects billing and reimbursement but also is responsible for the security and privacy of health data. Although the recent changes for Medicare reimbursement have provided some consistency to billing agents, Medicaid is subject to local and regional differences. A compilation of each state's Medicaid reimbursement guidelines for air ambulance would be helpful.

CMS is also responsible for enforcing the privacy rule under HIPAA. There have been recent revisions in the privacy rule that directly impact the protected health information of patients transported by air. Air medical services need to understand their obligations under the new revisions and the consequences of not following procedures according to HIPAA.<sup>72</sup> There may exist organizations, such as AAMS, that could provide assistance through technical advisors for compliance issues.

The Emergency Medical Treatment and Active Labor Act (EMTALA) is a federal law passed by Congress in 1986 as part of the Consolidated Omnibus Budget Reconciliation Act (COBRA) of 1985 (42 U.S.C. 1395dd). It defines the appropriate transfer of *unstable* patients and holds responsible parties legally liable for compliance. In some cases, hospitals try to shift the costs of uninsured patient transports and liability to the air medical service and may inflate the utilization of air transport. The referring agents, in many cases, do not understand EMTALA. Education of the direct care providers, especially at referring facilities, is needed so that access to care is applied uniformly when dealing with transport services. Underutilization and overutilization of AMT also should be studied.

**Establish consistent FAR interpretations.** The FAA, under Title 14 Code of Federal Regulations, oversees and enforces regulations for all civil aviation. These regulations are not specific to the unique aspects of AMT, and this has created inconsistencies in how FARs are interpreted. In addition, there are local and regional inconsistencies in interpreting FARs. The AMT community should seek to develop consistent and nationally applied interpretations.

For example, medical crew members are generally not considered crewmembers as defined by the FAA, in that they do not have specific duties related to the operation of the aircraft. However, this is a grey area because medical crew members may assist the pilot in safety-sensitive areas such as emergency evacuation of patients.

When are aircraft operating under Part 91 regulations and when are they operating under Part 135 regulations? This is another grey area in interpretation of FARs. Part 91 regulations address general aviation; Part 135 regulations address commuter and on-demand operations (aircraft for hire), for

example, when a patient is transported. But when is the air medical transport considered for hire? Is it when a hospital pays for aviation services from a vendor, in which case it would be under Part 135 regulations? Or when a patient is on-board, being charged for the services, in which case certain aspects of the flight (such as going for the patient) could be conducted under Part 91?

The issue of public law enforcement agencies that transport patients competing with private AMT programs also presents a challenge for the private programs. The public services are not required to comply with FARs. Therefore, they do not have the same expenditures as the private sector in keeping pilots trained to the level required and in keeping aircraft maintained according to FARs. Some suggest that the FAA should require all public service aircraft that transport patients to be in compliance with Part 135 regulations.

The law enforcement groups have begun to recognize their lack of standardization and may be receptive to some sort of regulatory or voluntary accreditation process. Recently, the Airborne Law Enforcement Agency (ALEA) has been a proponent of developing standards for its airborne agencies.

Other inconsistencies also exist in the interpretation of the FAA regulations regarding air space and instrument approaches, the use of night vision goggles, and the 337 certificates for medical configurations.

Hospital helipads are not enforced by regulations, but there is an FAA advisory circular that addresses public use helipads. In some cases, hospital helipads have been shut down by the FAA due to noncompliance with this circular. Again, there are inconsistencies in interpretation because there is still a question about hospital helipads being classified as public or private use.

In summary, most work group members agreed that groups such as the Aviation Rulemaking Committee (ARC) should continue to work closely with the FAA to address these inconsistencies.

The last issue discussed was homeland security and what happened during the 9/11 crisis. Most air medical programs were grounded immediately on 9/11. Civil AMT services are a tremendous resource for the Transportation Security Administration (TSA), and the AMT community needs to take a proactive stance so that the FAA can issue a special airspace status to air medical services if another disaster happens.

The following recommendations resulted from the above discussion items.

## RCWG Recommendations

### Issue #1: Standards and Accreditation

#### ■ Establish national essential minimal standards that are mission appropriate and address the following issues:

- Work with states to ensure uniformity across state lines so that air medical programs that border several states do not have to meet several different types of state requirements
- Require licensure that meets minimal standards or accreditation

- Provide state EMS agencies with minimal standards and model legislation. There are still five states that do not license air ambulances at all, and many states that license air ambulances use similar licensing regulations for air as for ground. Also, many states that have air ambulance regulations address only helicopters.
- Require advertising that reflects the service provided. One of the issues identified was that brokers who arrange for air transport for a fee advertise on the same page as air medical programs that actually provide the service. Lobby state attorney general offices to cite brokers for false advertising.

#### ■ Improve air medical transport by changing regulatory requirements, encouraging compliance, and identifying the cost/benefits of the mandated changes

- Identify costs to air medical services to meet government requirements
- Measure benefits to air medical community, patients, and the public at large

#### ■ Develop a method to implement and monitor the national essential minimal standards

- Meet with NAEMSD and educate them regarding air medical transport standards
- Present state directors with minimal standards and model legislation

### Issue # 2: Compliance (HIPAA/EMTALA) and Access to Care

#### ■ Develop an analysis of current access to care difficulties and the effects of the pending changes in federal regulations on proposed legislation on AMT

- Identify payer coverage issues that are affected by EMTALA
- Examine local and regional differences and then create a strategy (eg, position papers)
- Gather data on payer outcomes based on criteria referencing transports that were referred because no specialty care was available
- Collect data on Medicaid reimbursement rates and billing criteria from each state
- Be proactive in getting feedback to EMTALA
- Get on the list of organizations to be notified for future changes in EMTALA legislation
- Update AMPA position paper on new EMTALA changes

#### ■ Develop and implement a comprehensive strategy for lobbying government agencies and constituency groups on coverage issues to include greater advocacy and education

- Seek consistent applications on contested matters and interpretations
- Educate payers and influence lobbying efforts by constituents
- Lobby to communicate ramifications of EMTALA changes
- Lobby for universal rulings
- Establish a public education campaign (eg, public service announcements)
- Lobby CMS and Congress for clarification of Medicare coverage of air ambulance transports
- Lobby for change to allow AMT services to bill for trans

port in situations where the hospital requests transport because no specialty providers are available

- Find media advocates (entertainment, political, and influential people or groups) that have an interest in promoting AMT

#### ■ Document difficulties in access while generating research and examples to support an industry position related to appropriate and inappropriate air medical utilization and reimbursement

- Develop and distribute condition lists identifying appropriate helicopter transports (condition codes)
- Establish and distribute a list of conditions that do not warrant helicopter transport
- Implement a data collection form to track overutilization of helicopter transport
- Encourage programs to participate in providing utilization data to a central website. Programs that participate should be able to access information.
- Market the utilization of helicopters in areas that are underutilized

#### ■ HIPAA action items

- Educate public, associations, and peers on HIPAA and how it relates to information that can be released to covered entities
- Assist transport services with template tools/forms for business associate agreements

### Issue # 3: Federal Aviation Regulations (FARs)

#### ■ Work closely with the FAA to revise FARs to benefit AMT

- Develop a database regarding inconsistent application of “337” approvals (eg, field approvals for repair and/or alteration) and other interpretation inconsistencies in FARs
- Petition the FAA for consistent application and interpretation of FARs
- Petition FAA to allow Instrument Flight Rules (IFR) landing procedures without weather reporting
- Develop operation-specification for utilization of night vision goggles
- Develop a resource document on interpretation of FARs for medical personnel
- Continue the ARC

#### ■ Petition the FAA to define hospital helipads as private-use helipads

#### ■ Petition the FAA to require FAR Part 135 compliance for all aircraft transporting patients to include public-use operations

- Collect data on areas of the U.S. that interpret or ignore laws to benefit use of public service over private use aircraft
- Share information and maintain ties with ALEA and other public service organizations to develop standards that improve patient care and safety

#### ■ Ensure that government agencies treat air medical transports as essential response entities in terms of homeland security

- Proactively, petition FAA and TSA to grant air medical services special status for air space before another disaster occurs

## The Final Recommendation

As history reveals, past AMT summits have created important industry recommendations. Yet the ultimate success of these summits can be measured only by whether or not their recommendations were implemented. For the AMT community to move forward, recommendations derived from the 2003 Air Medical Leadership Congress must be set in motion. We suggest that the various AMT associations and organizations reconvene to assign responsibility and initiate the above recommendations. But the burden of initiating these actions lies not just with the AMT community associations and organizations; this burden lies with each and every one of us who are engaged in the specialty of AMT. It is only through national, regional, and local efforts that the AMT community can best position itself for a successful future.

## References

1. Collett HM. The safety challenge. *Hosp Aviat* 1986;5(3):6.
2. Schneider C. The bottom line. *Air Med J* 1994;7:269.
3. Schneider C. 1996 accomplishments, 1997 goals. *AirMed* 1997;3(1):5-9.
4. Mancuso D. The drive to improve industry safety. *AirMed* 2000;6(4):15-6.
5. Parmelee LP, Marasco ER, Keyes FN. The Air Medical Reimbursement Congress: a report. *J Air Med Transport* 1991;10(10):41-7.
6. Lind K, Gage L. The Air Medical Reimbursement Congress. *J Air Med Transport* 1992;11(5):15-20.
7. Stults KR, Association of Air Medical Services, The Abaris Group. 1996 Air Medical Transport Summit summary. Alexandria: The Association; 1996.
8. Rocky shifts all pilots to 12-hour duty schedule. *AeromedWeek* 1988;(2)10:1.
9. Crew member flight time and duty period limitations and rest requirements. FAR 135.261 Applicability. Federal aviation regulations aeronautical information manual. Newcastle (WA): Aviation Supplies and Academics; 2004. p. 292-3.
10. Crew member flight time and duty period limitations and rest requirements. FAR 135.263 Flight time limitations and rest requirements: all certificate holders. Federal aviation regulations aeronautical information manual. Newcastle (WA): Aviation Supplies and Academics; 2004. p. 293.
11. Crew member flight time and duty period limitations and rest requirements. FAR 135.265 Flight time limitations and rest requirements: scheduled operations. Federal aviation regulations aeronautical information manual. Newcastle (WA): Aviation Supplies and Academics; 2004. p. 293.
12. Crew member flight time and duty period limitations and rest requirements. FAR 135.267 Flight time limitations and rest requirements: unscheduled 1- and 2-pilot crews. Federal aviation regulations aeronautical information manual. Newcastle (WA): Aviation Supplies and Academics; 2003. p. 293-4.
13. Crew member flight time and duty period limitations and rest requirements. FAR 135.273 Flight time limitations and rest requirements: unscheduled 1- and 2-pilot crews. Federal aviation regulations aeronautical information manual. Newcastle (WA): Aviation Supplies and Academics; 2003. p. 295-6.
14. Crew member flight time and duty period limitations and rest requirements. FAR 135.271 Helicopter hospital emergency medical evacuation service (HEMES). Federal aviation regulations aeronautical information manual. Newcastle (WA): Aviation Supplies and Academics; 2003. p. 294-5.
15. FAA regulates aeromedical pilots. *Hosp Aviat* 1985;4(9):5-6.
16. FAR Part 136.271. *Hosp Aviat* 1985;4(9):7.
17. MacDonald E, Heffernan J. Safety above all: An Air Medical Safety Advisory Council update. *Air Med J* 2002;21(4):15-6.
18. Wright Jr RM. Root cause analysis of air medical service accidents. *Rotor* 2001-2002 Winter:28-9.
19. Thomas F, Romig L, Hutton K, et al. The Air Medical Leadership Congress: setting the health care agenda for the air medical community. *Air Med J* 2003;22(5):34-9.
20. Frazer RS. Air medical accidents: a 20-year search for the information. *AirMed* 1999;5(5):39-44.
21. North M. Cause factor: human. *Air Med J* 2000;19(1):4-5.
22. Thomas F. Life Flight safety statement. Salt Lake City: IHC Life Flight; 2004.
23. Blumen IJ, et al. A safety review and risk assessment in air medical transport. *Air Medical Physician Association handbook*. Special supplement. Salt Lake City: Air Medical Physician Association; 2002. p. 26.
24. Cox K. When angels fly with eagles: safety as a culture. *Air Med J* 2002;21(2):17-22.
25. Manacci C, Rogers K, Martin G, et al. Efficacy of 24-hour shifts: prepared or impaired? A prospective study. *Air Med J* 1999;18(1):20-5.

26. Allen TL, Delbridge TR, Stevens MH, et al. Intubation success rates by air ambulance personnel during 12- versus 24-hour shifts: does fatigue make a difference? *Prehosp Emerg Care* 2001;5:340-3.
27. Weinger MB, Ancoli-Israel S. Sleep deprivation and clinical performance. *JAMA* 2002;287:955-7.
28. Cauthorne CV, Fedorowicz RJ. Work/rest schedules and their potential impact on flight crew performance. *Hosp Aviat* 1985;4(3):5-7.
29. Mann NC, Pinkney KA, Price DD, et al. Injury mortality following the loss of air medical support from rural interhospital transport. *Acad Emerg Med* 2002;9:694-8.
30. Kaplan L, Walsh D, Burney RE. Emergency aeromedical transport of patients with acute myocardial infarction. *Ann Emerg Med* 1987;16:79-81.
31. Powell DG, Hutton K, King JK, et al. The impact of a helicopter emergency medical services program on morbidity and mortality. *Air Med J* 1997;16(2):48-50.
32. Thomas SH, Harrison TH, Buras WR, et al. Helicopter transport and blunt trauma mortality: a multicenter trial. *J Trauma* 2002;52:136-45.
33. Baxt W, Moody P. The impact of a rotorcraft aeromedical transport emergency care service on trauma mortality. *JAMA* 1983;249:3047-51.
34. Baxt WG, Moody P, Cleveland HC, et al. Hospital-based rotorcraft aeromedical emergency care services and trauma mortality: a multicenter study. *Ann Emerg Med* 1985;14:859-64.
35. Schwartz RJ, Jacobs LM, Juda RJ. A comparison of ground paramedics and aeromedical treatment of severe blunt trauma patients. *Conn Med* 1990;54:660-2.
36. Jacobs LM, Gabram SG, Sztajnkrzyer MD, et al. Helicopter air medical transport: ten-year outcomes for trauma patients in a New England program. *Conn Med* 1999;63:677-82.
37. Oppe S, De Charro FT. The effect of medical care by a helicopter trauma team on the probability of survival and the quality of life of hospitalized victims. *Accident Analysis Prevention* [AQ: Please confirm journal name and abbreviation according to Index Medicus.]2001;33:129-38.
38. Topol EJ, Fung Ay, Kline E, et al. Safety of helicopter transport and out of hospital intravenous fibrinolytic therapy in patients with evolving myocardial infarction. *Cathet Cardiovas Diagn* [AQ: Please confirm journal name and abbreviation according to Index Medicus.]1986;12:151-5.
39. Fromm RE, Taylor DH, Cronin L, et al. Bleeding complications following initiation of thrombolytic therapy for acute myocardial infarction: a comparison of helicopter transported and nontransported patients. *Ann Emerg Med* 1991;20:892-5.
40. Brathwaite CE, Rosko M, McDowell R, et al. A critical analysis of on-scene helicopter transport on survival in a statewide trauma system. *J Trauma* 1998;45:140-4.
41. Kent RB, Newman LB, Johnson RC, et al. Helicopter transport of ruptured abdominal aortic aneurysms. *Ala Med* 1989;58:13-4.
42. Nicholl JP, Beeby N R, Brazier JE. A comparison of the costs and performance of an emergency helicopter and land ambulances in a rural area. *Injury* 1994;25(3):145-53.
43. Nicholl JP. The role of helicopters in pre-hospital care. *Pre-hosp Immed Care* 1997;1:82-90.
44. Arfken CL, Shapiro MJ, Bessey PQ, et al. Effectiveness of helicopter versus ground ambulance services for interfacility transport. *J Trauma* 1998;45:785-90.
45. Schiller WR, Knox R, Zinnecker H, et al. Effect of helicopter transport of trauma victims on survival in an urban trauma center. *J Trauma* 1988;28:1127-31.
46. Hotvedt R, Kristianson IS, Forde OH, et al. Which groups of patients benefit from helicopter evacuation? *Lancet* 1996;347:1362-6.
47. Bledsoe BE. EMS myth #6: air medical helicopters save lives and are cost-effective. *EMS* 2003;32:88-9.
48. Thomas SH, Cheema F, Wedel SK, et al. Trauma helicopter EMS transport. Annotated review of selected outcomes-related literature. *Prehosp Emerg Care* 2002;6:359-71.
49. Thomas SH, Cheema F, Cumming M, et al. Nontrauma helicopter EMS transport. Annotated review of selected outcomes-related literature. *Prehosp Emerg Care* 2002;6:242-55.
50. Arndt K, Air & Surface Transport Nurses Association. Standards for critical care and specialty rotor wing transport. Lexington: The Association; 2003.
51. Air Medical Physician Association. Medical direction and medical control of air medical services [position statement]. *Air Med J* 2003;21(1):14-5.
52. Kerr WA. Bears in the air: Maryland State Police Aviation Division. *AirMed* 1995;1(2):28-31.
53. Association of Air Medical Services, National Highway Transportation Safety Administration. CentIR atlas and database of air medical services. Washington: Center for Transportation Injury Research; 2003. p. 8.
54. Silbergleit R, Scott PA, Lowell MJ. Cost-effectiveness of helicopter transport of stroke patients for thrombolysis. *Acad Emerg Med* 2003;10:966-72.
55. Cummings G, O'Keefe G. Scene disposition and mode of transport following rural trauma: a prospective cohort study comparing patient costs. *J Emerg Med* 2000;18:349-54.
56. Snooks HA, Nicholl JP, Bazier JE, et al. The costs and benefits of helicopter emergency ambulance services in England and Wales. *J Public Health Med* 1966;18:67-77.
57. Gearheart PA, Wuerz R, Localie AR. Cost-effectiveness analysis of helicopter EMS for trauma patients. *Ann Emerg Med* 1997;30:500-6.
58. Lang M, Samuels D. Financial reimbursement: the challenge of the 90s. *J Air Med Transp* 1991;10(4):19-20.
59. Department of Health and Human Services. Centers for Medicare & Medicaid Services. 42 CFR Parts 410 and 414 Medicare Program; Fee schedule for payment of ambulance services and revisions to the physician certification requirements for coverage of non-emergency ambulance services. *Fed Reg* Feb 27, 2002.
60. Vermont Helicopter Review Committee Report. Vermont Health Authority; 1998.
61. Schneider C. AAMS signs on to World Wide Web. *AirMed* 1996;2(3):13-4.
62. Schneider C. AAMS response to pending Vermont legislation. *AirMed* 1996;2(4):18-9.
63. Bruhn JD, Williams KA, Aghababian R. True costs of air medical vs. ground ambulance systems. *Air Med J* 1993;12:262-8.
64. Zalar C. Aeromedical programs: the foundation for "shared services." *Air Med J* 1987;7(2):18-9.
65. Rickey PH. Confronting change: program models evolve to meet managed care challenges. *AirMed* 1999;5(4):24-7.
66. Thomson DP, Thomas SH. Guidelines for air medical dispatch. *Prehosp Emerg Care* 2003;7:265-71.
67. Association of Air Medical Services. Position paper on the appropriate use of emergency air medical services. *J Air Med Trans* 1990 Sept:29-33.
68. Talbert S. Pilot study for predicting appropriate use of air medical helicopters. Part 1: interfacility transports. *Air Med J* 2000;19(2):59-65.
69. Grace T. Controversy: blending EMS and law enforcement into a united helicopter program. *J. Aeromedical Healthcare* 1985 Nov/Dec:8-9.
70. Marly CL. Lifeguard: an alternative method for aeromedical helicopter finance. *Hosp Aviat* 1985 Jan:14-6.
71. Association of Air Medical Services. Air medical transport systems as a health care integrator. *Air Med J* 1994;13:405-6.
72. Williams AR. How will HIPAA affect air medical operations. *Air Med J* 2002; 21:7-8.

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