Federal Air Surgeon's
Medical Bulletin

Aviation Safety Through Aerospace Medicine

Vol. 42, No. 1
2004-1

For FAA Aviation Medical Examiners, Office of Aerospace Medicine Personnel, Flight Standards Inspectors, and Other Aviation Professionals.

U.S. Department of Transportation
Federal Aviation Administration

HEADS UP


Dr. Fraser


Dr. Silberman


Telly Award

QUICK FIX
Airman Medical History Errors

By Richard "Dick" Jones, MD

Problem. There are two places on the front of the FAA Form 8500-8 (Application for Airman Medical Certificate or Airman Medical and Student Pilot Certificate) where airmen are required to expand on their medical history. These are the "explanations" part of Item 18 and the "reasons" section of Item 19. Sometimes, aviation medical examiners (AMEs) or their staff members (when entering applicant exams into the Document Imaging Workflow System) are paraphrasing the information that the airman writes, instead of transcribing the information verbatim, usually to save space or in an attempt to clarify the statements.

The *Guide for Aviation Medical Examiners* intentionally requires all entries on the front of the FAA Form 8500-8 to be written by the airman because this history becomes a legal document. If someone transcribes changed information into the electronic record, the airman can no

Continued on page 3

Transmission of FAA Form 8500-8 Via the Internet for International and Military/Federal AMEs: *Time To Change*

By Bobby Ridge

CURRENTLY, INTERNATIONAL and military/federal aviation medical examiners (AMEs) are not required to transmit their FAA Form 8500-8s via the Internet, as stated in the FAA Order 8520.2E, *Aviation Medical Examiner System* (under Appendix D in the *Guide for Aviation Medical Examiners)*. However, after reviewing AME Performance Summary Reports, there is an obvious indication that transmitting these forms certainly will improve the submission delays that are now being blamed on postal systems worldwide.

Internet transmission of FAA physicals was instituted to help further the ultimate goal of correct and same-day certification for all airmen. For international examinations,

Continued on page 3

IMPORTANT NOTICE

German AME Seminar Planned

This is an excellent opportunity for AMEs living within a reasonable distance of Seeheim, Germany, to attend a seminar that meets FAA requirements for recurrent training— without the expense of traveling to the U.S. Drs. ***Melchor Antuñano, Warren Silberman****, and* ***Richard Jones****, all from the Civil Aerospace Medical Institute, will be presenting at the seminar, along with many European medical experts. —Ed.*

The German Academy for Aviation and Travel Medicine announces that it will host its first aviation medical examiner (AME) seminar in Germany. The seminar is certified by the Federal Aviation Administration as meeting the requirements for recurrent AME training, as well as by the Joint Aviation Authority.

The seminar will be held in Seeheim, which is near Frankfurt, from July 1 through 4, 2004.

For more information and an application form:

- On-line: www.flugmed.org (click "Lehrgänge" and "Intern. AME Seminar").
- E-mail: daf.frankfurt@t-online.de

Convincing Our International Colleagues

Some of our international colleagues have concerns about the adequacy of our medical standards and the required scope of our routine medical examinations: What they ought to consider.

By Jon L. Jordan, MD, JD

The Federal Air Surgeon's Column

By Jon L. Jordan, MD, JD

Several years ago, I wrote an article for the *Bulletin* focusing on world leadership in aviation[FASMB, fall 1996, p. 3]. I wrote how we in the Office of Aerospace Medicine develop and implement aeromedical standards, airman medical certification, aviation physiology, and accident investigation research.

I wrote the article because of questions raised by an aviation medical examiner as to why we should place emphasis on international involvement. The AME's point was that resources might be better spent on solving some of our own domestic issues.

Federal Air Surgeon's Medical Bulletin

Library of Congress ISSN 1545-1518

Secretary of Transportation
Norman Y. Mineta

FAA Administrator
Marion C. Blakey

Federal Air Surgeon
Jon L. Jordan, MD, JD

Editor
Michael E. Wayda

The Federal Air Surgeon's Medical Bulletin *is published quarterly for aviation medical examiners and others interested in aviation safety and aviation medicine. The* Bulletin *is prepared by the FAA's Civil Aerospace Medical Institute, with policy guidance and support from the Office of Aerospace Medicine. An Internet on-line version of the* Bulletin *is available at:* http://www.cami.jccbi.gov/AAM-400A/fasmb.html

Authors may submit articles and photos for publication in the Bulletin *directly to:*

Editor, FASMB
FAA Civil Aerospace Medical Institute
AAM-400
P.O. Box 25082
Oklahoma City, OK 73125
e-mail: Mike.Wayda@faa.gov

As you might imagine, I pointed to the rapid worldwide growth of travel by air and that American citizens find themselves dependent on foreign air carriers, foreign aviation systems, and foreign-manufactured airplanes to reach their destinations – in other words, worldwide safety for the flying public. What I did not mention is the objective of ensuring, in so far as possible, that airmen found qualified under our medical standards and certification practices are accepted internationally as being medically qualified.

Some of our international colleagues have concerns about the adequacy of our medical standards and the required scope of our routine medical examinations. Admittedly, other than resting electrocardiograms for first-class certificate applicants and urine examinations for all classes of certificates, no special routine medical testing is required under our medical standards. Finding pathology, therefore, is dependent on the historical information provided by the applicant and the general physical examination conducted by the aviation medical examiner. One might ask whether this is enough? I believe our excellent safety record answers the question.

In addition, there is the issue about the flexible approach we take in determining the medical competence of an airman who has a history of a significant medical condition and, therefore, does not meet the requirements of the established medical standards. Airmen with a wide variety of medical conditions are evaluated on an individual basis, and we exclude relatively few medical conditions from consideration.

Experience has validated the appropriateness of our medical certification practices. Our accident data indicate that airmen granted Authorizations and special-issuance medical certificates are significantly less likely to be involved in accidents than airmen who have not. On the whole, medically related accidents are rare, whether in relationship to the scope of our medical examinations or the issuance of certificates to persons with a history of known pathology.

All physicians have an inclination to apply preventive medicine practices when dealing with people. I believe that this may drive some of the thinking in countries that have established standards more comprehensive than ours. Promoting health is an appropriate thing for physicians to do but, as persons with regulatory oversight responsibilities, I think that so long as the individual's health does not compromise safety, he or she should be permitted to fly.

The same is true when making medical certification decisions concerning persons with medical conditions that we know are likely to be progressive. If we can (without compromising aviation safety) provide the opportunity for these persons to participate in aviation activities, we ought to do so. Recognizing that an individual eventually will be unable to meet our safety criteria should not influence us in arriving at a favorable decision.

We have developed one of the most, if not the most, comprehensive systems in the world for assuring the medical qualifications of airmen. Our AMEs are carefully selected, trained, and monitored. We provide centralized oversight of their work through a sophisticated electronic processing system that guarantees correct decision-making. We have staffs here in Washington, in our

Continued on page 3

INTERNATIONAL from page 1

18.2% reach the Aerospace Medical Certification Division (AMCD) more than 60 days after the examinations were performed. This exposes the FAA to significant liability, as 14 CFR, Part 67 makes it very difficult to recover an improperly issued medical certificate from an airman after 60 days have passed. The AMCD is now issuing error letters each time an examination is received late. Evaluation of error letters will be a major part of future AME performance reports. These error letters will be a significant factor in determining an AME's eligibility for redesignation.

We encourage international and military/federal AMEs to transmit their FAA Forms 8500-8 via the Internet. Transmission of examinations will save you mailing costs over using priority mail to avoid delays, speed processing for your airmen, and eliminate certain errors. Because of legal issues, you will have to mail in the hardcopies of the Form 8500-8, but you do not have to complete the back of the form. You may batch mail the Form 8500-8s to the AMCD at the end of each month, unless a certificate has been deferred or denied.

EDITORIAL from page2

regional offices, and in Oklahoma City that are trained and highly qualified to administer the system. I believe this comprehensive oversight more than compensates for any value that might be realized through more comprehensive routine medical testing of applicants.

In hopes of arriving at greater commonality in medical standards and certification practices, we will continue to interact with medical representatives from the international community, sharing our experiences in certification of airmen and administration of our standards. While I am convinced that our medical standards are appropriate and effective, and our certification decisions are correct, convincing certain segments of the international community presents a challenge.

JLJ

If you can connect to the FAA Internet site, you will be able to transmit the FAA Form 8500-8. After entering <www.cami.jccbi.gov>, click on the link labeled AMCS/DIWS. This will bring up the on-line support page, then click on the LOGIN button. If you can view the login page, then you are capable of transmitting Form 8500-8.

It will be necessary for you to apply for a username and password. Apply by fax, E-mail, or mail.

Fax (405) 954-3917

E-mail

9-amc-aam-certification@faa.gov

Mail

Federal Aviation Administration
CAMI, AAM-300
P.O. Box 26080
Oklahoma City, OK 73125

The application form will be returned to you by E-mail, fax, or mail, depending on your preference. Return the completed form per the instructions shown on the form. Your username and password will be mailed to you in two separate envelopes the day after your request is received.

The Internet-based system requirements will accommodate any computer system—regardless of operating system—that is capable of supporting:

- An Internet Protocol (IP) dial-up or local area network connection
- An Internet Service Provider (ISP) to provide the IP dial-up or network connection
- Any reliable Internet browser capable of 128-bit encryption, e.g., Microsoft Internet Explorer®, Netscape Navigator®.

For more information about system requirements and recommended hardware and software, visit <http://www.cami.jccbi.gov/cgi-bin/Start/amcssupport.htm>, scroll down to the INFORMATION links under the AMCS/DIWS LOG IN page. Under it you will find System Requirements. Also, check out other useful information items: Quick Tips, Frequently Asked Questions, and Limitations.

Bobby Ridge is the AME Program Analyst for the International and Military/Federal Region at CAMI's Aerospace Medical Education Division.

✈

QUICK FIX from page 1

longer be held legally accountable for the information. Sometimes the transmitted information is inaccurate and actually prejudicial to the airman; this can cause the AME legal problems.

Result. One of the Regional Flight Surgeons recently brought two cases to our attention where the changed information caused problems for the airman, prompting this article. Apparently, the airmen had been required to attend some type of training for a traffic stop, in lieu of convictions. The transmitted information was converted to "DUI" as their complete statements. These airmen may have been found to have breath alcohol levels below the legal limit but above what might have been considered safe for driving; without further details, it is hard to know. Apparently, neither airman had actually been convicted of a DUI, but because they were required to have remedial education for some infraction, it is appropriate that they reported the events. They are, nonetheless, entitled to be upset with their AMEs for the modification of their histories.

It would also be unfortunate if the reverse occurred and an airman-provided history of a DUI was changed to minimize the history. Since the national database is checked for a history of alcohol-related convictions on all applicants, an airman could be initially accused of falsification of the history when the database check reveals an (ostensibly) unreported alcohol incident. Once again, the airman might be justifiably upset with the AME.

Solution. All entries by the airman on the FAA Form 8500-8 must be transcribed to the Internet-based record precisely as the airman wrote them. The AME has sufficient opportunity to request the airman to expand on or to modify this written history when reviewing the form with the airman.

Dr. Jones manages the Aerospace Medical Education Division at the Civil Aerospace Medical Institute.

✈

Certification Update

Information About AME-Assisted Special Issuances

By Warren S. Silberman, DO, MPH

YOU SHOULD BE AWARE that *Permax* (pergolide), a medication that is used as an adjunct to levodopa/carbidopa in patients with Parkinsonism, has been found to cause sudden falling asleep, especially during activities and can occur while driving a motor vehicle. Therefore, we no longer allow medical certification of airmen taking this medication. This is much the same warning that came with the Parkinson medications *Mirapex* (pramipexole) and *Requip* (ropinirole), which are also unacceptable now for medical certification as a result of this warning. We have also decided to deny all those airmen who are currently taking this medication. Prior to the denial letter being sent, a legal instrument examiner will phone airmen to inform them what is going to occur and why.

The Aerospace Medical Certification Division has also been in discussions with the Medical Specialties Division in Washington about the use of *Orthokeratolgy* for correction of refractive error. This procedure is already permitted for the treatment of keratoconus in airmen upon receipt of a favorable FAA Eye Exam (Form 8500-7). The guidance is as follows:

> Orthokeratology is acceptable for medical certification purposes, provided the airman can demonstrate corrected visual acuity in accordance with medical standards defined in 14 CFR Part 67. When corrective contact lenses are required to meet vision standards, the medical certificate must have the appropriate limitation annotated (MUST WEAR CORRECTIVE LENSES). Advise airmen that they must follow the prescribed or proper use of orthokeratology lenses to ensure compliance with vision standards. Airmen should think about how they wear their lenses to modify their corneas in relation to their flying habits so that their visual acuity is within standards during the time period of flight. Airmen should also consider changes or extensions of their work schedules when deciding on orthokeratology retainer lens use.

Another inquiry since the last *Bulletin* concerned the *Crystalens*, a model AT-45 accommodative intraocular lens (IOL). Per the *Ophthalmology Times*, the lens affords patients clear, uncorrected vision at near, intermediate, and distance. Once inserted, it was found that the ciliary muscle allows it to adjust the vision. The lens was approved in November of 2003. Now that it is in wide use, there have been some issues with glare. Prior to accepting it for flying, we are going to wait one year to evaluate the secondary effects.

We also need to reiterate that the uses of multifocal lenses, either as contacts or as intraocular lenses, are **unacceptable** at this time. They can cause glare and halos at night, even requiring the use of the unacceptable topical medication Pilocarpine!

Now, let's do some cases. Note, only the Federal Air Surgeon or his designees, the Regional Flight Surgeons, and the Manager, Aerospace Medical Certification Division, can authorize a waiver or special issuance.

1 Richard Reid, a 35-y/o airman from Florida with a British accent, comes to you for a 1st-class medical certificate. His history is negative, with the exception of an appendectomy at age 10. You have not seen him before. He claims to have had a medical certificate by the Civil Aviation Authority in the United Kingdom for carrying cargo. As an AME who keeps up with the information from the Federal Air Surgeon, you ask him for some identification, and he produces a current British passport. He claims to live at the Warren Short Term apartments on Bin Laden Blvd. You find him to be healthy without any disqualifying defects, but in this current world situation (especially in America), you find his whole story does not "sit right" with you. What should you do?

Answer: In the case where you find nothing that disqualifies the airman you have evaluated, you should issue the medical certificate. After the airman leaves your office, call your Regional Flight Surgeon's office or the Aerospace Medical Certification Division (AMCD) to report your uncomfortable feelings. We shall call FAA Security to check the airman out.

2 Napoleon Fry, a 49-y/o 1st-class pilot with a major carrier, comes to your office. You note on his history that he has 10,000 flight hours. He reports a history of a "delusional disorder." He has been on various medications for this condition and was hospitalized several times in the past. He informs you that he has been off all medications since September of 2003 and that he has had no problems since then. He comes prepared with a note from his treating psychiatrist that confirms all of this history. You also read that during one of his delusional episodes, he diverted his jet filled with passengers to another airport because he thought that someone had drained some of the fuel out of the plane prior to departure. Now that he has been asymptomatic for five months and not requiring any medications, he is "good to go," — right?

Answer: No, he is not. The DSM IV Manual categorizes delusional disorders in the chapter on *Schizophrenia and Other Psychotic Disorders.* As a physician, do you even think that discontinuing the medication on such an individual was proper care? The AMCD has requested current psychological testing on this airman and will forward this case to the Federal Air Surgeon for review.

3 Jake Clanton was recently paroled after 20 years in prison. He was incarcerated for murdering his best friend. His lawyer had argued that it was self-defense, but the jury didn't see it that way and sent him to prison. The Parole Board thought he was rehabilitated and, because he is now 75 years old, granted him a parole. He has been working as the grounds keeper for a local country club. While in jail, he read a great deal

Continued ➤

Dr. Silberman manages the Civil Aerospace Medical Institute's Aerospace Medical Certification Division.

about flying and wants to take lessons to gain his Private Pilot's License. He comes to you with this history. He also comes well prepared with a letter from his parole officer, his supervisor at work, and the psychologist who saw him while in prison. So, would you issue a medical certificate to this fellow?

Answer: Just because Jake was labeled a "murderer" doesn't mean that he is automatically ineligible for medical certification. If the remainder of the history and physical examination does not elicit any disqualifying disorders and all the provided documentation is favorable, then you could issue the medical certificate. A phone call to the Regional Medical Office or AMCD to go over the case would also be a good idea.

4 Ramón Courvoisier is a 1st-class airman on an authorization for special issuance for alcoholism. As a requirement for this authorization, he is to provide quarterly reports from his aftercare facility and employee assistance representative at his airline. He is also required to be followed by an approved AME who has been trained by the Human Intervention Motivation Survey (HIMS) course to follow airmen with substance dependence and abuse disorders. The airman decides to go to you; however, you have not received the required training to follow these airmen. The airman claims that he has a "personality conflict" with the assigned AME. He has not contacted the FAA or even the medical office at the airline to relate this. You issue an unlimited medical certificate. Was this correct?

Answer: No it was not! Airmen that are followed through the HIMS Program are given strict requirements to follow to maintain their medical certification. Following these requirements is seen as a step towards the maintenance of their sobriety. Don't you think that this airman is trying to be manipulative? Can you trust that he is sober? The AME did know that the airman had a special issuance for alcohol dependence. This airman's authorization for special issuance was withdrawn by the AMCD for not complying with the special issuance letter.

5 Jose Cuervo goes to you for a 3rd-class private pilot medical examination. On his history, he reports several "Driving While Intoxicated" offenses. You have never seen him before. He currently reports 20 hours of flight time. His initial DUI offense was in 1995 while going to bartender school. He informs you that he had been sampling his mixed drinks before he was stopped by the Highway Patrol, and he blew a .08% (the limit for his state was 0.08%). The next offense was in 1999 when he was stopped for erratic driving. His level at that time was 0.15%. He related that he was at a wine-tasting seminar and this was "job related." The most recent offense was in 2001 when he was stopped by the local police and tested. He claims that he was at a party and drinking. While waiting for his friend to drive him home, a police officer drove up and asked why his car was parked in a no-parking zone out front of an apartment building on a busy street. He said he got into the car and was about to move it, but he was cited for DUI. That time he blew a 0.25%. He says he has "not drank a drop since." So, you issue a medical certificate. Was this a correct decision?

Answer: No, it was not. Even though the airman claims he has not drunk for three years, do you believe him? How many times has he driven and not been stopped? What do you think about an alcohol level of 250 mg%? Might he be demonstrating tolerance? AMCD has a rule that three DUI offenses in a lifetime require a denial. You should recall that substance dependence and abuse are specifically disqualifying medical conditions. To be considered for a medical certificate for any class, this airman will require current psychiatric and psychological evaluations. We have seen many times when either the interviewing psychiatrist or psychologist will not make a diagnosis of dependence while the other one does. This is the reason for the requirement for both.

✈

Denial of Health Insurance and Medical Certification

Are They Mutually Exclusive?

By Donato J. Borrillo, MD, JD

Question **18(t)** on the FAA Form 8500-8 (Application for Airman Medical Certificate or Airman and Student Pilot Certificate) asks if the airman has been rejected for life or health insurance. Pursuant to the *Guide for Aviation Medical Examiners* (AMEs), the examiner should inquire regarding the circumstances of rejection and record the history in item number 60. Disposition (denial or deferral) will depend upon whether or not the rejection or denial was due to a medical condition that still exists or is disqualifying.

Recent changes in healthcare law have decreased this question's positive predictive value, and it is incumbent upon the AME to understand how an applicant can answer "no" and still have a pre-existing condition.

The Health Insurance Portability and Accountability Act of 1996 (HIPAA), took effect January 1, 1998, and set strict limits on the ability of health insurance companies and self-insured health plans to apply traditional pre-existing condition restrictions to new participants. State laws regulating access to, and premiums for, small group and individual policies vary widely; however, most states simply have enacted minimum standards to comply with HIPPA, while others have enacted laws that go well beyond HIPPA requirements.

A "pre-existing condition restriction" is a health plan's limit on coverage for (or, in some cases, refusal of coverage for) conditions in existence prior to an individual's eligibility for coverage under that plan. Historically,

Continued on page 16

Is There a Doctor on This Flight?

Medical intervention that a physician may provide could change an otherwise negative outcome into a positive one for a passenger in medical distress. Having enhanced emergency medical equipment available may provide passenger physicians some reassurance.

By Judi Citrenbaum

Maybe it's happened to you. You're on a flight for business or pleasure; you're settled into your seat catching up on paperwork, watching a movie, or enjoying a good book when the captain asks if a physician would be available for a fellow passenger in need of medical assistance.

While you probably wouldn't hesitate to offer assistance, it is quite normal to feel somewhat apprehensive because, let's face it— all things being equal— an airliner is not an optimal environment in which to render medical assistance. It isn't only a matter of having reduced space, it's also a matter of the other normal circumstances of flight— reduced air pressure, reduced humidity, high ambient noise levels, possible air turbulence, and delayed access to the most effective hospital care.

Compounding the logistics is the matter of being called upon to advise or treat someone who is not a patient and whose medical history is completely unknown to you. Because in-flight medical events appear to occur somewhat randomly, however, it would be ludicrous to imagine that airliners could be reconfigured or that passengers could be asked to travel with medical records at the ready to accommodate the possibility of such an event occurring. One thing, however, is clear—the days of

having to request flight attendants to ask passengers to rummage through their carry-on baggage for oral antihistamines, non-narcotic analgesics, or whatever may seem appropriate, have all but vanished.

Most large, passenger-carrying aircraft now carry enhanced emergency medical kits (EMKs), more comprehensive than the basic, 11-piece EMK heretofore mandated. Most also carry automated external defibrillators (AEDs) and have flight attendants trained in their usage. Moreover, effective April 12, 2004, the Federal Aviation Administration (FAA) mandates that all large, passenger-carrying aircraft with a maximum payload capacity of more than 7,500 pounds, and serviced by at least one flight attendant, carry on board at least one enhanced EMK and at least one AED.

Title 14 of the Code of Federal Regulations, Part 121, Appendix A, specifies that specific items must be carried in EMKs (see Table 1).

In making the determination to regulate, the FAA considered several factors, in addition to what it had learned from its own studies and data collections. To begin with, the existing regulation had not been modified since 1986, except to add protective gloves. Further, beginning in the mid-1990s, the increase in number of portable, easy-to-use AEDs being made available for use in public places provided cause to consider their potential for usage on board commercial airliners and, indeed, many air carriers sought FAA approval to begin carrying them on board. With more air carriers adding not only AEDs but also enhanced EMKs, the FAA faced certain, unique airworthiness and inspection oversight issues most appropriately addressed by means of regulation. Finally, the Aviation Medical Assistance Act, enacted on April 24, 1998 [Pub. L. 105-170, 49 USC 44701], directed that the FAA evaluate the adequacy of emergency medical equipment and any concomitant need for enhanced crewmember training.

While the FAA considers regulatory action justified and provided a 3-year window (from April 12, 2001 to April 12, 2004) for affected air carriers to come into full compliance, it fully recognizes that the availability of these enhancements do not eliminate the logistical and medical difficulties experienced in attempting to

Ms. Citrenbaum is a program analyst in the Office of Aerospace Medicine at headquarters. She served as team leader on the FAA Emergency Medical Equipment rulemaking teams.

Continued on next page ➤

effectively treat a passenger while in flight. Therefore, the intent is not to raise expectations in the passenger or physician community regarding the level of medical care available in flight. On-board medical assistance will continue to be discretionary and must be regarded as emergency treatment, with no unrealistic expectations of favorable outcomes for passengers experiencing medical distress in flight. For this reason, it is likely that the Aviation Medical Assistance Act provides a "Good Samaritan" clause that limits "non-employee passenger liability." This means that persons, such as passenger physicians, who are not employed by the airline and who, in good faith, offer their assistance, will not be held liable unless the assistance is "grossly negligent" or is "willful misconduct."

Limitations notwithstanding, medical intervention that a physician may choose to provide could change an otherwise negative outcome into a positive one for a passenger in medical distress. It is hoped that having enhanced emergency medical equipment available may provide passenger physicians some reassurance the next time the captain asks if there is a doctor aboard.

For further information, download a copy of the following:

- The Aviation Medical Assistance Act:
  http://dmses.dot.gov/docimages/pdf48/84064_web.pdf
- The Emergency Medical Equipment Notice of Proposed Rulemaking:
  http://dmses.dot.gov/docimages/pdf47/80979_web.pdf
- The Emergency Medical Equipment Final Rule:
  http://dmses.dot.gov/docimages/pdf62/126161_web.pdf

✈

Table 1. Mandated items to be carried in airline medical kits.
Note: Modifications to the previous mandate are shown in **bold**.

CONTENTS	QUANTITY
Sphygmomanometer	1
Stethoscope	1
Airways, oropharyngeal (3 sizes): 1 pediatric, 1 small adult, 1 large adult or equivalent	3
Self-inflating manual resuscitation device with 3 masks (1 pediatric, 1 small adult, 1 large adult or equivalent)	1: 3 masks
CPR mask (3 sizes), 1 pediatric, 1 small adult, 1 large adult, or equivalent	3
IV Admin Set: Tubing w/ 2 Y connectors	1
Alcohol sponges	2
Adhesive tape, 1-inch standard roll adhesive	1
Tape scissors	1 pair
Tourniquet	1
Saline solution, 500 cc	1
Protective nonpermeable gloves or equivalent	1 pair
Needles (2-18 ga., 2-20 ga., 2-22 ga., or sizes necessary to administer required medications)	6
Syringes (1-5 cc, 2-10 cc, or sizes necessary to administer required medications)	4
Analgesic, non-narcotic, tablets, 325 mg	4
Antihistamine tablets, 25 mg	4
Antihistamine injectable, 50 mg, (single dose ampule or equivalent)	2
Atropine, 0.5 mg, 5 cc (single dose ampule or equivalent)	2
Aspirin tablets, 325 mg	4
Bronchodilator, inhaled (metered dose inhaler or equivalent)	1
Dextrose, 50%/50 cc injectable, (single dose ampule or equivalent)	1
Epinephrine 1:1000, 1 cc, injectable, (single dose ampule or equivalent)	2
Epinephrine 1:10,000, 2 cc, injectable, (single dose ampule or equivalent)	2
Lidocaine, 5 cc, 20 mg/ml, injectable (single dose ampule or equivalent)	2
Nitroglycerine tablets, 0.4 mg	10
Basic instructions for use of the drugs in the kit	1

Transient Global Amnesia

Transient global amnesia (TGA) is a prognostically benign condition with an annual incidence of up to 32/100,000 individuals aged 50 and older (1). This condition is disqualifying, and special issuance consideration must be deferred to the FAA for all classes. In this article, a TGA case report of an airline transport pilot is presented along with a discussion of the syndrome and its aeromedical implications.

Case Report, by Rod Friend, MD, MPH

A **52-YEAR-OLD MALE** airline pilot reported the day his symptoms began as starting no different from any other. He went jogging in the morning and returned to his apartment. He then began to feel nauseated and took a shower, thinking it would help him to feel better. The next thing he recalls is "awakening" that evening in the emergency department of the local hospital.

The patient's recently estranged wife provided the remainder of the history. About 2:00 PM that day, she received a call from the airman who related to her that something had happened to him. He asked if they were divorced and asked her where he was and what apartment he was in. About ten minutes later, he called back and asked the same questions. He was bewildered and emotionally distressed. The airman's wife went to his apartment and took him to the emergency room. He continued to repetitively ask questions regarding his condition.

In the emergency department, the patient's vital signs were normal. He denied dizziness, and his presenting neurological exam was normal, as was an EKG and urine toxicological screen. The patient could recall his own name and could recognize his wife and child but had difficulty making any new lasting memories. He persisted with repetitive questioning regarding his condition, location, and purpose for being there. A head CT and eventual MRI of the brain, with and without contrast, were normal. Metabolic labs, including a thyroid screen, were also normal. The patient began to recover about 5:30 that evening and regained the ability to form new memories. He was released the next day with no apparent sequelae. A comprehensive cardiac work-up, consisting of a transthoracic echo, Holter monitor, thallium stress test, and carotid ultrasounds, was also negative for pathology.

The patient later related stress associated with his impending divorce, having been married for many years. He was also involved with a major project and presentation at work. The patient's only other medical problem was hyperlipidemia controlled with Pravachol (pravastatin sodium). He denied any history of migraines and did not smoke. He had no history of either primary or reactive psychiatric illness. Both his father and mother had cardiovascular disease, manifesting at elderly ages. The patient was diagnosed as having suffered an episode of transient global amnesia.

Transient global amnesia. Transient global amnesia is a well-reported, yet enigmatic phenomenon. Hundreds of cases have been noted since the syndrome was described in the 1950s. Recently, authors have attempted to define the syndrome more stringently to establish a diagnostic standard. Hodges and Warlow (2) have advocated the following diagnostic criteria for TGA: 1) Attacks must be witnessed and information available from a capable observer. 2) Clear-cut anterograde amnesia must be present during the attack. 3) Clouding of consciousness and loss of personal identity must be absent and cognitive impairment limited to amnesia. 4) There must be no accompanying focal neurological symptoms or signs, and epileptic features must be absent. 5) Attacks must resolve within 24 hours. 6) Patients with a recent head injury or known active epilepsy are excluded. Patients with many other clinical entities may present with amnesia or an amnestic response as part of an overall symptomatology, and these need to be ruled out before the diagnosis of TGA can be made. These conditions can include alcoholic "blackouts," thromboembolic transient ischemic attacks, temporal lobe epilepsy, brain tumors, metabolic/toxic drug effects, intracerebral or subarachnoid hemorrhages, polycythemia, or possibly, malingering, or entities of a psychiatric origin.

Transient global amnesia is a syndrome in which the patient does not lose consciousness, only the ability to form new lasting memories. The patient is able to conserve immediate memory and personal identity. Motor function is not affected. Often, however, the individual will be disoriented to place and time. The patient will often recognize that something is wrong and will frequently become distressed at this realization. Case-control studies have shown an association between the following antecedent events or activities with the occurrence of episodes of transient global amnesia: physical exertion, sexual intercourse, emotional stress, physical symptoms such as nausea or headache, temperature extremes, and taking a bath or shower (1,2,3). The average age of patients with TGA is 62 (range 47-80) and the mean duration of the episode is 5.7 hours, with a range of 20 minutes to 20 hours (1).

Interestingly, patients whose attack lasts less than one hour have a higher frequency of eventually presenting with epilepsy, although the percentage of TGA patients who later manifest epilepsy is small (2). The attack rarely recurs and is prognostically benign, in contrast to individuals with transient ischemic attacks. The only statistically significant associated medical problem in patients with TGA is a prior history of migraine headaches (2). In fact, some authors suggest that the features of TGA are in keeping with a migrainous pathogenesis (4). In migraine attacks, there is a predilection for posterior circulation

Dr. Friend is a resident in aerospace medicine at the USAF School of Aerospace Medicine, Brooks City Base, Texas. He wrote this case report while rotating at the Civil Aerospace Medical Institute.

Continued ➤

RESOURCES

By Mike Wayda

New Pilot Trainer Joins 'Fleet'

The Civil Aerospace Medical Institute's Airman Education Program has added the GAT-II General Aviation Trainer to their "fleet" of training devices for use in their physiological training program. GAT-II is a multifunctional flight trainer that emulates the performance of a typical single-engine, general aviation aircraft.

It provides pilots with a realistic flight experience. For example, the trainer is so versatile that it can expose a pilot to different meteorological conditions, spatial disorientation illusions, instrument and engine failures, and mishap scenarios—depending on the training objectives.

The GAT-II's primary function while at home at CAMI is to demonstrate the effects of spatial disorientation to general aviation pilots taking physiological training courses.

CAMI's GAT-II Trainer

Program Leader **Rogers V. Shaw, II,** says there are plans to take the new trainer to the Experimental Aircraft Association's airshow at Oshkosh this year and to other major airshows.

The other physiological training devices in the Education Program's fleet are the GYRO simulators and one virtual reality spatial disorientation device.

CAMI offers two training programs for general aviation pilots:

- A one-day aviation physiology course with altitude chamber and vertigo simulator demonstrations.
- A one-day post-crash survival course.

For more information about attending CAMI's physiology and survival training classes, visit their Web site: www.cami.jccbi.gov/aam-400/AEP.htm or call (405) 954-4837.

AMNESIA (continued)

vessels, and precipitants frequently cited antecedent to TGA are known to bring on migraine in susceptible individuals. Studies also show no significance of cardiovascular disease among patients with TGA when compared to controls (2,5,6).

This seems to dispute the theory that TGA stems from a thromboembolic event, in contrast to patients who experience transient ischemic attacks with associated motor involvement. Some authors have espoused the theory that TGA is due to a localized temporal lobe seizure, though it would be extremely rare for the patient to present with only memory loss (7). In one study, 7% of people who experienced TGA later presented with epilepsy, usually within one year of the event (2). In these cases, it appears that epilepsy was masquerading as TGA, making strict adherence to the diagnostic guidelines important to assist in the exclusion of such cases.

Aeromedical Disposition. The FAA has recently determined a one-year waiting period is required before consideration for a special issuance of a medical certificate (all classes). This is an observation period to allow other diseases or disorders to become apparent, should they exist concomitantly in a patient with TGA. Because the exact etiology of this syndrome is unknown, potential causes that could lead to sudden incapacitation, such as a thromboembolic event from cardiovascular disease, must be ruled out. Though an EEG is not specifically required, the one-year waiting period is sufficient for observance of development of an epileptic event. This airman was evaluated in the context of his overall generally excellent health and completely negative cardiac work-up. The significant emotional stressors at the time may have played a role in precipitating the attack. The airman remained entirely symptom-free for a one-year period. He was granted a special issuance of a first-class certificate. The manifestation of other pathology would require reevaluation. If the airman were to have a recurrence of transient global amnesia, special issuance of a medical certificate would generally not be granted.

References

1. Zorzon M, Antonutti L, Mase G, Biasutti E, Vitrani B, Cazzato G. Transient global amnesia and transient ischemic attack: Natural history, vascular risk factors, and associated conditions. *Stroke.* 1995. 26(9):1536-42.
2. Hodges JR, Warlow CP. The aetiology of transient global amnesia. A case-control study of 114 cases with prospective follow-up. *Brain*. 1990. 113:639-57.
3. Miller JW, Petersen RC, Metter EJ, Millikan CH, Yanagihara T. Transient global amnesia: Clinical characteristics and prognosis. *Neuro*. May 1987: 733-7.
4. Caplan LB, et al. Transient global amnesia and migraine. *Neuro.* 31:1167-70.
5. Gandolfo C, et al. Prognosis of transient global amnesia: A long-term follow-up study. *Eur Neurol* 1992;32:52-7.
6. Nausieda PA, Sherman IC. Long-term prognosis in transient global amnesia. *JAMA.* 1979 Jan 26;241(4):392-3.
7. Fisher CM, Adams RD: Transient global amnesia. *Trans Am Neurol Assoc*. 1958. 83:143-6.

Gastrointestinal Stromal Tumors: Aeromedical Implications of Therapy

Case Report, by Kerry B. Patterson, MD, FCAP

Malignant Gastrointestinal Stromal Tumors (GISTs) are relatively uncommon aggressive tumors that, until recently, were difficult to manage and typically spelled an end to the flying career of an afflicted aviator. The case history presented here describes an airman with a pelvic GIST and the surgical and medical therapy that lead to re-certification. A brief discussion of future applicability of the novel treatment used in treating GISTs, as it may pertain to other serious malignancies, is also presented.

THIS 58 YEAR-OLD airman presents to the AME with a request for a third-class medical certificate. A multi-lobular 14 x 12 cm tumor had been detected on CT-scan in the midline lower pelvis. A CT-guided needle biopsy revealed a malignant spindle cell neoplasm consistent with a malignant gastrointestinal stromal tumor (GIST). Immunohistochemical studies showed diffuse strong staining for c-KIT (CD117) and were negative for smooth muscle actin. The light microscopic features and immunochemical-staining pattern was consistent with a GIST, rather than a true leiomyosarcoma.

Over the ensuing year, he underwent treatment with Gleevec (imatinib mesylate), resulting in significant shrinkage of the tumor that made the residual tumor amenable to adjuvant surgical resection. At surgery, a 10 x 10-cm pelvic mass was noted invading the terminal ileum with second focus invasion into the sigmoid mesentery and multiple peritoneal implants in the abdomen and lower pelvis. The tumor was completely resected, followed by an ileal cystecomy and ileocolic anastomosis, sigmoid resection and colorectal anastomosis, and resection of the peritoneal implants. No distant metastases were found during any of the physical exams, CT scans, or operative procedures.

His post-operative course was unremarkable, and his recovery has been excellent. He has taken Gleevec 600 mg daily for 15 months without any adverse side effects. Subsequent studies have revealed no recurrence of disease.

Aeromedical Concerns. The aeromedical concerns regarding GIST, like most maligancies, center around potential incapacitating metastases to the CNS and the impact of Gleevec, formerly known as STI-571. Gleevec has been formally approved by the FDA for treatment of Chronic Myelogenous Leukemia (CML) and c-KIT (CD117) positive malignant GIST, including metastatic and unresectable tumors.

Treatment with Gleevec is not innocuous and has been associated with adverse reactions, including edema, nausea, diarrhea, abdominal pain, muscle cramps, fatigue, and rash; most of these events are mild-to-moderate in severity and occur in 10% of patients taking 600 mg daily. Much less common (1-10%), infrequent (0.1-1%), and rare (< 0.1%) adverse events have been reported and are referenced in the Prescribing Information provided by Novartis Pharma AG, the manufacturer of Gleevec. Most of these side effects are rare, but the AME must be certain the airman is free of potentially impairing side effects if medical certification is sought. Infrequent, serious adverse effects have been described that include blurred vision, syncope, somnolence, hypotension, and cardiac failure.

Gastrointestinal stromal tumors are a subset of gastrointestinal mesenchymal tumors, which vary in differentiation. These tumors were formerly classified by pathologists as GI leiomyomas, leiomyosarcomas, leimyoblastomas, or schwannomas, depending upon their histologic presentation and relationship with the muscularis propria of the intestinal wall. Most tumors formerly classified as leiomyomas and leiomyosarcomas are currently designated as GISTs, but there remains a great deal of controversy regarding the diagnostic criteria of GISTs. Many authors exclude tumors of myogenic origin (e.g., leiomyosarcoma) and neurogenic origin (e.g., schwannoma) from GIST, while others have restricted the diagnosis to tumors expressing the CD117 and/or CD34 antigen.

These tumors present as well-demarcated, spherical masses that appear to arise from the intestinal wall along the GI tract. Rapid growth typically results in ischemic necrosis and hemorrhage within the tumor. Two cytological cell types have been described: spindle cell GIST, with nuclear palisading and perinuclear vacuolization histologic patterns, and epitheloid cell GIST, with solid and myxoid histologic patterns. Malignant tumors have higher mitotic activity. The cell of origin is believed to be the "interstitial pacemaker cell of Cajal," cells associated with regulating intestinal motility and peristalsis. These cells express both CD34 and CD117 antigens and are the only intestinal cells with these markers. Other immunohistochemical markers such as actin, desmin, and S100 are useful in distinguishing GIST from other intestinal neoplasms. While 10-30% of GISTs behave aggressively and are considered malignant, it is difficult to predict behavior histologically or on the basis of tumor size, as small benign-appearing tumors can have a clinically malignant course. Poor prognostic factors include tumor rupture, high cellularity, tumor necrosis, invasion or metastasis, and mutation in the c-KIT gene.

Continued ➢

Because of these difficulties, many pathologists advocate treating all GISTs as malignant entities and classifying them on a low-to-high grade scale. GISTs rarely spread to regional lymph nodes; rather, they invade locally. Hematogenous spread to the liver, peritoneum, lungs, bone, and (potentially) to the brain are of greater concern. Most metastases involve the liver (50-65%), peritoneum (21-43%), and less commonly, to the bone and lung (10%). CNS metastases are rare.

Fortunately, GISTs are rare and comprise less than 3% of all gastro-intestinal malignancies. Unfortunately, malignant GISTs are often (41-47%) metastatic at the time of clinical presentation. Malignant GISTs are very aggressive with survival rates of 69% at one year, 38-44% at 3 years, and 29-35% at 5 years. Even with complete gross resection of the tumor, 40% of patients experience recurrence with a median survival of 66 months. In nonresectable or incompletely resected primary tumors, the median survival time falls to 22 months.

There is no racial predilection of GISTs, they occur equally in both sexes, are not familial, and have a peak incidence in persons between 40-70 years. Fifty to seventy percent of GISTs occur in the stomach, 33% in the small bowel, 5-15% in the rectocolon, and 1-5% in the esophagus. When symptomatic, GISTs may produce abdominal pain, GI bleeding, and a palpable mass. Perforation occurs in 20% of cases and may be associated with peritonitis. However, intestinal obstruction is rare. Larger malignant GISTs may appear as complex masses on radiologic studies, but the radiological findings are often non-specific. Diagnosis depends on pathologic examination of tissue, with definitive classification based on immunohistochemical studies (e.g., CD117).

The Achilles' heel of GIST tumors lies within the cancer cell's DNA, a KIT gene that expresses an active enzyme (located on the cancer cell surface) that is essential to the cell's survival and tumor growth by inhibiting apoptotic cell death. CD117 is a marker for this enzyme and permits identification of tumors with this defect. The development of "targeted therapies" over the past 5 years has resulted in agents that suppress tumor growth by "turning off the switch" that has resulted in uncontrolled cell growth. Gleevec (imatinib mesylate), formerly known as STI-571, one such "targeted" therapeutic agent, is a KIT-selective tyrosine kinase inhibitor that has resulted in 50-80%, or more, tumor shrinkage in 55% of cases. The tumor reduction has been permanent in most cases. Tumors with the same or similar "growth switches," such as CML, show equally encouraging responses to target therapy. Other tumors that share CD117, such as angiosarcomas, metastatic superficial spreading melanoma, uterine stromal tumors, and small cell carcinoma of the lung, are being studied to determine if tumor growth can be arrested in these malignancies.

Aeromedical Certification – Yes or No? Medical certification can be considered for an airman with malignant GIST

- that has been resected and is in complete remission,
- who is free of adverse side effects from Gleevec,
- and is in good general health.

Given the rarity of CNS metastases, the risk for sudden incapacitation in airmen with completely resected GIST tumors is extremely low. The primary concern is whether the airman is experiencing significant side effects from his maintenance therapy (Gleevec).

Unlike melanoma, there is no evidence to suggest that aviators have any greater risk for developing GIST tumors than the general public. The initiating and promoting events that lead to uncontrolled growth of the intramural interstitial cells of Cajal in the GI tract are not well understood and await study.

Conclusion. The airman was granted a special issuance to resume third-class aviation activities—with the stipulation that he must furnish a current status update yearly, including the maintenance medication used, dosage, frequency of use, and side effects. Any adverse changes in his clinical course must be promptly reported and flying activity ceased.

References

Nguyen V, Taylor A. Gastrointestinal stromal tumors – leiomyoma/ leiomyosarcoma. *Emedicine.com*, Topic 388, 11 December 2002.

DeMatteo RP, Lewi JJ, Leung D. Two hundred gastrointestinal stromal tumors: Recurrence patterns and prognostic factors for survival. *Ann Surg* 231 (1): 51-8, Jan 2000.

Miettinen M, Lasota J. Gastrointestinal stromal tumors—definition, clinical, histological, immunohistochemical, and molecular genetic features and differential diagnosis. *Virchow*, 438(1): 1-12, Jan 2001.

Sircar K, Hewlett BR, Huizinga JD. Interstitial cells of Cajal as precursors of gastrointestinal stromal tumors. *Am J Surg Pathol*, 23(4): 377-89, Apr 1999.

Canonico B, Felici C, Papa S. CD117. *J Biol Regul Homeost Agents.* 15: 90-4, 2001.

Novartis Pharma AG. Gleevec (imatinib mesylate): Prescribing Information, T2004-10, 89019002.

Silberman WS. Certification Issues and Answers, Certification Issue #8, *Federal Air Surgeon's Medical Bulletin*. 41(3):3-4, 2003.

Lt Col Patterson was a USAF resident in aerospace medicine when he wrote this case report at the Civil Aerospace Medical Institute. He is a board-certified clinical, anatomic, and forensic pathologist and a chief flight surgeon in the USAF.

✈

Carbon Monoxide: A Hidden Danger in General Aviation

The possibly mistaken belief that CO poisoning is rare could lull unsuspecting pilots to their deaths.

By G.J. Salazar, MD, MPH

CARBON MONOXIDE (CO) poisoning is one of those little-thought-of aviation safety issues. The incidence in general aviation is unknown, but when it does occur it could have significant consequences for aircraft occupants. Fortunately, it is preventable.

Carbon monoxide is produced by the incomplete combustion of carbon-containing materials. Aviation fuels contain carbon; therefore, expect CO whenever an engine or other fuel-burning device is operating. Even though piston engines produce the highest concentrations of CO, turbine engines could still be a significant source.

Carbon monoxide is truly a hidden danger because it is a colorless and odorless gas. However, because it is a byproduct of combustion, it is frequently associated with other gases that do have an odor. By leaving an environment with known exhaust fumes, an individual can avoid CO exposure. Problems usually occur when exposure is gradual or CO levels far exceed other gases in a mixture and a person does not realize a problem exists. Often, exposed individuals become confused or incapacitated before being able to leave the contaminated environment. When this happens in an airplane, the invariable end result is an accident.

Is CO Poisoning a Problem in Aviation?

Depending on who is asked, carbon monoxide poisoning in general aviation may or may not be considered a problem. Several studies have confirmed that fatal aviation accidents related to in-flight CO contaminated aircraft interiors are rare. However, non-fatal CO poisoning in aviation is likely a more common occurrence than currently believed. No one is sure how many times pilots or passengers feel ill and do not realize they have been exposed to CO. Because no significant incident or incapacitation occurred, the matter is not reported and, hence, not investigated. Symptoms that could be attributed to airsickness, altitude hypoxia, fatigue, or a variety of other conditions could, in fact, be CO poisoning. Exposure and symptoms may occur repeatedly over several flights until finally someone suspects CO exposure or, tragically, a fatal accident happens. At present, no database exists that accurately collects or tracks non-fatal aviation CO exposure information.

Death in an aircraft accident is a readily identifiable end-point that is extensively studied from technical and human factors perspectives.

Death in an aircraft accident is a readily identifiable end-point that is extensively studied from technical and human factors perspectives. Feeling ill is not as striking an event; therefore, the magnitude of CO poisoning in general aviation may never be fully ascertained. Yet, the possibly mistaken belief that CO poisoning is rare could lull unsuspecting pilots to their deaths.

Aircraft Environmental Systems

The potential for CO intoxication in most general aviation airplanes comes from the process utilized to heat the cabin. The majority of these airplanes will have either a combustion heater or an exhaust-manifold heater. Of the two methods, the latter is most commonly encountered in single-engine, piston aircraft, primarily because it is a simple, inexpensive, and effective design. A portion of outside air entering the aircraft ventilation system is forced into a shroud that surrounds the engine exhaust manifold. Convective heating of the air surrounding the sealed exterior of the manifold occurs, and ducting then transfers the air into the cabin. Cabin occupants set cabin temperature by regulating the mixture of heated and unheated air.

Combustion heaters, on the other hand, are more complex, expensive, and heavy. For these reasons, they are typically found in multi-engine aircraft. This type of device produces heat by burning fuel in a sealed chamber. External air is vented over or near the sealed combustion chamber, again heating the air by convection, and the heated air is then ducted to the cabin.

Aircraft manufacturers go to great efforts to ensure manifold exhaust and combustion chamber systems are sealed and isolated to prevent fume leakage. Unfortunately, any defect could permit CO and other exhaust gases to combine with the air used to heat and ventilate the cabin. Obviously, wintertime flying presents the greatest risk, since pilots and passengers try to stay comfortable, perhaps unwittingly permitting CO to enter the cabin when they turn on cabin heat. CO contamination could be a

Continued ➢

Dr. Salazar is the Southwest Regional Flight Surgeon, Fort Worth, Texas.

factor at any time of the year, however, if defects exist in the airplane's structure or heating system.

Another possible source of CO contamination is an in-flight fire. Fortunately, this is a rare occurrence and leads any pilot to take immediate emergency action by landing as quickly as possible. However, if the smoke production is significant and/or a delay in landing occurs, blood levels of CO and other toxic substances may rise very quickly and incapacitate cabin occupants.

People living in polluted urban environments will have 3-10% COHb concentration because of the CO in the smoke and fumes they inhale.

Mechanism for Toxicity

Carbon monoxide has a very high affinity for hemoglobin, the molecule in blood responsible for oxygen transport. This affinity is about 240 times that of oxygen, causing CO to tightly attach to hemoglobin, thus creating the compound carboxyhemoglobin (COHb), which prevents oxygen from binding, hence blocking its transport. The result is hypoxia but through a mechanism different from that produced by altitude but with symptoms and end-effects that are very similar to those caused by hypoxia.

There should be little or no CO in the blood of individuals who have not been exposed to smoke or other by-products of combustion. People living in polluted urban environments will have 3-10% COHb concentration because of the CO in the smoke and fumes they inhale. Cigar or heavy cigarette smokers could have 7-10% COHb. People in certain occupations (foundry workers, welders, mechanics, firefighters, and tollbooth or tunnel attendants) who are exposed to products of combustion may also have elevated baseline levels.

Table 1. CO Concentrations and Symptoms

% CO in Blood	Possible Symptoms
< 10	No symptoms
10-20	Mild headache, giddiness
21-30	Headache, slight increase in respirations, some drowsiness
31-40	Headache, impaired judgment, shortness of breath, increasing drowsiness, blurring of vision
41-50	Pounding headache, confusion, marked shortness of breath, marked drowsiness, increase in blurred vision
>51	Unconsciousness, eventual death if a person is not removed from source of CO

Symptoms

The approximate blood concentrations of CO needed to produce the most common symptoms of exposure are shown in Table 1. Note that these symptoms are for an individual with normal hemoglobin at sea level. Expect that symptoms could be worse and/or appear sooner than they otherwise would at altitude. Wide personal variation in symptoms also occur.

Protection From CO Exposure

Pilot education and awareness are the most important tools in preventing exposure to CO. Pilots must understand the danger posed by CO poisoning and should be alert to the symptoms. Any unusual cabin smell or symptoms listed in Table 1 should call for immediate troubleshooting and decisive action, including identifying the closest airport to which to divert. Cabin heat should be turned fully off. The rate of cabin fresh air ventilation should be increased to the maximum. If available, and not a safety or fire hazard, consideration should be given to the use of supplemental oxygen.

However, unlike altitude hypoxia, symptoms will not immediately improve with oxygen. Poisoning by CO may require more than oxygen to treat; however, by using a mask with a tight seal, a person may minimize further exposure. The pilot must land as soon as possible and, if necessary, ask for air traffic control help for vectors to the nearest airport.

Once on the ground, medical attention should be sought because, depending on the degree of CO exposure, more aggressive treatment may have to be initiated. Finally, a certified mechanic should thoroughly inspect the airplane before it is flown again.

The best protection against CO poisoning is to avoid exposure. Aircraft owners, operators and pilots must ensure that heating and exhausts systems are in good working order, per manufacturer and FAA specifications. Certified mechanics must conduct all required inspections. Special attention should be paid to older aircraft because of corrosion or simple wear and tear of components. Firewall and aircraft structure should be verified and any defects sealed by a certified mechanic.

Several devices are available to monitor for the presence of CO. The least expensive are handheld or stick-on colorimetric devices that indicate the presence of CO by changing color. While these are effective, they are not without problems and need to be changed frequently to maintain accuracy. Powered detectors are also available in either portable or panel-mounted models. They are more expensive but are also more reliable.

Before using any particular device, the pilot should verify its use in aircraft is approved. Ultimately, pilot awareness of the risks and decisive action to prevent the causes are the best weapons to prevent CO exposure and ensure years of safe, enjoyable flying.

CAMI Lab Receives Second Professional Certification

Members of CAMI's Bioaeronautical Sciences Research Laboratory

The American Board of Forensic Toxicology (ABFT) recently accredited the Bioaeronautical Sciences Research Laboratory at the Civil Aerospace Medical Institute. The lab also holds certification from the College of American Pathologists (CAP), which makes the Bioaeronautical Sciences Research Laboratory the only laboratory in the country to be certified by both the ABFT and the CAP.

The lab is only the 15th in the nation certified by the ABFT. According to **Dennis Canfield**, PhD, manager of the Bioaeronautical Sciences Research Laboratory, "It certainly tells the community that we are making a strong effort to see the quality of the products we produce are correct."

The laboratory serves as the primary national toxicology-testing site for FAA and NTSB. Post-mortem toxicology testing is routinely conducted on biological specimens from flight crew fatalities. At NTSB request, the lab may also perform toxicological testing to help investigate railway, maritime, pipeline, or highway accidents. And, because of the legal consequences of a positive drug finding, these tests are considered "forensic." This is yet another reason that the lab maintain high quality standards.

Certification Manager Receives ALPA Award

Warren S. Silberman, DO, manager of the Aerospace Medical Certification Division, received an award from the Air Line Pilot's Association International for "outstanding achievement in medical certification of professional airline pilots."

The association's president, **Duane E. Woerth,** presented the award, which was the first such recognition given to an Federal Aviation Administration physician and only the second time an agency employee was honored by the pilot's association.

Presentations Promote Mexican Aeromedical Safety

Shown (L-R) are Dr. **Pedro Rodríguez Merino** (Chief of the Mexican Air Force's Aeromedical Evaluation and Certification Center), **Héctor Cuauhtémoc García** (CPAM Director), Cap. **Octavio Amezcua Pacheco** (CPAM Instructor), Cap. **César Llaneza Arana** (CPAM Vice-President), Cap. **Luis Eduardo Neve Brito** (CPAM Secretary), and Dr. **Antuñano**.

Dr. **Melchor J. Antuñano**, Director of the Civil Aerospace Medical Institute (CAMI), was a guest speaker in the "Accident Prevention in Aviation Course" organized by the Colegio de Pilotos Aviadores de Mexico–CPAM (Mexican College of Aviator Pilots). He delivered 11 scientific presentations in aviation human factors and aerospace medicine to aviation personnel from the civil aviation community and the Mexican Air Force.

The feedback received from the attendees was very complimentary of the high quality and practical value of his presentations. Dr. Antuñano's participation in this event contributed to the promotion of aeromedical safety in México.

Medical Specialties Division Manager Selected

By R. Mark Adams

James R. Fraser, MD, is the new manager of the Medical Specialties Division in the Office of Aerospace Medicine. He began his position at the Federal Aviation Administration headquarters on February 23rd.

Dr. Fraser is responsible for developing aerospace medicine policies and procedures, administering the medical appellate process, providing oversight of employee drug and alcohol testing, managing and administering psychiatric and medical review officer functions, and providing aerospace medicine expertise and advice to the Federal Air Surgeon.

Dr. Fraser has more than 20 years of professional experience in Aerospace Medicine. He retired from active duty with United States Navy in September 2003.

At the time he retired from the Navy, Dr. Fraser was a Captain (O-6) and the Command Surgeon, Naval Safety Center, Norfolk, Va. As the Command Surgeon, he was responsible for medical oversight of all Naval Flight Surgeons. Just prior to his retirement, Dr. Fraser served as a member of the Columbia Space Shuttle accident investigation board. Before he was the Command Surgeon, Dr. Fraser served as the Force Medical Officer, Naval Air Force, Atlantic Fleet, where he was responsible for medical oversight and quality assurance for the medical departments and hospitals aboard seven aircraft carriers, 18 Naval Air Station branch medical clinics, and he supervised more than 100 physicians.

Prior to that position, he was the senior medical officer aboard the USS Theodore Roosevelt, where he supervised a medical staff of 62 and was responsible for the health of 6,000 personnel aboard the aircraft carrier and approximately 12,000 personnel attached to the Carrier Battle Group, when it was deployed.

Dr. Fraser graduated from the University of Oklahoma with a BA in 1972. He earned a Master of Public Health degree from the University of Oklahoma College of Health in 1973. In 1977, he competed his medical degree at the University of Oklahoma College of Medicine. Dr. Fraser is licensed to practice medicine in Oklahoma, and he is board certified in both family practice and preventive medicine (Aerospace Medicine).

Federal Air Surgeon **Jon L. Jordan**, M.D., welcomed Dr. Fraser to the Office of Aerospace Medicine saying, "I am very pleased to announce the selection of James R. Fraser, M.D., to serve as the manager of the Medical Specialties Division. Dr. Fraser has strong managerial skills and an excellent background in aerospace medicine. He will strengthen our organization and bolster our corps of highly qualified physicians trained in aerospace medicine. I am confident that Dr. Fraser will make significant contributions to the success of our programs."

Mr. Adams manages the Program Management Division at FAA headquarters in Washington, DC.

Pilot Fatigue Video Wins 'Telly' Award

By Mike Wayda

A new pilot safety video produced by the Civil Aerospace Medical Institute's Airman Education Program, *Pilot Fatigue in Aviation***,** has won a "Telly" award under the category of Non-Broadcast Production/Health and Medicine. The project was developed in collaboration with the Information Media Division's video production team at the Mike Monroney Aeronautical Center. According to Division Manager **Cheryl Cooley**, "In our business, this is like winning an Oscar!"

The Telly Awards are among the largest national and international video competitions, as more than 10,000 entries are received annually. Entries in the competition are not judged against one another, but rather are evaluated independently based on each program's merits.

Posing with the Telly trophy are (left-right) video producers: Will Schmieding, Laura Shepherd-Madsen (scriptwriter), Chris Steves (producer/director), and Paul McGlasson (graphic animator). Airman Education Team: Rogers Shaw (team leader), Roger Storey , Larry Boshers, and J.R. Brown (instructors). Not available for picture: Jeffery Hoopingarner (producer/director).

"I doubt if there is a better example of cross-organizational synergy in the FAA," said CAMI Director **Melchor Antuñano**, MD. "This achievement was made possible by the atmosphere of collaboration established at the Mike Monroney Aeronautical Center," added **Richard Jones**, MD, Manager, CAMI Aerospace Medical Education Division.

This is the third award the team has garnered in producing pilot education videos. Others are *Will to Survive* and *Tropical Survival,* both of which were honored with *Aurora* Awards.

Pilot Fatigue in Aviation is part of 18 videos in a series of programs designed to educate pilots about the physiological hazards encountered in the aviation environment.

The pilot safety videos will be available soon for viewing through the CAMI Web site: www.cami.jccbi.gov

INSURANCE from page 5

pre-existing condition restrictions have severely limited the ability of individuals with chronic health problems to change insurance and helped to identify pilots with undisclosed medical problems.

Today, a health insurer or self-insured group health plan may apply a pre-existing condition requirement only under the following circumstances: [a] the restriction can be applied only to a condition for which the individual received medical advice, diagnosis, care, or treatment during the six-month period before his or her enrollment date, and [b] the coverage denial period for the pre-existing condition can't exceed 12 months. In theory, the FAA question should read, "Have you been denied insurance over the past year?"

In addition, that 12-month denial period must be reduced by the period of time the person was covered under a prior health insurance plan. Thus, in the most common situation, if an airman changes jobs and was covered for more than 12 months under a health plan provided by the previous employer, there can generally be no denial of coverage for pre-existing conditions under the new employer's health insurance plan.

More importantly, the coverage denial period described above must be reduced by the individual's "creditable coverage." In a nutshell, the creditable coverage rules under HIPAA mean that a person's prior coverage under another group health plan, health insurance policy, Medicare, or certain other government programs, count toward satisfaction of the coverage denial period under a new group health plan. For many airmen, the creditable coverage rules will allow them to completely skip any coverage denial period for pre-existing conditions applied by a new employer's health plan.

Finally, this employee protection can be lost if there is a roughly two-month break between coverage. For this reason, employers are required to provide their employees who lose coverage under their health insurance plans with certificates detailing their length of coverage. These certificates are then used to prove prior coverage to new health insurers for purposes of determining whether and for how long coverage of a pre-existing condition can be denied.

In sum, question 18(t) may appear to be straightforward; however, the AME must understand that an applicant who hasn't been "denied" health insurance may still have a disqualifying condition.

Dr. Borrillo is the Medical Director of Occupational and Hyperbaric Medicine, The Toledo Hospital, ProMedica Health System. He is also a senior aviation medical examiner, an attorney, and a pilot with a Commercial rating.

✈

Aviation Medical Examiner Seminar Schedule

2004

May 3–6	Anchorage, Alaska (AsMA)	CAR (3)
June 21–25	Oklahoma City, Okla.	Basic (1)
July 9–11	Denver, Colo.	AP/HF (2)
August 6–8	McLean, Va.	OOE (2)
September 13–17	Oklahoma City, Okla.	Basic (1)
November 5–7	Tampa, Fla.	N/NP/N (2)
November 15–19	Oklahoma City, Okla.	Basic (1)

2005

January 21–23	Irvine, Cal.	CAR (2)
March 14-18	Oklahoma City, Okla.	Basic (1)

CODES

AP/HF Aviation Physiology/Human Factors Theme
CAR Cardiology Theme
OOE Ophthalmology - Otolaryngology - Endocrinology Theme
N/NP/P Neurology/Neuro-Psychology/Psychiatry Theme

(1) A 4½-day basic AME seminar focused on preparing physicians to be designated as aviation medical examiners. Call your regional flight surgeon.

(2) A 2½-day theme AME seminar consisting of 12 hours of aviation medical examiner-specific subjects plus 8 hours of subjects related to a designated theme. Registration must be made through the Oklahoma City AME Programs staff, (405) 954-4830, or -4258.

(3) A 3½-day theme AME seminar held in conjunction with the Aerospace Medical Association (AsMA). Registration must be made through AsMA at (703) 739-2240. A registration fee will be charged by AsMA to cover their overhead costs. Registrants have full access to the AsMA meeting. CME credit for the FAA seminar is free.

The Civil Aerospace Medical Institute is accredited by the Accreditation Council for Continuing Medical Education to sponsor continuing medical education for physicians.