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Cabin Crews Must Be Prepared for Wide Range of In-flight Medical Emergencies

*In life-threatening situations, crews rely on training,
radio links to physician expertise and medical kits.*

—
Mary Edington Rand

In-flight medical emergencies are rare in commercial aviation. But when they occur they are often challenging to cabin crews, who cannot count on a doctor being on board. They also raise policy issues: what medical qualifications and training should cabin crew have? How extensive should the requirements for onboard medical equipment be? How necessary are diversions for unscheduled landings? Should airlines be more assertive in trying to prevent ill passengers from flying?

The most recent in-depth studies of airborne medical emergencies suggest that, while they are hardly an everyday occurrence for cabin crews, when they do happen life can hang in the balance.

During a two-year study period (August 1986 to July 1988) of U.S. domestic flights, mandated and monitored by the U.S. Federal Aviation Administration (FAA), 2,322 medical emergencies (averaging about three per day) were documented, with 33 resulting in deaths. Of the fatalities, 48 percent were apparently related to heart disease or failure, 6 percent to accidents, 6 percent to terminal cancer, 3 percent to allergies, 3 percent to AIDS, and the remaining 33 percent to unknown causes.¹

A study published in the *Journal of the American Medical Association* (JAMA) collected data on in-flight deaths that occurred during commercial air travel from 1977 through 1984, and were reported to the International Air Transport Association (IATA). Although the figures concerned only fatalities,

and thus did not reflect all cases in which passengers needed medical attention in flight, they suggested minimum numbers of in-flight emergencies during an eight-year period.

In the IATA study, a total of 577 in-flight deaths were reported during that period, averaging 72 per year. The in-flight death rates were 0.31 per million passengers and 25.1 per million departures.²

Another JAMA study, "Frequency and Types of Medical Emergencies Among Commercial Air Travelers," reported on a one-year survey from September 1, 1986, through August 31, 1987, of emergency medical responses at the Seattle-Tacoma [Washington, U.S.] International Airport (SEA-TAC).

The total number of people evaluated by emergency personnel was 1,107. Of those, 754 (68 percent) were air travelers. One hundred ninety (25 percent) experienced their medical emergencies during flight. The frequency of in-flight medical emergencies was one per 753 inbound flights, or one per 39,600 inbound passengers.³

The *Annals of Emergency Medicine* published an article on the "Prevalence of In-flight Medical Emergencies on Commercial Airlines." A six-month survey evaluated in-flight medical emergencies among passengers arriving at Los Angeles International Airport (LAX) from October 1985 through March 1986.

Of the 8,735,000 passenger arrivals at LAX during the six-month period, 260 (0.003 percent) developed medical complaints in flight. Twenty of these 260 (8 percent) were rendered in-flight physician assistance. One hundred thirty-seven (52.6 percent) passengers required first aid or declined medical advice; 123 passengers (47.3 percent) were referred to the emergency department at LAX; 25 passengers (9.6 percent) were admitted to the hospital; and seven passengers suffered fatalities while in flight.⁴

The First Flight Attendants Were Nurses

Medical care of in-flight passengers has been a concern since the beginning of commercial aviation. Passenger flight was in its infancy in 1930, but the need to care for passengers in flight quickly became apparent. Stephen A. Stimpson, West Coast district traffic manager for Boeing Air Transport, the forerunner to United Airlines, realized at that time that as passenger flights lengthened and greater demands arose to assist customers in the cabin, an additional crew member was necessary. At this same time, Stimpson was approached for a job by Ellen Church, a registered nurse who had taken flying lessons. Stimpson believed that Church was a perfect match for the new job.⁵

Stimpson's original memo to Boeing's passenger traffic manager proposing that nurses be hired to attend to passengers' needs was rejected. He followed it with a wire to W.A. Patterson, the assistant to the president. Patterson showed the wire to his wife and was won over by her enthusiasm for the suggestion. Stimpson was given one month to hire eight stewardesses for a three-month trial period. The principal requirements were that a candidate for the position be female and be a graduate nurse. Other airlines copied Stimpson's idea, because passengers preferred flights staffed with stewardesses.

Church flew on the first flight employing stewardesses on May 15, 1930. Her medical training proved invaluable on a subsequent flight as she attended to what may have been the first in-flight passenger medical emergency. The following humorous account was published in 1961 in *Flying Mary O'Connor*.

On a day during her first week on duty, when flying from Cheyenne [,Wyoming,] to Salt Lake City [,Utah], she could not help noticing that one of her passengers was in acute distress. She questioned him several times and after making a simple examination was convinced he was suffering from appendicitis. She went up to the cockpit and asked the pilot to radio ahead for a doctor to meet the plane at Rock Springs, an unscheduled stop on the way. And here she met her first real rebuff.

"Wouldn't you know it!" The pilot addressed the sky without turning. "A guy gets a stomach ache from eating too much lunch and just because there's a stewardess aboard he raises the roof. Tell him to pipe down. We've

got mail aboard for Salt Lake City and that's where we're going. Now beat it!"

Little Ellen's chin came up. "You forget," she told the flinty young man at the controls, "that I am a registered nurse and I recognize the symptoms. The man has acute appendicitis and every second counts. Radio for help or I'll not be responsible."

That put quite another light on the matter. Reluctantly the pilot radioed and the plane put down at Rock Springs where a doctor and an ambulance were waiting. The little nurse's diagnosis was correct. The sick man was rushed to the hospital and an emergency operation was performed which undoubtedly saved his life. The red-faced pilot apologized. The world's first stewardess had shown how important the presence of trained women aboard all airplanes could be.⁶

Until World War II, most major U.S. airline companies required applicants for the position of stewardess to be graduate nurses, who had completed a three-year training course in an accredited hospital and practiced the profession successfully for one year.⁷ With the entry in 1941 of the United States into World War II, the airlines dropped the requirement of nurse's training, because nurses' medical services were urgently needed elsewhere.⁵

While it could have been argued that a registered nurse was overqualified for the position of stewardess, there was subsequently a vast reduction in the medical knowledge among cabin crew members.

Cabin Crew Must Handle Majority of Medical Emergencies

Christopher Witkowski, director of air safety and health for the Association for Flight Attendants, said that "in a majority of emergencies, a physician, nurse or a medically trained person such as a paramedic, or someone who has received rescue training, is on board."⁸ Witkowski's union represents United Airlines, USAir, Aloha Airlines, Alaska Airlines, Air Wisconsin, American Trans Air, West Air and other carriers. But at least two studies suggest that flight attendants must often rely on their own resources.

The SEA-TAC study reported that the passengers were assisted by an airline employee in 97 cases (51 percent), a passenger in 27 cases (14 percent), a physician in 25 cases (13 percent) and a nurse in 8 cases (4 percent). No assistance was noted in 49 cases (26 percent).³ It was reported in the IATA study that a physician was available to offer assistance in only 43 percent of the in-flight emergencies resulting in death.²

The corollary of those figures is that cabin crew were called upon to take whatever lifesaving measures were possible in more than half of those emergencies.

In the United States, the FAA provides general medical guidelines in U.S. Federal Aviation Regulations (FARs) Part 121.417 and Part 135.331, which require airlines to give instruction to crew members in the handling of “illness, injury, or other abnormal situations involving passengers and crew members,” with FARs Part 121 including “familiarization with the emergency medical kit.”

To help airlines develop appropriate first-aid training programs, FAA Advisory Circular No. 120-44, *Air Carrier First Aid Programs*, issued April 17, 1987, details specific illnesses, medical emergencies and procedures for assisting passengers. Some conditions listed are possible heart attack, lack of breathing, stroke, profuse bleeding, shock, injuries to extremities, skull, spine and chest injuries, seizures, drug and alcohol abuse, abdominal distress, childbirth, diabetic emergencies, airsickness, ear distress, eye injury, hyperventilation, nosebleed and anemia.

Beyond meeting FAA guidelines, airlines determine for themselves the extent of the medical knowledge to be conveyed to employees. Witkowski explained that “airlines provide a whole range of education from comprehensive medical training to a minimal understanding. Flight attendants are taught the basics of how to administer oxygen and when to seek assistance if symptoms are serious.”⁸

Most carriers teach first aid and cardiopulmonary resuscitation (CPR) in one to two days and include medical instruction in annual recurrent training.

“Continental’s flight attendants have a full day of first-aid and emergency medical training,” said Peggy Mahoney, spokesperson for Continental Airlines. “They receive the training for CPR, although they do not become certified.” Continental also has a medical center staffed by physicians in each of its hub airports for employees and passengers.⁹

Northwest Airlines’ trainees spend 12 hours during a six-week initial training course on in-flight medical emergencies including CPR, said Sally Anders, staff instructor in flight attendant training. Anders said that their students are told, “Don’t rush to diagnose.” Rather, attendants are taught to check the passenger’s airways, monitor his or her pulse, provide oxygen if necessary and give the person comfort by allowing more room and elevating his or her legs.

Northwest began using a centralized computer system in 1993 to track in-flight medical emergencies and the airline is beginning to use the data to better prepare flight attendants. Northwest’s data revealed that the five most common in-flight emergencies were fainting, respiratory problems, cardiac problems, asthma and allergic reactions.¹⁰

Susan Wallace, national health coordinator for the Association of Professional Flight Attendants, a union representing American Airlines’ flight attendants, explained, “There is a wide range of medical emergencies that flight attendants are

prepared for, including heart attacks, asthma attacks, body fluid spills and unconsciousness.”¹¹

Flight attendants for regional carriers are trained to recognize common problems involved in flight, such as passenger excitement that may lead to hyperventilation and fainting. Walter Coleman, president of the Regional Airline Association (RAA), suspects that companies that routinely take passengers to and from retirement communities or the Mayo Clinic may have more extensive medical training.¹²

Cardiac Problems Top the In-flight Emergency List

In-flight medical emergencies cover a wide spectrum. “A medical emergency could be anything from a finger cut on a piece of metal to a heart attack,” Mahoney said.⁹

Based on the IATA study, it appears that cardiac (heart-related) problems are a significant portion of in-flight emergencies. “Sudden unexpected cardiac death ... seems to be the major cause of death during air travel,” the study noted. More than half (56 percent) of the deaths reported to IATA appeared to be associated with cardiac problems. The percentage was even higher (63 percent) among deaths of passengers who had no reported health problems at the time of departure. “This observation,” the study said, “has important implications for prevention because it is known that apparently well individuals who suffer sudden cardiac death are frequently able to be resuscitated. These deaths may be reversible by using advanced cardiac life-support interventions in flight.”

Other causes of in-flight death were attributed to “prior medical problems,” carcinoma, respiratory problems, central nervous system problems, and a miscellaneous category that included medication overdoses and one apparent suicide.

Of the passengers who died, 66 percent were men and the average age was 53.8 years. Sixty-nine percent were apparently healthy before the flight, with no medical problems known in advance to cabin crews or airline authorities.²

In the SEA-TAC study, the average age of the passengers with in-flight medical emergencies was 44, and 48 percent were males.³

When the situation appears life-threatening, such as a passenger who feels chest pains radiating to his arms and back — symptoms typically associated with a heart attack — there is a sequence of responses. “The flight attendant will page the aircraft passengers for a doctor, inform the cockpit and make contact with 24-hour emergency service or nearby ground control,” explained Witkowski.⁸

Even if there is a medical doctor on the aircraft, the doctor may not be the ideal candidate to provide help. All kinds of physicians respond to these in-flight emergencies — obstetricians,

pediatricians, cardiologists, podiatrists and even pathologists. "It's been a long time since I treated a live patient," a pathologist is said to have remarked after treating a 90-year-old woman during a flight, said Joan Sullivan Garrett, R.N., founder and president of the Phoenix, Arizona, U.S.-based company MedAire and its MedLink service.

Garrett said, "Even medically trained professionals, doctors and nurses, are out of their element. There is no x-ray equipment, no backup services. A pediatrician does not usually treat heart attack victims."

Garrett also claimed that "there is a great ignorance among physicians about the effects of increased pressure above sea level and the [potential for] a passenger's condition to deteriorate."¹³

Coleman expressed concern that "[medical] doctors do not carry a license to prove they are who they say they are, so there is no way of knowing [that a passenger is a physician]."¹²

Expert Medical Advice Is Available Through Radio Links

Airlines also have methods for providing ground-based expert advice to those in flight. Northwest has had a contractual relationship with the Mayo Clinic in Rochester, Minnesota, U.S., since the 1930s. Physicians at the Mayo Clinic are linked by radio to provide medical advice during an emergency. Several airlines rely on their own medical departments to provide in-flight advice.

Another option for airlines is a company, such as MedLink, which specializes in providing medical advice to airlines.

"MedLink provides 24-hour air-to-ground link, from anywhere in the world, to physicians specializing in remote diagnosis so that they may advise anyone in flight from a lay person to a physician," explained Garrett. The company also handles emergency ground arrangements when necessary by coordinating arrangements with airports, hospitals, physicians and the passenger's family. MedLink provides subscriber airlines with a monthly report, so that the data can be used by in-flight services to train flight attendants to be more proficient and better prepared.

Garrett recalled an instance in which five cardiologists were on a flight en route to a convention when a passenger complained of breathing problems. The pilot radioed MedLink to inform them the flight would be making an unscheduled landing because of a potential heart attack. The MedLink physician spoke by radio with each of the cardiologists on board. Each doctor recounted his diagnosis, and it was decided that the flight could be continued as scheduled with no risk to the passenger.¹³

How Much Emergency Medical Equipment Is Enough?

When asked about the provisions made for handling in-flight medical emergencies, Russell B. Rayman, M.D., an aerospace medicine specialist and executive director of the Aerospace Medical Association, responded, "There are shades of opinion. The more conservative would like an entire flying hospital while others think you have to take your chances."¹⁴ The doctors and health professionals who authored the IATA study were skeptical about the "flying hospital" option. "A number of variables ... suggest that, with the notable exception of cardiac defibrillators, little benefit would result from a policy of more sophisticated on-board equipment for physicians to use. These variables include the infrequency of deaths and the wide range of [their] causes, the impracticalities of having airlines carry a variety of sophisticated equipment and unexpired medications, and the variable competency of physicians who offer their assistance in an emergency," the study said.²

Before the 1980s, the contents of the first-aid kits on aircraft had remained essentially the same as in the one used by the Wright brothers.

Today, aircraft are required to have from one to four first-aid kits of rudimentary supplies, depending on the number of aircraft passenger seats, and the kits must be evenly distributed for easy access by crew members. Because of an FAA ruling in 1986, aircraft with more than 30 passenger seats are now required also to have a medical kit with advanced diagnostic equipment and medication. The emergency medical kit is restricted for use by physicians only, unless the pilot authorizes the kit's use by a nurse, emergency medical technician or other medically trained passenger.

The mandated contents of the first-aid kit and the medical kit are outlined in Appendix A to FARs Part 121 (Table 1, page 5 and Table 2, page 6) and in FARs Part 135.177.

After several years of debate in the aviation industry, the U.S. court system forced the FAA to finally take action to require U.S. commercial aircraft to carry emergency medical care equipment in addition to one or more first-aid kit[s].

The FAA published a Notice of Proposed Rulemaking (NPRM) on March 14, 1985. The rule was designed to enhance the potential for care of medical emergencies during flight by requiring additional equipment and medicine, familiarizing crew members with the kits and requiring air carriers to report use of the kit for a period of two years after the effective date of the rule.

The FAA received approximately 140 public comments in response to the NPRM. Of 46 physicians commenting, 44 were in support of the expanded medical kit. Some physicians recommended that additional equipment such as a defibrillator be included. Opponents expressed concern that drugs in the

kit might be misused, that limits should be established for who was authorized to use the kit and that the kits should be required only on long flights. They also worried that attempts to treat a medical emergency in flight might delay a diversion to a nearby airport and further jeopardize the stricken passenger.

The FAA studied in detail the financial repercussions of requiring a medical kit. The FAA even estimated the cost of the average fuel consumption that would result from the approximately seven pounds (three kilograms) the medical kit would add to the weight of the aircraft. The FAA established a benefit/cost ratio to determine the value of the number of lives saved vs. the costs to the airlines in implementing the new rule.

Table 1
First-aid Kit Required by
FARs Part 121.309

Number of passenger seats	Number of first-aid kits
0 – 50	1
51 – 150	2
151 – 250	3
More than 250	4
Contents	Quantity
Adhesive bandage compresses, one-inch	16
Antiseptic swabs	20
Ammonia inhalants	10
Bandage compresses, four-inch	8
Triangular bandage compresses, 40-inch	5
Burn compound, 1/8-ounce or an equivalent of other burn remedy	6
Arm splint, noninflatable *	1
Leg splint, noninflatable *	1
Roller bandages, four-inch	4
Adhesive tape, one-inch standard roll	2
Bandage scissors	1

* Arm and leg splints that do not fit within a first-aid kit may be stowed in a readily accessible location that is as near as practicable to the kit.

Source: U.S. Federal Aviation Regulations

The FAA concluded that an expanded medical kit was appropriate. The final rule mandating one medical kit per aircraft during passenger flight became effective August 1, 1986. A summary of the rule, published in the *Federal Register*, reads as follows:

This amendment requires certificate holders to carry in their aircraft medical kits containing equipment for use in the diagnosis and treatment of medical emergencies that might occur during flight time. The amendment further requires each certificate holder to report such medical emergencies annually for two years after implementation of the rule and to describe how the medical kit was used, by whom, and the outcome of the medical emergency. The intended effect of this amendment is to enhance the potential for diagnosis and initial treatment of medical emergencies during flight time.¹⁵

Two-year Study Mandated by the FAA

The records kept by airlines for two years following implementation of the ruling were to reflect how the medical kit was used, by whom and the outcome of the medical emergency. After examining the results, which were published in 1991, the FAA concluded that the contents specified for the kit would remain as initially prescribed.

At the time of the monitoring period (August 1986 to July 1988), Dr. David Millett of Eastern Airlines estimated a 50 percent reduction in unscheduled landings for medical reasons in the medical kit's first year of use. He determined that the average cost of the kit was \$58, refurbishment was about \$33 per kit and that these costs were more than covered by the savings from the reduction in diversions.

In 85 percent of the 2,293 actual uses of the medical kit during the monitoring period, the provider was a physician, in 8 percent the provider was a registered nurse or emergency medical technician, and in the remaining 7 percent the provider was "unknown." The most common medical symptom was pain (280 cases), of which 205 were chest pains. The next most common symptoms were unconsciousness (241), shortness of breath (137), nausea or vomiting (154) and various myocardial (heart) conditions (97).¹

The LAX study questioned the benefit of any comprehensive medical kit on airliners because of the rarity of in-flight emergencies combined with low physician availability. The study also concluded that none of the passengers benefited from the equipment or drugs available, and that no deaths were prevented.⁴

The LAX study's conclusion, however, contrasted sharply with results of a study published in JAMA, whose authors reviewed medical kit use by United Airlines in the first year the kit was mandated by the FAA. The study reported that health-care providers indicated that the kit was useful

Table 2
Emergency Medical Kit Required by FARs Part 121.309

Contents	Quantity
Sphygmomanometer	1
Stethoscope	1
Airways, oropharyngeal (three sizes)	3
Syringes (sizes necessary to administer required drugs)	4
Needles (sizes necessary to administer required drugs)	6
50% dextrose injection, 50cc	1
Epinephrine 1:1,000, single dose ampoule or equivalent	2
Diphenhydramine HCl injection, single dose ampoule or equivalent	2
Nitroglycerin tablets	10
Basic instructions for use of the drugs in the kit	1

Source: U.S. Federal Aviation Regulations

in more than 80 percent of emergencies and was occasionally a lifesaver. The article concluded that the kit was indeed beneficial and that its effectiveness would be improved with the addition of a bronchodilator for inhalation.¹⁶

Medical Kit Raises Quality-assurance Questions

Garrett expressed concerns about the quality of the contents of the in-flight medical kit that physicians have access to with the pilot's approval. "The kit is not bad," she claimed, but the contents are "cheap, disassembled parts. Manufacturers take advantage of the airlines by putting substandard equipment in the kit. Where is the quality assurance?"

FAA regulations specify contents of the medical kit but do not make determinations about their quality. Donell Pol-lard, FAA Office of Flight Standards, said that Principal Operations Inspectors are assigned to periodically inspect airline medical kits. They give special attention to the shelf life of medicine and are expected to report if the quality of the contents is questionable.¹⁷

The FAA report published in 1991, and based on the two-year study of medical kit use, said that "there were scattered references about the poor technical quality of the most frequently employed equipment." In the report, doctors used words such as "too cheap and useless," "piece of junk," "too small," and "inoperative," to describe the sphygmomanometer and stethoscope in the emergency medical kit.¹

In-flight Diversions May or May Not Be Appropriate

Regional carriers respond to in-flight medical emergencies by landing, rather than treating the situation in the air. RAA's

Coleman explained that because regional carriers fly legs with an average of 200 miles (322 kilometers), there is usually an airport no more than 30 minutes away. A plane can be met by an ambulance at any airport.¹²

In-flight diversions, although infrequent, can be costly. There are the direct costs of additional fuel, fees when landing at an alternate airport and the possibility that the airport is not a station for the airline.

The FAA does not specify at what point in an emergency a carrier must divert for an unscheduled landing but leaves the decision to the individual airlines. Ron Welding, director of operations and standards, Air Transport Association of America, estimated that planes divert to seek professional medical attention for a passenger an average of 400 times per year in the United States.¹⁸ The IATA study found that among the 577 in-flight passenger deaths there had been 82 in-flight diversions.²

The SEA-TAC study reported that seven of the 190 in-flight medical emergencies were in aircraft that made unscheduled landings at the airport. The aircraft made in-flight diversions for the following reasons:

- Chest pain, in a 60-year-old man, that was resolved with self-administration of his nitroglycerin spray;
- Abdominal pain in a 69-year-old woman;
- A minor scalp laceration in a 67-year-old man;
- A seizure in a 19-year-old man with a known seizure disorder;
- A woman's acute asthma attack that was resolved with self-administered bronchodilatory treatment;

- Syncope (loss of consciousness) in an intoxicated 23-year-old man; and,
- Irregular heart rhythm in a 27-year-old woman.

The 60-year-old man with chest pains and the 69-year-old woman with abdominal pains were admitted to local hospitals and the remaining five were evaluated and released by local emergency physicians. The study concluded that these unscheduled landings were “probably unnecessary,” which suggested that treating an in-flight medical emergency without flight diversion is often appropriate.³

“No one wants to take responsibility to say ‘don’t land,’” said Garrett. Nevertheless, radio links with physicians on the ground and a changing assessment of the risk-reward ratio may be making diversions less common. “Carriers used to divert nine out of 10 times for a medical emergency,” said Garrett. “Now they only divert 10 percent of the time.”

Aircraft on international flights often cannot easily divert to accommodate a medical emergency, so more attention is given to providing care while in flight. Some airlines teach first aid for up to four days to flight attendants and install more advanced medical support systems on their aircraft.

Sixty to 70 percent of heart attack victims suffer ventricular fibrillation, a disorder in which the rhythmic electrical stimulus that causes the heart to beat becomes chaotic. “A defibrillator is a small device weighing eight to 12 pounds that applies shocks to the heart through electrodes placed on the chest,” said Al Weigel, director of marketing at Laerdal Medical Corp., which makes defibrillators.¹⁹ The device is able to restore the heart rhythms of up to half of the heart attack victims who suffer ventricular fibrillation.²⁰

Aboard an aircraft, the most practical equipment for emergency treatment is an automatic defibrillator — “automatic” because the device can determine whether the patient’s heart needs electric shock, and the unit’s voice prompts direct the person administering the device. Two major international carriers, Qantas Airways and Virgin Atlantic Airways, have automatic defibrillators on board.^{21,22}

Because heart attack victims cannot effectively be provided care with standard CPR procedures, the Aviation Consumer Action Project (ACAP) and others recommend that a defibrillator be a standard part of the medical kit to help prolong the life of a heart attack victim. Garrett believes that all airline flights should have a defibrillator on board.

Garrett said that reasons for opposing such a move include the cost (approximately US\$4,000 to \$8,000), the additional training required, potential for misuse and greater liability.¹³

Passenger Screening Offers Further Safeguard

Can the incidence of medical emergencies be drastically reduced by a policy of excluding ill passengers? The authors of the IATA study believe that, at least in terms of in-flight deaths, the answer is no. Eliminating passengers who had obtained medical certificates permitting them to fly, or who otherwise were known to be ill before takeoff, would have reduced the number of in-flight deaths by 20 percent at most. Such a policy would also be ethically dubious, the authors said, because “many certifiably ill passengers are traveling to seek better medical care or a desperately needed operation or procedure; others are making one last visit to their homeland, to family members, or to religious shrines.”²

Still, airlines take health precautions by visually screening passengers before they board. Staff at ticket gates are alert to passengers who have open wounds or sores who may carry highly contagious illnesses such as chicken pox or tuberculosis. These types of illnesses pose a serious health risk to other passengers and crew members. Airport staff can consult by telephone with a company physician and, if believed necessary, a passenger who appears at risk of an in-flight emergency can be prohibited from boarding an aircraft.

When requested, airlines provide guidelines to their passengers about in-flight medical risks. For example, a pregnant woman approaching her eighth month is advised against flying and to waive that caution she may need consent from an airline’s medical director. Some recently released hospital patients are also advised against flying because high altitudes and the added stresses of travel can exacerbate delicate conditions. In general, anyone who has undergone heart, lung or gastrointestinal surgery should not fly for at least three weeks; eye surgery patients should wait at least two weeks. Heart-attack patients should wait from four to six weeks before flying.²⁰

By paying more attention to passenger health, some airlines are creating a win-win situation. Passengers receive better attention in flight, and flight attendants with the help of physicians through air-to-ground links are able to discriminate between life-threatening emergencies and less serious ones, which results in fewer in-flight diversions. ♦

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