SOARING Rx

BY DR. DANIEL L. JOHNSON

Medical Risk

Previous columns may be found at: http://www.tinyurl.com/drdanscolumns

"... the pilot had suffered a stroke about 10 years before the accident. Further, toxicological testing detected several medications commonly used to treat conditions that could be impairing ...."

— NTSB File No. 34058

If you have a disease or take drugs, does this increase risk – for you, your passenger, the tow pilot, people and property on the ground, your family, employees, or firm?

Yes, it does. This is worth thinking about.

As our cohort of active pilots age, we are moving through time like a pig through a python. I don't need to point out that this pig is getting steadily smaller, through the digestion of mortality and disability, and we all will eventually pass through life's cloaca, afterward honored with people saying positive things about us that we never heard in life, a short essay in the local paper, and then a lump of granite on a lawn with our name and dates carved on it.

The best goal of us docs is not to prevent death, or even senescence, but to help life be good. Honestly, we often lose sight of this while shooting medical darts at one varmint or another, and we sometimes only prolong the misery, though with kind intentions. (For decades, about half of all health-care costs are incurred in the last six months of life. Someday the Tea Party faithful may take this to its logical conclusion to save money, though whose Mom goes first may be an issue.)

One special goodness of life is using the miracle of atmospheric fluid dynamics acting on airfoils to enjoy wonderful emotions. We aren't eager to set aside this miracle.

Still and all, we should take a moment to think about conditions and circumstances that might blow things up. For example, the fatal accident referenced at the head of this essay.

This particular pilot was only 67; many soaring pilots are older than that. He'd had a stroke shortly before he turned 60, so something unusual was happening medically. The report says that his medications implied that he had several medical conditions, each of which could cause impairment. The NTSB preliminary report does *not* state that these *medications* "could be impairing," but that these medications implied he might have *conditions* that could be impairing.

In these two sentences, we have a précis of the three medical things that can increase risk of accident or premature death:

– Past injuries
– Present conditions
– Medications (pejoratively, drugs).

It's fun to use the scraps of information in the NTSB report and the obituary to guess what might have been wrong with Rick, yet my goal is not to talk about him, but to use his fatal crash as a reminder of how we must all, from time to time, judge our own medical risk.

This risk is not merely to ourselves. For example, when a neurosurgeon crashed his Bonanza out of IMC into a suburb, with impairing drugs in his body that he had kept secret from the FAA, people on the ground died, property was destroyed, and a flock of people were innocent victims of his recklessness, last of all his widow, impoverished by the lawsuits as well as bereaved.

Rick caused no such spreading tragedy. He had a wife but no children; he died alone in a field in his beautiful state-of-the-art glider. He did leave his family, colleagues, and friends, but no victims.

These two accidents illustrate the span of risk of in-flight incapacitation or death, from solo tragedy to group disaster.

Let me be clear: I am not opposed to death, even death in a glider. We will all die; we can choose what our life is like.

I am opposed to foolishness.

Judgment Is the Ability to Anticipate the Consequences of Our Actions

– The easier aspect of this is understanding the inevitable consequences, the expected outcome, of a planned action.

– The harder part of this is assessing the random or sporadic consequences – the *risk*.

I help people form judgments every day. When we docs recommend treatment, we must help the patient understand both the *expected* effects, pro and con, and also the sporadic and *unpredictable* consequences of surgery or medication. This allows the patient to form an independent judgment (though of course biased by our authoritative recommendation).

As your friends and family know, your emotions cloud your judgment. Well, yes, their emotion clouds theirs, too. Emotions are the energy that creates the drive to make decisions. "Drunk with happiness" and "blind rage" and "love is blind" are the epitaphs on monumentally bad decisions.

Letting emotions subside is the reason we sleep on big decisions. Still, I am not a big fan of taking a nap right before important in-flight decisions. (We discussed motion-induced drowsiness in August, 2015.)

Fortunately, we are rational creatures. On one hand, this means that we can make change while working at the concession stand without getting all emotional about it. On the other, it means that we are able to *recognize* emotion and accommodate to it. The clouds may be booming, and emotion wants to launch. Reason looks at the 35 kt crosswind and whispers, "Go inside and tell stories."

The problem with assessing risk is the invisibility of the future. We cannot see the bumps in the air, we can only feel them, whether in clear air or in cloud. Still, there are signs. Swirling dust and leaves, tossing trees, roiling clouds are all hints about bumps and increased risk.

The presence of risk makes exploration exciting. So we probe the boundaries. If I stick one wing into that roll cloud, what will it feel like? Yes, Buffy, curiosity did kill the cat, and a cottony, roiling cloud can (and has) broken off a wing.

Medical Risk

What about Rick's situation? "Several conditions that *could* be impairing." What does this mean?

First, it means that he knew, or had reason to know, that he had the conditions. (It's unthinkable that his doctor would prescribe any medication without explaining the condition it was intended to treat, and the medication's expected benefits.)

It does not mean that he understood the risks they carried, or sought to.

Frankly, we docs are generally not so diligent about exploring the potential risks, or even the expected adverse effects of treatment. This oversight leads to confusion or negativity at the drugstore for the patient who actually reads in the fine print every adverse symptom ever reported for the class of drug prescribed.

Risks from Medication

It's important for us patients to learn something about how a drug works, so that we know why the expected adverse

effects occur, and that not everyone experiences these. It's also important for us to realize that each drug may have unique effects in each individual. That laundry list on the pharmacy "information" sheet does not discern between adverse effects that are understood and those that were coincidental and got reported.

For example, my friend had an epileptic seizure. He was promptly put on an anticonvulsant. His job is creative writing. After a week, he said to me, "I can't write." He assessed his personal risk-benefit balance and quit the medication. He said to me the next afternoon, "I woke up this morning bubbling with ideas."

Rick's body contained four drugs, atorvastatin (for cholesterol), valsartan (for blood pressure), diphenhydramine (an OTC antihistamine used mostly for sleep), and citalopram (used for depression and anxiety). Both diphenhydramine and citalopram are cognitively impairing. (See this column, October, 2013, "Over-the-Counter Incompetence.")

All medications aimed at the brain dumb us down and increase driving-error rates, which is why the FAA prohibits their use in pilots.

Impairing drugs do **not** make us into zombies. We *feel fine!* But they slow reaction time, retard decision time, and increase error rates. They increase *risk.*

The question that will eternally remain unanswered is whether the combination of these two medications hindered him from responding quickly and properly to something, or amplified a misperception.

Accepting Drug Treatment

Fundamentally, for the patient there are three important questions to which every answer must be, "yes."

• First, is the medication *tolerable*?

If not, obviously we go to plan B. Admittedly, tolerability is related to benefit – we put up with more from a life-saving drug.

For pilots and other people operating at the fine edge of excellence, impaired cognitive performance may be intolerable due to increased risk, even without perceptible side effects.

• Second, is the medication *effective*?

If a drug is given to make us *feel* better, the answer is obvious. Some drugs are given for long-term benefit, or for risk reduction, with the benefit demonstrated for the herd, but individual benefit is unknowable. The effect of other meds has to be measured metabolically with lab testing, as for diabetes or cholesterol.

• Third, is taking the drug *worth it*?

This is not merely a financial calculation – it's the balance between effects. For example, my friend's *risk* of another seizure is expected to be reduced by the anticonvulsant he was prescribed, but with it he could not work. His doctor was annoyed by this "non-compliance" but acquiesced.

For pilots, we have to remember that *all* medications that affect the brain increase error risk, even if they make us feel better.

Risk from Disease

Obviously, some conditions are continually impairing. A broken ankle is continuously limiting. Benign positional vertigo reliably causes the world to spin with certain head movements. Such conditions make judgment easier.

But a known limitation may also let us deceive ourselves that we can easily accommodate, perhaps because we don't expect an emergency that might test these limits and our adaptation to them.

Other conditions carry a *risk* of impairment. For example, a friend had hip-joint "resurfacing" and was told by his surgeon not to fly for a month. This got him time off his airline job, but left him with hours to spend working in his hangar. After two weeks, feeling just fine, he decided that no harm could come from taking up his aerobatic plane and doing a little routine. The flight was short, and after just a couple of aerobatic maneuvers, he simply flew around near the airport for a few minutes.

After landing, he carefully extricated himself from his plane and said, "Geez, I guess I shouldn't have done that! My thigh totally cramped up and I couldn't do anything! I just had to fly around until it let up."

Rick had had a stroke. This means that some part of his brain had been damaged and no longer functioned. The fact that he was flying both gliders and airplanes implies that the damage was well compensated by recovery. But it does increase risk, particularly of another stroke or a seizure.

He was taking a cholesterol-lowering medication and was 67, so he surely had coronary heart disease that may have been unknown, and had some risk for a heart attack or sudden death.

I mention this, not to analyze his accident, but because a large majority of pilots over 50 have atherosclerotic disease, mostly undiagnosed. We are in his boat; we are a risk to ourselves.

You can give your doctor a little helpful mental calisthenics by asking for a list of the possible impairments from your condition, each med or combination, and their likelihood. Don't be surprised if you get a vague answer rather than a helpful one, partly because sometimes only vague answers are possible. (A simple written note ahead of

the visit will at least remove the surprise.)

Quite often, people have unknown and undetected conditions that increase risk.

What We Can't Know Can Harm Us

Every disease is occult until it's diagnosed, and diagnosis may not be possible. For example, about one in six people with heart disease first discover they have it by dying suddenly. Furthermore, our cardiac tests aren't very good at measuring this risk. We all know stories of people who died shortly after being pronounced healthy at a complete physical exam.

One of my more delightful patients, a multilingual college professor who was meticulous about health and lifestyle, died abruptly of a brain bleed (a subarachnoid hemorrhage) while on a long-awaited vacation with her husband just two weeks after a thorough exam.

If she had been piloting an aircraft at the time, this would have added to the big NTSB collection of medically-related crashes, but no lessons could have been drawn for "aviation safety."

Risk Isn't Measurable

We can look at the experience of vast herds of people and create statistics from their events. For example, about 10% of people who've had a "mini-stroke" ("TIA") go on to have a permanently-impairing stroke within the next six months.

So we who hold the reins of authority tell the other 90% to quit flying because of this risk (which is fairly high, as risks go).

Meanwhile, we might be able to do some things to reduce the risk, with medication or surgery.

However, every individual either does or does not have a bad outcome. If your risk of sudden death is 8% per year, you will not end the year 8% dead. Nor, after 10 years, will you be 80% dead.

Weigh the Circumstances

Part of judgment is assessing the damage from an unpredictable incapacitating event. Obviously, we can accept much less risk in the pilot of an airliner or the instrument pilot flying over a city in bad weather, and can accept more risk in the solo pilot flying over uninhabited terrain.

For example, Rick, flying solo in his own glider, with modest personal responsibilities, crashed in a field. We don't know whether his medical conditions had anything at all to do with his crash.

There was a crash in my neck of the woods a few months ago. A man in late middle age, known to have diabetes and heart disease, took off in his powered ultralight from a private grass strip, located amongst farm fields, after the Saturday-morning club breakfast there. He was observed to lose control and crash. A witness, talking to me later that day, accurately speculated, "I think he died before he crashed. His leg was torn off and it didn't bleed."

I can't think of a better circumstance than this to end one's life: swift, happy, no one else injured. I take care of far too many people who spend their days lying safely in the lift chair/recliner, driving the remote, bored and depressed, strength dissipating until standing erect is unsafe, the next stop a nursing home until debilitation in some way grants release.

Sudden death is not rare, and can happen anytime. What should we expect of someone who might have a *known* risk? The highest risks, in certain heart conditions, may be 20% per year.

What "Impairment" Could Actually Happen?

There is little said outside of aeromedical texts about what the impairments of "conditions" actually are, physiologically. Read "Fundamentals of Aerospace Medicine" for details. Google the jargon you don't understand.

There are many ways to be impaired prior to flight. *In-flight* impairment is pretty much pain, the brain, the heart, and oxygen.

Pain: severe pain, in case you don't yet know, is extremely distracting, and the problem causing it can be disabling. Gallstone pain, kidney stones, intestinal obstruction, muscle cramps, and sinus pain are examples.

Brain: Any medication that affects the brain, anxiety, hypoxia, low blood pressure, low blood sugar, sleepiness, and glee can impair thinking and judgment. Strokes and seizures are incapacitating.

Heart: Well, doh. If it's not beating properly, we may faint, and have at least poor G-tolerance. If it fibrillates or stops, the

landing is going to be a hard one.

Oxygen: Carbon monoxide from cigarettes, fires, or heaters create hypoxia by locking down hemoglobin. Altitude first slows down thinking, and as we go higher, thinking eventually stops, causing your heirs to collect.

What about the Club Safety Officer?

Years ago, an 85 year old man with metastatic cancer showed up at his rural club. He was obviously weak and miserable. "I'm going to take one last flight," he said. "Then I'm done."

He took a high tow, did a couple of loops, flew around in circles as he descended, landed safely, then sat and kibitzed and watched operations. A few days later he died at home.

Was there risk in letting him fly? Yes. What if he passed out in the loop, lost control, and crashed, destroying the elderly club 1-26? What if in the crash, he struck the clubhouse and killed the club safety officer? But the club is located in a rural setting. Collateral damage was unlikely.

Seriously, it's a dilemma for clubs. It's unimaginable that the officers might have liability for assessing the medical risk of club pilots, yet they often feel responsibility as individuals for the pilots, passengers, the equipment, the folks on the ground, and the club's reputation. This does create some anxiety.

The FAA labors to make fair decisions on medical risks during certification. Traditionally, they have erred in caution; ironically, now that medical issues affect most of our aging pilot population, intense political pressures are altering this stance.

Club officers have neither statutory nor regulatory authority. Often, their only tool is moral suasion. Their burden is not helped when a self-centered macho member gets angry and insulting when the club tries to make the risk assessment a joint decision.

My own philosophy is to be permissive and to trust others' judgment. This is hard when someone is all bent out of shape, and sometimes, I think, the inclination to be accommodating is transformed to opposition simply in reaction to a hard-nosed attitude.

Our Personal Responsibility

Ultimately, we have to ask ourselves, "Would I ride with this pilot?"

This means, if I'm taking medications or have a "condition," am I endangering my passenger, student, or instructor simply by being at the controls? The question is, "Am I asking this person to take an unknown risk?"

How many of us are willing (and able!) to correctly inform a passenger of the real risk, so they can make their own decision? "Before we take off, I should tell you that I have coronary disease, diabetes, and an old stroke, and am taking seven medications for cholesterol, blood pressure, fluid retention, and chronic foot pain. My estimated risk of sudden in-flight incapacitation is 4% per year."

I am confident that there are pilots in just this sort of condition who are not giving students, passengers, and friends this chance to bail while still standing on the ramp.

The decision whether to fly isn't easy even for the expert. One of my very favorite people had to take a year away from the airline in his mid-forties after a small stroke. He's been a friend, companion, and a great instructor. He's been my patient for almost 30 years. A few years ago, he and I and his wife sat looking at an x-ray of the arteries in and near his brain, raggedy-looking and worrisome. We talked about the possibilities and how to reduce risk.

If I fly with him, as his student, friend, or pilot, what is the worst thing that can happen? Not death. A seizure. An epileptic seizure is a real but unusual possibility. A person sitting in front of the controls who has a seizure first goes rigid, for what seems like an eternity, then after some seconds begins powerful, rhythmic jerking.

Will I then have any ability to control the aircraft? I think about this every time he and I get in an airplane together, and each time, I consciously decide that I am willing to die for this friendship before we take off. We don't fly very often because most of the time my life circumstances don't permit that risk.

His wife's response to the x-ray was decisive and instantaneous: No more PIC, sell the airplane when you can. The only glitch with this, is that in requiring he fly with another pilot, she requires that he put someone else at risk. I would be more comfortable requiring that he fly solo, only over lake, forest, and field.

Despite my concerns, he's trudging along, feeling fine except for guilt about his smoking addiction, without an "event" for more than thirty years. And despite everything, he's much less likely to go suddenly than to drift sadly into senescence.

What is your condition? What is your risk? Think about the consequences before you decide.