The Checklist—Part 2

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(Dr. Shufeldt began a three-part discussion of the importance of procedural checklists in the September issue of JUCM. *That column is available at www.jucm.com.)*

I went to Mardi Gras two years ago. One of the events I attended was called the MOMs Ball. *MOMs* is an acronym for Mystic Orphans and Misfits; it's a party by invite only, and only those with costumes and ticket are admitted.

I was struggling to think of a costume suitable for such a wild event. For example, one guy arrived wearing only a bagel. I will leave it to your imagination how he wore the bagel. Let's just say, a danish would not have worked.

Anyway, since the party was not long after Capt. Chesley "Sully" Sullenberger (aka the Hero on the Hudson) landed an airliner safely in the Hudson River, and since I already had part of the pilot's costume, I decided to go as Sully.

Unfortunately, the blue pilot's blazer at the costume store was not made for someone my size and the pilot's hat did not fit my apparently "walking candy apple-sized cranium." The getup did, however, fit my attorney friend Bill, who was thrilled to wear a hero's costume and receive the subsequent welcome. Regrettably, I was forced to dress as the less-than heroic flight attendant who opened the rear passenger door and flooded the cabin. So, while Bill was getting kissed by a multitude of intoxicated but grateful topless woman, I was fighting off drunken male partygoers bent on groping me so much so that I felt like Jodie Foster in the *Accused*, but I digress.

Unlike my friend "Capt. Bill," Sully did not believe he was a hero. Amid the hoopla surrounding him in the days following the water landing, Sullenberger said, "I want to correct the record right now. This was a crew effort." The outcome had as much to do with his skill as with teamwork, and with their adherence to procedures and checklists.

Climbing through 3,000 feet with copilot Jeff Skiles flying the plane, U.S. Airways Flight 1549 crossed through a gaggle of geese, knocking out both engines.

The two aviators' training kicked in immediately. Sullenberger said, "My airplane" and took control. Skiles (who, by the way, also had nearly 20,000 hours of flight time) went right for the checklist. First, he tried to relight both engines, then one engine. Investigators later commented that it was very remarkable that he was able to actually go through these procedures.

He also was working to ensure he went through the most crucial procedures on the ditching checklist. As Skiles methodically went through the checklists, Sullenberger lined up with the Hudson and communicated with air traffic control (ATC):

15:26:54	**SULLENBERGER:**	Flaps up.
15:27:07	**SULLENBERGER:**	After-takeoff checklist complete.
15:27:10.4	**SULLENBERGER:**	Birds.
15:27:11	**SKILES:**	Whoa.
15:27:	**CAM**	[sound of thump/thud(s) followed by shuddering sound]
15:27:12	**SKILES:**	Oh [expletive deleted].
15:27:13	**SULLENBERGER:**	Oh yeah.
15:27:13	**CAM**	[sound similar to decrease in engine noise/frequency begins]
15:27:14	**SKILES:**	Uh-oh.
15:27:15	**SULLENBERGER:**	We got one rol- both of 'em rolling back.
15:27:18.5	**SULLENBERGER:**	Ignition, start.
15:27:21.3	**SULLENBERGER:**	I'm starting the APU.
15:27:23.2	**SULLENBERGER:**	My aircraft.
15:27:24	**SKILES:**	Your aircraft.
15:27:25	**CAM**	[sound similar to electrical noise from engine igniters begins]
15:27:26.5	**COMPUTER:**	Priority left. [Auto callout from the computer; this occurs when the sidestick priority button is activated on the captain's sidestick.]
15:27:28	**CAM**	[sound similar to electrical noise from engine igniters ends]
15:27:28	**SULLENBERGER:**	Get the QRH... [Quick Reference Handbook "checklist"] loss of thrust on both

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	engines.
15:27:28	**COMPUTER:** [sound of single chime begins and repeats at approximately 5.7 second intervals until]
15:27:32.9	**SULLENBERGER:** Mayday mayday, mayday. Uh this is uh Cactus 15-39 hit birds, we've lost thrust (in/on) both engines we're turning back towards LaGuardia.
15:27:42	**DEPARTURE:** OK, uh, you need to return to La-Guardia? Turn left heading of uh 2-2-0.
15:27:46	**SULLENBERGER:** 2-2-0.
15:27:50	**SKILES:** If fuel remaining, engine mode selector, ignition. Ignition.
15:27:54	**SULLENBERGER:** Ignition.
15:27:55	**SKILES:** Thrust levers confirm idle.
15:27:58	**SULLENBERGER:** Idle.
15:28:02	**SKILES:** Airspeed optimum relight 300 knots. We don't have that.
15:28:05	**SULLENBERGER:** We don't.
15:28:05	**DEPARTURE** Cactus 15-29, if we can get it for you do you want to try to land runway 1-3?
15:28:05	**SKILES:** If 3-19...
15:28:10.6	**SULLENBERGER:** We're unable. We may end up in the Hudson.
15:28:14	**SKILES:** Emergency electrical power...emergency generator not online.
15:28:19	**SULLENBERGER:** (It's/is) online.
15:28:21	**SKILES:** ATC notify. Squawk 77 hundred.
15:28:25	**SULLENBERGER:** Yeah. The left one's coming back up a little bit.
15:28:30	**SKILES:** Distress message, transmit. We did.
15:28:31	**DEPARTURE** Arright Cactus 15-49 its gonna be left traffic for runway 3-1.
15:28:36	**DEPARTURE** OK, what do you need to land?
15:28:37	**SKILES:** (He wants us) to come in and land on 1-3...for whatever.
15:28:45	**SKILES:** FAC [Flight Augmentation Computer] one off, then on.
15:28:46	**DEPARTURE** Cactus 15-(29) runway four's available if you wanna make left traffic to runway four.
15:28:49.9	**SULLENBERGER:** I'm not sure we can make any runway. Uh what's over to our right anything in New Jersey maybe Teterboro?
15:28:55	**DEPARTURE** OK yeah, off your right side is Teter-boro Airport.
15:29:00	**SKILES:** No relight after 30 seconds, engine mas-ter one and two confirm...
15:29:02	**DEPARTURE** You wanna try and go to Teter-boro?
15:29:03	**SULLENBERGER:** Yes.
15:29:05	**SKILES:** ...off.

15:29:07	**SULLENBERGER:** Off.
15:29:10	**SKILES:** Wait 30 seconds.
15:29:11	**SULLENBERGER:** This is the captain brace for im-pact.
15:29:14.9	**COMPUTER:** 1,000 [feet above the ground].
15:29:16	**SKILES:** Engine master two, back on.
15:29:18	**SULLENBERGER:** Back on.
15:29:19	**SKILES:** On.
15:29:21	**DEPARTURE** Cactus 15-29, turn right 2-8-0, you can land runway one at Teterboro.
15:29:21	**SKILES:** Is that all the power you got? (Wanna) number one? Or we got power on number one.
15:29:25	**SULLENBERGER:** We can't do it.
15:29:26	**SULLENBERGER:** Go ahead, try number 1.
15:29:27	**DEPARTURE** OK which runway would you like at Teterboro?
15:29:28	**SULLENBERGER:** We're gonna be in the Hudson.
15:29:33	**DEPARTURE** I'm sorry say again Cactus?
15:29:36	**SKILES:** I put it back on.
15:29:37	**SULLENBERGER:** OK put it back on...put it back on.
15:29:37	**COMPUTER:** Too low. Terrain.
15:29:44	**SKILES:** No relight.
15:29:45.4	**SULLENBERGER:** OK let's go put the flaps out, put the flaps out.
15:29:45	**SKILES:** Flaps out?
15:29:49	**COMPUTER:** Terrain terrain. Pull up. Pull up.
15:29:51	**DEPARTURE** Cactus uh....
15:29:53	**DEPARTURE** Cactus 15-49 radar contact is lost you also got Newark airport off your 2 o'clock in about seven miles.
15:29:55	**COMPUTER:** Pull up. Pull up. Pull up. Pull up. Pull up. Pull up.
15:30:01	**SKILES:** Got flaps out.
15:30:03	**SKILES:** 250 feet in the air.
15:30:04	**COMPUTER:** Too low. Terrain.
15:30:06	**SKILES:** 170 knots.
15:30:09	**SKILES:** Got no power on either one? Try the other one.
15:30:09	**DEPARTURE:** 2-1-0, uh, 47-18. I think he said he's goin in the Hudson.
15:30:11	**SULLENBERGER:** Try the other one.
15:30:14	**DEPARTURE** Cactus 15-29, uh, you still on?
15:30:15	**COMPUTER:** [Sound of continuous repetitive chime begins and continues to end of recording.]

At this point, the plane was touching down in the water. Sul-lenberger had pitched the plane's nose up slightly for best glide speed; Skiles lowered the flaps at the last minute to provide fur-ther lift at the lower airspeed. After touchdown, Skiles contin-ued to work through the After Ditching Checklist as Sullen-

The author and "Capt. Bill" pay homage to Sully Sullenberger and the crew of U.S Air Flight 1549, Mardi Gras-style.

berger went back to check on the evacuation. You can see while reading the transcript the extreme professionalism and discipline of both Sullenberger and Skiles.

According to Atul Gawande, MD, in *The Checklist Manifesto*, all learned professions have a code of professional conduct:

- Selflessness—Placing the needs of those who depend on us above our own needs.
- Expectation of skill—We always aim for excellence in our knowledge and ability.
- Trustworthiness—We are responsible for our behavior towards those we are in charge of.
- Discipline—The expectation that professionals will follow procedures and work collaboratively and effectively with others. (This is from our aviation brethren.)

One more relevant aside: I am a frustrated rock star. Save for my lack of any musical talent (I have lost friends after singing *Happy Birthday* to them), I could be David Lee Roth.

I recently went to see Van Halen, a band which Roth once fronted. You may remember him. He was the nut-job who insisted on having a large bowl of M&Ms provided to him backstage before concerts. He had one clause in his contract which stated that no brown M&Ms were allowed in the bowl. If any brown M&Ms were found in the bowl, he had the unilateral right to cancel the show with full compensation for the band.

In fact, he canceled a show in Colorado after finding a single brown M&M.

As Roth explained in his book *Crazy from the Heat*, Van Halen was one of the first groups to play in the large-scale stadium shows. They would arrive with 10 large semi-trailer trucks full of equipment.

His contract read like the yellow pages. Deep in the contract, in Clause 126, was the "no brown M&M" sentence. Roth said if he saw one brown M&M in the bowl, he knew that other items would be missed as well.

Sure enough, in Colorado, the promoter had not read the weight requirement for the stage and the song *Jump* would have turned into *Fall* as the entire staging would have plunged through the arena floor. Even nut-job David Lee Roth used a pre-concert checklist.

Why then, if they are good enough for pilots and big-hair 80s rock bands, has the medical profession been one of the last to embrace the use of checklists? Historically, the medical profession valued autonomy which is in direct contradistinction to discipline. In medicine today, to overcome necessary fallibility (see last month's column), success now depends on a team of individuals working in concert to provide the best care for the patient.

Over the years, I have introduced a large number of checklists and standing orders. Here are some of the resultant comments from providers:

- "I did not go to medical school to be told how to practice."
- "This is cookbook medicine."
- "These are idiotic, everyone knows this already."
- "The computer told me what to do."
- "These standing orders are for morons; I already know all this."

A multitude of studies have been done in hospitals around the world, showing that the use of these "idiotic checklists" saves lives, prevents infections, alerts the team to potential etiologies for diseases, prevents wrong-side surgery, etc., etc.

Despite our natural inclination toward autonomy and independent thinking, it is clear that the disciplined use of checklists in medicine has come of age.

The final installment of this series next month will discuss how to write and implement useful checklists for an urgent care practice. ∎