Perfusion Safety
Airline Safety
Are they comparable?

Craig Vocelka, CCP
Chief, Perfusion Services
Department of Surgery
University of Washington
Seattle, Washington

UW Medicine
REGIONAL HEART CENTER
Disclosure

Other than running a pump and having been a passenger on a plane, I have nothing to disclose.
Trace the wine to its source.
# Definitions

## PERFUSION

**per·fu·sion** (p r-fy zh n)  
*n.*

1. The act of perfusing.  
2. The injection of fluid into a blood vessel in order to reach an organ or tissues, usually to supply nutrients and oxygen.

## SAFETY

**safe·ty** (s f t )  
*n. pl. safe·ties*

1. The condition of being safe; freedom from danger, risk, or injury.  
2. A device designed to prevent accidents, as a lock on a firearm preventing accidental firing.
"Perfusion Safety"

Perfusion Safety About 7,737,000

Perfusion Safety Articles About 841,000 results
Recent Safety Articles

**Emergency management of heat exchanger leak on cardiopulmonary bypass with hypothermia.**
Gukop P, Tiezzi A, Mattam K, Sarsam M.
*Perfusion*. 2015 April

**Modular minimally invasive extracorporeal circulation systems; can they become the standard practice for performing cardiac surgery?**
Anastasiadis K, Antonitsis P, Argiriadou H, Deliopoulos A, Grosomanidis V, Tossios P.
*Perfusion*. 2015

**Safety and efficacy of biocompatible perfusion strategy in a contemporary series of patients undergoing coronary artery bypass grafting: a two-center study.**
Shapira OM, Korach A, Pinaud F, Dabah A, Bao Y, Corbeau J, de Brux JL, Baufreton C.
*J Cardiothorac Surg*. 2014

**Human factors analysis of a near-miss event: oxygen supply failure during cardiopulmonary bypass.**
Spiess BD, Rotruck J, McCarthy H, Suarez-Wincosci O, Kasirajan V, Wahr J, Shappell S.
*J Cardiothorac Vasc Anesth*. 2015 Feb
Real-time data acquisition and alerts may reduce reaction time and improve perfusionist performance during cardiopulmonary bypass.

Beck JR, Fung K, Lopez H 2nd, Mongero LB, Argenziano M. Perfusion. 2015 Jan

Fatal air embolism during cardiopulmonary bypass: analysis of an incident and prevention measures.

van der Zee MP, Koene BM, Mariani MA. Interact Cardiovasc Thorac Surg. 2014 Nov

Advances in Perfusion Techniques: Minimally Invasive Procedures.

Shann K, Melnitchouk S. Semin Cardiothorac Vasc Anesth. 2014 Apr
Kriewall Manufacturers’ approaches in the development of intelligent multilevel safety systems to assist perfusionists during cardiopulmonary bypass  Perfusion 2005

Mulholland The Great Britain and Ireland perspective: current perfusion safety issues, preparing for the future  Perfusion 2005

Graves Perfusion in Europe: managing risks, learning from mistakes  Perfusion 2005

Palanzo Perfusion safety: defining the problem  Perfusion 2005

Stammers An update on perfusion safety: does the type of perfusion practice affect the rate of incidents related to cardiopulmonary bypass?  Perfusion 2001

Palanzo Perfusion safety: past, present, and future  J Cardiothorac Vasc Anes 1997

Utley Techniques for avoiding neurologic injury during adult cardiac surgery  J Cardiothorac Vasc Anes 1996


Is it one
or the other
or both?

Equipment?  People?
Pilot Licensing

Student Pilot
Sport Pilot
Recreational Pilot
Private Pilot
Commercial Pilot
Airline Transport Pilot
Commercial Astronaut
Newest Pilot Safety Brochure
Fatigue in Aviation (PDF)

Complete listing of available Pilot Safety Brochures
Alcohol and Flying: A Deadly Combination (PDF)
Altitude-Induced Decompression Sickness (PDF)
Carbon Monoxide: A Deadly Menace (PDF)
Deep Vein Thrombosis & Travel (PDF)
Fatigue in Aviation (PDF)
Hearing and Noise in Aviation (PDF)
Hypoxia: The Higher You Fly...The Less Air In The Sky (PDF)
Information for Pilots Considering Laser Eye Surgery (PDF)
Medical Certification Questions and Answers (PDF)
Medications and Flying (PDF)
Medications and Flying Poster (PDF)
Physiological Training Courses for Civil Aviation Pilots (PDF)
Pilot Medical Certification Information for the Aviation Community (PDF)
Pilot Vision (PDF)
Seat Belts & Shoulder Harnesses: Smart Protection in Small Airplanes (PDF)
Smoke (PDF)
Spatial Disorientation: Visual Illusions (PDF)
Spatial Disorientation: Why You Shouldn't Fly By the Seat of Your Pants (PDF)
Sunglasses for Pilots: Beyond the Image (PDF)
FAA Equivalent

Who regulates safety in medicine?
Phil Higton
Director of Training
Terema, Ltd
U.K.

Safety lessons from aviation

Airline Safety Eras

Earliest balloon flights to end of WWII
Risk reduction
1980s
Human Factors Training

Acknowledges fallibility
Then – seeks to manage it
One Big Difference

When a pilot makes a mistake it’s likely to have a major impact on him as well as the passengers.
The SAQ was adapted from the Flight Management Attitudes Questionnaire (FMAQ) and its predecessor, the Cockpit Management Attitudes Questionnaire (CMAQ), both of which were developed to address accidents in the airline industry. The theory behind all these surveys is that improving work-area issues improves safety, according to co-researcher J. Bryan Sexton, Ph.D., an assistant professor of anesthesia and critical care medicine at Hopkins. The survey is not limited to the OR. Variations of the SAQ have been used to analyze work environments throughout the hospital, he says.
"The SAQ provides hospitals with an accurate method for rating safety in the OR because it asks frontline caregivers about the OR work environment," says lead researcher Martin Makary, M.D., M.P.H., an assistant professor in the Department of Surgery at The Johns Hopkins University School of Medicine. "Results, like those telling us that surgeons rate poorly in teamwork, help target areas for improved communication and provide a benchmark for rating strategies aimed at improving patient safety."

Makary says other questions, like ones that directly ask OR teams members if they would feel comfortable being operated on in their own hospitals, send a clear message regarding patient safety concerns in the OR.

"The bottom line is, you wouldn't want to fly with a pilot or copilot who wasn't happy with his working environment and the same applies to the OR," he says.
What have we “copied”?

Check list
PM
What haven’t we?

Work time regulation
Simulator
Recertification
Co-pilot
Reporting
Investigation
Is this safe?
Commercial Airlines

Most Common

Airbus  14 models
Boeing  23 models

Total  71 models

http://www.airliners.net/info/
Surgical Procedures

Adults
Peds
Cath lab
Patients

NO TWO ARE ALIKE!
Things to think about

Should we have specialties?
Should we have various “steps” based on complexity?
Should there be an internship?
Thank you for your attention and comments