

Patient Safety Tip of the Week

April 16, 2013

Distracted While Texting

Long-time readers of our column remember that we often use aviation analogies to illustrate patient safety issues and also that we have often been critical of the medical helicopter industry. Today's column allows us to do both based on a recent NTSB investigation report on a 2011 medical helicopter accident ([NTSB April 9, 2013](#)).

The 2011 accident involved the crash of a medical helicopter that was transporting a patient from a rural community hospital to a larger hospital. Four people (the patient, a nurse, a flight medic, and the pilot) were killed in the crash. After the initial takeoff of the helicopter from its home base the pilot recognized the helicopter did not have enough fuel. After picking up the patient at the community hospital, the pilot decided to continue flying and attempt to land at an alternate site to refuel. The crash occurred about one mile short of that site when the helicopter ran out of fuel and the pilot failed to make the emergency maneuvers that would have allowed the helicopter to glide to a safe landing. The investigation revealed that the pilot had not done the pre-flight evaluation that is routinely performed before such flights, which would likely have identified the fuel shortage before takeoff. The NTSB Board identified as a root cause likely distraction of the pilot due to frequent text messaging throughout his shift and even in-flight. They felt that such very likely contributed to the failure to perform the pre-flight checklist and perhaps also to the failure to perform the emergency maneuvers when the fuel ran out.

The texts sent and received were apparently of a personal nature, unrelated to the pilot's responsibilities with the helicopter transport company. NTSB notes that these occurred during a period in which the helicopter was being repaired for return to service, during flight, and even during a phone call to his flight communications specialist while he was making a decision about whether to continue the flight. Though they found no evidence of texting at the time of engine failure, they wondered whether the distractions related to the issues involved in the texting might have interfered with his ability to react quickly to the rapidly evolving events.

NTSB also considered it likely that fatigue may have played a role since this occurred near the end of his shift and his sleep the prior night may have been restricted.

They note that the pilot missed three opportunities to detect the condition: 1) before departing on the first leg of the mission as a result of his inadequate preflight inspection, 2) before takeoff by failing to properly complete the before-takeoff confirmation checklist, and 3) after takeoff when he erroneously reported the fuel level. They also felt that self-induced pressure likely caused the pilot to fixate on his intended refueling point and continue the flight rather than make a precautionary landing as the fuel gauge indication approached zero.

NTSB also found inadequate training on how to recover from the sort of malfunction that occurs on fuel exhaustion (i.e. how to successfully perform an “autorotation”).

But, just as we see in medical incidents with adverse consequences, **a series of events came together** to contribute to this unfortunate accident (see the multiple documents included in the [NTSB docket](#) for this accident).

The pilot on the previous shift did sign out to the pilot involved in the accident. He informed the incoming pilot that the helicopter needed servicing and would be in need of refueling after servicing. There apparently was a **second helicopter** that would be used in the event an emergency transport call came in prior to that servicing being completed. The servicing, however, was completed on the first helicopter (which was the one involved in the actual crash). The helicopter mechanic completed the maintenance logbook entries required to return the helicopter to service but the pilot did not initial the “conform your aircraft” entries as required before flight. The **pilot also did not sign the Daily Flight Log/load manifest** for after the helicopter was put back into service. The requirement is that the pilot record the preflight/airworthiness check by signing the appropriate section of the Daily Flight Log. The pilot and medical crew transferred the medical gear from standby helicopter back to the actual flight helicopter once it was back in service.

Shortly after takeoff on the first leg of the transport mission the pilot reported to his communications team that he had 2 hours worth of fuel, even though he apparently had never completed the pre-flight checklist. After arrival at the sending hospital he told his communications team that about halfway through the flight he realized he did not have as much fuel as he had reported (the standby helicopter may have had about 2 hours worth of fuel but the fuel level in this helicopter had not been checked). Various options about whether and how to proceed were discussed but the ultimate decision is up to the pilot. After several attempts to locate an airport that had the Jet-A fuel needed for the helicopter, an airport was located about 58 miles away. The pilot indicated he would go to that airport and refuel. When asked whether he would go there first and return to pick up the patient, he indicated he would take the patient and refuel with the patient onboard.

Handoffs may also have played a role. The first conversations about the fuel status occurred with one communications specialist who was going off shift. He did convey the information to the oncoming communications specialist, who handled all further communications. The first communications specialist also went to speak to his supervisor face-to-face to inform him about the situation.

Assumptions also played a role. All the communications people interviewed noted that refueling during a mission was very rare and that refueling with a patient onboard likely even rarer. The supervisor, upon hearing about the possible fuel shortage, noted who would need to be contacted about the situation. Since communications personnel do not make clinical decisions, any question about whether the patient should be onboard for refueling (or could wait for refueling first) would be up to clinical people. However, he noted that the medical director was “on the flight” (?meaning he was in contact with the helicopter personnel) and did not feel he had to call that medical director. He assumed the medical director would address those issues.

As usual, the **authority gradient** issue also reared its ugly head. Just as in medical incidents with adverse outcomes, someone usually knows that something is wrong but is afraid to speak up or question the authority of others. All the communications specialists and supervisors felt something unusual was happening but all noted that flight decisions are up to the pilot. Interestingly, a good policy at the air transport company was that any flight crew member could cancel any flight any time they felt uncomfortable. And they indicated they had spoken up in cases where, for example, weather conditions were a factor. However, it was apparent in interview with other flight crews that seldom were the other members of the flight crew (nurse or medic) aware of flight operational issues like fuel supply. And staff at the sending hospital said the crew did not mention anything about fuel status. Guidance and advice on the fuel issue could have been available through the company’s Operational Control Center but they were never consulted. Staff noted that the pilot would usually contact the OCC directly or ask the communications specialist to patch him through if the pilot felt assistance was needed.

You’ll recall our “big three” we see in almost every RCA we do on an adverse event with patient harm: communications issues, failure to buck the authority gradient, and **failure to heed alarms**. We’ve discussed the first two. There likely was also a factor related to alarms. The helicopter did have a low fuel alert light. However, the status of the lighting on the low fuel alert was not known. It was speculated that it may have been on “night mode” which may have rendered it difficult to see during daylight.

Time and monetary pressures are always concerns. Such were not discussed much in the documents. However, apparently this air transport company is the not primary one for that rural hospital but the other one was not available at that time. The helicopter transport industry is very competitive and lucrative (see articles at the end of today’s column) so it is conceivable the pilot may have wanted to demonstrate timely performance. Also, not much was said about day of the week. These events occurred around 5PM on a Friday. We always kidded at our hospitals that typically “all hell broke loose” around 3:30 PM on every Friday. There are lots of staffing issues and availability of services in hospitals and other industries that change for the weekend, often leading to decisions that might be different on another day of the week.

Another good policy at the company was a **Just Culture** approach. Just about everyone interviewed felt that if the pilot had turned around or delayed to refuel, the company

would not have disciplined him but rather would have done an “atta boy”. But that does not mean the pilot may not have put pressures on himself. He might have felt embarrassed that he had left with an inadequate fuel supply. He might have felt he would be denigrated in the minds of others if the flight was delayed even though the Just Culture approach existed. But some of the time pressures may also have been personal. Some of the texts exchanged were about a dinner date to follow the flight.

So can you picture an analogous situation with similar factors contributing to an incident in your hospital? Picture a surgeon who has an emergency case to do on Friday afternoon. He’s busy texting family or friends about their weekend plans that may now have to be altered. The nursing and surgical staff and anesthesiologists are scrambling to see who will start the case (and will they all stay on the case through completion or will they have to switch teams in mid-operation?). A surgical tech mentions to the physician that she thinks they are missing a certain piece of equipment or a specific implant. The surgeon, distracted by his texting or cell phone calls, angrily says “just get me ready to operate”. No pre-op huddle is done. A perfunctory “timeout” is done that verifies the patient, the procedure, and the site are correct but discusses little else about the case. An hour into the procedure the nurse and scrub tech are replaced by new staff. Fifteen minutes later the surgeon asks for that piece of equipment or implant that the first surgical tech was concerned about. They don’t have it. The surgeon decides to proceed anyway and improvises a solution rather than wait for that item to be obtained from a nearby hospital. The patient suffers a complication as a result of the above events and has an unsatisfactory outcome or even death.

Of course, we are simply picking on a surgeon in the above case. The distracted individual in a real case could be an anesthesiologist. Or an ER physician at the end of a shift. Or a PCP in the office. Or any one of a number of providers in various healthcare settings.

The point is that distractions, especially when added to a variety of other latent or active factors, may be paramount in accidents and incidents.

NTSB also pointed out that, although this may have been the first aviation accident where distraction due to electronic devices was an important factor, multiple other transportation accidents have involved texting or other forms of electronic device distractions ([NTSB 2012](#)). They do also note a prior aviation incident in which pilots overflew their destination by over 100 miles because they were distracted while doing things on their laptop computers. They state that portable electronic devices that do not directly support the task at hand have no place in vehicles, planes, trains, and vessels. In that communication they cite the literature that shows the cognitive effects of such interactions with electronic devices, rather than the physical interactions, are responsible for the distractions.

Texting has been in the news in many motor vehicle accidents lately. A recent CDC report ([Naumann 2013](#)) shows that 68.7% of US adult drivers aged 18-64 years reported they had talked on their cell phone while driving at least once in the past 30 days and 31.2% had read or sent text or e-mail messages while driving at least once in the past 30 days.

About a year ago there was a New York Times article on the potential patient safety issues related to distractions from electronic devices in hospitals ([Richtel 2011](#)). It describes things like a neurosurgeon making personal calls on a cell phone via wireless headset during an operation, and a nurse in the OR using an OR computer to check airline prices during an ongoing operation.

The New York Times article quotes an article from the journal *Perfusion* ([Smith 2011](#)) which found that 55 percent of technicians who monitor bypass machines acknowledged to researchers that they had talked on cellphones during heart surgery. Half said they had texted while in surgery. The NYT article also cites an article by anesthesiologist Dr. Peter Papadakos ([Papadakos 2011](#)). In that article he quotes an abstract presented at the 2011 annual meeting of the American Society of Anesthesiologists that nurse anesthetists and residents were distracted by something other than patient care in 54% of cases—even when they knew they were being watched! Most of what took their time were pleasure cruises on the Internet (abstract 1726).

Take a look around your healthcare setting some time and see what sort of distractions due to electronic devices are in play.

Then we have our standard complaint about the NTSB root cause analyses in such medical air crashes. Not once do we see the issue of necessity for helicopter transport addressed. Of course, their response will be that such questions are not within their jurisdiction. Technically, they are correct. However, if we do an RCA on a surgical case that had a bad outcome, one of the first questions we always ask it “was the surgery indicated?”. Our previous columns discuss the surprising lack of oversight of the medical air transport industry. Unless there is a local/regional body doing quality assurance on all such transports, no one has any idea of the appropriateness of air transport and whether alternative land ambulance transport might have been as or more appropriate.

Pertaining to the case at hand, Google Maps shows the distance between the two hospitals to be 74 miles and the estimated driving time to be 1 hour and 5 minutes, the route being almost entirely interstate highway. Even if the helicopter had successfully made the trip (62 nautical miles each way), the time elapsed would have been at least the same or longer (from original takeoff to time of crash was roughly 71 minutes and there were still about 7 more miles to go to reach the receiving hospital). Of course, there are other factors to consider which we are not aware of. For example, we don't know if there were any construction or other delays on that route on that day. We also don't know whether ground ambulance would have had adequate medical support to accompany the

patient on the trip. Though clinical details are lacking in the NTSB reports, apparently the patient was hypotensive so the need for accompanying medical personnel was present. Rural hospitals seldom have extra staff available that they can send on such road trips and many rural ambulance services lack the sort of medically trained personnel needed to accompany a critically ill patient. And we don't know where the ground ambulance would have been located. Also some ambulance services, particularly those dependent upon volunteers, don't like long distance transports that are very time consuming.

But the point we have made repeatedly in the past is that hospitals often reflexly call for helicopter transport without recognizing they may actually delay the patient reaching the ultimate destination. We've also seen families in rural areas hit with \$10,000+ bills for helicopter transport that may not be covered by insurance because of lack of medical necessity.

We've done multiple columns pointing out inappropriate use of helicopters (or other air transport) for many medical patients and the dangerous track records of helicopter safety for patients and medical personnel. In our July 8, 2008 Patient Safety Tip of the Week "[Medical Helicopter Crashes](#)" and our October 2008 What's New in the Patient Safety World "[More Medical Helicopter Crashes](#)" we discussed the "epidemic" of crashes of helicopters and other medical rescue aircraft in the recent past. We have been very critical that the regulatory agencies involved in oversight of the air medical industry have focused too much on proximate causes and ignored root causes (see our Patient Safety Tips of the Week for February 3, 2009 "[NTSB Medical Helicopter Crash Reports: Missing the Big Picture](#)" and September 1, 2009 "[The Real Root Causes of Medical Helicopter Crashes](#)" and our November 2010 What's New in the Patient Safety World column "[FAA Safety Guidelines for Medical Helicopters Short-Sighted](#)"). Proposed solutions to these crashes have always focused on proximate causes and recommendations have come out in favor of mandating night vision goggles, terrain warning systems, better weather information, changes in pilot training, etc.

All these solutions ignore some of the most important root causes and failed to ask an important question "Was an air medical evacuation really necessary here or could ground ambulance have been adequate?". Even the few root cause analyses (RCA's) we have seen following actual medical helicopter crashes have failed to ask that fundamental question "Was the helicopter transport indicated in the first place?".

We previously noted a 2006 study done by Dr. Bryan Bledsoe and his colleagues that was a meta-analysis of helicopter transport of trauma patients ([Bledsoe 2006](#)). Using several widely-used injury severity or trauma scores, they showed that almost 2/3 of trauma patients brought by helicopter to a trauma center had minor or non-life-threatening injuries and that 25% were discharged from the hospital within 24 hours. Another new study ([Delgado 2013](#)) questions the cost-effectiveness of helicopter transport (vs. ground emergency services) for trauma scene transport.

In our March 2012 What's New in the Patient Safety World column "[Helicopter Transport and Stroke](#)" we discussed some relevant issues related to timing and mode of

transport of transfers of stroke patients and MI/ACS patients, noting on how transport issues become important

In our November 2010 What's New in the Patient Safety World column "[FAA Safety Guidelines for Medical Helicopters Short-Sighted](#)" we highlighted some questions you should ask before sending your patients (and staff) off on medical helicopter transports.

So you really do need to take a hard look at the types of patient you are sending out to tertiary centers, make sure that they get the best evidence-based treatments available within a realistic timeframe, and make good decisions about mode of transport for those that do need transfer.

Our prior columns dealing with medical helicopter issues:

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"

References:

NTSB (National Transportation Safety Board). Public Meeting of April 9, 2013 (Information subject to editing). Medical Helicopter Operated by LifeNet Crash Near Midwest National Airport Mosby, Missouri, August 26, 2011 NTSB/AAR-13/02 http://www.nts.gov/news/events/2013/mosby_mo/Abstract_Mosby_MO.pdf

NTSB (National Transportation Safety Board). Docket Table of Contents. Accident Investigation CEN11FA599. Medical Helicopter Crash. Date of occurrence: August 26, 2011 near Mosby, Missouri <http://dms.nts.gov/pubdms/search/hitlist.cfm?docketID=51714&CFID=360856&CFDKEN=27891206>

NTSB. NTSB Most Wanted List. Eliminate Distraction in Transportation. Modified December 11, 2012 http://www.nts.gov/safety/mwl3_2012.html

Naumann RB, Dellinger AM. Mobile Device Use While Driving. United States and Seven European Countries 2011. MMWR 2013; 62(10): 177-182
http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6210a1.htm?s_cid=mm6210a1_w

Richtel M. As Doctors Use More Devices, Potential for Distraction Grows., New York Times, December 14, 2011
http://www.nytimes.com/2011/12/15/health/as-doctors-use-more-devices-potential-for-distraction-grows.html?pagewanted=all&_r=0

Papadakos PJ. Electronic Distraction: An Unmeasured Variable in Modern Medicine. Anesthesiology News 2011; 37:11 November 2011
http://www.anesthesiologynews.com/ViewArticle.aspx?d=Commentary&d_id=449&i=November+2011&i_id=785&a_id=19643

Smith T, Darling E, Searles B. 2010 Survey on cell phone use while performing cardiopulmonary bypass. Perfusion 2011; 26(5): 375-380
<http://prf.sagepub.com/content/26/5/375.abstract>

Papadakos PJ. Electronic Distraction: An Unmeasured Variable in Modern Medicine. Anesthesiology News 2011; 37:11 November 2011
http://www.anesthesiologynews.com/ViewArticle.aspx?d=Commentary&d_id=449&i=November+2011&i_id=785&a_id=19643

Bledsoe BE, Wesley AK, Eckstein M, Dunn TM, O'Keefe MF. Helicopter scene transport of trauma patients with nonlife-threatening injuries: a meta-analysis. Journal of Trauma-Injury Infection & Critical Care 2006; 60(6): 1257-65
<http://www.jtrauma.com/pt/re/jtrauma/abstract.00005373-200606000-00015.htm;jsessionid=LzvDYgJNbkdJpBhDDCFtr3VBPJJ6WwQ1bvdXstQHvMNQ7Lk0Mygl!447927974!181195628!8091!-1?index=1&database=ppvovft&results=1&count=10&searchid=1&nav=search>

Delgado MK, Staudenmayer KL, Wang NE, et al. Cost-Effectiveness of Helicopter Versus Ground Emergency Medical Services for Trauma Scene Transport in the United States. Ann Emerg Med 2013; xx: xx (In Press Corrected Proof) April 11, 2013
<http://www.annemergmed.com/article/S0196-0644%2813%2900203-5/abstract>



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