

Patient Safety Tip of the Week

August 20, 2013

Lessons from Canadian Analysis of Medical Air Transport Cases

We've done numerous columns about fatal accidents involving medical helicopter services or other medical air transport services (see list at the end of today's column). We've often focused on the question of whether there was a legitimate indication for air transport (as opposed to ground transport).

Unfortunately, in the US there is little oversight of medical air transport services. The FAA has limited jurisdiction over such services. The NTSB reports of such accidents do a great job looking at the mechanical, environmental, and human factors involved in such crashes. However, they never delve into the question of necessity for air transport. Many trauma systems do review air transport cases as part of the quality assurance activities. However, most other cases of medical air transport are never reviewed for necessity by either the sending or receiving hospitals and there are few or no state agencies overseeing the medical air transport industry.

In Ontario, Canada a commission was recently appointed to study deaths related to air ambulance services and that commission has just released its report ([Muir 2013](#)). Note that this was not a study of helicopter (or other air transport vehicle) crashes but rather a study looking at deaths of patients who had been transported by air ambulance. Cases were identified via a variety of flags but ultimately 40 cases were included in the final review by an expert panel. Cases were stratified by the likelihood that the air ambulance transport had had an impact on the fatal patient outcome. The report has 25 recommendations. We dare say that most apply equally to the medical air transport industry in the US.

Decision-making was a major theme identified. The panel noted that for any given patient transport, decisions must be made regarding both medical and operational issues. Medical professionals need to make medical decisions and operational professionals need to make operational decisions. The Expert Panel found that there were issues with decision-making in 21 of 40 cases. In many of these cases, medical professionals were making operational decisions and vice versa.

The review determined that many avoidable delays occurred when the responsibility for different aspects of the decision-making became blurred. They note that this also involves information exchange with sending and receiving facilities, caregivers and associated land transportation providers and that often the most appropriate form of transportation is not via air ambulance. They also note that when timelines are impacted by unforeseen developments during the course of a transport, revised decisions may be needed and communicated to all parties.

They go on: “When many people become involved in the decision-making on a given case, the ability to maintain situational awareness may become compromised. For instance, when multiple call takers and flight planners take part in coordinating a flight, incomplete or inaccurate information hand-offs and lack of awareness of “the big picture” may result in incorrect decision-making. While such scenarios were noted to be a concern in only a relatively small number of cases included in the Review, the importance of this cannot be overstated.”

“Finally, a common misperception exists that air ambulance transport is the fastest, and therefore the most effective and efficient form of transport. This, however, is not always the case and needs to be considered in full when making decisions surrounding air versus land transport. The Expert Panel identified that appropriateness of transport was an issue in 15 of the 40 cases reviewed.”

A specific recommendation on decision making: “Decision-making around mode of transport (air versus land) for inter-facility transfers should be coordinated between the Transport Medicine Physician, operations staff, and, where possible, the sending and receiving physician(s). This should include a consideration of the various options available, including the expected transfer times via each route.”

Another recommendation: “If, in the course of a transport, it appears that an unanticipated delay will occur (due to weather or mechanical issues), the Transport Medicine Physician should be consulted so that a decision can be made whether or not to proceed with air versus land transport. Whenever possible, decision-making in such situations should involve input from the sending and receiving physicians.”

Another recommendation is that at the communications center all reasonable efforts should be made to minimize hand-offs of a given call between call-takers and other staff, and to ensure that all staff maintain situational awareness of calls in progress, assets available, and other critical operational information. In several cases decision-making was hampered by a lack of complete awareness on the part of the call-taker about both the call details and the options available for response. The problem was compounded when multiple calls were in progress simultaneously, and when multiple persons within the Communication Centre were managing the call.

Other recommendations had to do with response processes, scene (of accident) responses, and special considerations such as remote locales, international transports,

communication, aircraft/equipment, staffing, paramedic training/education/certification, and investigation/quality assurance.

With the exception of some trauma hospitals, most hospitals we've seen in the US (whether sending or receiving hospitals) don't do quality assurance reviews on their air transport cases. Both hospitals need to be aware of the previous track record of such transports to and from specific locations. Without that it is difficult to render the most appropriate patient care. For example, if a remote hospital is transporting a patient to a tertiary center for percutaneous coronary angioplasty for an MI and the statistics suggest that such patients seldom arrive within the standard window for PTCA, the remote hospital should consider giving thrombolytic therapy before sending the patient. The real question you should always be asking is "**What's the fastest way to get the patient/victim the medical interventions he needs?**" and then assessing the risk:benefit ratio of air vs. ground transport.

Surprisingly little information is shared between sending and receiving hospitals. Sometimes the air ambulance company may provide logs of takeoff and arrival times but seldom does the receiving hospital get back to the sending hospital regarding outcomes and full timelines (eg. time to PTCA).

Does your hospital do quality assurance and improvement activities related to air transports? Do you share it with the sending (or receiving) hospital? Do you include statistics about air transport with your new ER providers during their orientation? Do you regularly assess your transports by clinical type (eg. MI, stroke, neonatal, trauma, etc.)? How often have you reassessed your decision about mode of transport when an unexpected delay pops up?

Not included in the Canadian report was a fatal air ambulance (helicopter) crash that occurred in Ontario in May 2013. But it does have some safety implications. In that incident, 2 pilots and 2 paramedics died in a crash of a helicopter that had just taken off in northern Ontario to pick up a patient. It was a nighttime flight. In northern Ontario there are broad swaths of land having no lights, often referred to by pilots as "black holes". Such absolute darkness can be extremely disorienting for pilots. This particular helicopter apparently had neither a ground proximity warning system, also known as a terrain awareness and warning system ([Campion-Smith B May 31, 2013](#), [Campion-Smith B June 24, 2013](#)), nor night vision goggles ([Campion-Smith B July 20, 2013](#)), 2 types of equipment that have been strongly recommended for medical ambulance services in the US. In Canada the terrain proximity warning systems are required for fixed wing aircraft but not helicopters.

Though the investigation by the Transportation Safety Board of Canada won't be complete for about a year, there were likely other root causes. The Toronto Star had done multiple articles about problems with ORNGE, the air ambulance service. Such included

bringing the fleet and oversight of the aviation issues internally ([Campion-Smith B June 22, 2013](#)). Previously the aviation services had been provided by Canadian Helicopters, Ltd. which had operated Ontario's medical helicopters since 1977 without fatalities. Many felt that ORNGE did not have the internal expertise to oversee the fleet. They had also centralized command operations in southern Ontario, removing some personnel that had been based at local bases. Apparently there had been an exodus of experienced pilots in recent months. Multiple issues had been raised regarding pilots meeting required training updates ([Campion-Smith B July 15, 2013](#)). They had even suspended night flights in some locales until training in night flights was done. In addition, specific training for flying in the "black holes" was in 2 parts, one a simulation and the other practical. It turns out that the simulation training was done on a helicopter simulator different from the helicopters typically flown by ORNGE. The pilot and first officer, while both experienced pilots, apparently were relatively new to their current assignments and some have felt that violated the rule not to pair "green-on-green", i.e. 2 inexperienced pilots should not be assigned together.

Reports in the media don't mention the nature of the medical condition necessitating the helicopter transport. However, it should be noted that towns are few and far between in this rather remote area of northern Ontario so it is usually much easier to justify air transport there than in southern Ontario, which is much more urban.

Our previous columns have many of the questions that should be being asked when considering air vs. ground transport for transfers. We think you'll find them of interest from both a clinical and system perspective:

July 8, 2008	"Medical Helicopter Crashes"
October 2008	"More Medical Helicopter Crashes"
February 3, 2009	"NTSB Medical Helicopter Crash Reports: Missing the Big Picture"
September 1, 2009	"The Real Root Causes of Medical Helicopter Crashes"
November 2010	"FAA Safety Guidelines for Medical Helicopters Short-Sighted"
March 2012	"Helicopter Transport and Stroke"
April 16, 2013	"Distracted While Texting"

References:

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http://www.mcscs.jus.gov.on.ca/english/DeathInvestigations/office_coroner/Publications_andReports/OrngeReview/Ornge_Air_Review.html

Provincial air ambulance deaths lead to 25 recommendations
Tuesday, July 16, 2013 by: SooToday.com Staff
<http://www.sootoday.com/content/news/details.asp?c=59393>

Pilot questions need hard answers in ORNGE copter crash: Editorial
thestar.com June 25, 2013
http://www.thestar.com/opinion/editorials/2013/06/25/pilot_questions_need_hard_answers_in_ornge_copter_crash_editorial.html

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http://www.thestar.com/news/canada/2013/07/15/ornge_inspection_revealed_pilot_training_woes_at_ornge.html

Campion-Smith B. ORNGE considers night-vision goggles for its aircraft. Two nighttime crashes prompt a second look at goggles that help pilots see their surroundings and avoid disorientation in deep darkness. thestar.com July 20, 2013

http://www.thestar.com/news/canada/2013/07/20/ornge_considers_nightvision_goggles_f_or_its_aircraft.html

Crash prompts ORNGE to consider night vision goggles.

EMS Flight Crew blog

<http://emsflightcrew.com/blogs/crash-prompts-orng-e-consider-night-vision-goggles>



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