Editorial

Aeromedical Transport

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Aeromedical transport (AMT) became a vital tool for saving lives in the Vietnam war. Subsequently, civilian utilization of AMT became popular in the United States and in other developed countries. As Fromm and Varon[1] point out in this issue of the Journal, it is incumbent upon family physicians to understand the advantages as well as the limitations of this technology.

Fixed- and Rotary-Wing Transport

Aeromedical transport is divided into two major subdivisions: fixed wing (airplane) and rotary wing (helicopter). Helicopter transport has inappropriately become the preferred method of AMT by the general public and many in medicine because of the illusion that it is the best and fastest way to transport a patient to a hospital. Unfortunately, many hospitals have established helicopter transport services for public relations and patient recruitment reasons instead of patient care enhancement.

Medical transport by helicopter is usually to unplanned locations at unplanned times. Weather, darkness, pilot experience, crew fatigue, lack of knowledge of landing sites, and varying terrain can make transport difficult and dangerous. For a pilot involved in AMT, nothing is more frustrating than flying an exacting and perilous mission only to find that the patient was not seriously ill or that ground transport could have accomplished the mission more safely.

Transport of a patient by fixed-wing aircraft is far safer than by helicopter because established landing areas are used. Traditionally, fixed-wing transport has been used for long missions, whereas rotary-wing transport has been used for distances of less than 150 to 250 nautical miles. In the mountainous terrain of Wyoming, we use fixed-wing transport between facilities for distances as short as 60 nautical miles because of severe weather conditions that make helicopter transport unacceptable. Helicopter transport is also 400% more expensive than fixed-wing transport for distances greater than 101 nautical miles.[2]

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Safety Concerns

During 1990, aeromedical transport was heralded for finally attaining a level of safety expected by our society. There were no aeromedical accidents in that year after a decade of dubious safety statistics. Since January 1, 1991, however, eight AMT helicopter crashes have resulted in 14 deaths (four pilots, five nurses, four paramedics, and one patient), eight injuries, and eight helicopters lost.[3,4] Only two of the crashes were even remotely related to mechanical difficulties, and only one crash occurred while a patient was on board. It is not known whether the failure of the other seven missions resulted in any increased morbidity or mortality for the intended patients because of delays in transport.

There were no reported fixed-wing AMT accidents during the same period. Annual reviews have shown that twin-turbine fixed-wing aircraft are from 25% to 50% safer than single- and twin-turbine helicopters.[5] One study showed that safety records were better among those AMT organizations that transported the most patients.[6]

Responsibility for the Decision to Transport

There are three circumstances in which a physician must make the difficult decision of whether AMT is necessary: (1) when a nonphysician call comes into the emergency service AMT system requesting transport, (2) when a physician wants to transfer a patient to another facility, or (3) on the rare occasion when he or she is actually on the scene when an out-of-facility emergency occurs.

There are two "sins" in aeromedical transport that the dispatching physician must avoid: (1) the loss of an aircraft and its crew in the process of transporting a patient for whom other more suitable transport was available; and (2) the death of an unstabilized patient during interfacility transport.

The primary question is which mode of medical transportation is the safest, most efficient, and in the best interest of patient care? In most situations, air transport cannot compare with the safety, cost, and availability of

ground transport. However, when transport to unpaved areas is needed, long distances are involved, or ground transport is not available, air transport becomes a critical option.

Thirty nautical miles is usually considered the "break-even" point where helicopter transport may be faster than emergency ground transport, assuming that there is no air or surface traffic congestion to be considered. "Fastest" does not, however, equate to safest, most cost-efficient, or best patient-care modality for emergency conveyance. Whether a 5-, 15-, or even 60-minute difference in transport time of a stable patient justifies AMT use must be decided on a case-by-case basis.

The referring physician has full responsibility for the patient being transported and cannot relinquish this responsibility until the patient is personally received by a physician with access to equal or greater medical resources. Although physician presence on AMT flights has not been shown to be a determining factor in outcomes, the transfer of a patient to an AMT flight team does not relieve the transferring physician of responsibility for the patient. It is incumbent on the transferring physician, therefore, to ensure that the method, destination, and timing of the transport satisfies the requirements for safety, efficiency, and patient care.

Many emergency medical services now use trauma scoring systems that measure the physiologic response of the patient on a numeric scale such as CRAMS Scale or the Glasgow Coma Scale, the number of deaths at the scene, and whether extrication is required as indicators to initiate air evacuation of a patient before a full assessment of need is performed.[7] Assessment systems used by individual hospitals and AMT services may take into account surface traffic patterns, geographic regions, weather, and other specific local idiosyncracies.

Fixed- or rotary-wing transport of an unstabilized patient between hospital facilities should never be attempted. A good understanding of the problems of medical transport by the transporting physician should dictate patient preparation for the flight and the final medical decision to transport ("go/no go"). If a crisis is going to occur, it is far better for it to occur at the referring hospital than in an aircraft cabin.

Protocols for Air Transport Use

Most family physicians do not have the time, inclination, or opportunity to become involved in AMT on a regular basis. Thus, it is incumbent on the AMT service to establish a protocol for transporting patients that is as easy as possible for the physician. The AMT service should have a physician director who has aeronautical experience and expertise to supervise and be available for backup and discussion with the transport medical and pilot staff. Flight nurses and other technical medical staff such as respiratory therapists should be a part of the patient care team to ensure that the patient is stabilized and equipped for transport.

Decisions concerning the appropriateness of air transport use should be based on general protocols that are not subject to the emotional turmoil of a medical crisis. Pilots, as mentioned by Fromm and Varon,[1] should make the final decision to transport based strictly on the aeronautical safety of the mission. To avoid the undertaking of unacceptable flight risk, flight crews should not be apprised of the critical nature of the patient's condition.

Conclusions

Physicians, who rely on objective data in medicine, are sometimes stymied by the difficulty in evaluating the efficacy of aeromedical transport. Data have been difficult to obtain, and controlling for variables is an enigma; therefore, reliable morbidity and mortality comparisons of aeromedical transport vs ground transportation have not been done. Cost assessment has also been deceptive since many of the expenses are difficult to appraise, such as that of employing highly trained personnel and that of providing replacement staff for the base facility while the transporting personnel are in flight. Hospital remuneration is also a factor since Medicare patients' reimbursements are DRG-limited, and many other patients have no source of payment.[8]

Although aeromedical transport, particularly helicopter use, is exciting, dramatic, and a major public relations factor for hospitals, cost, safety, and risk-benefit ratios must be the basis on which AMT utilization decisions are made. As with all medical technologies that may be affected by nonmedical interests, physicians must differentiate between situations in which the use of medical air transport is appropriate and those in which its use is extravagant.

References

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