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Author: Jack Blaylock at OSTNOVM

Date: 5/21/97 2:47 PM

Priority: Normal

TO: Steve Palmer

TO: Peter Halpin

TO: Cresence Massei

BCC: Jack Blaylock

Subject: 5/21 House Aviation Hearing on Medical Kits

----- Message Contents -----

The following issues were of particular concern to subcommittee members:

- liability concerns of doctors and flight attendants who might be called on to use defibrillators on stricken passengers;

- "Good Samaritan" laws;

- are flight attendants prepared to take on the added responsibilities of enhanced medicine and medical-emergency equipment on-board carriers;

- the risk of defibrillators being used improperly;

- the need for standardized medical kits and medical emergency training.

There was discussion about the training program instituted by American Airlines for its flight attendants. Congressman Blunt (R-MO) asked FAA witness Jon L. Jordan, M.D., if the FAA was doing anything to make medical kits better. Blunt made the comment that American Airlines is ahead of the FAA on the medical kits issue.



Committee on Transportation and Infrastructure

Congress of the United States

**House of Representatives
Washington, DC 20515**

**Bud Shuster
Chairman**

**James L. Oberstar
Ranking Democratic Member**

May 19, 1997

AGENDA

SUBCOMMITTEE ON AVIATION

hearing on

Medical Kits on Commercial Airlines

on

Wednesday, May 21, 1997

9:30 a.m.

2167 Rayburn House Office Building

Witnesses Include:

MEMBERS FORUM

Representative Barbara Kennelly (D-CT)

PANEL I

**Ms. Carolyn McDowell
Montclair, New Jersey**

**Ms. Lynn Talit
West Hartford, Connecticut**

**Ms. Denise C. Hedges
President
Association of Professional Flight Attendants**

Ms. Mary Kay Hanke
International Vice President
Association of Flight Attendants, AFL-CIO

Ms. Joan Sullivan Garrett
President
MedAire, Inc.

James M. Atkins, M.D.
American College of Cardiology

PANEL II

Jon L. Jordan, M.D.
Federal Air Surgeon
Federal Aviation Administration

Russell B. Rayman, M.D.
Executive Director
Aerospace Medical Association

Mr. Edward A. Merlis
Senior Vice President
Government Affairs
Air Transport Association of America

Eric Donaldson, M.D.
General Manager Aviation Health Services
Qantas Airlines

David K. McKenas, M.D., M.P.H.
Director, Corporate Medical Department
American Airlines



Committee on Transportation and Infrastructure

Congress of the United States

House of Representatives
Washington, DC 20515

Bud Shuster
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Ranking Democratic Member

May 16, 1997

MEMORANDUM

TO: Members, Aviation Subcommittee

FROM: John J. Duncan, Jr., Subcommittee Chairman

SUBJECT: SUMMARY OF SUBJECT MATTER: Hearing on Medical Kits aboard Commercial Aircraft. Hearing scheduled for Wednesday, May 21, 1997, 2167 Rayburn House Office Building, 9:30 a.m.

PURPOSE OF HEARING

The purpose of this hearing is to examine the extent of medical emergencies occurring in flight as well as a review of current Federal Aviation Administration (FAA) regulatory standards related to the contents of medical kits aboard commercial airlines, the training of personnel, and other related matters.

BACKGROUND

Brief History

In the late 1920s, when commercial air passenger service began, Boeing Air Transport (BAT), one of the four predecessors of United Airlines, required flight attendants to be qualified registered nurses in order to help passengers with the discomforts of flying.

During the early days of commercial air travel, flights were much longer, lacked pressurization in the aircraft, had no climate control, and many apprehensive first-time passengers.

While air travel has become more comfortable in numerous ways, flight attendants today are still called upon to assist passengers with medical problems and emergencies.

The Boeing Air Transport requirement that flight attendants be qualified registered nurses changed in the 1940s when nursing skills were in demand for World War II efforts.

In 1986, the Federal Aviation Administration (FAA) first established regulations requiring air carriers to place medical kits on board their aircraft.

Prior to this, air carriers were required to have first-aid kits for treatment of injuries or medical emergencies that might occur during flight time or in minor accidents.

First Aid Kits/Medical Kits

First aid kits are required to have such items as bandages, antiseptic swabs, splints, adhesive tape, and scissors.

Equipment placed in medical kits are more comprehensive and include such items as a stethoscope, blood pressure measuring device, airways, drugs for allergic reactions, and the basic instruction for use of the drugs.

Congressional/Federal Oversight

This is the first Congressional review of medical kits on commercial air carriers in thirteen years.

The House Aviation Subcommittee held three days of hearings in the summer of 1984 (98th Congress) on various legislative proposals to improve airline safety. There were three different legislative measures introduced in the House that would have required air carriers to have onboard medical kits.

The introduction of these proposals as well as a similar bill introduced by Senator Barry Goldwater, the In-flight Medical Emergencies Act of 1985, prompted the FAA to review its policies regarding medical equipment on board commercial passenger airplanes.

Moreover, in response to a petition from the Aviation Consumer Action Project (ACAP), a Ralph Nader led group, the FAA promulgated new regulations requiring an on-board medical kit containing equipment for use in the diagnosis and treatment of medical emergencies that might occur during flight time.

These regulations (51 FR 1223 January 9, 1986) applied to carriers carrying passengers under FAA rules in Part 121 (more than 30 seats) and those operating aircraft with more than 19 passengers seats under Part 135.

Federal Aviation Regulations addressing medical kits were first amended in 1994. This amendment required the addition of disposable latex gloves to be added to medical kits.

On January 19, 1996, these regulations were further amended to require commuter scheduled operations that have passenger configurations of 10 to 30 seats to place medical kits on board their aircraft.

ISSUES

Adequacy of Medical Kits

In recent years, there has been growing debate outside and within the aviation industry as to whether or not current medical kits are adequate. Several foreign air passenger carriers have extensive medical kits, including defibrillators, on-board their overseas flights. Defibrillators are used to restore normal heart rhythm by electric shock.

American Airlines recently announced that it will place defibrillators on their over water flights beginning July 1, 1997. American Airlines will monitor the program for a suitable period before committing to expanding the program to domestic flights.

American will be the only U.S. carrier to deploy defibrillators and will be the fourth airline in the world to carry these machines. The other three carriers who carry these systems include Qantas, an Australian airline, Virgin Atlantic from England, and Air Zimbabwe from Africa.

The FAA's requirements for medical kits today are the same as they were in 1986, with one exception, the addition of latex gloves. Charts have been provided in this memorandum listing the items required in these medical kits.

Incident Data

Attention has focused on in-flight cardiac arrests and heart attacks in recent years and the ability to deal with these serious medical situations.

Recent technology improvements in Automated External Defibrillator (AED) systems, which are now portable, compact, and easy to use, have enabled air carriers to consider installing them on their aircraft in order to address cardiac situations.

Although there have been a number of short-term data collections and assumptions from various sources, there does not appear to be enough historical data on the number and types of medical emergencies in order to determine trends that would be helpful in assessing the scope and extent of in-flight emergencies.

The FAA receives reports of accidents, incidents, and diversions; however, the diversion information is only maintained for a 30-day period.

According to the FAA, at the present time, there is no way to actually monitor the incidence of in-flight medical emergencies because airlines are not required to report them. The available data for air carriers are from multiple sources, are collected and classified differently and often use different categorizations.

The FAA's Civil Aeromedical Institute issued a report in February, which noted the difficulties mentioned above, stating that the in-flight medical emergency rate appeared to have nearly doubled between 1990 and 1993, the interval covered by the study.

According to a study of 120 airlines conducted from 1977 to 1984 and published in the Journal of the American Medical Association in 1988, about 72 deaths occur aboard aircraft each year. The study states that about 63% of the deaths were due to sudden, unexpected cardiac problems, and that the most likely victims were middle-age men.

Qantas Airlines placed defibrillators on all of its 53 international route airplanes and throughout Qantas airport terminals in 1991. From September, 1991 to August 1996, the defibrillators were used on 87 occasions; 47 times for monitoring an acutely ill passenger, and 40 times for cardiac arrest; 22 episodes of cardiac arrest occurred on the airplanes. Qantas aircraft diverted on 17 occasions during this five year period.

Most airlines do not keep records of passenger deaths. However, according to American Airlines, cardiopulmonary resuscitation is a good indicator as to when a defibrillator would be necessary.

From 1991 through 1996, American Airlines indicated that CPR related incidents on board aircraft have almost tripled. In 1991, there were 12 reports of CPR being administered while in 1996 there were 33 cases reported. Moreover, the Chicago Tribune reported that American Airlines recorded some 4,800 in-flight medical emergencies over the last two years.

According to the Chicago Tribune, in 1994 and 1995 Northwest Airlines made 171 emergency medical landings, and American Airlines made 285 during the same two years.

The most common in-flight medical occurrences for American Airlines from 1991 through 1996, by percentage, are as follows:

cardiac events:	40%	bleeding:	6%
unconscious:	17%	obstetrical:	6%
seizures:	14%	asthma:	3%
unknown:	9%	turbulence:	3%
psychiatric:	7%	diabetes:	2%
gastrointestinal:	7%	infections:	1%

Estimating deaths on board air carriers

The number of onboard medical deaths varies widely among different airlines over different periods of time, with the airlines that fly the fewest passenger-miles recording the fewest deaths. When the number of passenger-miles flown is divided by number of deaths, the resulting death rates range from one death for every 1.5 billion passenger-miles flown (Alaska Airlines) to one death per 4.7 billion passenger miles (Air Canada and SAS). If this range is applied to all U.S. airlines, which collectively carried 548 million passengers and flew some 540 billion passenger miles in 1995, it is possible to estimate the annual number of onboard deaths aboard all U.S. airlines at between 114 and 360.

	British Airways 1990-95	United 1970-74	Qantas 1992-95	Air Canada 1991-94	Scandinavian Airlines 1990-94	Alaska Airlines 1994	All U.S. airlines 1995
Billions of passenger miles flown	293	134.7	102	56	52	75	540
Deaths on board	111	38	20	12	11	5	114-360*
Billions of passenger miles flown per death	2.6	3.5	4.6	4.7	4.7	15	15-47*

Sources: Airlines and FAA

* Estimate
Chicago Tribune

Flight Attendant Medical Training

Some question the current medical training of flight attendant personnel as well as the liability concerns of the airlines and their employees. There are also debates about the level of medical training flight attendants should receive or be held responsible for during flights.

Under current Federal Aviation Regulations, crewmember training programs must provide instruction in: first-aid equipment and its proper use; illness, injury, or other abnormal situations involving passengers or crewmembers, and familiarization with the emergency medical kit.

American Airlines, who will deploy defibrillators in July, train their lead Flight Attendants in both first-aid and cardiopulmonary resuscitation (CPR). These Flight Attendants are receiving a three hour course given by the airline's internal corporate medical staff.

The training by American Airlines consists of a one hour lecture, demonstration, video, and discussion, followed by two hours of hands-on training using resuscitation mannequins and training defibrillators. They will receive recurrent training on the device yearly.

In-Flight Medical Communications

Today, should a medical emergency occur onboard an aircraft, a pilot can usually contact an in-house medical emergency physician on the ground for guidance. In some cases, airlines contract-out this service to a company which provides 24-hour medical advisory and assistance service.

The emergency physician will advise onboard personnel on how to best manage the emergency. Physicians can also advise the pilot as to whether or not the flight should be diverted to a nearby hospital.

One such company, MedLink, has responded to approximately 2,600 in-flight emergency cases over a ten year period. Their data shows that neurological, cardiac and respiratory episodes are the most frequent categories of medical emergencies occurring in-flight.

Currently, the FAA is reviewing MedLink's ten year data on the frequency and types of in-flight illness and injury in order to better understand the overall situation on today's U.S. carriers.

MEDICAL KITS

In the United States, the FAA has minimal requirements mandating that all passenger carriers have on board a first aid kit and in most cases a medical kit.

The medical kit is not generally available to the flight crew. Under the direction of the captain it can only be released to a medical professional (MD, nurse, paramedic, EMT) that might be on board.

Following is a chart outlining the items required for a U.S. medical kit today and when they were first required in 1986.

FAA MEDICAL KIT REQUIREMENTS

1986 Content Requirements	1997 Content Requirements
Sphygmomanometer Stethoscope Airways (3 sizes) Syringes Needles 50% Dextrose injection Epinephrine Diphenhydramine Hcl Nitroglycerin tablets Basic instruction for use of the drugs in the kit	Sphygmomanometer Stethoscope Airways (3 sizes) Syringes Needles 50% Dextrose injection Epinephrine Diphenhydramine Hcl Nitroglycerin tablets Basic instruction for use of the drugs in the kit Protective latex gloves or equivalent

FAA FIRST-AID KIT REQUIREMENTS

Adhesive bandage compresses, 1 inch (16)
Antiseptic swabs (20)
Ammonia inhalants (10)
Bandage compresses, 4 inch (8)
Triangular bandage compresses, 40 inch (5)
Arm Splint, noninflatable (1)
Leg Splint, noninflatable (1)
Roller bandage, 4 inch (4)
Adhesive tape, 1 inch standard roll (2)
Bandage scissors (1)

LEGISLATION

Representative Barbara Kennelly (D-CT) has introduced legislation, the Airline Passenger Safety Act, that would require all U.S. airlines to carry adequate medical supplies and equipment to deal with in-flight medical emergencies.

This legislation would mandate that all U.S. carriers place automatic external defibrillators (AEDs) on board their aircraft. The bill would also require all flight crews to be trained in CPR and the use of AEDs.

The measure also carries a provision that would exempt from liability the airlines and passengers who step forward to help during an in-flight medical emergency.



FAA-REQUIRED U.S. MEDICAL KIT

Aids to respiration

- A** Breathing tubes (for mouth, nose)

Miscellaneous

- B** Blood pressure cuff
- C** Antiseptic wipes
- D** Tourniquet
- E** Stethoscope
- F** Sterile gloves

Administration of drugs and medicines

- G** Hypodermic needles
- H** Hypodermic syringes

Drugs

- I** Diphenhydramine
- J** Nitroglycerin
- K** Epinephrine
- L** Dextrose

Sources: Qantas Airways, North Safety Products
Chicago Tribune / Steve Layton

Photo special to the Tribune by Carol Cheetham (above)
Tribune photo by James F. Quinn (right)

Source: Chicago Tribune, Sunday, June 30, 1996 edition.

								
U.S. air carriers	Air Canada	British Airways	Cathay Pacific	Japan Air Lines	Lufthansa	Qantas	SAS	Virgin Atlantic
Angina pectoris (chest pains)								
• Nitroglycerin	• Nitroglycerin	• Nitroglycerin	• Isosorbide dinitrate	• Nitroglycerin	• Nitroglycerin	• Nitroglycerin	• Nitroglycerin	• Nitroglycerin
Cardiac arrest, myocardial infarction, cardiac arrhythmias and congestive heart failure								
Nothing	• atropine, • furosemide, • Inderal, • lidocaine, • sodium bicarbonate	• atropine, • digoxin, • furosemide, • lidocaine	• atropine, • digoxin, • furosemide, • lidocaine	• atropine, • dopamine, • furosemide, • lidocaine, • nifedipine, • sodium bicarbonate	• atropine, • calcium chloride, • digoxin, • furosemide, • lidocaine, • sodium bicarbonate, • verapamil	• atropine, • calcium chloride, • furosemide, • lidocaine, • sodium bicarbonate	• atropine, • digoxin, • furosemide	• atropine, • bretylium, • calcium chloride, • furosemide, • lidocaine, • sodium bicarbonate
Cardiac arrest								
Nothing	• aspirin, • codeine, • morphine	• aspirin, • buprenorphine, • nalbuphine	• aspirin, • buprenorphine, • codeine, • morphine	Nothing	• aspirin	• aspirin, • codeine, • morphine, • pentazocine	• aspirin, • buprenorphine	• aspirin, • nalbuphine
Coma								
Nothing	• diazepam, • lorazepam	• diazepam, • lorazepam	• diazepam	Nothing	• diazepam	• diazepam	• diazepam, • oxazepam	• diazepam
Convulsions								
• Diphenhydramine, • epinephrine	• Diphenhydramine, • epinephrine	• dexamethasone, • epinephrine, • promethazine	• chlorpheniramine, • dexamethasone	• chlorpheniramine, • epinephrine, • hydrocortisone	• epinephrine, • prednisone	• dexamethasone, • epinephrine, • hydrocortisone, • promethazine, • prednisone	• acrivastine, • epinephrine, • hydrocortisone	• epinephrine, • hydrocortisone, • promethazine
Diabetic coma (usually resulting from an insulin overdose)								
• dextrose	• dextrose	• glucagon, • glucose	• glucagon	• glucose	• glucose	• glucagon, • glucose	• glucose	• glucagon
Drugs, alcohol, barbiturates								
Nothing	• haloperidol	Nothing	• chlorpromazine	• hydroxyzine	Nothing	• chlorpromazine, • haloperidol	• steleazine	Nothing
Overdose								
Nothing	• naloxone	Nothing	Nothing	Nothing	Nothing	• naloxone	Nothing	• naloxone
Respiratory distress								
Nothing	• albuterol	• albuterol	• albuterol, • beclomethasone, • terbutaline	• aminophylline, • terbutaline	• terbutaline	• aminophylline, • albuterol	• aminophylline, • terbutaline	Nothing
Stomach, motion sickness, nausea, vomiting								
Nothing	• Gravol	• Buscopan, • compazine, • loperamide, • metoclopramide	• Buscopan, • Cinnarazine, • hyoscine, • loperamide, • metoclopramide	• aminophylline, • Buscopan, • terbutaline	• Buscopan, • Vomex A	• Buscopan, • loperamide, • metoclopramide, • prochlorperazine	• loperamide, • Marzine, • Serepax	• Cinnarazine
Stroke (cerebral hemorrhage)								
Nothing	Nothing	• ergometrine	• ergometrine	• ergometrine, • ritodrine	• ergometrine	• sytocinon	Nothing	Nothing

Source: Chicago Tribune, Sunday, June 30, 1996 edition.

	 U.S. air carriers	 Air Canada	 British Airways	 Cathay Pacific	 Japan Air Lines	 Lufthansa	 Qantas	 SAS	 Virgin Atlantic
Aids to respiration									
Breathing tubes for insertion into mouth and nose	YES	YES	NO	YES	YES	YES	YES	YES	YES
Respiration masks	NO	YES	YES	YES	YES	YES	YES	YES	YES
Breathing tubes for insertion into windpipe	NO	YES	NO	YES	NO	YES	YES	YES	YES
Resuscitator for manual ventilation	NO	YES	NO	YES	YES	YES	YES	YES	YES
Laryngoscope for inserting endotracheal tube	NO	NO	NO	YES	NO	YES	YES	NO	YES
Suction device for clearing mouth and throat	NO	NO	NO	YES	YES	YES	YES	YES	NO
Administration of drugs and medicines									
Intravenous fluid	NO	YES	YES	NO	YES	YES	YES	NO	YES
Intravenous tubing	NO	YES	YES	NO	YES	YES	YES	NO	YES
IV needles	NO	YES	YES	YES	YES	YES	YES	NO	YES
Hypodermic needles	YES	YES	YES	YES	YES	YES	YES	YES	YES
Hypodermic syringes	YES	YES	YES	YES	YES	YES	YES	YES	YES
Surgery and childbirth									
Scalpel	NO	NO	YES	YES	NO	YES	NO	NO	YES
Surgical needles, sutures	NO	YES	YES	YES	YES	YES	NO	NO	YES
Assorted bandages and dressings	NO	YES	YES	YES	YES	YES	YES	YES	YES
Sterile surgical scissors	NO	YES	YES	YES	YES	YES	YES	YES	YES
Urinary catheter	NO	YES	YES	YES	YES	YES	YES	YES	YES
Forceps	NO	NO	YES	YES	YES	YES	YES	NO	YES
Clamps for closing umbilical cord	NO	YES	YES	YES	NO	YES	YES	NO	NO
Other medical equipment									
Thermometer	NO	NO	YES	YES	YES	YES	YES	YES	YES
Blood pressure cuff	YES	YES	YES	YES	YES	YES	YES	YES	YES
Stethoscope	YES	YES	YES	YES	YES	YES	YES	YES	YES
Glucose test kit	NO	YES	NO	NO	YES	NO	YES	NO	NO

Source: Chicago Tribune, Sunday, June 30, 1996 edition.

WITNESS LIST

MEMBERS FORUM

Representative Barbara Kennelly (D-CT)

PANEL I

Ms. Carolyn McDowell
Montclair, New Jersey

Mrs. Lynn Talit
West Hartford, Connecticut

Ms. Denise Hedges, President
Association of Professional Flight Attendants

Mary Kaye Hanke, International Vice President
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Edward Merlis, Vice President
Air Transport Association

David McKenas, M.D., Director Corporate Medical
American Airlines

Jon L. Jordan, M.D.
Federal Air Surgeon
Federal Aviation Administration

Testimony of Representative Barbara B. Kennelly
before the Subcommittee on Aviation
May 21, 1997

Mr. Chairman, thank you for this opportunity to speak on an issue that is so important to all of us -- passenger safety during air travel. I want to say a few words about this issue, and then I would like to introduce my constituent, Mrs. Lynn Talit, who knows only too well why adequate medical supplies and equipment must be carried on board our commercial airlines.

As a frequent traveler on our commercial airlines, I know how important safe air travel is. Yet every year, passengers on U.S. airlines die in the air because the medicine or equipment that could have saved their lives was not on board the plane. Today we have the technology to deal with in-flight medical emergencies, such as sudden cardiac arrest. But we do not require that airlines train the flight crew to deal with medical emergencies and we do not require airlines to carry potentially life-saving equipment. In fact, we do not even require airlines to keep records of in-flight medical emergencies.

Cardiac emergencies occur everywhere -- in homes, in places of business, in movie theaters and shopping malls. So it is no surprise that they also occur in the air. What is surprising is that airlines are not adequately prepared to deal with a cardiac arrest.

In the event of sudden cardiac arrest, the key to survival is a rapid response. This includes immediate CPR and rapid defibrillation. It is vital that the flight crew be trained in CPR and that planes carry emergency medical equipment.

Technology to deal with sudden cardiac arrest has come a long way and today's automated external defibrillators (AED) are smaller, lighter and more durable and with appropriate training, can be used by anyone. This past fall, the US Food and Drug Administration approved the use of these devices for commercial aircraft. I think it is time to put AEDs aboard all flights.

I have introduced legislation which would improve the chances of survival for passengers in the case of an in-flight medical emergency, like a sudden cardiac arrest. My bill would require all airplanes to have an automated external defibrillator on board and would also require each member of the flight crew to be trained in CPR and in the use of an AED.

I would like to note that one commercial carrier, American Airlines, has taken the initiative; the company will soon put AEDs aboard some of their international flights, and by the end of 1998, will have AEDs on all their flights. I commend American Airlines and hope that other airlines will follow suit in putting these lifesaving devices aboard all flights.

I would like now to introduce Mrs. Lynn Talit. Mrs. Talit contacted me after her husband suffered a fatal heart attack aboard a commercial flight. This tragedy might have been prevented if adequate medical supplies and equipment had been aboard the flight. Mrs. Talit has crusaded on this issue to prevent any other family from suffering a similar tragedy. I am honored to have this opportunity to introduce her. Thank you, Mr. Chairman.

UNITED STATES HOUSE OF REPRESENTATIVES
House Subcommittee on Aviation

Testimony of Carolyn McDowell
May 21, 1997

Mr. Chairman, Members of the Subcommittee, my name is Carolyn McDowell and I want to thank you for the opportunity to speak to you today regarding in-flight medical emergencies and some changes I think should be considered by you in discussing new regulations in this area.

On May 18, 1996, my husband, John, suffered a heart attack aboard Continental Airline Flight 2000 and died after the plane landed in Nassau. It is my belief that **inadequate medical safety procedures, inadequate training of flight crew personnel and the fact that cardiac medicines and equipment were not available** were all factors which contributed to his death.

1. MEDICAL SAFETY PROCEDURES, TRAINING AND EDUCATION:

A. CPR TRAINING. CPR training and yearly recertification for flight crew is not adequate. In my husband's case none of the flight crew that attempted CPR on John could do it properly. Fortunately, there was a passenger on board, Dr. Pinder, who was able to do the CPR. However, because none of the flight crew could perform the CPR properly Dr. Pinder was forced to continue with the chest compressions, unassisted, for more than forty-five minutes. If Dr. Pinder had not been on the plane there would have been no one who could have properly administered CPR. I have been told by emergency personnel that someone who is certified in CPR but not routinely practicing it needs interim training 4 to 6 times a year. It was very stressful for me to hear Dr. Pinder say to the flight crew on the plane they were not performing the CPR correctly.

B. NURSE/MEDICAL TECHNICIANS. If Dr. Pinder had not been on Continental Airline Flight 2000 to assist John there would have been no one able to help him. The present system seems to rely on there being a passenger on every flight which has medical training and is willing to volunteer their services to assist an ill passenger. In the 1940's a nurse was one of the flight crew members on all commercial airlines. Statistics and studies tell us the United States population is getting older. This would seem to indicate that medical emergencies like John's will occur with increasing frequency in the future. Steps should be taken to insure that there is someone on board commercial airlines who is qualified to assist an ill passenger.

UNITED STATES HOUSE OF REPRESENTATIVES
Subcommittee on Aviation
Testimony of Carolyn McDowell
May 21, 1997

2. CARDIAC MEDICINES AND EQUIPMENT.

It was very distressing for me to watch Dr. Pinder caring for my husband and not have available to him any of the medicine or equipment which he needed. For instance, the on board medical kit has a heart drug in it called Epinephrine, but the medical kit does not have the needle which is necessary to properly administer the medication. Dr. Pinder also wanted to intubate John but did not have the equipment needed to do this procedure either. I have also recently read about American Airlines putting defibrillators in some of its airplanes. If Continental Airlines had some or all of this equipment on the airplane we were on my husband would be alive today.

3. REPORTING REQUIREMENTS.

Perhaps one of the reasons in-flight medical emergencies and the lack of adequate personnel and equipment to care for these emergencies has reached the present crisis stage is the fact the FAA presently has no requirement that an airline report these in-flight medical emergencies. **THIS IS TRUE EVEN WHEN AN IN-FLIGHT MEDICAL EMERGENCY RESULTS IN THE DEATH OF A PASSENGER, LIKE MY HUSBANDS.** So long as airlines like Continental know it is not accountable for documenting and reporting incidents like the one involving my husband the public will continue to face flight crews that are not only inadequately trained but are lacking the necessary equipment to properly deal with these in-flight medical emergencies.

4. CONCLUSION.

There was no reason my husband had to die on Continental Flight 2000. Properly trained personnel and the proper equipment could have and would have saved his life. I urge you make changes in the present regulations so future air travelers do not have to go through the trauma I did of being forced to sit helplessly by my husband's side and watch him die as the plane flew on to its scheduled destination.

I thank the chairman and the members of this committee for their time today.

Testimony of Lynn Talit - 1978 Asylum Avenue - West Hartford, CT 06117
Telephone: (860) 233-7793 • Fax: (860) 232-0815
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In the Air, Adequate Medical Emergency Preparedness is A Necessity, Not an Option. My husband, Ben, A senior analyst, and frequent business traveller, died of cardiac arrest on Northwest Airlines from Detroit to Los Angeles, in the First Class section. His death, and hundreds like his, draws attention to the inadequate in-flight medical kits on passenger airlines and the urgent need to make automated external defibrillators (AEDs) mandatory parts of the kits. Minutes count when cardiac emergency strikes, and Ben's flight lacked such simple essentials as oxygen cannisters, a length of endotracheal tubing and lidocaine. No life-saving AED was on board - even though the need has been well-known in the airline industry and AEDs have been saving lives on foreign airlines for years.

Underscoring our family's incalculable loss is that Ben was a fire/rescue volunteer, a deputy fire chief, and an EMT - dedicated to saving life and property. Typically, the day before he died he was on ambulance duty. So it's bitter irony that at age 43, with no known health problems - on April 23, 1995 - Ben suffered a fatal medical emergency on an airplane. A thoughtful, loving, husband of twenty years; exemplary father; valued professional and truly good citizen died for the lack of exactly the preparedness he supported and practiced every day of his life.

The public and most officials like you still have no clear idea of the scope of medical emergencies because airlines are not required to keep records. Both federal and airline industry data, therefore, are so seriously-flawed that no airline industry or related agency position against on-board AEDs or medical kit enhancements can

Testimony of Lynn Talit - 1978 Asylum Avenue - West Hartford, CT 06117

be taken seriously. A few examples of the scope of this egregious condition: March, 1995, Bill Rose, age 57, a Simsbury, CT fire chief whom, coincidentally, my husband know, died of a heart attack on a Northwest flight from Detroit to Phoenix. His wife told me his death certificate, like Ben's, doesn't say he died in flight, but rather in the city where the body was removed from the plane. Ergo, no in-flight death statistics

Jamie Somes, widow of Steven Somes, of Wellesley, Massachusetts, tells me how the father of 2, in his late 30s, was in First Class on a United flight to San Francisco from Boston in October, 1995, when he arrested, and doctors aboard told her of their frustration at losing him because of inadequate supplies. April, 1997, on Northwest Airlines Los Angeles to Detroit flight, Mr. Sandy Peters, age 45, of Sterling Heights, Michigan had cardiac arrest while the plane was on the ground but no AED was on board -- CPR by a flight attendant was not enough -- and his mother tells me by the time the medics got him they said he was already cyanotic as far down as his nipples. He has brain damage.

Moreover, the two doctors who tried to save my husband, a cardiothoracic surgeon, and an intensivist, both wrote me that Ben could likely have been saved with a defibrillator, and both encourage my efforts here today. Furthermore, for the cardiothoracic surgeon, Ben was his second in air cardiac emergency in a single weekend, having had one on his Detroit to Los Angeles flight. Contrary, then, to what the airlines would have us believe, these are not rare or occur only to the old and the infirm, and the number of people who die in-flight like Ben did far exceeds airline crash fatalities in a single year.

Testimony of Lynn Talit • 1978 Asylum Avenue • West Hartford, CT 06117

Enough is enough. The airline industry cannot reasonably expect, nor can they be allowed, to take millions of people 35,000 feet in the air every day, sometime for hours on end, with no realistic measures in place to respond to the most common of life-threatening emergencies - cardiac arrest, which alone claims 350,000 lives a year, on the ground and in the air, exceeding the annual death toll from accidents or AIDS. I urge an end to this crisis in the skies forthwith -- an end to these silent, hidden statistics like my husband. We can stop this in-flight epidemic tomorrow, and we're not asking for flying hospitals. Medical kits need more, and defibrillators need be mandatory. Portable AEDs have been available since the 1980s, and foreign carriers like Qantas have had them for years. Back then, they were about the size of a briefcase weighing 15 pounds - ran on rechargeable batteries; and took approximately 5 hrs. training to learn. Today they weigh only 4 lbs, don't need recharging, take virtually minutes to learn, and cost about \$3,000. Last year, two AED makers, Physio Control and Heartstream, sought and received FDA approval, and American Airlines plans to put the Heartstream Forerunner aboard its overseas carriers - but one airline voluntarily putting them on overseas flights only - is not nearly enough.

Hoping to make a difference in my community, last week, I met with local officials to allocate gifts of defibrillators in Ben's memory. If a widow of modest means and her children can manage this much, can the United States Government fail to do proportionately more?

Lynn Talit

Bibliographic Information

(to Accompany Written Testimony for the Subcommittee on Aviation Hearing on Medical Kits on Commercial Airlines, Weds. May 21, 1997)

Sample Newspaper Coverage:

Associated Press, "Surprise Adventure on a Routine Flight" Hartford courant, p. A15, Sun. Jun. 2, 1996

Business Travel - "Airlines upgrading medical equipment" USA Today, p. 6B, Tue. Mar. 19, 1996

Chase, Marilyn, "What's Available When you Need Care Aboard an Airplane?" Wall Street Journal, Marketplace sec. p. B-1, Mon. Mar. 18, 1996

Crandall, Robert L., "Medical Care Aloft" AmericanWay Magazine, Vantage Point Sec., p. 10, April 1, 1997

Crewdson, John, "Code Blue: Survival in the Sky" Special Report, Chicago Tribune, special supplement pp. 1-10, - Sun. June 30, 1997

Crewdson, John, "Ill in the air? Don't count on fast landing" Chicago Tribune, Chicagoland Sec., p.1 Sec. 1, Sun. Aug. 4, 1996

Crewdson, John, "Airline Expanding flight Medical Kits - American Plans to Add Drugs, Defibrillators" Chicago Tribune, News Sec. p. 3, Nov. 20, 1996

Crewdson, John, "Finally, the right tools to save lives in the air" Chicago Tribune, Perspective p. 1, Sun. Dec. 22, 1996

Crewdson, John, "Study: Illness rate doubles on U.S. Airlines FAA Reveals" Chicago Tribune, Chicagoland Final, News Sec. P. 1, May 11, 1997

~~DeChristina, Maricette, (in Popular Science) appearing in Reader's Digest,~~
"News From the World of Medicine - Sky Doc" p.136, Sept. 1996

Doheny, Kathleen, "Qantas Leap: Averting In-Flight Cardiac Deaths" Los Angeles Times, *The Healthy Traveler*, sec. L p. 20, Sun. Apr. 13, 1997

Bibliographic Information, (cont'd)

(to Accompany Written Testimony for the Subcommittee on Aviation Hearing on Medical Kits on Commercial Airlines, Weds. May 21, 1997)

Fritsch, Jane, "Doctors Say Debibrillators Save Lives, but Laws Slow Wider Use" - *Racing the Ambulance*, A special report, New York Times, Metro Sec., p. A1, Wed. Apr. 16, 1997

Goldenberg, Gary, "Sudden Death, A National Scandal: Public access defibrillation could prevent 100,000 deaths a year" American Health Magazine, pp. 65-67, April, 1996

Gray, Clark, EMS in the air - Letters Sec., CondeNast Travcler, p. 20, Dec. 1995

King, Ralph T., Jr., "Gear that restarts hearts goes portable" Wall Street Journal Medicine Sec. Mon. Aug. 5, 1996

Levy, Doug, "Defibrillators Key in Public sites" USA Today, front page, Thur. Apr. 17, 1997

Woodyard, Chris, "Calling for Better Care in the Air" Los Angeles Times, Column One, p. 1 - Oct. 27, 1995

Sample Television Special Coverage

ABC World News Tonight - Defibrillators on Airlines, Coverage of American College of Cardiology Conference in Anaheim, CA, Mar. 17-20, 1997. Air Date: Weds. Mar. 19, 1997

CNBC - Steals & Deals - 2-Part Investigative Report by Steve Daniels on In-Flight Medical Emergencies and Deaths, Includes Death of Benjamin Talit. Air Dates: Feb. 28 & 29, 1996

NBC Dateline - In-Flight Medical Emergencies, Coverage of Death of Benjamin Talit aboard NWAL, Air Date: Sun. Dec. 22, 1996

WXYZ-Channel 7, Detroit, MI. - "Sick in the Sky" feature report on In-Flight Medical Emergencies and the Death of Benjamin Talit, Air Date: Apr. 25, 1997

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Before the Subcommittee on Aviation
House Transportation and Infrastructure Committee

Requirements for Medical Equipment on Airlines

May 21, 1997

Testimony of Denise C. Hedges
President of the Association of Professional Flight Attendants

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Good morning Chairman Duncan, Mr. Lipinski and Members of the Subcommittee.

My name is Denise Hedges and I am the President of the Association of Professional Flight Attendants, representing the 20,000 men and women of the American Airlines flight attendant corps. On behalf of myself and my fellow safety professionals in the air everyday, I am pleased to be able to speak with you on the exciting new medical technology that is available to all airlines today.

It was on May 15, 1930 that aviation history was made. It was on that date at 8 a.m. that Ellen Church, a trained nurse, boarded a Boeing Air Transport (a predecessor of United Airlines) tri-motor airplane to work a flight from Oakland to Chicago. Not only did she become the first "stewardess," but because she was a trained nurse, she began the chapter in aviation history of the flight attendant as a safety professional. Today, through the advent of new technology, we are able to add yet another chapter to that book.

The safety and health of our passengers have and always will be our primary concern. While flight attendants are trained to handle most types of medical emergencies which might occur 30,000 feet in the air, witnessing a passenger experiencing a Sudden Cardiac Arrest (SCA) is exceptionally stressful. At times even after performing 45 minutes of exhausting CPR, flight attendants must accept the passenger's death. There are now medical tools and medicines available to us which might prevent this scenario. To deny the availability and use of these life-saving tools to the flying public seems senseless, since advanced technology provides the opportunity to save lives safely.

One tool is the Automatic External Defibrillator (AED). The use of defibrillators for the general public is a direct result of a task force under the American Heart Association. The task force began to promote public access defibrillation with a grass roots effort as the only way to increase the survival rates of Sudden Cardiac Arrest. The American Heart Association is aware that this will take a shift in public perception and commitment on the part of communities, municipalities and corporations that provide safety measures for general public gatherings. The goal of public access defibrillation was to make the device as common, useful and accessible as fire extinguishers while supporting training and preventing misuse.

American Airlines' flight attendants are already trained in first aid instruction for on-board emergencies such as epileptic seizures, burns, choking, and broken bones, just to name a few. During flight attendants' initial six weeks of training, the majority of the time is spent on safety and health related procedures. In addition, every year flight attendants are required to attend recurrent training for updates and review.

Currently Cardio-Pulmonary Resuscitation or CPR is the only tool that a flight attendant has to assist a passenger in cardiac arrest. The nearest medical assistance is normally at least forty minutes away. Forty precious minutes to land the aircraft, taxi to the gate and get the paramedics onboard. On international flights landing the aircraft is often not even an option. In

addition, medical personnel at many smaller airports may not have defibrillators.

In Sudden Cardiac Arrest, the time it takes to treat an individual is the deciding factor in whether that person lives or dies. Whether he or she is at 30,000 feet over the Atlantic ocean or at your local mall, the victim's chance of survival decreases ten percent with each minute that passes without defibrillation. After ten minutes, very few resuscitation attempts are successful. Rapid therapy is the critical factor. An airplane may be the ideal environment for the victim of Sudden Cardiac Arrest with a defibrillator and a trained flight attendant only seconds away.

The Association of Professional Flight Attendants, APFA, was involved very early in the process in determining which defibrillator would be used on American. APFA representatives attended four meetings with different manufacturers and gave their feedback during the selection process.

I am proud to be a member of a company that is taking the lead in the airline industry in providing this life saving device on its aircraft. The defibrillators are currently being installed on all of American's international 767-300 aircraft with a completion date of July 1, 1997. Currently, American Airlines is in the process of training our Purser's on the use of defibrillators. The three-hour sessions will be completed in early June. By that time over 2300 American Airlines flight attendants will be trained in the proper use of defibrillation.

American's flight attendants are considered to be agents of American's Medical Department. Therefore, liability coverage for use of the defibrillator will be an extension of the Medical Department. While there may be physicians or other medically trained passengers who can assist when a passenger becomes ill, the flight attendants are being trained to use the defibrillators when a passenger is in cardiac arrest. Since there are several makes and models of these devices on the market - some operating differently from others - there would be no assurance that someone medically trained would know how to operate this particular device. Therefore, it is the flight attendant's responsibility to operate the defibrillator.

When alerted to an unconscious passenger, one flight attendant will tend to the passenger while another retrieves the defibrillator. After lying the passenger down on the floor, the pads of the device are applied, the device then initiates the self test and analyzes the heart's electrical impulses. At that time, the defibrillator determines whether to proceed with CPR or whether an initial shock is necessary. Through voice and text prompts, the flight attendant is walked through the treatment process from diagnosis to the delivery of shock. Defibrillators do not require the assistance of a physician, but the readouts provided by the machine can be used by American Airlines' on-call physician to evaluate and determine care through radio to ground contact. The defibrillator will continue to monitor the passenger until the aircraft can land and ground assistance arrives.

Eventually, all American Airlines flight attendants will be trained on this device in their yearly recurrent safety training. With the first phase of installation of Automatic External

Defibrillators already onboard American Airlines' international aircraft and the upgrading of on board medical kits, American Airlines passengers can rest assured that should the need arise they will receive the best possible first aid care, short of a major hospital emergency room.

Along with the addition of the defibrillators on board American's fleet, an upgrade to the on-board medical kit is in progress. In the near future, our medical kits will contain prescription medicines to treat cardiac arrest, epileptic seizures, asthma or bronchitis, psychosis or anxiety, nausea, vomiting and postpartum bleeding. The kits may be used by qualified medical personnel who may be on-board as passengers.

Before I conclude, I would like to add that while American Airlines and the men and women of the Association of Professional Flight Attendants, APFA, are taking the lead in the use of defibrillators on-board aircraft in this country, I would like to urge other U.S. carriers to follow suit. The American aviation industry is a leader throughout the world. Let us make the use of this device on board all of our aircraft a priority.

Thank you for giving me this opportunity to testify before you and I would be pleased to answer any questions.

Statement of
JOAN SULLIVAN GARRETT
PRESIDENT, MEDAIRE[®], INC.
Before the
SUBCOMMITTEE ON AVIATION
of the
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE
of the
U.S. HOUSE OF REPRESENTATIVES
CONCERNING
MEDICAL KITS ON COMMERCIAL AIRCRAFT
MAY 21, 1997

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Mr. Chairman, Members of the Committee. I am Joan Sullivan Garrett, President of MedAire, Inc. We are pleased to have this opportunity to present our views, information and analysis on the proper resources for managing in-flight medical emergencies onboard commercial aircraft. We thank you for holding this hearing on an issue that is just as important to the airlines as it is to the traveling public.

In listening and reading my comments, I hope you will consider that while medical kits are important, perhaps bigger benefits can be achieved through:

- attention to aircraft first aid kits,
- focusing flight crew's existing first aid training on medical situations that actually occur during flight, and
- making our skies a friendlier place for medical professionals to volunteer their services.

1) MEDAIRE -- 10 YEARS PROVIDING EMERGENCY MEDICAL SERVICES TO THE AVIATION INDUSTRY

MedAire was founded in 1986 with the mission of providing immediate expert medical support to people facing medical emergencies in remote locations -- whether they were on land, in the air or at sea. Our clients are in more than 36 countries and primarily consist of commercial airlines and more than 600 Fortune companies with flight departments. We also have clients in the maritime industry.

To the aviation industry, MedAire conducts more than 300 flight crew training sessions a year on managing illnesses and injuries in remote environments, on automated external defibrillators (AEDs) and managing bloodborne pathogens. We provide aircraft first aid kits and emergency medical kits to the corporate aviation industry, including those that are standard equipment on board aircraft made and sold by manufacturers such as Gulfstream and Canadair/Bombardier.

2) MEDLINK 24-HOUR MEDICAL EMERGENCY HOTLINE FOR PILOTS

However, our highest profile service to this industry is our 24-hour emergency medical hotline service called MedLink[®]. Anytime a client has a medical situation on board their aircraft, no matter where in the world they are flying, they can contact, via satellite or standard air-to-ground voice/data communication services, the MedLink Communications Center and talk directly and immediately to one of our 16 board certified emergency physicians.

Our physicians are highly skilled in remote diagnosis and directing non-medically trained people to collect data, provide aid and stabilize many situations. Our physicians will offer advice and treatment recommendations (including severity analysis) so patients can be stabilized and pilots can make informed decisions as to whether or not they will divert their aircraft. However, our physicians are so effective in helping flight crews manage in-flight medical emergencies, that our commercial airline customers have reduced their number of medical-related diversion by more than 90 percent within the first year of beginning their MedLink service.

In the event of a diversion, MedLink has an exclusive, worldwide, medical services database that is used to assist pilots in selecting a diversion site that has qualified and appropriate medical care to handle the medical emergency. Additionally through this database MedLink will notify and manage emergency medical response, transport and hospital admission at the destination city.

(For your information, a script of an actual transmission follows this report. The script is a transcription of an audio tape that was created following a dramatic series of events that lead to the diversion of a commercial aircraft -- saving the life of a baby and his mother. The tape is narrated by the communication specialist who handled the call and includes the actual air-to-ground communications involving the pilot, an on board volunteer medical professional and a MedLink emergency physician.)

MedLink is based within the emergency department of Good Samaritan Regional Medical Center, Phoenix, Arizona, a Level I Trauma Center, which gives our emergency physicians additional access to specialists in more than 45 fields of medicine as well as a certified regional poison control center.

3) HANDLED MORE THAN 3000 IN-FLIGHT MEDICAL SITUATIONS

We took our first call during the night of November 15, 1987. It came from a trans-Atlantic commercial flight bound to New York from Ireland. A passenger suffering from chest pains had been given nitroglycerin tablets from the emergency medical kit -- but without relief. After evaluating all available information, our physician recommended the flight divert to Shannon. We notified and coordinated emergency response on the ground, and had the passenger taken to the most qualified hospital where he was admitted into the coronary care unit. He was treated for a heart attack, underwent angioplasty and discharged a week later. MedLink monitored his progress on a daily basis until he returned home.

Since that call, MedLink has taken more than 3000 calls from pilots and flight crews who are facing a broad range of medical situations on board their aircraft. Currently we are taking about 150 calls a month.

With each and every one of those calls, MedLink monitors the situation to its conclusion, whether it's consulting with an on board volunteer medical professional, arranging for advanced life support response, notifying immigrations and customs, or facilitating admission into a hospital. As such we have developed a significant database of statistics on in-flight medical emergencies that spans 10 years.

4) 80% OF INCIDENTS FALL INTO ONE OF FIVE MEDICAL SITUATIONS

In evaluating the most recent statistics from the past five years, we can identify a number of risk insights. In fact, what we find is that 80 percent of all medical situations can be attributed to one of just five medical situations:

36% of all calls have historically been classified as neurological in nature -- such as stroke or seizures. Prior to 1997, we have always categorized a vasovagal event as neurological. A vasovagal event is a phenomenon that occurs when people stand-up and become light headed and many times faint and lose consciousness. This can be the result of cardiac-related problems. As of 1997, we are now tracking vasovagal events separately. To date -- it is accounting for 23 percent of all calls. Neurological-related calls so far this year, not including vasovagal, are 11 percent of all calls.

19% of all calls have been cardiac related, but this percent is on a steady yearly climb. So far this year, cardiac-related calls are at 23%.

11% of all calls are respiratory in nature -- such as asthma, allergic reactions etc.

10% of all calls have been gastrointestinal in nature.

4% of all calls have been endocrine -- primarily diabetic-related issues

The remaining 20% is spread out over a variety of different categories of medical events.

Other relevant statistics include the most prominent causes of medical-related diversions. In taking a look at the most recent full year of statistics on this, we find that in 1996:

44% of all diversions were cardiac related

30% were neurological in nature

7% were attributed to gastrointestinal-related situations

5) 1924 FIRST AID KITS NEED TO REFLECT 1997 NEEDS

As you may know, today's aircraft first aid kits under federal specification GG-K-391a are virtually unchanged since they were first developed in 1924. In fact, the biggest change came just last year when burn ointment was deleted and protective gloves were added to the kit. It was in 1986 that the onboard medical kit, which is available for use only by qualified physicians, was mandated.

With the power of now knowing what type of medical incidents are most likely to occur during flight, versus what may have been believed to be important in 1924, it seems reasonable to focus our attention on matching medical preparedness in relation and proportion to the likelihood of an event taking place. This allows for risk informed decision making.

With more than 3000 in-flight medical incidents worth of experience behind our emergency physicians, they are seeing some common challenges that they and the flight crews are facing using first aid kits circa 1924 to deal with 1997 realities.

6) EMERGENCY PHYSICIANS' FIRST AID KIT WISH LIST

It's important to remember that an aircraft cannot be a flying hospital. The goal during an in-flight medical emergency isn't to make a definitive diagnosis and cure the passenger -- rather it is to identify the immediate threat to their well being and stabilize their condition until proper emergency medical care can take over. With this in mind, feedback from our emergency physicians suggest the following medical resources may be worthy of future consideration:

a) AUTOMATED BLOOD PRESSURE CUFFS AND STETHOSCOPE

After obtaining a patients medical history (if they are conscious or traveling with a relative), obtaining vital signs is the most significant in determining how to stabilize a person. Of the vital signs, pulse and blood pressure are most significant. Most laypersons can be instructed on checking pulse rate, but while there is a sphygmomanometer and stethoscope in the medical kit they are available only to a qualified physician. An automated cuff would allow for accurate readings by less trained individuals.

b) SELF-INJECTABLE SYRINGE OF EPINEPHRINE

Marketed under names such as EpiPen®, these prescription-only devices allow patients to self-administer a standard dose of adrenaline, a life-saving medication in cases of severe allergic reaction. Major causes of fatal allergic reactions are sensitivities to certain foods, especially shellfish and nuts. In a review of fatal allergic reactions to foods, it was noted that many patients ingested foods to which they knew they were allergic. However, many allergic reactions occur without warning, and because they can cause death within minutes, the availability of injectable adrenaline that can be self-administered is an important precaution.

c) DIPHENHYDRAMINE (BENADRYL)

In contrast to adrenaline, which must be injected, Benadryl can be administered orally and is available in liquid form for children and those who cannot swallow tablets. Rarely does Benadryl produce adverse reaction, as evidenced by its over-the-counter availability in the United States. Injectable Benadryl is currently carried in the onboard medical kit for use by medical personnel only.

d) ALBUTEROL METERED DOSE INHALER

It provides quick relief in the event of an asthmatic attack. Ironically, as this paper was being written, a patch came in from an aircraft where an asthmatic child was having an attack. As is the case so often...he had forgotten his own inhaler and no one else had one on board the aircraft.

e) AUTOMATED EXTERNAL DEFIBRILLATOR (AED)

According to the American Heart Association, more than 1000 people die in the U.S. every day from cardiac arrest. It's not unreasonable to expect that some of those people might be on board an aircraft on any given day.

During flight, the most feared medical emergency is indeed cardiac arrest -- a situation in which breathing and circulation stops. Although cardiopulmonary resuscitation (CPR) should be initiated, it is relatively ineffective in maintaining viability of the heart and brain. In fact, for Sudden Cardiac Death victims (ventricular fibrillation), CPR by itself has a success rate of less than five percent. For most patients who suffer Sudden Cardiac Death, the definitive treatment is rapid defibrillation, in which an electrical current (a shock) is passed through the heart in order to stop the ineffective hearth rhythm.

However, the longer the delay in delivering a shock, the lower likelihood that a person will survive. If the shock comes within three or four minutes of fibrillation, a patient's chances of survival range from 50 to as high as 90 percent. If the shock comes after 10 minutes, in the case of ventricular fibrillation, their chances are virtually zero. Arguably, in such situations, it would be difficult to land a plane and get EMS personnel onboard within that very small window of time.

Today's defibrillators can be used by nonmedical personnel who have had training in their use. In the case of defibrillators, these devices need only be applied to the patient and turned on. They analyze the patient's rhythm and when appropriate deliver an electrical shock -- or in some cases -- using a human voice, asks the care-giver to press a button to deliver the shock. These devices weigh less than 10 pounds, use latex-like pads to deliver the shock, and are much easier to learn and administer than the process of CPR. They are designed so that it is impossible for the AED or the care-giver to do harm to the patient. Only good. Because of this, it is my belief that AEDs should be considered a first aid tool.

f) COMPREHENSIVE MEDICAL KIT

In light of what we now know about in-flight medical emergencies, we have found that the medical kit does deserve some attention -- again with the focus being on stabilizing a situation. We believe medical kits carried by a number of international air carriers serve as excellent models worthy of emulation, however, at a minimum, our physicians see a persistent need for drugs such as injectable Epinephrine, injectable Atropine and Adenosine. Other emergency drugs would indeed be helpful, but without the ability or equipment to monitor a patient's heart rhythm, our emergency physicians believe it would be inadvisable to administer them. Additionally, airway management tools, and IV equipment would be welcome additions. It should be noted in this situation that care must be exercised in allowing access by "medical passengers" to these kits. Not all physicians and nurses are qualified to administer certain medications that would be contained in a medical kit. Ideally, a qualified ground-based emergency physician would speak directly with the in-flight medical "volunteer" to ascertain their qualifications and appropriateness for care.

7) REFOCUS EXISTING FIRST AID TRAINING

This discussion leads to the issue of training flight attendants and cabin managers to understand the resources that are available to them for managing in-flight medical emergencies and giving them the appropriate knowledge and skills to use them.

Fundamentally, basic first aid training provides a good foundation of information and skills to flight crews. However, we believe consideration should be given to placing more time and emphasis in training on knowledge and skills that are important in managing the types of situations that make up 80 percent of the onboard medical situations -- and less of an emphasis on first aid situations that are rarely if ever seen on board.

Examples of areas where greater focus could be beneficial include:

- assessment and early recognition skills,
- ability to obtain pulse,
- ability to obtain respiration rate and quality,
- gathering medical history information including important questions to ask the patient and family under certain conditions,
- emergency airway management and use of personal protection equipment

- greater knowledge on the risks from bloodborne pathogens and utilization of personal protection equipment

If an airline chooses to equip its aircraft with defibrillators then it should be expected that flight crews be trained in their use. Initial training ranges from 3 to 6 hours, and from then on can easily be incorporated into any ongoing CPR course completion.

8) LIABILITY AND LITIGATION ARE THE REAL KILLERS

In a closing thought, I would like to offer you one last, very compelling observation that could one day, very soon, develop into a very startling statistic. Our MedLink physicians are telling us that time and time again that medical professionals are becoming scared, and even refusing to get involved in offering medical help for fear of legal liability.

The legal liability to volunteers, to the airlines and to their flight crews is staggering. Today, we're finding that in nearly 80 percent of our calls, a medical professional -- a physician, nurse or emergency medical technician -- has volunteered their services.

I predict in the future, the willingness of people to help will decline.

Unfortunately, the Good Samaritan law that protects rescuers in some states -- has virtually no application in the sky. I would argue that unless action is taken to appropriately limit liability to airlines, flight crews and medical professional volunteers...there is little value in spending time worrying about equipment, or worrying about training when everyone is fearful, and rightly so, of being sued for using what they know.

Mr. Chairman, this concludes my testimony. I would be pleased to answer any questions you or any committee members may have.

Communications Patch Between MedLink Emergency Physician, Commercial Pilot and On Board Medical Volunteer.

The following is the transcription of an audio tape created following a life-saving incident in May, 1996. The communication specialist who handled the call narrates the tape.

Background

May, 1996

Passenger, female - 6 to 7 months pregnant.

Journey began in Cairo, Egypt. Ultimate destination - Los Angeles.

Incident occurs over Omaha.

A doctor is onboard.

Communication Specialist

I got a call from an airline. They had a pregnant female on board. She was bleeding.

Pilot

We're enroute to Los Angeles and we're over Omaha. And we have a patient....lady...38 years old...female. She's conscious. She's 6 months pregnant. She's traveling from Cairo. She's had what she considers to be a contraction...and lost quite a bit of blood.

Communication Specialist

They did have a doctor on board, that felt they could continue on to California which was their destination.

Onboard Doctor

She's been fine today in her flight from Cairo and has been feeling the baby all day along until about an hour ago...right after they ate.

She got up and she just had a large amount of bleeding which she felt to be something like a half liter...and when I came in and evaluated her, her blood pressure looked fine...running about 170...her pulse was about 70.

We have her laying down, giving her a little oxygen for the baby. The main issue is...number one...she says that when we try and set her up a little bit she feels like she's having more bleeding. And number two...I couldn't really hear any heart tones on the baby.

She's not feeling any fetal movement at this point....and when I try and just elicit some movement from the baby...just like palpation, she doesn't really feel anything.

If anything she gets a little pressure or pain when we press on the baby.

She's feeling a little bit of discomfort...let's say in the uterine area below the baby.

But I wouldn't say any kind of major pain.

So...it seems to me she was probably stable to get from here to Los Angeles.

Communication Specialist

And....I got my doctor on the line and he asked..."Well what about the baby?"
The (onboard) doctor says, "well it's a good sized baby...she's about 7 months. There's no fetal movement since the bleeding started.
At that time, my doctor made the decision, that we recommended the diversion of the aircraft.

MedLink ER Physician

The concern is that if she is really quote-unquote six months pregnant -- this child is still potentially deliverable at this age.
It seems to me from the information you're giving me that we need to have her get medical attention as soon as possible -- this could be an early abruption.
Give the control back to the pilot, and we're going to....and we'll have our dispatcher talk to them about diverting to closest city.

Communication Specialist

And the captain said, okay great. We took them down into Kansas City.

Airline Dispatch

Okay....you've been released to destination Kansas City...IFR...you're going to be KNB 16-50...go ahead.

Passenger

When I became very sick...at the time...all I knew was that the plane was diverted to Kansas City, Missouri. And I was taken to a hospital.

Communication Specialist

I called the hospital and talked to the charge nurse of the ER. I told her this is the situation...
We have got a lady seven months pregnant, she's bleeding, I said she has lost about a liter and a half on the aircraft already...every time they stand her she loses even more.
And I said there has been no fetal movement.
And so she said...Well, I'll call in my team.
Within an hour of the aircraft being on the ground, they had performed a C-section, and the baby was in ICU and so was mom in ICU.

Passenger

They have saved my life, as well as my baby's life. My husband and I would like to thank them...to thank MedLink very, very much for that.

Passenger

....Everything turned out well, and my baby is here beside me in the hospital.
Yes...he's beautiful you know!

CARDIAC ARREST ABOARD COMMERCIAL AIRCRAFT

James M. Atkins, M.D.

The management of victims of a cardiac arrest poses major challenges on airplanes. Survival from cardiac arrest decreases rapidly from the time of the event until a rhythm is restored in the patient. In general, survival without proper medical treatment is unlikely after 10 minutes and nonexistent after 20 minutes. Performing manual cardiopulmonary resuscitation (CPR) only slightly improves the results at 10 and 20 minutes. Survival from cardiac arrest is determined mostly by the time from the event until they are defibrillated or shocked for those victims in ventricular fibrillation, which is one of three different rhythms that cause cardiac arrest. If they can be defibrillated within the first minute, greater than 90% survive. If they cannot be shocked until 5 minutes, 40% survive. If they cannot be shocked until 10 minutes after the event, less than 10% survive. Thus, survival from cardiac arrest occurs when the patient has ventricular fibrillation and is defibrillated or shocked rapidly. On an airplane, an emergency diversion and landing requires at least 20 minutes with another 10-20 minutes to get the plane to where the victim can be removed by the appropriate medical personnel.¹ Therefore, cardiac arrest on an airplane under normal circumstances is not survivable.

The incidence of cardiac arrest on commercial airplanes is extremely low, but with the enormous numbers of travelers the total is significant. In fact more people die each year of cardiac arrest on commercial airlines than die from crashes. The exact number of deaths is hard to determine. J. Crewdson of the Chicago Tribune and T. Friend of USA Today have estimated that there are up to 1,000 deaths on carriers that are members of the International Airline Transport Association (IATA).^{2,3} Reports from carriers are often incomplete or underestimate the magnitude of the problem. Qantas Airlines has carefully evaluated events both on their airplanes and in their terminals. Dr. O'Rourke and his co-investigators reported this information at the American Heart Association Conference on Public Access Defibrillation II in Washington in April of 1997. From their numbers, they have estimated that the rate of events would be 311 cardiac arrests per year for all IATA carriers.⁴ This is probably the best estimate that is available. This estimate is in line with many other estimates that have been made. From this estimate, the number of cardiac arrests on domestic carriers in the United States would be about 70-80 per year with 72 being the most widely accepted number.⁵⁻¹³ It should be pointed out that there are almost as many cardiac arrests in the terminals as on the aircraft. At Dallas/Fort Worth International Airport, the second busiest commercial airport in the United States, there are 15 to 16 cardiac arrests per year. Half of these events occur on the aircraft and half in the terminal. Qantas reported 19 events in their terminals and 27 events on their aircraft; not all of the terminals are under Qantas control causing an under-reporting of events in terminals.

From the Qantas data presented by Dr. O'Rourke, 17 of 19 events in the terminal were ventricular fibrillation and 6 of 27 events aboard aircraft were ventricular fibrillation. Defibrillators are only effective for ventricular fibrillation. Four victims were resuscitated and survived in the terminal group and two were resuscitated and survived in the aircraft group. If this data was extrapolated to the United States, then defibrillators aboard aircraft with trained responders would save about 10-20 lives per year. If defibrillators were placed in all terminals with trained responders, an additional 60-80 lives might be saved. The high incidence of

ventricular fibrillation in the terminals is probably due to the fact that most of these events are witnessed. The victim is standing or running and suddenly collapses which is immediately noticed. On aircraft, the patient is sitting in their seat and does not fall or visibly collapse. Most observers feel that the victim has gone asleep. It is only when the victim does not wake up for breakfast on long international flights or does not get up when the plane reaches the gate that the event is recognized. This explains the reported high incidence of aircraft cardiac arrests upon plane arrival at the gate. The other high risk periods appear to be in the terminal and just after boarding when the victim is under the highest stress. Even though the incidence of events is very low, it is interesting to note that the event rate is 20 times what would be expected from the same aged individuals doing their normal daily activity; this points out that air travel is associated with stress. Many of the victims have terminal illnesses or are elderly.

The issue of placing defibrillators on airplanes and in terminals has only been partially addressed by several major organizations. The American College of Emergency Physicians and the American College of Cardiology do not have an official position on placing defibrillators on airplanes. The position of both organizations has been to encourage methods that can improve survival from cardiac arrest. Both organizations feel that any proposed strategy should be evaluated for the benefit to risk ratio and have an acceptable cost-benefit analysis. The American Heart Association has stated that first responder defibrillation should be utilized in many venues and includes aircraft and terminals in those venues. Clearly, defibrillators on aircraft and in terminals would improve survival for some individuals. The cost-benefit analysis aboard aircraft is unique. If a system such as the one Qantas Airlines uses is utilized, then the reduction in aircraft diversions saves more money than the equipment and training costs; therefore such a program is potentially profitable for the airlines at the same time it provides a service. According to Qantas, the passengers and families are very appreciative of the effort even when it is unsuccessful. The only negative reported by Qantas is the stress on the crew members when they were unsuccessful; this is a common problem with emergency personnel and healthcare providers. The only question is the benefit to risk ratio. Newer types of defibrillators have markedly reduced the risk of defibrillation aboard an aircraft, as the electrodes are pasted to the patients chest, making it less likely for high voltage to be delivered to a rescuer, passenger, or to the metal frame of the aircraft. On smaller aircraft, there may be a problem with space. To perform CPR a patient, the victim must be lying on their back in a position where the rescuers can compress the chest and ventilate (breathe) the patient. To defibrillate the patient, the victim cannot be touching another person or metal. Some aircraft may be too small to provide adequate room for treatment. To perform CPR and defibrillate the patient, at least two and possibly three aircraft personnel are needed. It would be best to have at least four crew members available. One to perform chest compressions, one to ventilate the patient, one to defibrillate the patient, and the fourth to handle other problems and communication. This could possibly be reduced to two individuals; however, this will take further training and evaluation.

Based upon present information, it makes sense to place defibrillators in terminals and on wide body aircraft, particularly those with long flights and who carry older individuals. These have a higher incidence, there is sufficient room, and there is an adequate number of crew members. Placing defibrillators on smaller aircraft must be evaluated carefully. Smaller jets that have at least three cabin personnel probably have enough space and personnel to do the job

safely and effectively. We need to evaluate smaller aircraft and those with only two cabin personnel. With present technology, aircraft with no or one cabin attendant should probably not be equipped with defibrillators. This is a technology that has benefit properly applied. Further research and evaluation is needed to improve the results obtained in limited studies.

References

1. Cummins RO, ed. Textbook of Advanced Cardiac Life Support. American Heart Association, Dallas, 1994, p. 4-2.
2. Crewdson J. Code blue: survival in the sky. Chicago Tribune, Special Report 1996, June 30.
3. Friend T. Cardiac equipment on planes could save hundreds. USA Today 1994; Nov 17, p. 1.
4. O'Rourke MF, Donaldson E, and Geddes JS. An airline cardiac arrest program. American Heart Association: Public Access Defibrillation II Conference. April 1997, Washington D.C., abstract.
5. Rosenberg CA, and Pak F. Emergencies in the air: problems, management, and prevention. The Journal of Emergency Medicine 15: 159-164, 1997.
6. Rodenberg H. Medical emergencies aboard commercial aircraft. Annals of Emergency Medicine 16: 1373-1377, 1987.
7. Cummins RO, and Schubach MA. Frequency and types of medical emergencies among commercial air travelers. Journal of the American Medical Association. 261: 1295-1299, 1989.
8. Cummins RO, Chapman PJC, Chamberlain DA, Schubach JA, and Litwin PE. In-flight deaths during commercial air travel: how big is the problem? Journal of the American Medical Association. 259: 1983-1988, 1988.
9. Speizer C, Rennie CJ, and Breton H. Prevalence of In-flight medical emergencies on commercial airlines. Annals of Emergency Medicine. 18: 26-29, 1989.
10. Cwinn AA, Dinerman N, Pons PT, and Marlin R. Prehospital care at a major international airport. Annals of Emergency Medicine. 17: 1042-1048, 1988.
11. Coles NA, Lauer MS, Field TS, Connolly M, and Eagle KA. Cardiac emergencies at a major international airport: a prospective observational study. American Heart Journal. 124: 257-260, 1992.
12. Shesser R. Medical aspects of commercial air travel. American Journal of Emergency Medicine. 7:216-226, 1989.
13. Munk MD. In-flight medical emergencies. Journal of Emergency Medical Services. May, 1997. PP 64-72.

STATEMENT OF DR. JON L. JORDAN, FEDERAL AIR SURGEON, FEDERAL AVIATION ADMINISTRATION, BEFORE THE HOUSE COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE, SUBCOMMITTEE ON AVIATION, CONCERNING EMERGENCY MEDICAL KITS ABOARD AIRCRAFT.
MAY 21, 1997.

Mr. Chairman and Members of the Subcommittee:

I welcome the opportunity to appear before the Subcommittee this morning to discuss emergency medical kits on board passenger-carrying aircraft.

Before I describe for you FAA's ongoing effort to monitor and evaluate the appropriateness of the requirements setting forth the contents of emergency medical kits, I would like to provide you with some background that I hope will be useful to you in establishing a context for the testimony that you will have heard today.

Current regulations calling for emergency medical kits date back to 1986, when the FAA promulgated a final rule requiring large passenger-carrying aircraft, operating under part 121, to carry such kits beginning in August of that year. The FAA set a minimum standard for kit contents, requiring:

- a sphygmomanometer, which is an instrument for taking blood pressure;
- a stethoscope;
- 3 different sizes of airways, or breathing tubes;
- syringes;
- needles; and
- latex gloves, which were added to the kit's minimum contents list in 1995.

The emergency medical kit is also required to contain, at a minimum, these basic pharmaceuticals:

- 50% dextrose injection, to be used for treating hypoglycemia or "insulin shock";
- epinephrine, which is used for asthma or acute allergic reactions;
- diphenhydramine, which is used for allergic reactions;
- nitroglycerin tablets, used for cardiac-related chest pain;
- basic instructions for using these drugs.

These supplies are in addition to those contained in the required first aid kit, which include adhesive bandages, antiseptic swabs, ammonia inhalants, bandage compresses, arm and leg splints, roller bandages, adhesive tape, and bandage scissors.

As of January 1996, commuter aircraft with between 10 and 30 seats also have been required to carry emergency medical kits in addition to the first aid kits they have always had. This change came as a result of our ongoing "harmonization" of parts 121 and 135 regulations.

At the time the rule mandating the contents of emergency medical kits was promulgated, there was controversy over what types of instruments and pharmaceuticals the FAA should require they contain. Commenters to the rule, as well as your counterparts in the Senate, in the form of report language, expressed concerns about controlled substances and potentially dangerous weapons being stowed on board any passenger aircraft. These and other commenters also argued that an aircraft should not be a flying hospital, but that

the proper course of action in the event of an on board medical emergency is to put the aircraft down on the ground and get the ailing passenger to the nearest hospital facility.

As a result of these concerns, as well as the views expressed by a substantial number of professional medical organizations that more statistical information on the frequency of occurrence and types of medical emergencies on board aircraft was necessary before requiring additional equipment or pharmaceuticals to be contained in the kit, the FAA scaled down its original proposal in terms of the contents that would be required of medical kits. The rule promulgated was designed to ensure that, at the very least, U.S. aircraft would have the basic, minimum equipment on board to handle medical emergencies. That regulation also required airlines to report to their Principal Operations Inspector, for a period of 24 months after the effective date of the rule, information on each medical emergency occurring during flight time and resulting in the use of the emergency medical kit or the diversion of the aircraft.

That two-year collection of data resulted in the generation of two reports by our medical experts at the Civil Aeromedical Institute, or CAMI, in Oklahoma City. The final, comprehensive report, published in 1991, analyzed the 2,322 in-flight emergencies reported during this period. There were 33 in-flight deaths, with reports indicating that physicians responded to the call for help 85% of the time the request was made. The report noted that airlines were provided a good deal of regulatory latitude in terms of the data they were required to report, and the form in which they were to report it. The report

suggested that, based on the data obtained, the kit's medical contents might selectively be expanded to include analgesics, antiarrhythmics, antiemetics, and bronchodilators to address those symptoms (pain, difficulty breathing, nausea, heart) that occurred most often. The report also suggested that some of the more clinically serious cases might have been helped with a more complete medical kit that included a wider range of cardiovascular diagnostic and treatment tools. The report concluded:

Because the final chapter of consensus building on in-flight medical care has not yet been written, [FAA and the private sector] must continue to explore alternatives for improvement. Ongoing voluntary evaluation of in-flight health care experience by individual carriers will be especially useful as evidence to support action. This pooling of data will be needed to most efficiently meet the joint FAA-industry mandate to refine the "optimal" medical kit and applications.

Over the course of the next several years, FAA did receive cooperation from industry in terms of reporting medical emergencies, however, the data were not sufficient to determine what, if any, changes should be made to the contents of medical kits.

Therefore, in late 1995, the FAA convened a working group to coordinate our efforts with industry and the medical community to obtain the information necessary to make an informed decision concerning medical kits. CAMI will have two new sources of data to enable it to more effectively analyze the contents issue. The Aerospace Medical Association (AsMA) has solicited information on medical emergencies from airlines, in the form of questionnaires that have been provided to CAMI for analysis. The data will include information regarding the usefulness and limitations of existing inflight medical capabilities.

In addition to the AsMA questionnaires, a contract medical assistance company, MedAire, Inc., has agreed to provide anonymous, prospective data to CAMI through October 1997. The MedAire data will include information on the individual having the medical emergency, the medical equipment needed and used, the responding treatment provider or consultant, the final ground-based diagnoses, and the outcome of ground-based medical treatment. These new sources of information should facilitate a report by CAMI expected by the beginning of next year. I anticipate that the working group I have formed will review this information and recommend whether additional rulemaking to require more equipment and/or supplies as part of the emergency medical kit contents is warranted. In the meantime, we recognize the efforts of carriers like American Airlines, which recently elected to equip its overseas aircraft with, and to explore the utility of, automatic defibrillators, and of those other carriers who choose to exceed the minimum regulatory requirements posed by the FAA.

Mr. Chairman, we at the FAA recognize that this issue is important to many people; this morning you and I have heard from the family members of people who, tragically, passed away aboard aircraft. The FAA, in conjunction with industry and the medical community, are committed to resolving this issue. If, at the conclusion of our current efforts, we find that regulatory action is appropriate, FAA will take that action.

This concludes my prepared statement, Mr. Chairman. I would be pleased to respond to any questions you may have at this time.

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STATEMENT

For the Hearing Record

To the

Aviation Subcommittee
United States House of Representatives

Re: Inflight Medical Kits

May 21, 1997

Statement
of the
Aerospace Medical Association
for the Hearing Record
to the
Aviation Subcommittee
United States House of Representatives
May 21, 1997

The Aerospace Medical Association(AsMA) appreciates the opportunity to submit this statement to the House Aviation Subcommittee on the important issue of inflight medical kits. I am Dr. Russell B. Rayman, Executive Director of the Aerospace Medical Association, representing approximately 3,600 physicians, scientists, and flight nurses engaged in the practise of aerospace medicine or related research.

MEDICAL KITS

In 1986, the FAA mandated that the contents of U.S. air carrier inflight medical kits include four medications (50% glucose, epinephrine, diphenhydramine,

and nitroglycerin). Although this kit appeared to be adequate for a number of years, a reexamination of the medical kit with an eye toward expanding it is now in order because of the increasing number of travelers including those of advanced age. It is our overall impression at this time that more medication should be added.

However, in order to design a proper medical kit, it is necessary to have basic information such as the frequency of inflight medical events. Although there are some articles in the open medical literature on inflight illness and death, they are few, far between, and certainly not comprehensive nor accurate. Consequently, the Aerospace Medical Association strongly recommends that the airlines anonymously report all inflight medical events and deaths for a period of just twelve months to a designated central repository. At the end of twelve months no further reporting would be necessary. If the airlines would do this, aerospace medicine practitioners could with this comprehensive data design a medical kit based upon rationale rather than best guess or partial data.

AUTOMATIC EXTERNAL DEFIBRILLATORS (AEDS)

Regarding inflight AEDs, the Aerospace Medical Association has not yet taken an official position on this issue. However, there are clearly cogent arguments in favor of carrying AEDs on board commercial airliners, at least on some routes. Again, a decision based upon rationale would be possible if we had the twelve month data base recommended above.

CONCLUSIONS

Designate a central repository to which all U.S. air carriers would report for a period of twelve months all inflight medical incidents and deaths. The reporting form should be extremely brief requesting only essential information and should be anonymous. After the twelve month reporting period, convene a board of aerospace medicine practitioners and other clinical specialists to make recommendations regarding inflight medical kits and AEDs.

The Aerospace Medical Association stands ready to assist the Congress or any Federal or non-Federal agency on the issue of inflight medical kits and AEDs that is of utmost importance to the flying public. Thank you.

**Statement of Edward A. Merlis,
Senior Vice President, Government Affairs
Air Transport Association of America
Before the Subcommittee on Aviation
Committee on Transportation and Infrastructure
Hearing on Medical Kits on Commercial Airlines
May 21, 1997**

Mr. Chairman and members of the subcommittee, I am Edward Merlis, Senior Vice President of the Air Transport Association of America. ATA represents the major commercial passenger and cargo air carriers in the United States.¹ Collectively, our members account for over 95 percent of all revenue passenger and cargo ton miles that scheduled air carriers operate in this country. I am pleased to have this opportunity to present the industry's views on the various aspects of emergency in-flight medical care and equipment.

Emergency Medical Procedures

When a medical incident occurs aboard a commercial aircraft, it is the flight attendant who has the primary responsibility for dealing with the events. We can all be thankful that our professional flight attendants are trained to provide first aid and temporary care until professional medical care can be obtained. When medical emergencies occur on a commercial flight, chances are good that a physician will be nearby. In about 80-85% of the cases, medical professionals or medical rescue workers respond to the in-flight medical

¹ U.S. flag members are: Alaska Airlines, Aloha Airlines, American Airlines, American Trans Air, America West Airlines, Continental Airlines, Delta Air Lines, DHL Airways, Emery Worldwide, Evergreen International Airlines, Federal Express, Hawaiian Airlines, KIWI Airlines, Midwest Express, Northwest Airlines, Polar Air Cargo, Reeve Aleutian Airways, Southwest Airlines, Trans World Airlines, United Airlines, United Parcel Service, and US Airways. Our foreign flag technical members include: Air Canada, Canadian Airlines International, and KLM-Royal Dutch Airlines.

emergencies. We believe that this percentage would be even higher if it were not for the medical professional's fear of liability for the actions which they may take in this setting.

In-flight medical emergencies are handled on a case-by-case basis. The decision to make an emergency landing for medical reasons is made by the captain. Most airlines maintain air-to-ground access to a physician through a contract service or through a network of physicians that is on-call 24 hours a day to provide guidance to the captain regarding the medical emergency and to advise whether an unscheduled landing is necessary.

Ultimately, however, the decision as to whether or not to make an emergency landing for medical reasons is made by the captain, since the captain has the responsibility for the safety and care of all passengers and crew. In addition to determining the medical condition of an ill passenger, other criteria must be considered by the captain when deciding whether to divert for medical emergencies. These include weather conditions, turbulence, air traffic, approach charts, length of runway, landing weight of the airplane, and proximity to appropriate ground medical facilities.

Medical Equipment

Federal Aviation Regulations (FAR) require airlines to carry in their medical kits equipment for use in the diagnosis and treatment of medical emergencies that might occur during flight. This medical kit is in addition to a first aid kit which contains bandages, compresses, antiseptic swabs, arm and leg splints, tape and scissors. The minimum

equipment required includes the following:

blood pressure cuff,
stethoscope,
oropharyngeal tubes,
syringes and needles,
dextrose solution,
epinephrine,
diphenhydramine HCL,
nitroglycerin tablets, and
latex gloves

As Dr. David McKenas will describe, American Airlines plans to introduce enhancements to their medical kits, as well as equipping their international airplanes with a small, light, battery-operated defibrillator that the FDA recently approved. American's experience will be particularly critical in evaluating the efficacy of these devices which were approved based upon utilization in a medical setting, not an aircraft environment.

Research Needs

Concurrently, ATA member airlines are conducting a review of the contents of required medical kits and gathering data on emergency medical diversions. We are working with the Aerospace Medical Association, whose members have considerable expertise in this area, in order to insure that the data collected is relevant and any changes that may be

proposed for medical kits are safe and appropriate. There is concern that inclusion of some items in a medical kit, if used inappropriately, might exacerbate the condition of the ill individual. Therefore, we must act cautiously in evaluating the information collected, and perform the appropriate due diligence before making changes.

Interestingly, even at these early stages of our study, we are beginning to see that different airlines have different types of experiences. These may be due to the routes traveled, length of flight, and business versus leisure traffic. As a result, it is very important, particularly in this day of "one level of safety", that any changes adopted pursuant to regulatory or legislative action be focused on the need.

One handicap in our pursuit of data, particularly as to the individual's prognosis after the flight, is the inaccessibility of data due to privacy considerations. But this data is critical. The last authoritative study by the FAA, a two-year study conducted a decade ago, reported a total of 33 in-flight deaths, approximately half of which were due to cardiac causes, and one-third due to unknown reasons.

It is our view that these two studies should provide important information necessary for determining whether and what medical kit enhancements are necessary.

Liability

One last area of concern which we think the subcommittee needs to explore is the issue of liability. Our medical consultants have told us of instances in which trained

medical personnel traveling as passengers would not offer concrete opinions and recommendations as a result of their fear of liability. Moreover, carriers and our in-flight personnel share that concern. We recommend that the subcommittee explore this issue in greater depth to establish a regime which provides the traveling public, as well as the good samaritan or care giver, the protection necessary in our litigious environment.

Mr. Chairman, I would be pleased to respond to any questions you or the subcommittee may have.

**Testimony of David K. McKenas, M.D., M.P.H.
Before the U.S. House of Representatives
Subcommittee on Aviation
Wednesday, May 21, 1997**

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***The Role of Defibrillators and
Advanced Medical Care in American Airlines***

David K. McKenas, M.D., M.P.H.
Corporate Medical Director, American Airlines

Thank you Chairman Duncan, Congressman Lipinski, Members of the Subcommittee.

Recently, American Airlines purchased automatic external defibrillators for installation on its over water aircraft. Over water aircraft are those which fly international routes, such as Europe, Latin America and Japan, and on certain domestic flights that cross over water. The defibrillators units are expected to all be on board by July 1st, and by the end of the year, we plan to enhance our on-board medical kits so that a responding on-board physician may handle at least the first hour of most emergencies. As we are forging new ground with this new technology, we want to monitor the program for a suitable period before committing to expand the program to domestic flights. In the meantime, American will train 2,300 of its flight attendants on when and how to use these defibrillators by the Summer of 1997. At your invitation, we will address why American Airlines made what appeared to external observers to be a dramatic move, and how we are planning to construct our program.

The Epidemiology of Sudden Cardiac Arrest

First, one must be knowledgeable on the epidemiology of Sudden Cardiac Arrest, the condition which can be treated by automatic external defibrillators. According to the American Heart Association:¹

¹ American Heart Association *When Every Second Counts*, 1996.

- More than 1,000 people per day in the United States suffer sudden cardiac arrest.
- In most cases, it is all but impossible to predict who will have a sudden cardiac arrest, or where or when it will happen.
- The chances of surviving sudden cardiac arrest are less than one in ten, with most persons dying before reaching a hospital.
- Those people who do survive a cardiac arrest have a good chance of living many more years. Approximately 80 percent are alive at one year and as many as 57 percent are alive at five years.

With sudden cardiac arrest, the lifesaving shock of defibrillation must be given virtually within minutes, or the person will die. The chance of survival decreases 7 to 10% for each minute that defibrillation is delayed. Even if a passenger experienced a sudden cardiac arrest immediately after a plane leaves the gate, the time it takes for the plane to return to the gate to receive defibrillation from a responding paramedic team would be too late.

Automatic External Defibrillators

Technology has come a long way in recent years to help the medical profession deal with sudden cardiac arrest. Many physicians, nurses and paramedics have used the large hospital defibrillators, and others have seen them in movies and on television in hospital emergency room settings. Those units are cumbersome and they require a physician or trained medical personnel to interpret heart rhythms, and to use the device. Today's generation of automatic external defibrillators are smaller, lighter, more durable and easier to

operate and maintain, and are now a natural fit for use in the commercial aviation setting. American Airlines had been watching development of the automatic external defibrillators for the past few years. This past Fall, the U.S. Food and Drug Administration approved the use of these devices for commercial aircraft. Everything was then in place for American Airlines to complete its program to improve the medical environment for its passengers.

Corporate Rationale

American also carefully studied its internal medical event and medical diversion data to reach its conclusion that automatic external defibrillators and enhanced medical kits were worthy of implementation, beginning with overwater flights. First, we noted a mismatch between the contents of the existing FAA kit, which you may see in **Exhibit 1**, and the medical events experienced by American Airlines customers. **Exhibit 2**, shows the kinds of medical events our customers experienced, and these were so serious as to prompt a medical diversion. As you can see, cardiac events, consisting of angina, myocardial infarction, and sudden cardiac arrest, psychiatric, gastrointestinal, seizures and asthma disorders accounted for a high proportion of the events.

For those not medically versed, angina chest pain results when there is insufficient blood flow or oxygen received by the heart muscle. This can result from partial cholesterol blockages in the coronary arteries that supply the heart. Also, lower partial pressures of oxygen at cabin altitude contribute to less oxygen getting to the heart in some passengers. A heart attack, or myocardial infarction, results when a full blockage in the coronary arteries occurs, or the heart muscle

is so starved of oxygen, that heart muscle actually dies. The dying heart muscle can cause the heart rhythm to go haywire, and cause blood pressure to fall. A sudden cardiac arrest is the abrupt cessation of the pumping action of the heart. It can be due to a heart attack, angina or other insults to the heart or lungs.

Further, American reviewed the number of times that cardiopulmonary resuscitation was performed by flight attendants, and this is demonstrated in **Exhibit 3**. Cardiopulmonary resuscitation is administered by flight attendants for passengers who become unconscious, have no pulse and no breathing. This certainly is a clinical definition of death, however, the outcomes of these customers in the past were not tracked through conventional procedures. Please also note the increasing trend over the past few years. These findings demonstrated that our customers could be better served, and kept out of harms way, with more advanced medical response capability. The defibrillator also has a heart monitor, which would permit an on-board physician to interpret the heart rhythm, and to administer advanced medications and procedures using our enhanced medical kit, to save the person's life.

Lastly, we noted an increase in our medical diversions over the last years, as you may see in **Exhibit 4**. Exhibit four demonstrates medical diversions per billion revenue passenger miles. Although we can only speculate as to the reason for the increase, it was clear to use that medical events were occurring on board that were of an emergent nature, and their frequency was increasing. Therefore, American wanted to be prepared for those events in the best interest of the welfare and safety of the customer.

to the cockpit and cabin crew for real time review and advice on medical emergencies.

Also, since responding on-board physicians play a pivotal role in our program, American places a great emphasis on honoring these professionals. We do feel that a responding physician, though he or she voluntarily comes forward seeking no reward, should be recognized in some form.

However, American concurs with the American Heart Association in urging that some form of universal "Good Samaritan" legislation guaranteeing a qualified immunity from liability to responding physicians and the air carrier would serve to enhance programs such as American's, and further encourage physicians to respond.

Finally, American continues to pioneer and explore on-board medical telemetry systems, and have recently conducted successful tests in coordination with NASA and academic university centers. These systems would relay video, pulse, blood pressure, blood oxygen, EKG, and other vital real time medical data to a ground-based physician, from which where advanced medical care can be directed.

Summary

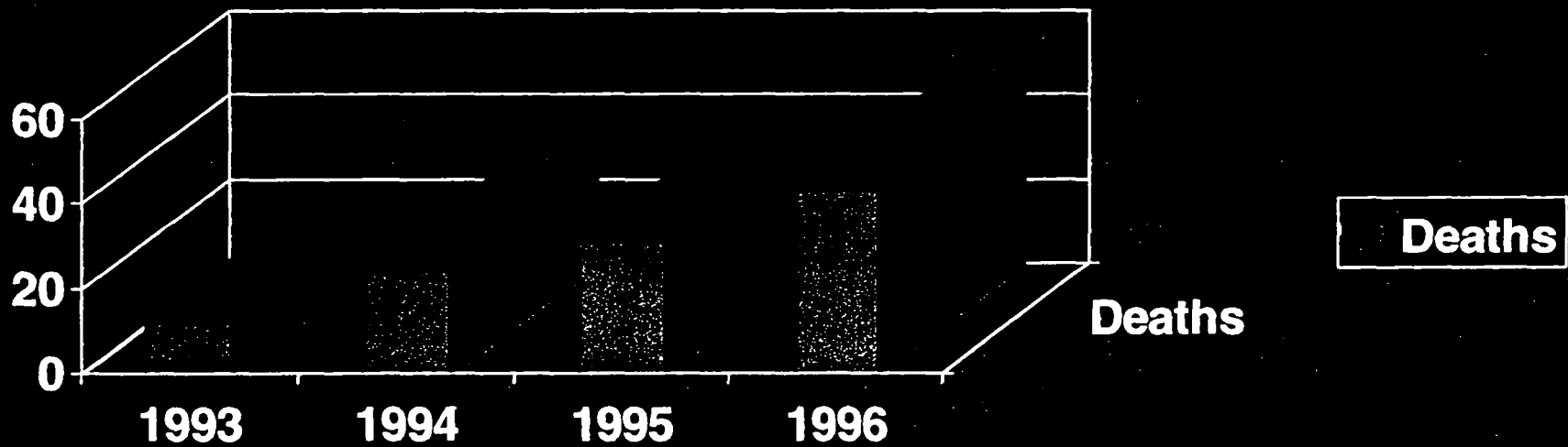
In closing, if there was one singular premise that was the foundation for our decision to place this lifesaving capability on board, it was the medical aphorism: *primum non nocere*, or 'First, do no harm.' Aviation medicine involves not only dealing with the health concerns of people, but the unusual environments in which those people go. In commercial air travel, that

environment is temporally remote from medical care. By not having the tools available to respond to a medical crisis, we felt we were not doing our best to be responsive to one of the most fundamental principles of medical and public health practice.

Therefore, placing defibrillators on board, and enhancing our medical kits, follows from a very simple review of the public health statistics pertaining to American Airlines, and from the very tenets of medicine itself. We felt it was the right thing to do. Being the public health physicians for a tremendously large traveling public, we are constantly and consciously making sure that on every flight every day, our passengers are kept clear of harm's way. This summer, that will extend to situations that are out of American's -- or anyone's -- control, such as sudden cardiac arrest. Our senior management recognized that this program would not be inexpensive—the program would certainly cost American Airlines substantial amounts of money. However, it certainly was the right thing to do for our customers, who are of paramount importance at American Airlines.

Thank you Chairman Duncan, Congressman Lipinski, Members of the Subcommittee. I am glad to answer any questions you may have.

In-Flight Death Patterns



Comparison of Domestic U.S. Carriers with International Carriers

	<i>Angina</i>	<i>Cardiac</i>	<i>Seizure</i>	<i>Allergy</i>	<i>Blood Sugar</i>
<i>U.S Carriers</i>	<i>Yes</i>	<i>No</i>	<i>No</i>	<i>Yes</i>	<i>Yes</i>
<i>Air Canada</i>	<i>Yes</i>	<i>No</i>	<i>No</i>	<i>Yes</i>	<i>Yes</i>
<i>British Airways</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Cathay Pacific</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Japan Airlines</i>	<i>Yes</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>Yes</i>
<i>Lufthansa</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Qantas</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>SAS</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Virgin Atlantic</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>

Comparison of Domestic U.S. Carriers with International Carriers

	<i>Mental Illness</i>	<i>Drug Overdose</i>	<i>Asthma</i>	<i>GI</i>	<i>Birth</i>
<i>U.S Carriers</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>
<i>Air Canada</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>No</i>
<i>British Airways</i>	<i>No</i>	<i>No</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Cathay Pacific</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Japan Airlines</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Lufthansa</i>	<i>No</i>	<i>No</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Qantas</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>SAS</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>Yes</i>	<i>No</i>
<i>Virgin Atlantic</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>

Other Airline Comparisons

Medical Diversion/Billion RPM*

	1991	1992	1993	1994	1995
American *	<i>1.29</i>	<i>0.77</i>	<i>0.92</i>	<i>1.30</i>	<i>1.52</i>
Air Canada*	<i>0.59</i>	<i>1.60</i>	<i>1.38</i>	<i>0.87</i>	<i>0.90</i>
Air Alaska	-	-	-	<i>1.57</i>	-
America West	-	-	-	<i>1.48</i>	-
Canadian*	-	<i>0.64</i>	<i>0.70</i>	<i>0.27</i>	<i>0.65</i>
Continental	-	-	<i>0.60</i>	<i>0.93</i>	-
Delta*	<i>1.55</i>	<i>1.89</i>	<i>1.63</i>	<i>1.33</i>	-
Northwest	-	-	-	<i>1.40</i>	-
United *	<i>0.31</i>	<i>0.26</i>	<i>0.21</i>	<i>0.42</i>	-

* expressed as 10⁹

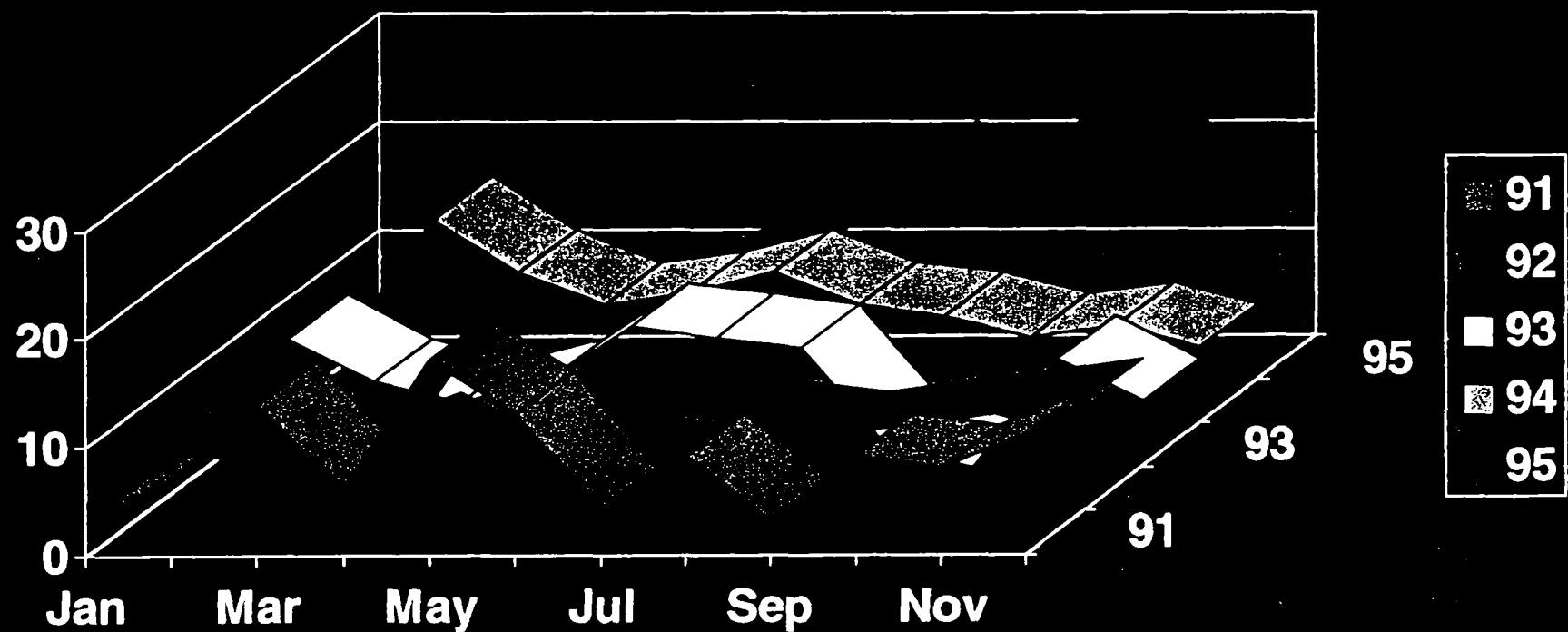
** Airlines with In-House Medical Departments

FAA-Required Medical Kit*

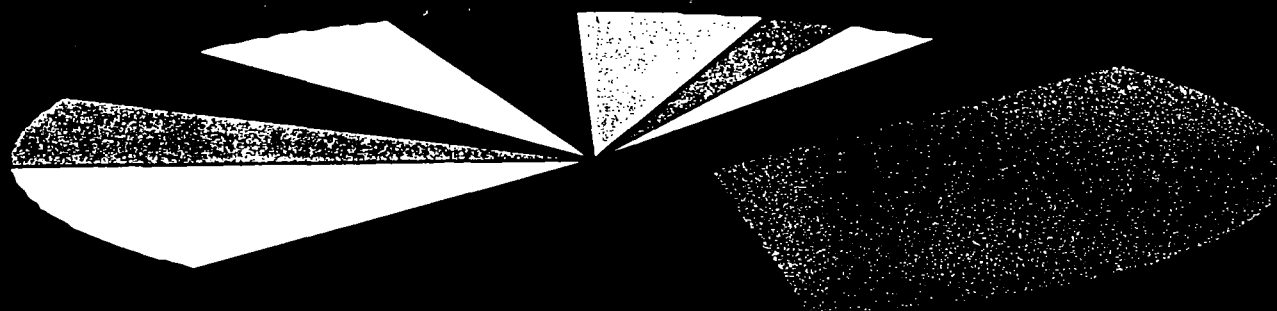
- ◆ Oropharyngeal Airway
- ◆ Blood Pressure Cuff
- ◆ Antiseptic Wipes
- ◆ Tourniquet
- ◆ Stethoscope
- ◆ Sterile Gloves
- ◆ Dextrose
- ◆ Hypodermic Needles
- ◆ Hypodermic Syringes
- ◆ Diphenhydramine
- ◆ Nitroglycerin
- ◆ Epinephrine

**Kit contents selected based on FAA usage research*

Summary of Emergency Medical Landings, 1991-1995



Medical Reasons for Diversions*



■ Cardiac	Unconsciousness	■ Seizures
■ Unknown	Psychiatric	■ GI
Hemorrhage	■ Ob/Gyn	Asthma
■ Turbulence/Burns	Diabetes	Infections

**112 diversions, 1994 data*

05/20/97 18:05
21-MAY-1997 08:32

202 822 9075

BOROS & GAROFALO

002

FROM QANTAS PUBLIC AFFAIRS

TO

0001512020229075

P.02

QANTAS

Qantas Airways Limited
ACN 009 661 901

Qantas Centre
203 Coward Street
Mascot, NSW 2020
Australia

Telephone: (02) 9691 3636
Telegraphic: Qantas Sydney
Telex: AA20113

U.S. HOUSE OF REPRESENTATIVES
TRANSPORTATION AND INFRASTRUCTURE COMMITTEE
AVIATION SUBCOMMITTEE

QANTAS TESTIMONY, Wednesday 21 May:
The Qantas Cardiac Arrest Program

WITNESS: Dr Eric Donaldson
General Manager Aviation Health Services
Qantas Airways Ltd

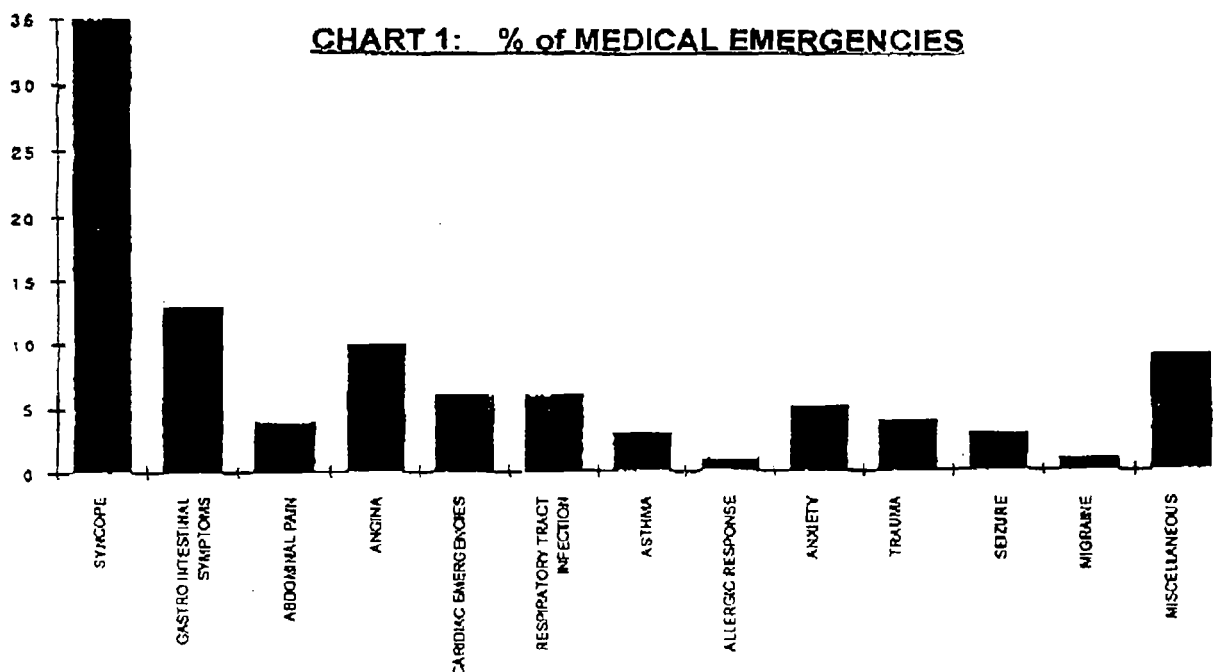
ADDRESS: Aviation Health Services
Qantas Airways Ltd
Admin Building B, Level 2
Qantas Jetbase
Qantas Drive
MASCOT NSW 2020
AUSTRALIA

CONTACT: Phone - +61 2 9691 3636
Facsimile - +61 2 9691 8341

DR ERIC DONALDSON
BRIEF SUMMARY: QANTAS TESTIMONY
AVIATION SUBCOMMITTEE, U.S. HOUSE OF REPRESENTATIVES

STATISTICS/DATA ON INFLIGHT EMERGENCIES

Qantas carries approximately 6,000,000 international passengers per year and has an incidence of inflight death of one per million passengers carried.



WHY DID QANTAS GO DOWN THIS PATH?

Equipment for the physicians' kit was chosen to meet predictable life threatening emergencies, i.e. hypoglycaemic coma, anaphylactic shock, status asthmaticus etc. and to manage sudden unexpected cardiac arrest.

QANTAS CREW TRAINING

All Qantas cabin crew must have a First Aid certificate before employment. Their cardio pulmonary resuscitation skills are refreshed every year and in addition the Flight Service Directors (senior flight attendants) receive one full day's training on the use of the defibrillator initially, and then six hours refresher training each year.

DID QANTAS HAVE ANY LIABILITY CONCERNS WITH THIS PROGRAM

The use or non-use of the Qantas medical kit has not been the subject of any legal action.

USE OF 3RD PARTY PHYSICIANS IN AIRLINE MEDICAL EMERGENCIES

It is a credit to the profession that medical practitioners do selflessly volunteer to provide assistance to fellow passengers in distress. In the Qantas experience, practitioners who do respond to the public address announcement on the aircraft or in the airport terminal are well aware of their professional limitations and act well within their abilities.

QANTAS AIRWAYS LTD.
SYDNEY, 20 MAY 1997