



Inflight CPR - Are You Capable?

Not on every flight can a pilot depend on having a flight attendant on board to take care of an inflight passenger medical problem. The author, therefore, encourages flight crew members, especially corporate pilots, to know CPR procedures in case of an emergency.

by

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The career corporate pilot can expect that inflight passenger medical emergencies will occur from time to time. Although airline pilots are supported by flight attendants should inflight passenger medical problems occur, corporate pilots rarely have trained cabin personnel available.

With an advance plan, expeditious lifesaving action can be delivered to a stricken passenger by one of the two corporate pilots. In the absence of such a plan, considerable confusion can be expected following the emergency, along with delays in applying the appropriate countermeasures, an unpleasant set of circumstances for all concerned.

The nature of the advance plan dealing with passenger medical emergencies will vary, depending upon the type of aircraft utilized, its seating configuration, the size of the passenger complement, the altitudes being flown, the routes utilized and the available equipment for first-aid treatment. This paper will explore various aspects of this topic.

CPR is short for "cardiopulmonary resuscitation," a lifesaving procedure that can be readily learned through classes conducted by the American Heart Association, the Red Cross or other qualified groups.

The two main conditions treated by CPR are airway obstruction and heart failure.

In regard to airway obstruction, the most common obstructive cause is a piece of food lodged against the tracheal airway near the point where the airway and the esophageal opening occur (the esophagus is the tube that transmits food and drink

from the lower throat to the stomach). Such an obstruction results in a laryngeal area spasm that makes inhalation and exhalation virtually impossible.

CPR training furnishes the rescuer with several methods of expelling the lodged food. These may involve reaching from behind the individual and, with clutched hands, pushing upward and inward against the diaphragm, suddenly forcing out some of the air that is present in the lungs. Called the Heimlich maneuver, this frequently pops the food out of the throat in a fashion similar to a cork popping out of a warmed bottle or a child's "popgun."

In the event of a severe cardiac dysrhythmia (a heart beat that is too fast, too slow, irregular or not present) caused by underlying conduction disease, coronary artery spasm, thrombotic obstruction of a coronary artery or other condition, appropriate presses against the chest wall in a rhythmic manner can result in sufficient blood circulation through the heart to save the brain, as well as the rest of the body.

The pressure against the chest wall raises the total pressure within the thorax, squeezing blood out of the heart and through the arteries because of the "one-way valve" structure in the heart. As the pressure against the chest is released, the chest cavity pressure decreases, drawing blood into the chest so that the blood flows out of the chest following the next manual compression.

Another aspect of CPR is that, in addition to providing manual chest pressure, exhaled air from the CPR provider (which includes some unused oxygen) is delivered into the stricken

individual's mouth and lungs so that the circulating blood can become sufficiently oxygenated to maintain brain life. The breaths must be interspersed with the compressions, a timing skill learned during CPR training.

As a general statement, the victim's brain may begin dying within four minutes of circulatory failure. This underscores the need for an advance plan so that the appropriate steps can be initiated relatively rapidly.

Practicing the Techniques of CPR

All corporate pilots should receive CPR training as a baseline skill. The CPR delivery skills should be developed using a mannequin that provides objective recordings of the quality of chest compression delivery. In addition, the quality of the delivered breaths should be recorded by the mannequin.

After the crew members have received the basic skills, practice with the mannequin should be in the specific aircraft flown. Sometimes there is insufficient room in small aircraft to move the stricken passenger to a floor area. The floor area itself may be insufficient for CPR, and, therefore, it will be necessary to deliver CPR to the victim in the seat of the aircraft.

The method of delivering CPR has been worked out for various types of seats and arrangements. However, because of the wide variety of aircraft seats, seat sizes, aisle widths and cabin configurations, it will be necessary for each corporate crew to develop the best method for its aircraft. Local chapters of the American Heart Association or other groups often will be willing for CPR instructors to go to a hangar and conduct a practice session in an airplane (see Figures 1 and 2, page 3).

Although inflight CPR emergencies are relatively rare — perhaps as often as an inflight engine fire — when the emergency does occur, prior thought is necessary for expeditious and appropriate handling. For example, it may take two minutes for the various passengers in the cabin to recognize that a true emergency exists. It may take another minute to notify the pilot and get one of the two cockpit crew members to the passenger cabin. This leaves one minute for appropriate CPR delivery before the high probability of brain death begins to occur.

There may be times, such as a CPR emergency during extremely adverse weather on an approach, when both crew members have to remain in the cockpit. Only after touchdown would one go back to deliver CPR, while the other continues taxiing to the terminal. At other times, one pilot at the controls may have to declare an emergency and ask for expeditious handling, while the other pilot deals with the victim. On still other occasions, over-ocean flights, for example, one pilot may have to deliver sustained CPR to the victim. The potential circumstances and alternatives should be outlined ahead of various flights.

One advantage of corporate flying as compared to airline flying is that there normally are fewer passengers in corporate flying, and the cockpit crew is much closer to the passenger. However, a disadvantage in corporate flying is that usually there are no flight attendants to aid in the CPR. Of course, single-pilot corporate operations require a totally different approach to leaving the cockpit in most circumstances. In these cases, a landing at an airport where aid can be obtained is essential. It would be advantageous if corporate passengers had CPR training as well.

Table 1 (see page 3) describes the various types of inflight emergencies that are seen daily on airlines. It should be emphasized that, owing to the large number of passengers carried by the airlines and the wide range of medical conditions characterizing the passenger population, the types of conditions listed may not often be experienced in corporate flying passengers. However, the listing does describe conditions that could be encountered. A first-aid kit should be carried on all corporate aircraft and, at minimum, contain the items required on U.S. airline aircraft. Additional items may be desirable, depending upon the nature of the corporate operation.

It would be a valuable aid to corporate pilots if passengers would volunteer information about various types of illnesses. These could include diabetes mellitus requiring insulin, heart disease requiring certain medications, epilepsy and other conditions.

Emergency medicine in the United States and other parts of the world has continually progressed by a very significant degree over the past years. The development of methods of delivering CPR on-site when an emergency occurs also has progressed markedly. In order that a passenger in a corporate aircraft may have this type of attention, the corporate flight crew must have basic training in this area. The development of an advance plan by each corporation and its pilots in regard to inflight passenger medical emergencies that may occur constitutes a major contribution to passenger trip safety. ♦

About the Author

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Mohler, who is an air Transport Pilot and certified flight instructor, spent five years as director of the U.S. Federal Aviation Administration's Civil Aviation Medicine Research Institute, and an additional 13 years as FAA's Chief of Aeromedical Applications Division.

He has written books on pilot medications, as well as one about aviator Wiley Post. He is a frequent contributor to Flight Safety Foundation's publications and other aviation publications.



Inflight CPR For 3-seat configuration

Figure 1. Cardiopulmonary Resuscitation (CPR) *in situ*, three seats are abreast. Note that the head of the victim is toward the aisle.



Inflight CPR For 2-seat configuration

Figure 2. Cardiopulmonary Resuscitation (CPR) *in situ*, two seats are abreast. Note that the head of the victim is toward the window.

Examples of Inflight Medical Emergencies Seen Daily on Airlines

Table 1

- | | |
|---|---|
| <p>1. Obstructed Airway
Mechanical Obstruction (Foreign Object, Food)
Acute Obstructive Lung Disease (Asthma)</p> | <p>6. Pain
Burn
Barotitis and Barosinusitis
Abdominal Pain</p> |
| <p>2. Cardiac Dysfunction
Myocardial Ischemia or Infarctions
Dysrhythmia
Cardiac Arrest</p> | <p>7. Miscellaneous
Alcoholic Intoxication
Drug Overdose
Childbirth
Miscarriage
Motion Sickness
Insulin Shock
Diabetic Coma
Psychiatric Problem
Epilepsy
Stroke
Vomiting
Anaphylactic Shock
Food Poisoning
Acute Infectious Illness</p> |
| <p>3. Trauma
Fracture
Eye Injury
Head Injury</p> | |
| <p>4. Hemorrhage
Puncture Wound
Deep Laceration
Nose Bleed</p> | |
| <p>5. Hypoxia
Decompression
Chronic Obstructive Lung Disease</p> | |

European Corporate Aviation Safety Seminar

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“Safe Aircraft Operation In A Congested Air Traffic System”

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