

Communiqué

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Let Your Safety Efforts Take Flight

What Healthcare Can Learn from the Aviation Industry

DESPITE AN UNFORTUNATE couple of years for highly-publicized aviation accidents, taking a commercial flight is still safer than it has ever been; however, the same cannot be said about avoiding death from preventable medical errors. What has the aviation industry done to prevent errors and make air travel more safe? What can healthcare workers learn from the same concepts that the aviation industry has known about for years? This article explores these questions, and more.

We have all been shocked and saddened by the commercial aviation accidents that have taken place over the last year. In 2014 alone, 962 lives were lost to seven major aviation accidents, an astronomical sum that equates to approximately two 747 jumbo jets fully loaded with passengers. While air travel still remains one of the safest ways to travel, thinking about these numbers can certainly give us pause.¹

What if this statistic were doubled or tripled? If the number of lives lost in total aviation accidents last year were equivalent to that of six jumbo jets, would we still think air travel is safe? How about 600 jumbo jet crashes? Such incidents would be unthinkable, but what if we saw deaths equivalent to over 850 jumbo jet crashes each year? Would we finally say “Enough is enough?”

While it may seem ludicrous to envision 850 jumbo jets crashing in a single year, that number reflects the

estimated number of deaths that occur in the United States each year due to preventable medical errors. Recent findings published in the *Journal of Patient Safety* estimate that “the number of premature deaths associated with preventable harm to patients was estimated at more than 400,000 per year.”² This means that death due to medical errors are the third leading cause of death in the U.S., with only heart disease and cancer ranking higher.³ This number is astounding for the year 2015, especially given that the ancient practitioners of the medical arts promised that they would “take care that [their patients] suffer no hurt or damage.”⁴

LESSONS LEARNED

We don’t yet know how many aviation deaths in 2014 were due to preventable human error; however, if the airlines are able to transport over 3 billion passengers worldwide per year with a relatively few number of fatalities, perhaps there might be a thing or two we could learn from the aviation segment about safety and error prevention.⁵

In the early 1970s, commercial airlines saw a spike in crashes that resulted in an astounding number of fatalities. It was the analysis of one of these accidents in 1978 that caused experts to recognize something had to change. The flight crew of United Airlines Flight 173 ran out of fuel while trying to troubleshoot a malfunction with the airplane’s landing

gear. They were so absorbed with solving this one issue – which would have been a relatively minor incident had the landing gear actually failed upon landing – that they didn’t realize that running out of fuel was the bigger, more pressing problem. The National Transportation Safety Board (NTSB) stated in its final report of this incident that the crash occurred due to “the failure of the captain to monitor properly the aircraft’s fuel state and to properly respond to the low fuel state and the crew member’s advisories regarding fuel state. This resulted in fuel exhaustion to all engines. His inattention resulted from preoccupation with a landing gear malfunction and preparations for a possible landing emergency.”⁶ The NTSB also found that “the failure of the other two flight crewmembers either to fully comprehend the criticality of the fuel state or to successfully communicate their concern to the captain...” was a contributing factor.⁷

United Airlines Flight 173 was the final straw for the NTSB, but it was by no means unique to aviation accidents. The NTSB realized that many commercial crashes often result from poor communication and team work, rather than some mechanical problem. The NTSB, along with a team from NASA, officially recommended that all airlines require specialized training in more effective crew leadership, situational awareness, assertiveness, and communication, among several other



key areas. The term Cockpit Resource Management (later Crew Resource Management or CRM) was used to describe this innovative training.⁸

As time would tell, the NTSB hit the nail on the head with its recommendation for universal CRM training in aviation. Several subsequent accidents were found to be a result of either a complete lack of CRM training or poor utilization of CRM principles (see accompanying graphic). By the 1980s, the Department of Defense had officially adopted this new human error prevention strategy.⁹ Many fields where there was a great risk for potentially lethal outcomes (i.e., nuclear power, firefighting, etc.) then followed suit.

HEALTHCARE LAGS BEHIND

Unfortunately, as an industry, healthcare has been far too slow in adopting and applying this scientifically-proven strategy. This is evident by the average of 400,000 healthcare deaths that occur each year due to human error. Despite the remarkable parallels in contributing factors of accidents across these various high risk, high stakes industries¹⁰ there are several reasons why CRM principles have not been adopted more quickly.¹¹ One important reason is that many of us don't even know about CRM training, what it specifically involves or how to ensure our healthcare teams are trained in its lifesaving principles. Perhaps fewer of us are aware of the available resources (especially to those of us in U.S. hospitals), which are offered at low- or no-cost.

One of the most reputable resources available is a training program called TeamSTEPPS. The name stands for Team Strategies and Tools to Enhance Performance and Patient Safety. TeamSTEPPS teaches many of the same universal principles that originated in commercial aviation and military CRM training, but with a healthcare-specific

application. The program is funded by the Agency for Healthcare and Quality (AHRQ), a division of the U.S. Department of Health and Human Services.

Here are the primary components of the TeamSTEPPS National Implementation program:

1. Master Trainer Course – This is a no-cost, two-day course with a “train-the-trainer” approach. The course “educates participants on the TeamSTEPPS Fundamentals content, provides them with resources for training others, and ensures that they gain the knowledge and training required to implement and coach the behaviors needed to achieve positive results. This course is taught by – and produces – Master Trainers.”¹² The course is taught in seven locations across the country. At the time of this writing, there are 18 scheduled session dates from the beginning of March 2015 until the end of August 2015, with more being published regularly. Since TeamSTEPPS principles are most effective when implemented across an entire system (or, at the very least, an entire department/service within a hospital), a three-person minimum is required to attend and represent an organization. There is also an initial “Readiness Assessment” that needs to take place before the leadership team attends the in-person training.
2. TeamSTEPPS Fundamentals – This is a 4- to 6-hour interactive workshop for hospital staff who have direct patient care roles. Healthcare organization leaders who received the Master Trainer Course training are qualified to teach this course.
3. TeamSTEPPS Essentials – This is an abbreviated version (roughly one to two hours long) of the Fundamentals

course, and is especially designed for non-clinical support staff. Organization leaders who received the Master Trainer Course training are qualified to teach this course.

Additionally, TeamSTEPPS has an annual national conference and ongoing web conferences, and all learning materials for the TeamSTEPPS training programs are available for free online.

At this point, you might be wondering what evidence there might be that TeamSTEPPS (or CRM-related principles) actually helps reduce human error in healthcare. To address that question, let's take a look at the evidence. Here are some key findings from scientific studies that have been cited by *AORN Journal*:

- 50% surgical count error reduction¹³
- 58% error reduction in the emergency department¹⁴
- 53% reduction in adverse outcomes in OB/GYN¹⁴
- ICU stays reduced by one full day, resulting in cost savings of \$2 million annually (2003)¹⁴

TeamSTEPPS has several more well-documented improvements that can be accessed from their Research/Evidence Base online.¹⁵

IN CONCLUSION

As healthcare workers, we understand and accept that 100% cure rates for all diseases and conditions are unrealistic. We also know and accept that death eventually happens to us all, and some of us may even be able to accept that, sometimes, our mistakes and frailties, inside or outside of healthcare can unintentionally cause harm to another. What we cannot and should not accept is the fact that, as an industry, our mistakes as healthcare professionals are causing an average of 400,000 preventable



Accident	Contributing Factor	Possible Error Preventative TeamSTEPPS (CRM) Principles
Flash Airlines 604	Multiple, including First Officer (copilot) failing to challenge the spatial disorientation experienced by his superior	<ul style="list-style-type: none"> • I'M SAFE Checklist • Mutual Support: Advocacy & Assertion • Mutual Support: Two-Challenge Rule • Mutual Support: CUS Assertion • Mutual Support: DESC Script
Korean Air Cargo 8509	Shortly after departure, captain ignored cockpit data discrepancy alarms. First Officer had correct data, but did not say anything. Engineer mentioned the issue vocally, but Captain made no response and took no corrective action. Wing struck the ground at high speed and plane exploded on impact.	<ul style="list-style-type: none"> • Cross-Monitoring • Communication: Call-Out • Communication: Check-Back • Mutual Support: CUS Assertion • Mutual Support: DESC Script
Eastern Air Lines 401	Flight crew did not notice autopilot was inadvertently disconnected while they were preoccupied with a burned out landing gear indication light. Plane gradually lost altitude, unnoticed to the crew, and crashed.	<ul style="list-style-type: none"> • Cross-Monitoring • Situational Awareness • Effective Team Leaders

deaths each year – and that we are not being proactive enough in learning and adopting proven principles that can significantly reduce that number.

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The views and opinions expressed in this article are those of the author(s) and should not be viewed as an endorsement by IAHCSMM.

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