Cleared for Takeoff

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I like checklists. I use them while treating patients, flying, cooking, and training. Despite the fact that I have a few thousand hours behind the controls of a variety of aircraft, I still use them every time I fly.

Why then, if I believe I am a fairly competent pilot, do I need to rely on something as pedestrian as a checklist for things that I have done countless times?

For example:

Alternator switch:	On
Oil pressure in 30 sec:	25 PSI
Clutch light:	Out
RPM:	60-70%
Mag drop at 75%:	7% max in 2 sec
Sprag clutch check from 75% RPM:	Needles split

Here's why:

On August 4, 2010 an SR22 (a very sleek, single-engine prop plane with a built-in parachute) crashed while attempting to return to a Phoenix airport. The pilot, who had just departed from Phoenix heading to North Carolina, radioed the tower that he was returning to close a door and that he did not require any assistance. Moments later, he crashed into the side of a building and was killed on impact.

On August, 2, 2010, a Phoenix-based Velocity (a five-passenger homebuilt aircraft) had just departed from Montgomery Field in San Diego when the pilot radioed that the door was open and that he was returning to the field. A few seconds later the plane crashed onto a golf course, killing three of the five family members on board. The father and daughter are in critical condition.

Next item on the checklist:

Doors: Closed and latched

Although the aviation community, at least in Phoenix where I am based, is fairly small, I did not know either of these pilots.

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I learned, however, that both were considered highly skilled, diligent, and safety-conscious.

How then, did something so ridiculous, so obvious, and so easily preventable end their lives? What did they miss, or what could they have done differently?

Checklists, as you will learn from the following excerpt from the book, *The Checklist Manifesto* by Atul Gawande, MD, were started in the U.S. Army Air Corp:

> "On October 30, 1935, at Wright Air Field in Dayton, Ohio, the U.S. Army Air Corps held a flight competition for airplane manufacturers vying to build its next-generation long-range bomber. It wasn't supposed to be much of a competition. In early evaluations, the Boeing Corporation's gleaming aluminum-alloy Model 299 had trounced the designs of Martin and Douglas. Boeing's plane could carry five times as many bombs as the Army had requested; it could fly faster than previous bombers, and almost twice as far.
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> "A Seattle newspaperman who had glimpsed the plane called it the 'Flying Fortress,' and the name stuck. The flight 'competition,' according to the military historian Phillip Meilinger, was regarded as a mere formality. The Army planned to order at least 65 of the aircraft. A small crowd of Army brass and manufacturing executives watched as the Model 299 test plane taxied onto the runway. It was sleek and impressive, with a 103-foot wingspan and four engines jutting out from the wings, rather than the usual two. The plane roared down the tarmac, lifted off smoothly and climbed sharply to 300 feet. Then it stalled, turned on one wing and crashed in a fiery explosion. Two of the five crew members died, including the pilot, Major Ployer P. Hill (thus Hill AFB, Ogden, UT).
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> "An investigation revealed that nothing mechanical had gone wrong. The crash had been due to 'pilot error,' the report said. Substantially more complex than previous aircraft, the new plane required the pilot to attend to the four engines, a retractable landing gear, new wing flaps, electric trim tabs that needed adjustment to maintain con-

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CODING Q & A

Claims Processing Manual, Chapter 20, §10.1) described by HCPCS codes with status indicators other than 'H' or 'N' are provided incident to a HCPCS codes with status indicators other than 'H' or 'N' are provided incident to a physician's service by a hospital outpatient department, the HCPCS codes for these items should not be reported because these items represent supplies."

Q4022 is a code with a Status Indicator of "B" (Codes not recognized under OPPS—Outpatient Prospective Payment System), so you do not report this code (or other splint supply Q codes) on the UB-04. ■

HEALTH LAW

trol at different airspeeds, and constant-speed propellers whose pitch had to be regulated with hydraulic controls, among other features.

"While doing all this, Hill had forgotten to release a new locking mechanism on the elevator and rudder controls. The Boeing model was deemed, as a newspaper put it, 'too much airplane for one man to fly.' The Army Air Corps declared Douglas's smaller design the winner. Boeing nearly went bankrupt. Still, the Army purchased a few aircraft from Boeing as test planes, and some insiders remained convinced that the aircraft was flyable. So a group of test pilots got together and considered what to do.

"They could have required Model 299 pilots to undergo more training. But it was hard to imagine having more experience and expertise than Major Hill, who had been the U.S. Army Air Corps' Chief of Flight Testing. Instead, they came up with an ingeniously simple approach: they created a pilot's checklist, with step-by-step checks for takeoff, flight, landing, and taxiing. Its mere existence indicated how far aeronautics had advanced.

"In the early years of flight, getting an aircraft into the air might have been nerve-racking, but it was hardly complex. Using a checklist for takeoff would no more have occurred to a pilot than to a driver backing a car out of the garage. But this new plane was too complicated to be left to the memory of any pilot, however expert.

"With the checklist in hand, the pilots went on to fly the Model 299 a total of 18 million miles without one accident. The Army ultimately ordered almost 13,000 thousand of the aircraft, which it dubbed the B-17. And, because flying the behemoth was now possible, the Army gained a decisive air advantage in the Second World War, which enabled its devastating bombing campaign across Nazi Germany."

In the 1970s, philosophers Samuel Gorovitz and Alasdair MacIntyre wrote an essay on human fallibility, titled Toward a Theory of Medical Fallibility. In it, they attempt to answer why humans fail at certain endeavors. They broke down the reasons to one of three root causes:

1. Necessary fallibility. We attempt to do something that is simply beyond our capabilities despite all the tools we possess. If we take out the things we should not even be attempting (necessary fallibility) there are two other reason why we fail in areas in which we do have the ability to be successful.
2. Ignorance. We fail because we do not yet have a complete understanding of everything we need to know to be successful.
3. Ineptitude. We have the knowledge; we simply fail to apply it correctly.

Over the last century, humans have made great strides to conquer ignorance. As a species, we know more about ourselves and our surroundings than ever before.

Where we still have challenges, though, is ineptitude. Odd as it sounds, our *lack of ignorance* may even contribute to our ineptitude. For example, in the old days (1960s), treating a patient with a heart attack simply meant putting them in the hospital, giving them oxygen, morphine for pain, and placing them on strict bed rest for two or three weeks.

Contrast today where patients I admit with an acute myocardial infarction get multiple drugs, are in the cath lab in less than 90 minutes, and are typically home the next day or, at most, the day after. There is simply so much more to know than there used to be, yet a provider cannot simply "plead ignorance" inasmuch as the information, thanks to Google, etc. is often just a few clicks or a phone call away.

When providers fail, it is often because of ineptitude; we miss the diagnosis, we cause an iatrogenic injury, we prescribe the wrong drug or dose or combination of medicines, we don't document appropriately.

With all of our training and knowledge, how is this possible? How are we forgetting to latch the proverbial door?

For all of you who have worked in a busy urgent care center, the answer is obvious: the volume and complexity of information necessary to practice safely is nearly beyond our ability to interpret, synthesize, and react to it in a timely fashion.

In short, the depth of our knowledge has become both a blessing and a burden.

In the next issue, I will discuss how we can reduce the likelihood of errors due to ineptitude. If you are like me and can't wait until next month, the answer is: The Check List. ■