Air Ambulance Operations: Too Little, Too Late

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In August, the Federal Aviation Administration (FAA) sent a notice to all of the nation's air ambulance companies, asking them to implement better safety practices to curb a tragic surge in helicopter ambulance crashes that have killed at least 64 people since 2000. Unfortunately, the FAA notice merely urged -- but did not require -- the companies to set up programs that would reduce the likelihood of pilots taking off and flying in instrument or marginal visibility conditions.

This appears to be another example of too little too late.

Since 2000, at least 86 air ambulances have crashed - more than double the number during the previous five years. The deluge of accidents is even more alarming because it contrasts with the overall trend toward fewer general aviation and commercial air crashes in the United States.

- At least 11 medical helicopters crashed in 2004. Eighteen people died. It was the deadliest year in the history of the air ambulance business.
- In August 2004, a mother, her ill infant and three crew members were killed when an air ambulance flight crashed at night in the Nevada mountains.
- In July 2004, four people died in the crash of a South Carolina medical helicopter flight that had just left an interstate highway accident scene.
- Crashes continue into 2005. On Jan. 3, 2005, a medical helicopter crashed in Arizona. Three days later, a pilot was killed in a Mississippi crash. Four days later, two crew members died when a medical helicopter plunged into the Potomac River.
- In February, a patient died in a medical helicopter crash in Arkansas. In June, a Care Flight pilot, nurse and paramedic died near Mancos, Colo. In September, a pilot and two nurses perished when an Airlift Northwest helicopter plunged into Puget Sound. In October an 18-year veteran LifeStar pilot died in Pennsylvania.

Inadequate FAA Oversight

When weather-related crashes began to climb in the late 1980s, the National Transportation Safety Board (NTSB) intervened and identified key factors contributing to the alarming increase in helicopter ambulance crashes. Pilots flying in instrument or marginal visibility conditions topped the list of chronic offenses.

In its 1988 study, the NTSB urged operators to tighten standards for acceptable flight conditions and to prohibit flights by helicopter ambulances in instrument conditions. In addition, the NTSB urged the FAA to be more vigilant and to adopt special requirements for helicopter ambulance operations. However, in intervening years, the FAA has declined to act with authority. The air ambulance industry refuses to self-regulate. Meanwhile, the number of senseless crashes has escalated.

The FAA's recent request to air ambulance operators is all but "toothless," since FAA inspectors cannot force air ambulance firms to implement the safety steps or hold them accountable if they fail to incorporate the more stringent standards. The FAA is also about 17 years late in confronting the industry over the chronic mistakes that are replicated in crash after crash.

The FAA proposal provided a few safety "bright spots," specifically asking operators to help pilots make the difficult "fly/no-fly" decisions, identifying a list of objective risk factors -- from weather conditions to maintenance -- that pilots should consider. But until the FAA drafts and implements mandatory safety regulations to govern this industry, more people will die simply because there is no hard and fast oversight with consequences.

Root of the Problem – Helicopters

Helicopter ambulances, which trace their origins to the Korean War, first began spreading across the United States in the 1980s. Over the past few years, the air ambulance industry has grown rapidly but has been essentially unregulated. For example, the number of air ambulance transports in Texas nearly tripled over two years' time, from 4,144 in 2002 to 11,694 in 2004.

Helicopters have become the "stars" of most air ambulance operations, but because of their frequent use and the inherent risk to fly them, they also are the primary example of what's wrong in the air ambulance industry.

The reasons for helicopter ambulance crashes are varied and complex:

Competitive Pressure: Under the pressure to compete, especially in metropolitan areas, far too many hospitals have helicopters which must fly frequently to justify the expense of the aircraft, pilots and flight crews. Because of the significant fixed expenses dedicated to helicopter air ambulance operations, hourly costs can be reduced only by frequent usage. Overpopulation of air ambulance helicopters in metropolitan areas has forced some operators to take risky calls to meet their flight quotas and generate revenues.

Pilot Error: Most helicopter air ambulance crashes result from poor pilot decisions. The 1988 NTSB study, as well as analyses of more recent air ambulance crashes, both point to poor piloting decisions as the predominate reason for crashes. Among the most common errors are flying in reduced visibility conditions, attempting long-distance transports in unfamiliar locales, crew fatigue, exceeding the helicopter's performance limitations, and attempting to land or take off from inappropriate or hazardous landing zones.

The "Go/No-Go" Decision: First responders, physicians, paramedics, and emergency dispatchers can request a helicopter, but pilots hold the ultimate "go/no-go" decision and responsibility. Far too many flights have been improvidently attempted when pilots took medically unnecessary flights after the first responders pleaded with the pilots to "take a chance," compromising the safety of the flights. Similarly, dispatchers often impart information to on-duty pilots about the circumstances of the emergent situations, compromising the pilots' abilities to make dispassionate risk assessments.

Poor Triage Systems: Usually missing from most helicopter EMS operations is a triage or screening system which inserts qualified medical personnel into the dispatch process. In many instances, incoming calls are not screened to determine the medical necessity and appropriateness of requested transports. The pilot of a standby helicopter should be isolated from the circumstances surrounding the pending emergency.

The threshold decision about whether to respond should be presented only to the pilot for a dispassionate flight decision after medical screening. Once presented with a

transport request, the pilot's risk assessment should focus solely on flight-risk factors and should not be influenced by the medical circumstances of the patient in need.

Unnecessary Transports: Studies have shown that up to 95 percent of transports by air ambulance helicopter are medically unnecessary. In other words, helicopter ambulance transport improves the mortality rate or enhances the medical outcome in 5 percent or fewer instances. This statistic underscores the over-utilization of medical helicopters due to economic or competitive pressures.

Unfortunately, many of the crashes involving air ambulances occur during medically unnecessary transports. This is typically due to the absence of qualified medical screeners who determine whether the dispatch requests are medically warranted before turning the "go/no-go" decision over to the pilot.

Air v. Ground Transport: Contrary to intuition, most patient transfers in metropolitan areas can be made faster in a land-based ambulance than by helicopter ambulance. This has been borne out by studies of patient-transfer times in a number of metropolitan areas. The reasons are more apparent than one might expect. There are typically large numbers of ground ambulances deployed or dispersed throughout metropolitan areas, and these vehicles can get to patients and find nearby care facilities quickly.

In contrast, a helicopter ambulance crew must be dispatched from a standby condition, start the helicopter, take off and fly to an appropriate landing zone. On landing, the pilot must reduce power for crew egress, wait for patient loading and then bring the engines and rotors back to take-off power before flying to a facility with an appropriate landing pad.

Not only is the net delivery time for a ground ambulance typically shorter, but the ground ambulance is not weight-limited like its helicopter counterpart. As a result, the ground ambulance can carry more medical personnel, more equipment, multiple patients and, in many instances, deliver patients to emergent care faster and with more comprehensive medical support on hand.

A High-Tech Solution?

The NTSB recently suggested allowing the use of night-vision goggles (NVG) as a solution to reduce nighttime or reduced-light medical helicopter crashes. There is no question that NVG can significantly improve pilots' visibility in night or reduced-light conditions. However, NVG is not a cure-all and, if entrusted to pilots with little NVG experience, may add significant risks to an already risky flight environment.

The military's own experience has taught us that proper NVG training is essential to avoid disorientation with this specialized equipment. Most NVG training for helicopters is given by the military, and most pilots with significant NVG experience are former military helicopter pilots. Most civilian trained pilots have little-or-no training or experience flying helicopters with NVG.

Given the increasing number of civilian-trained pilots being hired in the expanding air ambulance market, the introduction of NVG operations by unqualified pilots will simply add to the carnage, not reduce it. The NTSB needs to seriously reconsider this proposal.

The only cure for the spiraling tragedy of air ambulance crashes is for the FAA to implement mandatory safety regulations specifically tailored to the risks associated with air ambulance operations.

As a minimum, the FAA should mandate that:

1. Air ambulances should be restricted to operations in visual flight rules (VFR) conditions with at least three miles visibility. Operations in instrument flight rules (IFR) conditions should be prohibited under all circumstances. (The FAA should require that a transport not be initiated unless it can be completed within weather minimums to lessen the risk of flight into adverse weather).

Night operations, if permitted, should be permitted only in areas where pilots have an adequate horizon references due to ground lights. In such instances, pilots flying medical helicopters at night should have a minimum of 250 hours total night experience in helicopters, in addition to other minimum requirements specified below. The FAA must introduce more stringent minimum standards for medical helicopter flight operations.

2. Dispatch procedures for helicopter air-ambulance operations should include a mandatory medical-screening function with objective guidelines to determine whether a prospective helicopter transport is medically necessary. In fact, hospitals should not consider hosting air ambulance operations at all, if they are not willing to invest qualified medical personnel in screening transport requests. Initially, the screening team must determine if ground transport is more appropriate as alternative.

Except for infrequent instances, ground transport should be utilized for approximately 95 percent of all prospective transports, as medical outcomes are likely to be enhanced by medical helicopter transport in only 5 percent of incidences, according to studies. If a medically appropriate flight request emerges from the screening process, the flight crew should be asked to make a dispassionate flight-risk assessment, insulated from information about the patient's situation, with no implications or consequences for being declined.

3. Cross-country transports and transports outside an air ambulance operator's approved radius of operations should be prohibited. This will eliminate attempts to traverse elevated terrain, such as mountains and other obstructions which could exceed the aircraft's performance limitations under load.

4. Minimum pilot qualifications should include total helicopter time of at least 3,000 hours with 250 actual instrument flight hours. The requirement for actual instrument flight experience is needed to address inadvertent flight into instrument meteorological conditions (IMC).

If VFR flight during night is permitted in areas with sufficient ground illumination and horizon references, pilots should have a minimum of 250 hours of logged night experience in helicopters. While experience is no guarantee of good piloting judgment, it certainly beats the alternative.

5. Even though planned flight into IMC should be prohibited, inadvertent flight into IMC should be addressed in the operations specification as an emergency condition. Pilots should be routinely briefed and trained in avoiding and exiting IMC. Helicopters should be equipped for flight in IMC to permit safe exit from inadvertent IMC.

The FAA could implement other safety enhancements to reduce the incidence of air ambulance crashes, but the above recommendations are the essential steps to produce meaningful change. Unfortunately, too little has come far too late from the FAA, and there is no sign the agency is willing to attack the epidemic of air ambulance tragedies anytime soon.

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