

Blame the Pilots, Blame the Doctors: Lessons from SQ 006

SY Tan

On the fateful night of 31 October, 2000, Singapore Airlines SQ 006 taxied onto a closed disabled runway at Taiwan's Chiang Kai-shek International Airport, and crashed into the construction equipment as it took off⁽¹⁾. It was Singapore Airlines' first aviation tragedy, and it involved three pilots whose past record was unblemished. The accident claimed 83 lives.

The facts of the accident are incontrovertible. SQ 006 took an erroneous turn onto runway 05R that had been closed for repairs. Poor visibility, the absence of barriers, the unexplained presence of lights on the closed runway, and the all-clear signal from control tower were factors that misled the pilots into making the tragic turn. In its formal accounting released on 27 April, 2002, Taiwan blamed the accident squarely on the errant pilots and bad weather, and relegated airport deficiencies to a "risk" category rather than as causative or contributory factors. It recalled the three pilots to Taiwan to face further questioning and the spectre of criminal prosecution. Singapore drew quite different conclusions from these same facts. Even as it assumed full responsibility for the accident ("it was our pilots and our plane"), Singapore Airlines, as well as the Singapore Transport Ministry, refused to blame any single person or factor, preferring to call it a system error. In the name of passenger safety, it recommended learning from the cumulative mistakes, and correcting all deficiencies so that accidents of this type will never happen again⁽²⁾.

This tragedy holds lessons for the medical profession.

Just as pilots are entrusted with the serious responsibility of ensuring the safety of the flying public, doctors are expected to safeguard the well-being of their patients. And like aviation, the healthcare system is a complex one with many opportunities for mistakes. There is now widespread recognition that "medical errors" are responsible for many hospital injuries and deaths. This problem was highlighted many years ago by Lucian Leape⁽³⁾, and a

recent report⁽⁴⁾ from the U.S. Institute of Medicine entitled "*To err is human*" has brought the matter to public prominence. The report places medical errors as the cause of between 44,000 and 96,000 annual fatalities, which makes it the fourth most common cause of death.

Medical Errors: The term "medical error" denotes a preventable adverse event, which in turn is defined as an injury caused by medical management rather than the underlying condition of the patient⁽⁴⁾. The current approach to preventing medical errors is to assign individual blame rather than look at them as a systems problem. Despite the notion that healthcare professionals are not supposed to make mistakes, the truth is that we often do. Fortunately, the majority of medical errors cause no serious harm. However, studies conducted by Harvard researchers in 1991 indicate that 3.7% of hospitalised patients suffer significant iatrogenic injuries, typically from errors or negligence⁽⁵⁾. According to Leape, we make an average of 1.7 mistakes per patient per day in the intensive care unit. To be sure, almost 200 patient-care activities take place daily in the intensive care unit. Still, Leape makes the point that a 99% level of proficiency, i.e., a 1% failure rate, is too high to be tolerated in a hazardous industry like ours. At 99.9%, there would be two unsafe plane landings at O'Hare airport each day, the U.S. post-office would lose 16,000 pieces of mail, and 32,000 bank checks would be deducted from the wrong accounts every hour⁽³⁾.

Doctors respond predictably to medical errors. We deny them, we hide them, and we bury a few of them. Typically, we become defensive, and blame others for the mistake – the nurse, the hospital, even the patient. But the doctors most deserving of support are the ones who suffer in silence, fearing discovery and publicity, depressed with guilt and fallen esteem over what is perceived as failed duty.

Society, in conspiracy with the profession, has perpetuated the myth that good doctors do not make mistakes. Voltaire in 1764 compared doctors to God: "They even partake of divinity", he wrote,

University of Hawaii
School of Medicine
St Francis
Medical Center
2230 Liliha Street,
Suite 222
Honolulu, HI 96817

S Y Tan, MD, JD
Professor of Medicine
Adjunct Professor
of Law

Correspondence to:
S Y Tan
Tel: (808) 547 6497
Fax: (808) 547 6049
Email: siang@
hawaii.edu

“since to preserve and renew is almost as noble as to create”. During post-graduate residency training, all programme directors will exhort their trainees to strive for perfection. Unfortunately, this is an illusory goal, as one cannot escape making at least a few mistakes despite the best of intentions and the highest competence.

Reducing Errors: It has been estimated that during any overseas commercial flight, a human error or instrument malfunction occurs every four minutes – yet each event is promptly recognised and corrected⁽³⁾. This is the science of systems errors and failures at work. It can help the healthcare industry. Better standardisation, task design, checks and counterchecks, systems monitoring and backup, and automatic alerts will go far in reducing errors in the hospitals and clinics. There are already examples to support this approach. The death risks in anesthesia, for instance, have been dramatically reduced in the past decade because of monitoring devices such as the pulse oximeter and capnograph. Unit dosing in the hospital pharmacy is another innovation that has reduced medication errors. And electronic orders will soon do away with illegible handwriting, a key cause of dispensing errors.

But most importantly, to learn from our mistakes, we need to identify and tabulate them. This will not happen in an atmosphere of fear. The purpose of reporting must therefore be to educate, not punish; restore, not denigrate. A model that focuses on fair compensation and improvement in healthcare standards must replace our fault-based malpractice system. And the profession should encourage its senior members and its clinical teachers to share their adverse experiences with their junior colleagues. It is an effective way of saying, “We all make mistakes – let’s learn from them to benefit our patients”.

Being smart and careful may not be enough. Dr David Gaba, an anesthesiologist at Stanford, has emphasised that safety measures should focus on process rather than people. He has advanced criteria that define “High Reliability Organizations” – systems that are virtually failure-free in extremely hazardous environments. They include: 1) optimal organisational structures and procedures; 2) intensive training during operations and simulations; 3) creating and maintaining active cultures of safety; and 4) maximising learning from incidents and accidents⁽⁶⁾. Sadly, Dr Gaba laments that “while healthcare contains seeds of each of these approaches, and some of the seeds are sprouting, there remains a long way to go⁽⁷⁾”.

In “*To Err is Human*”, the U.S. Institute of Medicine has proposed nine broad recommendations to reduce medical errors, including establishing a

nationwide mandatory reporting system that provides for the collection of standardised information by state governments about adverse events that result in death or serious harm. Its mantra is for the healthcare system to shift from a culture of blame to one of patient safety⁽⁴⁾. In its follow-up report, “*Crossing the Quality Chasm: A New Health System for the 21st Century*”, the Institute called on the U.S. Congress to create a \$1 billion fund to support projects targeting safe, effective, patient-oriented, timely, efficient, and equitable patient care.

Two Examples in Singapore: Two unfortunate incidents in Singapore will serve to illustrate the relevance of reforming the system to reduce medical errors. The cases are outlined here to encourage the reader to see beyond the tragedy and finger-pointing, and to reflect on proactive measures to prevent similar future mishaps.

The first example occurred in 1994, when a 27-year-old patient with leukaemia died after the erroneous intrathecal administration of vincristine. The drug should have been given intravenously. The error was made by a junior house-officer who had only recently graduated from medical school. The coroner found the doctor criminally negligent in causing the death of the patient, and the young physician had to endure the adverse publicity and faced possible criminal prosecution⁽⁸⁾. Later, the Singapore Medical Council found that the unfortunate event occurred because of the lack of supervision of a junior doctor in training, and wisely decided that he was not guilty of gross negligence. It expressed great concern over the problem of proper supervision of doctor trainees⁽⁹⁾.

The second example was headlined in the Singapore press on 5 April, 2001⁽¹⁰⁾. A nurse was charged with causing the death of a two-day-old baby because she mistakenly gave the baby a lethal dose of the sedative promethazine, instead of the anti-convulsant phenobarbital. The nurse was apparently helping out in the short-staffed neonatal intensive care unit, whereas her usual duties were to manage the adult high-dependency unit. According to the news report, she was unfamiliar with the neonatal ICU’s setup. There was a mix of medications in the zipper bag where the drugs were kept, the drugs had similar names, and the ampoules looked alike. At the trial, she was found guilty of criminal negligence, and fined the maximum amount of \$10,000. The nurse, who received letters of support from some 30 specialists, wept in court and said: “The tragedy and the death of the baby has weighed heavily on my mind for the last two-and-a-half years. I want to tell the parents how sorry I am, and that I feel their grief⁽¹¹⁾”.

Moving From a Culture of Blame to a Culture of Safety: It's time for the healthcare profession to learn from aviation's tried and tested ways. We need to report near-misses as well as actual errors. Re-certify all doctors at periodic intervals (pilots do so every six months irrespective of experience and seniority). Seek out sources and root causes of medical accidents. Make preventing errors job one. But these measures will prove futile unless there is a mindset shift from one of blame and punishment to one of safety and understanding. In this regard, Singapore's analysis of SQ 006 is better reasoned than Taiwan's. Instead of simply blaming the pilots, it looked at errors compounded within the system, and instituted steps to prevent a similar accident from happening⁽¹²⁾. In the context of healthcare however, there is the universal myth that good doctors do not make mistakes, only bad or careless ones do. Keep blaming the healthcare professionals when something goes wrong, and we will surely go into hiding and denial. The situation will not improve simply by flogging the practitioners in the

name of zero tolerance. If the statistics from America are to be believed, extrapolating them to Singapore means the annual loss of as many as 1,000 lives through medical errors. That's equivalent to three jumbo jet crashes each and every year – on Singapore soil. **SMD**

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