Prepare for In-Flight Medical Emergencies

Thousands of times every year, attendants on U.S. airliners call on their physician passengers for help with a medical emergency—and ophthalmologists who travel by air should prepare for this possibility.

"With the frequency of at least 1 medical emergency in every 600 flights, the bottom line is: It's likely to happen to you, if you fly enough," said William J. Brady, MD, a Charlottesville, Va., emergency physician who coauthored a review of in-flight emergencies published in *The New England Journal of Medicine.*[1]

Of course, ophthalmologists are unlikely to encounter an eye care emergency at 30,000 feet—"I'm still waiting for the time I can run to the rescue for a patient with contact lens overwear, but that just doesn't happen," Preston H. Blomquist, MD, said with a laugh. But they may be called upon to handle other medical situations.

Dr. Brady, Dr. Blomquist, and other ophthalmologists who have provided medical assistance aboard airplanes stress the importance of preparing in advance to help the plane's crew cope with these medical emergencies.

Priority 1: Life Support

A 2013 study reported that cardiac arrests are very rare (0.3%) on U.S. commercial airliners, but they account for 86% of the in-flight medical emergencies that resulted in death.[2]

AED. *Dr. Gordon used the onboard automated external defibrillator to save a fellow passenger's life.*

Consequently, knowing how to use an automated external defibrillator (AED) is crucial, Dr. Brady said. "I would recommend that ophthalmologists become comfortable with the AED, which is very easy to operate and can be lifesaving when used appropriately in the early phases of cardiac arrest," he said.

Lynn K. Gordon, MD, PhD, a Los Angeles neuro-ophthalmologist, learned this 3 years ago, when she and her husband, pathologist Jonathan Braun, MD, PhD, were flying to Texas. "A man on our plane collapsed in the aisle right next to us. At first he was able to talk, but within seconds his breathing stopped and his pulse ceased," recalled Dr. Gordon, a professor of ophthalmology at the University of California, Los Angeles.

Aided by a medical resident and a medical student who also were on board, they started CPR and readied the plane's AED. "We had to use the AED to shock him multiple times. The plane made an emergency landing while we were all on the floor with him, and he survived," she said. (Find a PDF of the full account courtesy of *U Magazine* at www.eyenet.org.)

Dr. Gordon credits her quick, automatic reaction in this cardiac crisis to her certification in basic life support, which she keeps current as a condition of practicing part time at the Los Angeles VA hospital. "This experience taught me that you need to maintain your certification, so you'll be on autopilot when an emergency happens," she said. "Sure, we ophthalmologists have been through medical school, and we all know the basics. But you have to keep up your skill level, and I think everybody has an obligation to do this."

Ethical and Legal Issues

A duty to volunteer? Ophthalmic physicians have an ethical obligation to assist with medical emergencies that arise

BY LINDA ROACH, CONTRIBUTING WRITER, INTERVIEWING **PRESTON H. BLOMQUIST, MD, WILLIAM J. BRADY, MD, LYNN K. GORDON, MD, PHD, AND CHARLES M. ZACKS, MD**

in flight, said Charles M. Zacks, MD, a cornea specialist in Portland, Maine, and a past chairman of the Academy Ethics Committee.

"We've all taken an oath to help where we can," he said. Ophthalmologists shouldn't fail to respond to the call. Even if you aren't fully knowledgeable about the passenger's condition, he said, "Almost any reasonable intervention is better than nothing at all."

One does not need to be an emergency specialist to help these patients, Dr. Brady emphasized. "In my opinion, the ability of the doctor to be at the patient's side and assist simply by being there and talking to them can provide a fair amount of comfort and aid."

Protection from liability. The Aviation Medical Assistance Act of 1998 broadly protects providers of emergency care on airplanes from liability if a patient is harmed by the lack of appropriate medical equipment or by the refusal of the pilot to divert the plane. Dr. Zacks said he has had no hesitation in the past when flight attendants asked for help with a medical emergency. "If an ophthalmologist is called on to respond in an emergency, and they don't do so out of some concern for liability —that's not a well-founded fear."

The "gross negligence" exception. However, the act does not protect providers of emergency care from liability for their own "gross negligence," Dr. Brady said. For instance, a physician who has been drinking alcohol during the trip might need to think twice before volunteering to help, he said. "That is one of the situations in which a provider can get him- or herself into a certain degree of trouble."

Tools for Airborne Crises

The tool between your ears. The best resource in a medical emergency is the doctor's brain, said Dr. Brady. "That's the most important diagnostic tool that you have—in terms of looking at your patient, talking to your patient, examining your patient, and trying to come up with what you think is the problem that has to be addressed."

Know your medical kit. Commercial passenger planes in the United States are required by law to carry medical kits containing at least 1 AED, basic first-aid and resuscitation supplies, and a limited number of medications. "It's a very austere environment in terms of what you can do diagnostically and what you can do therapeutically," Dr. Brady said. (See "In-Flight Medical Kits.")

In addition to being familiar with using an AED, said Dr. Blomquist at University of Texas Southwestern Medical Center, it's helpful for traveling ophthalmologists to know in advance what they can expect the medical kit to contain—something he admits to not knowing until his first experience with an emergency on a flight to London. (In that instance, a man was feeling faint after combining blood pressure medication with alcohol.)

"It was only afterward that I found out that they had a complete medical kit on board the plane. It would have been nice to have a sphygmomanometer and a stethoscope, which the crew didn't offer to me. Now I know to ask for them," he said.

The treatment device that he and Dr. Brady would most like to see added to the medical kit is an epinephrine autoinjector to treat severe multisystem allergic reactions and anaphylaxis. Federal legislation to require this is under consideration, Dr. Brady said.

Electronic assistance. Because he has been asked to help with in-flight emergencies on several trips, Dr. Blomquist said that he has downloaded electronic versions of medical references to his smartphone. "I travel with several iPhone apps beyond just the *Wills Eye Manual.* I have several free apps, including the *Merck Manual, Epocrates, Outlines in Clinical Medicine,* the *Physician's Desk Reference,* drug interaction tables, and a nice little app from Memorial Sloan Kettering called *About Herbs,* so you can also know about the interactions with herbal medications that a patient may be on," he said. And he recently added a PDF copy of Dr. Brady's review paper[1] to this collection of smartphone references.

Ground-based assistance. Typically, a flight attendant relays information about the patient's condition to the plane's pilot, who in turn might radio for advice from a ground-based medical consultant, Dr. Brady said. The consultant also can give treatment advice to the volunteer physician, if requested.

Diversion to a nearby airport. In the most critical emergencies, the pilot may ask the volunteer physician for a recommendation about diverting the plane to the nearest airport, to allow hospital treatment. However, the final decision about diversion belongs to the pilot.

Treatment Options

Cardiac-related symptoms. More than half of the patients who require medical assistance during a flight are suffering from cardiac symptoms (8%), respiratory symptoms (12%), or syncope/presyncope (37%), Dr. Brady reported in his *NEJM* article.[1]

Aspirin or nitroglycerin pills in the medical kit might be an appropriate intervention for some patients, but they should be used cautiously, the review warned. In cases of syncope or

In-Flight Medical Kits

Assessment supplies
- Sphygmomanometer, stethoscope, gloves

Airway and breathing
- Oropharyngeal airways, bag-valve masks (3 sizes), CPR masks (3 sizes)

Intravenous access
- Intravenous administration set, 500 mL saline solution, needles, syringes

Medications
- Analgesic tablets, nonnarcotic; antihistamine tablets; antihistamine, injectable; aspirin; atropine; bronchodilator inhaler; dextrose, 50%; epinephrine, 1:1,000 solution; epinephrine, 1:10,000 solution; intravenous lidocaine; nitroglycerin tablets

SOURCE: Nable JV et al. *N Engl J Med.* 2015;373(10): 939-945, based on FAA requirements for all commercial airliners in the United States.

presyncope, laying the patient down in the aisle with feet elevated might be sufficient, but persistent hypotension might require intravenous fluids (from the medical kit).

Other emergencies. Less commonly, aircraft passengers require assistance due to seizures and postictal states (5.8%), psychiatric issues (3.5%), stroke (2%), and complications from diabetes (1.6%), Dr. Brady and coauthors wrote.

Minimal medical kits. Onboard treatment options are limited. For instance, the dextrose that is supplied in the medical kit can be used to treat hypoglycemia, but only empirically —because the kits do not contain a glucometer. And in psychiatric cases in which the passenger cannot be calmed, improvised restraints might be required to prevent physical injuries because the medical kit contains no sedatives.

A one-size-fits-many treatment: oxygen. Supplemental oxygen is available on airplanes, and it can be used empirically to ease symptoms for patients with a variety of conditions, Dr. Brady and coauthors wrote. These include cardiac-related symptoms, syncope, stroke, dyspnea, and other conditions that cause respiratory compromise. •

1 Nable JV et al. *N Engl J Med.* 2015;373(10):939-945.
2 Peterson DC et al. *N Engl J Med.* 2013;368(22):2075-2083.

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Dr. Gordon, a neuro-ophthalmologist, is the Vernon O. Underwood Family Professor of Ophthalmology at the David Geffen School of Medicine at the University of California – Los Angeles. She also serves as senior associate dean for diversity affairs, and chair of the College of Applied Anatomy. *Relevant financial disclosures: None.*
Dr. Zacks is a cornea specialist practicing in Portland, Maine, and is a former chairman of the Academy Ethics Committee. *Relevant financial disclosures: None.*
See the disclosure key, page 8.

EXTRA **MORE ONLINE.** For the full story of Dr. Gordon's experience, see this article at www.eyenet.org.

Steps for In-Flight Medical Emergencies

Dr. Brady and coauthors recommend that medical providers who respond to in-flight medical emergencies take the following steps:

- Introduce themselves and state their medical qualifications
- Ask the passenger for permission to treat, if feasible
- Request access to the medical kit or automated external defibrillator, as needed
- Use a language interpreter, if necessary, but be aware of patient privacy
- Take a patient history, perform a focused physical examination, and obtain vital signs
- Administer treatments within the scope of their qualifications, with the patient remaining seated, when possible
- Recommend diversion of the flight if the patient's medical condition is critical
- Communicate and coordinate with ground-based medical resources
- Continue to provide care until the emergency medical condition is stabilized or care is transferred to other qualified medical personnel
- Document the patient encounter

SOURCE: Nable JV et al. *N Engl J Med.* 2015;373(10):939-945.