HOUSE

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In This Issue of HOUSE

Articles

Front Cover Art –
"Golden Dreams," acrylic on canvas with gold leaf collage. Inspired by Persian calligraphy, this artwork is an ode to "Golden Dreams," a famous Persian piano piece.

Artist Megan Zare, MD, is a Pediatric Radiology fellow at Seattle Children's Hospital. She has painted for over 25 years, and has exhibited her work in group and solo exhibitions in Iran, China, and the United States. Working in watercolors and acrylics, her works are abstract/figurative modern, inspired by her Persian background encompassing Persian calligraphy and poetry. Her work has won multiple awards and top honors, and can be seen at www.meganzare.com

"A Just Culture Flies Higher Than A Blame Culture"

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Recently, a select group of UW residents, fellows, and faculty spent a Saturday morning visiting several Boeing facilities around Boeing field just south of Georgetown. Our own urology resident, Justin Ahn, whose long-time interest has been bringing aviation safety practices to medicine, arranged for this visit. He had previously collaborated with Captain Karsten Liljegren, Boeing's Chief Pilot for Safety, who was incredibly kind to host the group. Several additional Boeing employees volunteered to spend their Saturday morning facilitating this private visit and all deserve a special thank you.

The morning began with a presentation by Captain Liljegren covering, perhaps most appropriately, a bird's eye view of Boeing's safety program. Boeing defines safety as:

"The state in which the possibility of harm to persons or property is reduced to and maintained at or below an acceptable level through a continuing process of hazard identification and safety risk management."

Boeing's Flight Testing & Evaluation department is not your average group of pilots. They rigorously test fly every airplane that rolls out of the factory, not only flying within safety envelopes that aircraft should be operated within, but going well beyond these envelopes to test the extreme limitations of the aircraft systems and structures. They push the boundaries of flight conditions, and thus deal with safety and risk on a daily basis.

Aviation leadership previously came to an important conclusion, particularly with pilots. They noted that a *blame culture* penalizes an individual for an error; however, it fails at preventing future errors at a group or systems level. The fear of disciplinary action, public humiliation, or even losing one's license discouraged pilots from reporting close-calls or unintentional mistakes. Sound familiar? This lack of transparency perpetuated a cycle of near-miss and high risk conditions, unbeknownst to leadership and heads of safety. The Boeing group acknowledged these events as early warning signs that must be corrected, since they cannot afford even one major accident. Borrowing from Heinrich's pyramid theory of safety, they assume that for every 1 major accident there are approximately 30 minor accidents or incidents, 300 near misses, and 3,000 unsafe acts or conditions. Boeing had to be proactive rather than reactive, and shift their focus to the latter categories, rather than wait for the next big accident to occur.

The company found that a *just culture* was safer and allowed the systemic issues to be identified and solved before they turned into accidents. This not only allayed the pilots who made the mistakes, but it allowed others to learn best practices to prevent future errors and promoted a culture of safety.

Dr. Byron Joyner and the HQSC recognize Captain Karsten Liljegren for helping UW trainees shape a better culture of safety at UW Medicine.

Boeing has prioritized safety from the top down, something they argue is necessary to change culture. Their executive leadership understand that safety initiatives and culture change are slow and will require long-term investment of resources prior to seeing benefit. According to Captain Liljegren, it takes about 5 years to change culture. So when they decided to move from the standard punitive or blame culture toward a "just" culture of safety reporting, they needed to address the real concerns from pilots. The flight safety team experienced a 500% increase in reporting during a 5-year period of culture shifting. Here's how they did it.

They created a de-identified reporting system, but still offered an anonymous means to report. They offered 4 different methods of error reporting to make it as easy as possible: iPad app, web app (which surprisingly looks very similar to a PSN form), in person, phone call, or the tried and true - hand written card in a box. Reports go directly to Captain Liljegren and his safety team of pilots for analysis, importantly bypassing mid-level managers and supervisors. The team analyzes the events surrounding the report, sometimes contacting the reporter or other involved parties to get additional information, then compiles de-identified safety reports that are disseminated to Boeing leadership and their pilot community. Flat screen monitors all around the office display report statistics from the past month. Concise educational newsletters are published bimonthly summarizing valuable incident reports, topics of concern, and prevention tips. As the icing on the cake, Captain Liljegren wears a second hat at Boeing as a Director of Operations, which allows him to directly initiate changes in policies and procedures based on areas of concern that arise. He and his team also go out to different departments, such as maintenance and ground crews, and collaborate on mutually beneficial safety campaigns.

In recent years, as a testament to how successful their culture shift has been, it's rare now that someone reports anonymously, showing

that the pilots at Boeing trust the de-identified and protected reporting commitment. When other pilots or mid-level managers ask the safety team: "Who made that error?" The answer is: "it's irrelevant." Their ultimate goal is to move towards reporting not only for self-protection, but for the sake of other pilots, the company, and aviation. In such a complex and high-risk environment, who better to look to for concerns or suggestions than the pilots and personnel on the front line? In the eyes of the Boeing company, safety is what people do when no one is watching.

To behaviorally reinforce reporting, Captain Liljegren or a member of his safety team will respond to every reporter within 30 days or sooner, informing them of the outcome or responses taken as a result of their submission. This demonstrates a crucial part of the culture – team members need to feel valued, and closing this loop provides the reward for their action to reinforce similar future behavior. In order to tackle uncertainty about what to report, Boeing's expectation is that all concerns are reported, and the burden of filtering is on the safety team.

Boeing also worked to incentivize reporting, offering protection from punitive action by the company and Federal Aviation Administration if pilots report within 24 hours of an event. In other words, if you make an honest mistake and report it promptly, Boeing will not take punitive action against you and the regulatory agency will not take your license away. Because of this incentive, more pilots are now reporting on themselves! This is not a get out of jail free card, however. Reporters are excluded from protection if an event involves criminal activity or blatant disregard for company policies - such as a pilot flying drunk or intentionally reckless.

Pilots are not the only ones involved with safety culture. Every employee at Boeing carries a card on their lanyard which displays company safety steps. The steps on the card review when to perform a risk assessment, what questions to ask, areas to consider in analysis, and how to evaluate if controls are effective and safety is assured.

Dr. Byron Joyner and HQSC members visit Captain Karsten Liljegren at Boeing in Seattle.

Later in the morning, we had the privilege of boarding a 787 test plane and were able to see the so-called "guts" of the plane while still in pre-production testing. It was a flying laboratory with equipment and gear laid out along the entire cabin, providing space for engineers to test performance in flight. We couldn't have a visit without experiencing one of Boeing's flight simulators, mainly used by their own pilots and engineers and occasionally by airline pilots, to test new controls and configurations. The windows of the cockpit showed us a lifelike virtual representation, making the experience feel so real that it took a moment for our visual and vestibular systems to orient while we received contradictory sensory stimuli. Finally, we had another special privilege to see the famous and historic Boeing Transonic Wind Tunnel which has enabled the design and testing of many of the most important planes in history, including the B-47 bomber and the modern 737-MAX. Testing in the wind tunnel allows Boeing to save billions of dollars in design and research costs, as only airworthy designs make it to the factory floor.

What lessons can we bring back to UW Medicine? Perhaps the most important lesson is the importance of a just culture. Healthcare continues to face numerous challenges, particularly when trying to change culture. Punitive culture is still pervasive nationally in medicine and may be the one of the most significant barriers to quality and safety. Although healthcare is not the same as aviation, it can certainly borrow heavily from the lessons they've learned. We all know that surgeons adopted checklists with great success. The human body, though, is an ever-unique and dynamic test bed, and a fully controlled environment is unobtainable. The most important factor in medicine is us, humans. Although we have the ability to make errors, we also have the ability to mitigate the risk of error and improve safety.

We must learn from our colleagues within our community, to whom we also provide healthcare – and incentivize reporting practices with the backing of executive leadership. Consistent and timely closed-loop feedback with reporters, dissemination of lessons learned, specialty-specific safety advocates with protected time, increased discussion of near-miss and adverse events, and clearly outlined policies regarding de-identification and reporter protection are just some of the ways to accomplish this ambitious goal. Academic hospitals such as UW may reap the greatest benefit from such initiatives, due to the sheer volume of front line trainees that can report safety events from which to learn. Sometime in the near future, perhaps the state medical board could assure medical license protection to physicians who self-report safety concerns to their respective hospital systems.

Beyond specific processes, culture change is paramount. We will miss opportunities to drive changes in the system by pointing fingers at individuals. PSN reports should be rewarded and looked at positively, not used as threats or for personal vendettas. It's time we came together as a community, much like the aviation industry, and shift our perspective to viewing an error, not to seek an individual to blame, but to see an opportunity to explore and fix the processes, environmental factors, and policies that led the individual down the wrong path.