



Federal Air Surgeon's Medical Bulletin

Aviation Safety Through Aerospace Medicine

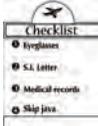
For FAA Aviation Medical Examiners, Office of Aerospace Medicine
Personnel, Flight Standards Inspectors, and Other Aviation Professionals.



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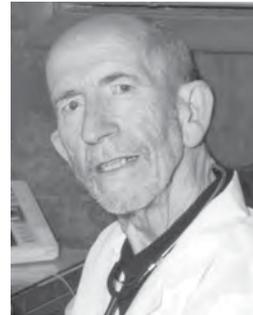
A Dean Among Doctors

By Mark Grady
General Aviation News

DOCTOR W. DONALD MOORE of Coats, N.C., knows a lot of pilots — many quite intimately. After all, as an Federal Administration Aviation Administration-approved medical examiner, he's poked and prodded quite a few of them during his more than 40 years of making sure they meet the FAA's physical requirements for flying.

He also knows what it's like to fly, because he flew for 40 years.

Moore began giving FAA physicals in 1960, the same year he learned to fly. Now 83 years old, he is not as active at his medical clinic as he once was, but he still ventures in for an hour or two each



Dr. Moore, shown in his Coats, N.C., office

This article launches Best Practices, a new series of profiles highlighting the shared wisdom of the most senior of our senior aviation medical examiners. Written by one of Dr. Moore's pilot medical certification applicants, this article appeared in the November 22, 2002, issue of General Aviation News. —Ed.

morning just to give medical exams for pilots in the area. He estimates he's given more than 12,000 flight physicals over the past 41 years.

"I've given an average of 300 flight physicals a year since 1960," he says, noting those exams have been in addition to running a busy general medical and obstetrics practice.

While he majored in Greek and English at Wake Forest, Moore was always interested in the sciences. He couldn't escape an interest in

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Quick Fix

By Richard F. Jones, MD, MPH

PROBLEM

Student pilots are sometimes receiving an FAA Form 8500-9, Medical Certificate, instead of an FAA Form 8420-2, Medical Certificate and Student Pilot Certificate, at the time of their FAA medical examination.

Another part of this problem is where an applicant has requested a combined Medical and Student Pilot Certificate in block 1 on the 8500-8 form, but the aviation medical examiner (AME) indicates in block 62 of the form that only a Medical Certificate has been issued.

RESULT

If only a Medical Certificate is issued, student pilots are flying without valid certificates and are subject to disciplinary action when caught. These student pilots are often very hostile toward the AME who failed to issue the appropriate certificate.

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Aerospace Medical Research: Making Air Travel Safer

TO MANY PERSONS outside the Federal Aviation Administration (FAA), the Office of Aerospace Medicine's greatest visibility relates to our administration of the airman medical certification system. There is good reason for this since ensuring that air- men meet sound medical criteria and are free of drugs and alcohol have long been considered our highest priorities. Sometimes overlooked are the significant contributions and support our research organizations provide, not only to the certification process but also to the overall safety of the national air- space system.

The FAA is blessed with having two "World Class" research organizations at the Civil Aerospace Medical Institute (CAMI). Much of the work carried out by these two research organizations

is accomplished quietly and without a great deal of fanfare. I can assure you, however, that the contributions these organizations make to system safety provides a big "bang" for the relatively small expenditure of dollars that go to their support.

Human Resources. Research psychologists and supporting staff comprise the Human Resources Research Division. Their goal is to improve aerospace safety and workforce performance through human factors research. In plain language, these folks play a major role in identifying environmental and other factors that impact pilot and air traffic controller performance and cause or contribute to accidents. Among others things, the research includes human performance under various conditions of impairment, human error analysis and impact of advanced automation systems on personnel performance.

Medical Research. The other division, the Aerospace Medical Research Division, is composed of a more heterogeneous group of scientists. Among others, included are research physicians, chemists, and engineers. To name just a few, these folks engage in accident investigation from the medical perspective, look for ways to improve occupant protection and survival in the event of an accident or other life-threatening event, and identify physiological, psychological, and performance factors that threaten safety.

It is impossible to cover in this column all the important aviation safety contributions being made by our two research organizations. I feel compelled, however, to mention at least one. This is the wide-body environmental research facility that was completed in 2001.

The wide-body research facility was developed through refurbishing the hull of a scrap Boeing 747 aircraft. Through ingenuity in securing funds and a lot of

The Federal Air Surgeon's Column



By Jon L. Jordan, MD, JD

hard work by the staff at CAMI, what began as a cast-off hunk of metal has become a unique, multi-purpose, highly sophisticated, research facility.

Thus far, the facility has been used for a number of research tasks. Included among these is the training of aircraft accident investigators as well as security personnel for dealing with hijackers and unruly passengers. The facility is equipped to investigate cabin airflow that will define molecular, particulate, and microorganism dispersion and aid in studies of contamination of cabin and cockpit air from a variety of potential sources, including possible

acts of terrorism. Most recently, the facility was used to determine the time required to secure a passenger cabin following a warning of air turbulence. This research was in support of NASA for the development of an early-warning system for air turbulence. Future potential uses for the facility are virtually limitless.

Those of you who have had the opportunity to visit CAMI recently are familiar with the current high level of sophisticated research going on there. For others who have never been there or have only a dim recollection of our research activities, I simply wanted to let you know or remind you of the dedicated and highly professional staff that—in many ways—is working to make air travel as safe as it can be.

JLJ

Federal Air Surgeon's Medical Bulletin

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Wide-Body Research Facility at CAMI



Certification Issues and Answers

By Warren S. Silberman, DO, MPH

One of our hard-working medical review physicians, **Larry F. Wilson, MD**, is in the Oklahoma Army National Guard and has been mobilized for at least one-year [see story, page 12]. This has resulted in quite a strain on our other physicians, and we pray for his safe return.

I am requesting that you aviation medical examiners who regularly call the Aerospace Medical Certification Division to speak with one of our physicians to be patient and to utilize our *Physician of the Week (POW)* for all questions relating to medical certification. When phoning into AMCD to speak to the physician and that line is busy, the operator will ask you for a good phone number where we can reach you. Should you have an airman in the office and want our verbal authorization for a special issuance, you may want to tell the airman you will be in touch after speaking with us. We want to keep the phone calls to physicians who are not manning the phone left alone so they can perform their case reviews. The POW will return your call.

You need to also be aware that you may phone your Regional Medical Office for medical certification questions.

Now, I am going to continue with our questions and answers, all of which are referenced to the *1999 Guide for Aviation Medical Examiners*. The appropriate page numbers are in parenthesis after each answer.

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

1 A 22-y/o airman has a single episode of spontaneous pneumothorax and applies for a 1st-class medical certificate. What do you need to provide the AMCD? Can you grant medical certification?

2 A 45 y/o airman develops a bout of paroxysmal supraventricular tachycardia. Can you issue a 3rd class medical certificate for this?

3 Does the AMCD grant medical certification after an airman suffers a pulmonary embolus? What if the airman is still on Coumadin®?

4 An airman comes to your office for an initial flying examination. On examination, you note that he has a scar from childhood that goes across his orbit, and the cicatrix essentially resulted in a profound ptosis of the eyelid. You wonder if he has adequate field of vision in that eye. Should you issue the medical certificate?

5 A pregnant airman, just initiating her third trimester, applies for a 2nd-class medical certificate. What should you do?

6 Airman Bubba Ray Beauregard applies for a 1st-class medical certificate. Three months ago, he passed a calcium oxalate stone. He provides a note from his treating urologist stating that Bubba has retained a 4mm stone in the upper pole of the right kidney and that if he drinks plenty of fluids, he may not pass the stone. What should you do?

7 An airman in chronic renal failure on hemodialysis three times per week requests a 3rd-class medical certificate. He demonstrates stable electrolytes, BUN, and creatinine. He appears to be alert and oriented. He has some hypertension, which is adequately treated. Since he "looks great," the AME issues an unrestricted medical certificate. Was she right?

8 An applicant for student pilot 1st-class medical certificate has had an amputation above the right elbow. He wears a prosthesis, but the extremity is pretty much nonfunctional. The remainder of his flight exam is benign. What should you do?

9 An airman who last had an FAA medical certificate in 1992 has a history of chronic tension headaches. He writes in Block 17 that he takes Ultram® (tramadol hydrochloride) and Flexeril® (cyclobenzaprine HCL) for the headaches. He has been averaging four headaches per month, and they seem to occur when his boss "gets on his case" about things. The headaches are linked with nausea and photophobia. Noises seem to make them worse. He must get to a dark room and try to rest when he gets one of them. He claimed that he only takes the Flexeril® when he has to, but the Ultram® works quite well. You issue an unlimited medical certificate. Were you right?

10 What are the five mental health-related specifically disqualifying illnesses?

11 What criteria do the FAA consider in making the diagnosis of substance dependence?

12 An individual who had an Authorization for Special Issuance for substance dependence came in for an examination and informed you that she only had about four glasses of wine after work each day. Would you give her a medical certificate?

13 Airman Potawanamie Pauly, 35, presents for a 1st-class medical certificate and gives the following history. He answered "yes" to question 18 w., which asks applicants to list their history of nontraffic convictions (misdemeanors or felonies). When he was 16, Pauly received five tickets for speeding, and the police came to his home and arrested him for nonpayment of the fines. At age 18, he was arrested for stealing acne cream from a local drugstore. At 20, and while a student in political science at Yale, he was arrested for the rape of a freshman law student, but the charges were ultimately dropped. He was arrested for cocaine possession at age 27 and spent two years in a Federal prison. It seems that his friend asked him to drive his car to pick up some other guys at a not so good part of town. He really didn't know that in the trunk of the car was a kilo of cocaine, so when the police stopped the car for having an

Continued, answers on page 4...

Issues & Answers from page 3

out-of-date license plate, well, you know what happened from there! Pauly now tells you that all these events were due to a lack of maturity, and he has seen the error of his ways, and wants to become an airline transport pilot. Should you issue the medical certificate? Does this story sound right to you?

ANSWERS TO THE QUIZ QUESTIONS

1: To make a decision, we need to have the hospital and/or emergency room admission and discharge notes that describe the event. We need to know the treatment provided and some proof that it was successful. If you could provide some statement from the treating physician of the likelihood of recurrence, this would also be helpful. If the airman has a completely expanded lung and there has been no recurrence, you may grant medical certification. You **MUST** provide AMCD with all the information (*AME Guide, page 45*).

2: No, you cannot! An AME should provide the medical records that describe the event and surrounding circumstances. We will need a current status report that mentions the workup that was accomplished. The workup should have included thyroid function studies, 2 D echocardiogram, and 24 hour Holter Monitor. If there are increased cardiac risk factors, then a maximal Bruce Protocol Stress test should be performed (*page 46*).

3: An airman who suffers a pulmonary embolus can gain medical certification. We usually would like to know that all potential etiologies have been evaluated to include hypercoagulable states. An airman who is taking an anticoagulant can also be

medically certified. The airman should be stabilized on the Coumadin® for at least one month and all the International Normalized Ratio values should be provided, all of which should be within the therapeutic range. This will result in an Authorization for Special Issuance (*page 49*).

4: No. You should obtain an eye evaluation with field of vision and forward the case report to the AMCD (*page 53*).

5: Perform the exam and, if she is otherwise normal, you may issue an unlimited medical certificate. I would caution the airman about the risk of injury secondary to the aircraft restraint systems, but pregnancy is not, in itself, disqualifying (*pages 55-6*).

6: Defer to the AMCD. We would like to see some type of imaging procedure to note the exact site and size of the stone. Unless this stone was embedded in the kidney cortex, he will likely get a denial (*page 55*).

7: No, she wasn't! We do not grant medical certification to any airman for any class when they are on hemodialysis. We have granted medical certification to airmen who are stable receiving peritoneal dialysis. Recall that patients who are in chronic renal failure on dialysis are in a precarious metabolic situation requiring strict diet control and fluid balance. We will grant medical certification after they receive a renal transplant and demonstrate 6 months of stability. We do accept most of the antirejection medications (*page 55*).

8: The applicant will require a Statement of Demonstrated Ability (SODA). You should defer the case to the AMCD, but also have the applicant provide a letter requesting the SODA. This request will also result in the FAA administering a medical flight test in the aircraft that the applicant is familiar with. If the

applicant needs some modification of the aircraft, this will be noted. The applicant will also receive a notation on his airman certificate that his flying is limited to the particular aircraft in which the test was taken (*page 57*).

9: No, you were not! Both Ultram® and Flexeril® are unacceptable for flying duties. Both of these medications cause sedation. The other significant issue is the headaches, themselves. The airman appears to be having too many of them to allow medical certification at this time. Perhaps the AMCD would allow certification if the airman would try some non-sedating medications or biofeedback, and the headaches were less frequent and debilitating (*page 63*).

10: 1) psychosis, 2) bipolar disorder, 3) personality disorder manifested by overt acts, 4) substance dependence, 5) substance abuse (*page 3*).

11: 1) increased tolerance; 2) manifestation of withdrawal symptoms; 3) impaired control of use; or 4) continued use despite damage to physical health or impairment of social, personal, or occupational functioning (*page 67*).

12: No, I surely hope not! Note in Part 67 that the FAA does not grant medical certification to an airman with a known diagnosis of substance dependence until the airman can demonstrate total abstinence. This total abstinence also becomes a requirement of any future medical certification and is written into their authorization letters (*page 66*).

13: Fellow AMEs, what part of this story sounds right to you? Do you recall the specifically disqualifying condition, *personality disorder manifested by overt acts*? Do you think this diagnosis fits this case? It certainly does. Issuing a medical certificate is not appropriate in cases such as this.



Doctors' Dean from page 1

medicine and what he believes was a calling to become a medical missionary. He accomplished that goal by serving in a 100-bed, Baptist-run hospital in southern China for two years in the late 1940s. The missionary hospital treated patients who would not have access to or been able to afford decent medical care. The Communist-run Chinese government eventually ran Moore and other missionaries out of the country. He returned to the states on a different type of mission.

"When the doors closed in China, I felt I needed to be in a small community where the need was the greatest," he said.

Coats, a small town in the heart of North Carolina, became his new mission field. He set up practice there in 1949. Today, pilots and other patients still make their way to Coats Medical Clinic, which features two other doctors, including his daughter, Dr. **Linda Robinson**. She added the AME designation to her list of medical credentials a few years ago. She performs the flight physicals her father's reduced schedule can't fit in.

Moore says he was always fascinated with aviation, but his interest peaked during World War II while serving as a physician in the Philippines. Talking with Navy pilots fueled his interest in flight, as did some of the flights he took with those Naval aviators.

Eventually, 10 years after setting up his practice, he decided it was time to learn to fly. He called on another long-time Harnett County resident and aviator for help.

"I talked to **Gene Stewart**, who taught flying during the war," Moore recalled. "I told him, 'I think I want you to teach me to fly.' He had stopped teaching for a while, but he got back into it and continued to teach for quite a while."

Stewart taught Moore to fly in a Super Cub. He soloed that plane at the

BEST PRACTICES

DR. MOORE'S SUGGESTIONS FOR A SUCCESSFUL AVIATION MEDICINE PRACTICE

1. **Pilot area.** Have a separate place for pilots (especially if the practice has patients other than pilot applicants) for FAA materials to be displayed and organized. It could be located in the waiting area; it is a place for pilots to read, work on forms, and not be interrupted.
2. **Office assistant.** Have a very knowledgeable assistant. Our nurse, who schedules work for us, has doing it long enough to be able to answer all technical questions about forms, procedures, and so on. She was trained at the FAA seminar, which was very helpful.
3. **Regional Flight Surgeon.** Contact with the regional office is always very helpful. We enjoy our contacts with the regional office because they are knowledgeable and easy to talk with. You can discuss any questions that affect the certification outcome with them.
4. **Pilot status.** I recommend that all AMEs be pilots because they can better understand various situations as they arise. While I lost my own medical and am no longer eligible to fly solo, I still enjoy flying with others.
5. **Be engaged in the aviation community.** Speak at safety seminars, get involved in some of the seminar discussions, get to know the pilots in your area. Perspectives vary and you can promote aviation safety while in the health care business. I feel a great sense of responsibility for my pilots' safety.

Harnett County Airport near Erwin, N.C. He bought a Tri-Pacer after getting his private pilot's license in 1960.

During the same year he earned his license and bought his first plane, he decided to meet the FAA requirements to give pilot physicals. Eventually, he became the only doctor between the large cities of Fayetteville and Raleigh certified by the FAA to issue all classes of medicals. He says it's only natural for a doctor who flies to want to provide the service of flight physicals.

The Tri-Pacer was sold during the mid 1960s and Moore upgraded to a Mooney. It's obviously a plane he was very fond of. A picture of that Mooney still hangs inside the office where he performs his examinations on pilots. He actively flew until a few years ago.

One of the pleasures of giving flight physicals is in getting to know the pilots and some of the "characters" in aviation, Moore says. But being a doctor for pilots isn't always rosy. Moore

has always found it difficult to inform a pilot that he or she no longer meets the FAA medical requirements.

"I'm always reluctant to have to tell them," he says. "But, I think they understand you just can't get around some of the very specific requirements."

Moore has seen a great deal of change in both planes and pilots the past 41 years. When it comes to aircraft, he notes the biggest change is in navigation. "By far, the biggest change has been in the electronics. When I started, everything was based on homing in on a station, using ADF. Today, everything is so advanced and easier," he said, noting how he finds today's systems, such as GPS, fascinating.

When it comes to pilots, the change Moore notes should come as good news for those of us who hope to fly for a long time. "Some of the health problems are about the same, but for the most part pilots are healthier today," he said. →

The next issue of the Bulletin will feature Dr. James E. Moore, a Stamford, Conn., aviation medical examiner who will observe his 56th year in aviation medicine on March 1, 2003. —Ed.

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Bariatric Surgery and Medical Certification— How Long to Wait?



By Donato J. Borrillo, MD, JD

ACCORDING TO THE FEDERAL Centers for Disease Control and Prevention statistics, from 1999 to 2000, the number of overweight adults rose from 56% to 65% of the United States population. Given the prevalence of obesity in the general population, it behooves the aviation medical examiner to become familiar with surgical procedures that pilots may opt for in their “battle of the bulge.”

Admittedly, obesity is not an automatically disqualifying condition (1) and is not queried as part of the medical history (Box 18 on FAA 8500-8). However, the mortality associated with obesity is well known, i.e., a two fold mortality rate for men 50% above average weight. This is attributable to an increased prevalence of cardiovascular risk factor such as hypertension, diabetes mellitus, hypertriglyceridemia, and low levels of high-density lipoprotein cholesterol. In addition, the prevention of secondary complications of morbid obesity is an important goal of management, with data from the Framingham study to support the estimate that a 10% reduction in body weight corresponds with a 20% reduction in the risk of developing coronary heart disease.

As with smoking cessation, the aviation medical examiner should have an interest in providing dietary and exercise counseling for the pilot, since we all play a role in preventing sudden incapacitating events. However, when diet modification has failed, and morbidity and mortality become a significant risk, then bariatric surgery may be the only viable option.

The option of surgical treatment should be reserved to patients who are morbidly obese, well-informed, motivated, and willing to accept the operative risk. In addition, the patient should be able to participate in treatment and long-term follow-up. Surgical treatment of morbid obesity focuses on a body mass index of over 40kg per meter squared, or with being 100 pounds overweight.

Bariatric surgery is a recognized sub-interest in the field of general surgery and has been endorsed by the National Institutes of Health Consensus Conference of 1992. Surgery generally involves a reduction in size of the gastric reservoir, with or without a degree of associated malabsorption. Subsequently, eating behavior improves dramatically and reduces caloric intake; thereby ensuring that the patient practices behavior modification by eating small amounts and chewing each mouthful well.

The well documented prevalence of obesity in the United States has led to an increase in bariatric surgery. It is incumbent upon the AME to understand complications and prognosis associated with the various bariatric surgeries, so that the aviator is properly certified post operatively. The most serious complications associated with bariatric surgery occur within 30 days of operation and represent the greatest risk for sudden incapacitation. Accordingly, the author recommends waiting this period post-operatively, prior to medical certification.

The AME should realize that operations vary according to an individual surgeon's recommendation, patient choice, and availability. Complex operations combine gastric restriction and gastric bypass, whereas simple procedures are purely gastric restriction. The percentage of complex procedures has increased steadily from 1991, with 97% of the procedures performed in the year 2000 categorized as being complex; compared with 11% in 1986. Overall, 79% of operations submitted to the International Bariatric Surgery Registry's pooled report were indicated as being complex.

The mean percentage excess weight loss at five years ranges from 48-74% after gastric bypass and from 50-60% after vertical banding gastroplasty. In a ten-year follow-up series from the University of Virginia, weight loss was reported as 60% of excess weight at 5 years and as 96% of excess weight at 14 years. This weight reduction in a pilot would certainly improve several co-morbid conditions—glucose intolerance, diabetes mellitus, sleep apnea, and obesity-associated hypoventilation, hypertension, and serum lipid abnormalities.

Despite its benefits, the pilot who wishes to undergo such treatment

Continued ➤

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.

must assess the risk of surgical treatment, which includes the operative, peri-operative, and long-term complications. Specifically, the obese pilot has an increase in morbidity in the early post-operative period from wound infection, gastric or anastomosis leaks from staple breakdown, stenosis, marginal ulcers, various pulmonary problems, and deep thrombophlebitis, which may be more than 10%. Splenectomy is necessary in 0.3% of patients to control operative bleeding, and the risk of the most serious complications of gastrointestinal leak and deep vein thrombosis is less than 1%. Such conditions would obviously require grounding and deferral upon medical certification.

The current trend toward decreased length of post-operative hospital stay has increased the importance of the AME when examining or screening for medical events within 30 days of the operation. Indeed, some complications may not be recognized until

after hospital discharge, with approximately 0.1% of the patients requiring a re-operation within 30 days of the primary operation and death occurring in 0.3% of the patients.

The most common complications reported within 30 days of operation for severe obesity are respiratory (2%); minor complications (atelectasis, hyperventilation, plural effusion pleritis, and pneumonitis) represented the greater part; and major respiratory complications (pulmonary embolism and respiratory failure) only 0.3% of all complications.

Bowel obstruction and gastric leaks of the digestive juices into the abdominal cavity require immediate attention and occur approximately 0.3% of the time. As a general grouping, when staple breakdown, peritonitis, and sub-hepatic abscess were combined with the percentage of GI leaks, the incidence rose to 0.45%. Thirty percent of all 30-day deaths are associated with a GI leak.

In summary, the three most serious major complications associated with bariatric operations for severe obesity are pulmonary embolism, respiratory failure, and gastrointestinal leaks. Eighty percent of all deaths occur within 30 days of the operation; therefore, when confronted with an airman who presents post-operative from bariatric surgery, the AME should keep in mind these complications and defer medical certification, until at least 30 days post-operatively. In addition, a search for complications associated with bariatric surgery by review of systems should be conducted.

Reference

1. Pursuant to FAR part 67.113/213/313, obesity would fall under a "general medical condition" and would be disqualifying if it rendered the airman unable to safely perform duties.



ANOTHER CHECKLIST FOR THE FLIGHT PHYSICAL

Dr. **Robert Gordon** and Dr. **Donald Ross** presented a useful list of reminders for pilots about to undergo a flight physical in the last issue of the *Bulletin* (*A Checklist for Pilots Approaching the Flight Physical*, fall *FASMB*, p. 7). Here is a compressed list of these reminders that was prepared by Dr. **Guy Baldwin**, a Tulsa, Okla., senior aviation medical examiner, who advises pilots that this list "is nice to keep on hand when you are approaching your medical examination."

1. If you wear glasses or contacts, do not forget them. Make sure you have a recent eye exam and have updated your lenses accordingly, especially if your near/far vision has changed.
2. Bring all required medical records from your personal physician regarding any chronic medical conditions such as hypertension or asthma.
3. If you have been issued a Special Issuance letter from the Federal Aviation Administration, be sure to bring it with you to the examination, along with all medical information specified in the letter.
4. If you have borderline high blood pressure, see your personal physician for evaluation and treatment prior to the medical examination. Avoid coffee, decongestants, cigarettes, or any other stimulants prior to your exam. These may all raise your blood pressure.
5. If you have diabetes mellitus, **avoid** large amounts of sugar prior to the exam, as this can cause the urinalysis to show positive for sugar. If you have a family history of diabetes mellitus or other familial diseases, consult your personal physician for periodic checks prior to medical examination.

Palinopsia Secondary to a Motor Vehicle Accident

Case Report, by Ahmet Akin, MD

Palinopsia is a rare but ominous symptom of cerebral dysfunction and can be associated with brain lesions, some medications, physical brain trauma, or illicit drug use. This is a case study of a 44-year-old female airline pilot who experienced palinopsia after a car accident. Since her symptoms disappeared and there was no other associated pathologic etiology, the Aerospace Medical Certification Division granted 1st class medical certification (with restrictions) after reviewing her file and obtaining a neurology consult.

In February of 2001, a 44-year-old female airline pilot received a severe cervical whiplash injury and probable closed-head injury when the stopped car in which she was seated was struck from behind, forcing her car into the vehicle in front. The airbags did not deploy. When her vehicle was first struck, she was snapped backward, then thrown forward. When her vehicle struck the vehicle in front, her head and body continued forward, possibly striking the dash or the windshield and then snapping backwards again, with her head hitting the seat's headrest. Her seatbelt had been fastened during the accident.

She was taken to a hospital where she complained of neck pain. A CT scan disclosed degenerative changes at C5-C6 and C6-C7 with foraminal narrowing bilaterally at C5-C6, worse on the right, with reverse lordosis at C5-C6. No fractures or evidence of traumatic injury was seen. She was discharged to home after about four hours. An MRI in March 2001 showed no evidence of brain damage or collection.

Shortly thereafter, the pilot noted vision changes and a decrease in taste sensation; her sense of smell was unaffected. Visual symptoms consisted of an after-image of a "grayish/whitish glow" around objects that was present whether she was stationary or moving and followed when the object moved. There was no "frank" diplopia, no associated eye pain or

loss of consciousness with the accident. The visual sensations were present bilaterally, with or without one eye covered, but more marked with both eyes open. She noted acute visual blurring that lasted about six hours and then resolved completely in April 2001. Sometimes she noticed a "kaleidoscopic effect" of her vision bilaterally when things "appeared to become fragmented peripherally." This first occurred four times a week but had decreased to about twice a week later and then subsided. She denied seeing flashing or zigzagging lights. She was treated with Zanaflex[®], Vicoprofen[®], and Proxophene[®]. All medications were discontinued in June 2001.

Visual field studies in May 2001 revealed a "nonspecific" small superior deficit in the right eye and a "question" of superior nasal step in the left eye. Evaluation in the electrophysiology laboratory in June 2001 disclosed abnormal bilateral electrooculogram and suspicious ECG, suggesting photopsias due to early retinal degeneration. Electroretinography in July 2001 was unremarkable.

She had 50 sessions of physiotherapy from February to September 2001. It can be summarized as somewhat limited progress in the successful treatment of her cervical pain. The MRI of October 2001 showed entirely normal cervico-cephalic vasculature with no evidence of stenosis or aneurysm.

Palinopsia

Palinopsia, occasionally spelled *palinopia*, refers to the reappearance of an image after some time when the original external stimulus is no longer available. Palinopsia may occur soon after the object has been viewed or hours later. The other terms used to describe palinopsia are "after image," "visual perseveration," and "trails."

The neural basis of palinopsia is unknown but many palinopsia patients have some parietal, occipital, or temporal lobe lesions. Lesions in the non-dominant hemisphere have outnumbered dominant hemisphere lesions. In the former instance, palinopsia is usually associated with homonymous hemianopia, hemiparesis, and/or psychic disturbances. Palinopsia may also be induced by physical brain trauma or a variety of medications, such as clomiphene citrate, trazadone, nefazodone, and mitrazapine (1).

Palinopsia can occur after acute ingestion of lysergic acid diethylamide (2). According to the Diagnostic and Statistical Method of Mental Disorders (4th Edition), palinopsia following hallucinogen use is a common symptom of a broader category called hallucinogen persisting perception disorder (3).

Cases are also reported where there is no direct cause known. Palinopsia and related visual symptoms can occur in otherwise healthy individuals and in patients with disease apparently confined to the eye or the optic nerve (4).

Dr. Akin is an international exchange physician from Manisa, Turkey, and he wrote this case study while at the Civil Aerospace Medical Institute.

Continued ➤

Outcome

The pilot in this case applied for reconsideration about one year after the accident. She has been off flight status since the time of her accident. Her most recent visual examination, documented on the FAA Form 8500-7, was entirely normal with stable vision and visual fields. Her treating ophthalmologist approved returning her to normal activity without occupational restrictions.

In July 2002, an FAA neurologist consultant reviewed her case and approved 1st class medical certification. However, he recommended that she submit annual neurologic and/or neuro-ophthalmologic follow-ups for 2 years to ensure her continuing stability. He also advised her to submit an EEG obtained within the upcoming year for the same reason. An Authorization for Special Issuance was issued in August 2002 with the restriction "Valid for 12 months following the month examined" and requesting the above-mentioned evaluations.

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Factors in Human Error

The NTSB's accident archives are a treasured history— a testament to human frailty and to lessons learned the hard way

By Parvez Dara, MD, FACP

The evolution of decision-making rests on the signatures of past experience. This premise brings to mind two accidents that illustrate the domineering effect of the human mind, which overrides the clues of impending disaster. The National Transportation Safety Board's archives are a treasured history, both as a testament to human frailty and to lessons learned. There is no gain in adding to that ink and much value in learning from those unfortunate enough to have required it.

On a clear Friday afternoon, a man chose to fly from New Jersey to Texas. A mathematician, by profession, he had been drawn to aviation since childhood. A teller of tall flying stories, he embellished them with the raw power of numbers and made everything seem so real. His trips, mostly logged in the Northeast, covered 200-300 miles, all impeccably detailed in his logbook.

On this spring afternoon, he planned a solo flight from New Jersey to Texas, with a fuel stopover in Nashville, Tenn. Based on the distance and prevailing conditions at various flight levels, he decided on an uneventful VFR passage. In play were a receding "high" perched over Boston and a weak trough with a developing "low" angling its way over Indiana. This system promised scattered cloud layers above 8000 feet for the three-hour duration of the initial leg of his flight.

After a three-hour unexpected work delay, he was "wheels up" at 11 AM and on his way. The ride was smooth and he kept busy with changing frequencies as one controller handed him over to the next. His trusty E6B on the passenger seat was kept busy revealing secrets of the wind condition and the fuel flow data. All calculations indicated he would reach his destination within the legal VFR reserve limit.

As the low exerted its pressure and the ground speed slowly diminished, the E6B use increased. The right wing fuel light flickered and then began to burn continuously. He continued on, eventually switching to the other tank. He could see the faint lines of the approaching clearing that suggested the Nashville airport. Below him, the outline of a single runway airport slowly disappeared. "I wonder if I should..." No! The calculations showed he could make it to Nashville— only now with lesser reserves. Midway between the passed airport and the view of his destination, the engine sputtered and died.

The E6B flew out of his hand as the whoosh from the slipstream got his attention. He flew the plane onto a field of freshly harvested corn. After the aluminum met the brown earth in a twisted sort of way— but damaged beyond repair— the mathematician emerged shaken but able to fly another day.

Implicit in this story is human arrogance. A good pilot is careful in planning but cognizant about variability. Weather change not only relates to clouds, obscuration, rain, hail, sleet, freezing rain, or ice, it also relates to increasing winds. A mind so fixated on processing information is reluctant to see all that effort wasted, like a writer who falls in love with his words, unwilling to edit and adapt. Flying these sometimes unfriendly skies, we must understand the limits of our capacities.

What monster of the mind kills a rehearsed discipline with such impunity?

The same monster was at work on this bright summer's day, as the next story about a practicing ophthalmologist illustrates. An optimist, he saw the silver lining in every cloud or a good retina behind every cataract. He

Continued on page 10...

Quick Fix from page 1

In the case where the AME issues a combined Medical and Student Pilot Certificate but erroneously indicates in the block 62 of the Form 8500-8 that only a Medical Certificate was issued, no record is established that the applicant is a student. This means that the student pilot does not receive critical safety information mailings from the FAA or from various pilot organizations.

Human Error from page 9

believed there was always a blue sky above every storm cloud, and who could argue with his logic?

The chariot of his desire—a Beech Bonanza—loved, polished, and kept immaculate in a hanger, was the envy of all the local aviators. Even though he flew infrequently, he still stayed within the confines of legal currency. His spare time was sparse. So, never a refresher course was logged in his books, nor an employment of an instructor to hone his skills. Oh, but he loved to fly, for that there is no question.

So, on that fateful Friday afternoon, across a span of 300 nautical miles between the neighboring states of Pennsylvania and New Jersey, he and a companion were comfortably settled on the leathered seats of the Bonanza, monitoring things as “Jeeves” (the autopilot) flew. The sky, marred only by the contrails of a passing jet, presented a perfect foreground for a smooth VFR flight.

All of this suddenly ended, as the passenger who limped away from the fatal accident scene related:

“He kept saying, ‘We can make it!’” Holding back an imaginary yoke in both his clenched fists, he mimicked the aviator. “He kept counting down the distance to the airport. I mean the engine had quit 4 miles out at 5000 feet. We were gliding.” He broke for a breath. “Caught my attention when

SOLUTION

AMEs must pay more attention to which certificate is issued to student pilot examinees and recognize that the student pilot may not know which certificate he or she should be issued. To prevent errors from occurring, it would be helpful to have your reception staff remove and void the certificates (Forms 8500-9 or 8420-4) the applicant is not applying for from the Form 8500-8 at the time the examinee checks in and indicates which type of certificate is being sought.

the damned thing sputtered, and then a quarter-mile from the airport the plane kind of shuddered and then took a nosedive. All I could see was the ground coming at me, and I remember saying, ‘This is it!’” His face twisted for a pensive moment, “I wish he had pulled a little harder at the yoke, maybe he would still be alive.”

As the events of his last 20 minutes of life unfolded, one would have to agree with the NTSB, who ruled it as pilot error — both for starving the engine (one tank was still half-full) and for exceeding the angle of attack. Beyond the critical angle of attack pale lay the arrogance of an undisciplined optimist, all twisted into shards of aluminum and human remains. This was a testimony to observe the law of rules.

These tragedies, inextricably linked like the DNA helix, carry the urgings of past experience, casting a historical line into the present for us to draw upon. To develop good habits, it is important to keep an open and engaged mind like my newly minted instrument student.

“Is it okay to get butterflies every time you go up?” This was a question from this 21-year-old, private pilot flying a Piper Warrior from the left seat. “My hands get cold and sweaty every time I go flying.” His eyes were wide, as beads of sweat irrigated the lines of concern on his forehead. But through it all, he methodically checked line by line, every item on

Hopefully, this will avoid issuance of the wrong certificate.

Please double check for consistency the selection the applicant makes in block 1 and your selection in block 62 of the Form 8500-8 when transmitting and sending the paper application to the AMCD. This will assure that the correct records are created and available when needed.

Dr. Jones is the manager of the Civil Aerospace Medical Institute’s Aerospace Medical Education Division.

the checklist, mumbled to himself as his eyes darted to every knob and dial for confirmation.

I asked him if he was concerned about the safety of the flight.

“Every time,” he laughed, “You know, there are no gas stations in the sky.”

These events, albeit isolated, are nevertheless tethered to each other in the simple reality of human nature. The logical mathematician sticks doggedly to his numbers while giving no credence to the need for flexibility and a generous allowance for the ever-changing weather. An optimist rides the shimmering waves of desire, only to throw the caution of aerodynamic laws to the wind. So what, if any, lessons can one learn from this?

1. Keep an open mind, gather the whole picture.
2. Practice simulated emergencies – enhance your positive experience.
3. Always have a way out.
4. Adapt to changes.
5. Obey the rules – follow established procedures. The laws of physics are unyielding.
6. Err on the side of safety.
7. Respect nature, where change is a constant.
8. Understand your capabilities and your aircraft’s limits.
9. Remember, it could happen to you.



Dr. Dara is an aviation medical examiner who specializes in hematology and oncology in Toms River, N.J.; he is also a pilot with the ratings of Airline Transport Pilot, Certified Flight Instrument Instructor, and Multi-Engine Instrument with more than 2,400 hours in the air. He is a director of the Mooney Aircraft Pilot Association and a frequent speaker at ground and flight safety seminars.

An Unexpected Finding of Hydrocephalus in an Applicant Case Report, by Paul L. Blanchard, MD

With our increasing use of CT and MRI technologies, an airman will occasionally be found to have unexpected pathology that is unrelated to his symptoms. This applicant was found to have an asymptomatic arachnoid cyst and hydrocephalus. Now that this unexpected finding has appeared, what should the aviation medical examiner do?

This case involves a 20-year-old gentleman who desires to begin flight training. He presented to an aviation medical examiner in April 2000 requesting issuance of a 1st-class medical and student pilot certificate.

History. On review of his history, the applicant reported hay fever that was not currently symptomatic and required no medications. Additional history disclosed that he had been involved in a traffic accident in October 1999, when he was struck from behind while riding his bicycle. He suffered a broken left wrist and a laceration above his right eye that required sutures. He was alert and oriented when he arrived at the local emergency room and, according to the treating physician's note, this gentleman had a normal neurological exam. However, he had no recollection of the accident. Therefore, the attending physician felt it would be prudent to obtain a CT scan of the brain to assess possible intracranial pathology.

The CT scan showed some extracranial swelling above the right eye. No orbital fracture or intracranial hematoma was identified. There was, however, an interesting incidental finding. This gentleman had a congenital arachnoid cyst located at the superior cerebellar cistern. Because of the mass effect from the cyst, hydrocephalus with prominent lateral and third ventricles was seen. The radiologist recommended an MRI to further study the arachnoid cyst.

The MRI showed the arachnoid cyst to measure 6.5 centimeters AP diameter by 5 centimeters transverse diameter by 5.2 centimeters craniocaudal diameter. The cyst exerted a significant mass effect on the cerebellar vermis and the dorsal brainstem. There was narrowing of the cerebral aqueduct resulting in hydrocephalus of the lateral and third ventricles.

This gentleman was sent for a neurosurgical opinion. The neurosurgeon advised following him with serial MRI studies since he had no symptoms, and his neurological examination was completely normal. Follow-up MRI studies in January and May of 2000 showed no significant interval change.

Disposition. As previously stated, the applicant had presented to a local AME in April requesting airman medical certification. On review of his FAA Form 8500-8, the applicant had no complaints or concerns that day, and the AME recorded a normal physical examination. However, because of the abnormal CT and MRI studies, a medical certificate was not issued, and the case was deferred for review to the FAA Aerospace Medical Certification Division (AMCD) in Oklahoma City.

In September 2000, the AMCD denied the application for medical certification due to the "disqualifying general medical condition of arachnoid cyst with mild hydrocephalus." The relevant regulations are 14 CFR Part 67.113(b), .213(b), and .313(b).

The following month, the applicant filed an appeal for reconsideration of the denial. The CT and MRI studies

were submitted for review, and the case was forwarded to an independent neurologist for his opinion as to the applicant's suitability for medical certification. After reviewing the scans, the neurologist felt that the hydrocephalus was even more advanced and severe than had been reported. He also believed that the cyst would continue to expand over time and eventually occlude the fourth ventricle. Should this happen, both intraventricular and intracranial pressure would increase, and this could possibly lead to sudden incapacitation.

The applicant's neurosurgeon believed that piloting would be a safe activity, given the current stability of the arachnoid cyst and the absence of symptoms. The neurological consultant disagreed and recommended that "this airman be denied all classes indefinitely into the future."

The current recommendation for treatment depends on the person's symptoms. Asymptomatic cysts can be followed with serial exams and imaging studies. Surgical intervention becomes necessary if one develops symptoms of increased intracranial pressure, seizures, neurologic deficits, or cognitive impairment. Needle aspiration only provides temporary benefit and is not a long-term treatment option. At present, this applicant is denied medical certification because the transition from an asymptomatic to symptomatic arachnoid cyst is unpredictable, which poses an unacceptable risk to aviation safety.

If the applicant were to elect to undergo surgical treatment, he might be placed on anticonvulsants as a prophylactic measure after his procedure. If that were the case, he would need to have a seizure-free period for an appropriate observation period (determined on a case-by-case basis) following discontinuation of any prophylactic anticonvulsants before he could be reconsidered for issuance of a student pilot medical certificate.

Based on the neurological consultant's opinion, the original denial of September 2000 was sustained.

Continued on page 13...

Dr. Blanchard was a Wright State University resident in Aerospace Medicine when he wrote this case report at the Civil Aerospace Medical Institute.

Office of Aerospace Medicine NEWS



L-R: Mr. Traylor, Mr. Tien, Ms. Ritz, and Dr. Silberman

Librarian 2002 Employee of the Year

If the adage *knowledge is power* is accurate, then librarian **Katherine Wade** is a power broker. Ms. Wade was chosen as the 2002 Civil Aerospace Medical Institute's Employee of the Year by her co-workers at the Institute in recognition of her "professional expertise" and "in-depth ability" to find facts and figures. She was recognized as one who is keenly knowledgeable of vast resources of information available to researchers or anyone with "a need to know."



Ms. Wade

Review Physician Called to Active Duty

Larry F. Wilson, MD, a medical review physician in the Aerospace Medical Certification Division, is in the Oklahoma Army National Guard and has been mobilized for at least one year. He expects to be stationed in Bosnia. Prior to working at the AMCD, Dr. Wilson was a flight surgeon in the Southern Region.



Dr. Wilson

Chinese Official Visits CAMI

Mr. **Joseph Chu-Chen Tien**, Secretary General of the Taiwanese Civil Aviation Authority, visited the Civil Aerospace Medical Institute (CAMI) on November 19, 2002. Mr. Tien was interested in CAMI's medical certification and aviation medical examiner programs. He also visited the FAA Academy and the air traffic control tower simulator. Pictured are (L-R) **Bill Traylor** (FAA Academy Superintendent), Secretary General Tien, **Lindy Ritz** (Mike Monroney Aeronautical Center director), and Dr. **Warren Silberman** (Aerospace Medical Certification Division manager).

FAA Remembers Jim Spanyers

James (Jim) P. Spanyers, an aviation physiology instructor with the Civil Aerospace Medical Institute's Airman Education Program staff, passed away on October 18, 2002, after a terminal illness. Jim had worked at CAMI for seven years and was well known in the aviation community as an expert at demonstrating survival skills and as a lecturer. His talents were recognized by the U.S. Air Force, where he worked in a similar capacity during a 26-year career. At the Institute, he distinguished himself by teaching pilots valuable survival skills and physiological aspects of safe flight.

In addition to working in Oklahoma City, Jim and his fellow instructors traveled to many locations in the U.S. and abroad to teach aviation safety short courses to pilots and others. He had been recognized for his efforts by two major awards by the FAA and received numerous letters of appreciation from those he served.



Mr. Spanyers

International Exchange Physician Completes Tour



Dr. Akin

Major **Ahmet Akin, MD**, a native of Manisa, Turkey, completed a year-long tour in December 2002 as a participant in the International Exchange Visitor program at the Civil Aerospace Medical Institute.

Dr. Akin is an assistant professor in the Department of Aerospace Medicine at Gulhane Military Medical Academy in Eskisehir, Turkey. During his year at CAMI, Major Akin rotated through the research, education, and certification divisions, and he also co-authored a major research paper and a case report (see **Palinopsia**, page 8).

Dr. **Melchor Antuñano**, CAMI Director, said that Dr. Akin "worked hard and contributed much" during his rotation at the Institute. "We are pleased with his efforts and wish him every success in his future endeavors," he concluded. Dr. Akin is the second physician from Turkey to participate in the exchange program.

While he says he "really enjoyed" his year at the Oklahoma City, Okla., Institute, Dr. Akin said he was also looking forward to returning to Turkey to "get reacquainted with my friends, family, and professional associates."

The International Exchange Visitor program allows qualified foreign specialists to enter the US for up to two years to conduct studies and exchange information at FAA facilities.

The Office of Aerospace Medicine supports all international programs that promote interaction between aviation medicine professionals, enable the exchange of scientific information, and promote the FAA's prominence in civil aerospace medicine.

Continued ➤



DOT Secretary's Award. Patricia Calvert (center), is shown accepting the Secretary's Award from Department of Transportation Secretary **Norman Y. Mineta**, as FAA Administrator **Marion C. Blakey** looks on. Ms. Calvert works at the Civil Aerospace Medical Institute's Protection and Survival Laboratory.

Congratulations. Dr. **Stephen L. Carpenter**, a medical review officer in the Aerospace Medical Certification Division, was recently certified in Aerospace Medicine by the American Board of Preventive Medicine. Dr. Carpenter joined the FAA in 1990, and he is an avid pilot and also serves as a flight surgeon in the Oklahoma Air National Guard. →

Hydrocephalus from page 11

Discussion. Arachnoid cysts account for 1% of intracranial mass lesions, and most are congenital. Most of these cysts occur in an area where the arachnoid membrane becomes split or duplicated, and this allows CSF to collect between the split in the membrane. As the cyst increases in volume, it may compress adjacent brain tissue and obstruct CSF flow. Arachnoid cysts can occur anywhere in the nervous system where arachnoid membrane is found.

As this case demonstrates, the number of people found to have asymptomatic arachnoid cysts is likely to rise because of the increasing use of CT or MRI to assess unrelated problems.

Reference

Samuels MA, and Feske S. *Office Practice of Neurology*. Churchill Livingstone, Inc., 1996.



Aviation Medical Examiner

Seminar Schedule

2003

March 10-14 ----- Oklahoma City, Okla. ----- Basic (1)
 April 25-27 ----- Atlanta, Ga. ----- OOE (2)
 May 5-8 ----- San Antonio, Texas ----- N/NP/P (3)
 June 9-13 ----- Oklahoma City, Okla. ----- Basic (1)
 July 18 - 20 ----- Chicago, Ill. ----- AP/HF (2)
 August 15 - 17 ----- Washington, D.C./McLean, Va. --- CAR (2)
 September 15 - 19 --- Oklahoma City, Okla. ----- Basic (1)
 October 3 - 5 ----- Salt Lake City, Utah ----- OOE (2)
 November 3 - 7 ----- Oklahoma City, Okla. ----- Basic (1)

CODES

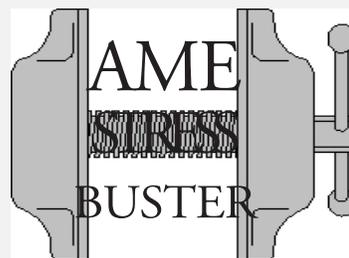
AP/HF Aviation Physiology/Human Factors Theme
 CAR Cardiology Theme
 OOE Ophthalmology - Otolaryngology - Endocrinology Theme
 N/NP/P Neurology/Neuro-Psychology/Psychiatry Theme

(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.

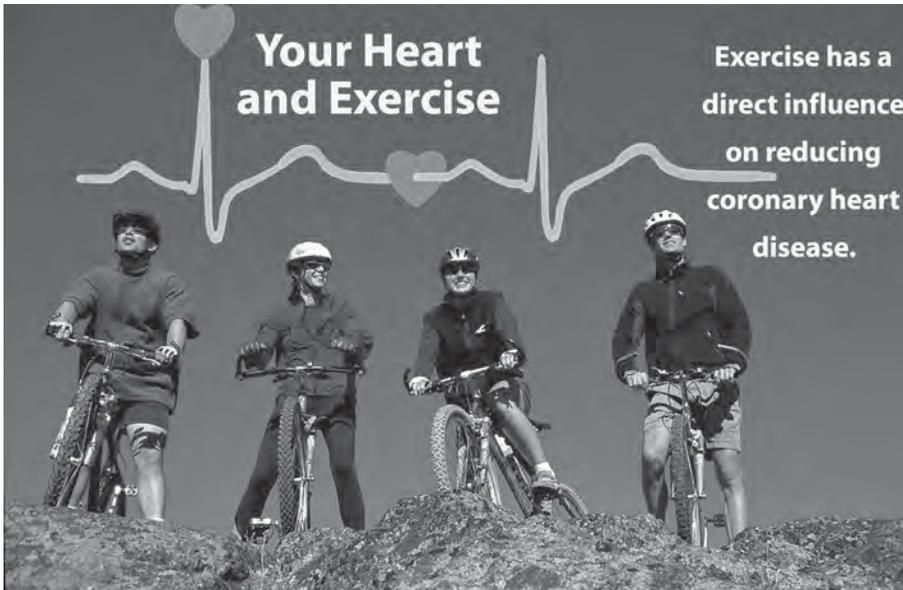


Be sure to order enough Airman Medical Certificate forms (FAA Form

8500-8) to last one year. When you deplete your supplies, order another year's supply.

If you follow this routine for restocking your medical forms, you should never be in the stressful position

of having an airman arrive for an FAA physical, only to find you are out of medical examination forms!



TOPICS AND ISSUES

Just for the
Health of Pilots

By Glenn R. Stoutt, Jr., MD, Senior
FAA Aviation Medical Examiner

Here is a summary of what I found important in the article:

- Studies have shown that exercise has a *direct* influence in reducing coronary heart disease in men, but data on the type and intensity of exercise have been sparse.
- The group studied included 44,452 US men (aged 40 through 75 years) in various health professions followed from 1986 to 1998 in a precise, well-controlled analysis of subsequent coronary heart disease (CHD) and levels of leisure-time physical activity.
- Men who ran for an hour or more a week had a 42% risk reduction for coronary heart disease.
- Men who trained with weights for 30 minutes or more per week had a 23% risk reduction.
- Rowing for 1 hour or more per week was associated with an 18% risk reduction.
- A half-hour per day or more of brisk walking was associated with an 18% risk reduction.
- Swimming and cycling were not included in the study (though obviously excellent exercise choices) because not enough were in the group to be of statistical significance.
- Walking pace was associated with reduced CHD *independent of the number of walking hours.*

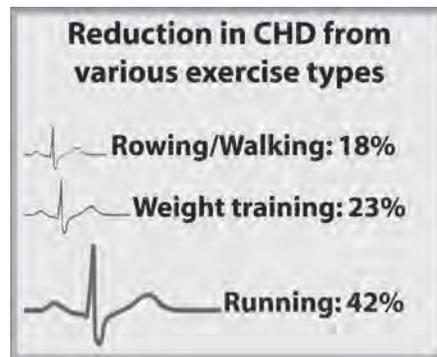
SINCE THIS IS THE ISSUE for winter of 2002-2003, you can't avoid thinking about flab. One way or another, you have to survive the eating (feasting) period that begins each year at Thanksgiving, goes through the religious holidays, and ends on the almost-holy day of Super Bowl Sunday. Chances are good that you have added a few unwanted pounds and have sworn to lose them.

For the past five years, this column has been dedicated to providing loads of information (all you really ever need to know) in many articles about **diet and exercise**. Fortunately, they are all now available on the Web site for the FAA's *Federal Air Surgeon's Medical Bulletin*:

www.cami.jccbi.gov/aam-400A/index.html

(If you can type all this address correctly the first time you are truly an amazing person—no one has ever done it before.) When you get to the site, just key in the part listing the articles of *Just for the Health of Pilots*. The articles on diet and exercise give a foolproof, medically sound method for losing the pounds of fat that you don't want.

The number of scientific and medical journals is pushing the 10,000 mark. Ideally, it would be nice to see the best articles from the best journals or even important articles from important journals. I luckily found a small jewel of an article in the October 23/30, 2002, issue of the *Journal of the American Medical Association* from researchers at the Harvard School of Public Health. The article was "Exercise Type and Intensity in Relation to Coronary Heart Disease in Men." No major breakthroughs in medicine were revealed, but some simple, solid, useful conclusions were reached.



Continued ➤

Dr. Stoutt is a partner in the Springs Pediatrics and Aviation Medicine Clinic, Louisville, Ky., and he has been an active AME since 1960. No longer an active pilot, he once held a commercial pilot's license with instrument, multi-engine, and CFI ratings.



The walking pace is a very important item in the analysis. Essentially what was revealed was that brisk walking for a short time has a greater protective effect than long periods of “strolling.” Walking pace was defined as *casual* (up to 2 mph), *normal* (2-3 mph), *brisk* (3-4 mph), or *striding* (4 or more mph). As a guide: a mile in 30 minutes is 2 mph, in 20 minutes is 3 mph, and 15 minutes is 4 mph. A person probably cannot walk faster than 8 mph unless he is “race walking.” Most of us would probably be satisfied with a mile in 20 minutes. (Of course, a casual walk in the woods or around beautiful scenery shouldn’t be hurried. There is the psychological and healthful boost of “smelling the roses” on a stroll through nature.)

This study was one of the few that showed the advantage of resistance or weight training in reducing CHD.

In summary, the article stressed that vigorous exercise was better than moderate-intensity exercise and that strength training also had a direct effect in lowering the incidence of CHD.

What is a measure of exercise intensity? At rest, the intensity is expressed as 1 MET (metabolic equivalent task). This is the energy we spend entirely at rest, such as sleeping or sitting in a chair. It is equivalent to 1 calorie per kilogram of body weight per hour. As an example: One kilogram (kg) is equal to 2.2 pounds. So, a 220-pound man weighs 100 kg. He then needs 2400 calories (100 kg times 24 hours) a day just to stay alive. To calculate your own basal metabolic needs, just divide your body weight by 2.2 to get the number of kilograms, and multiply by 24. *Anything* you do extra (walking, eating, standing, working, exercising) burns calories.

The article defines vigorous exercise as 6 METs, or 6 times as much effort as you expend sleeping or sitting still. This is really just brisk and intense—but not exhausting—exercise.

The take-home message from the study was stated at the beginning: Sedentary individuals have almost twice the risk of CHD as those performing high-intensity exercise.

Walking is the most common leisure activity among US men and women. As a rough measure, walking a mile burns about 100 calories.

Current guidelines from the National Institutes for Health recommend 30 minutes of moderate-intensity activity on most, and preferably all, days of the week to prevent CHD and other chronic diseases.

Dr. Jesse Wright of the University of Louisville Department of Psychiatry said (in a lecture on depression) that exercise was probably as good as the selective serotonin reuptake inhibitors (SSRIs such as Prozac®, Paxil®, and Zoloft®) for treating depression. He added that his running for the past 17 years allowed him to avoid much of the stress of treating severe psychiatric problems day after day.

Joggers and runners feel exhilaration from a surge of endorphins after a workout. The release of muscle tension of which we are unaware is also a significant benefit in promoting a feeling of calm. Exercise promotes more restful sleep. As psychiatrists say, “The answer to anxiety is action.” The body loves the action of exercise. Can you be mad or anxious after a five-mile run?

Stress and tension lead to fatigue, the number-one cause of pilot error. Stay healthy, stay calm, stay cool. Put exercise into your daily plan—it is as necessary as food and sleep for both your physical (especially heart) and mental health.

Yours for good health and safe flying,

Glenn Stoutt

SOME HELPFUL FACTS, FACTOIDS, PEARLS, AND TIPS

- ◆ The Honolulu Heart Program found that *regular* walking in older men (two miles a day) was associated with significantly reduced mortality. They studied 707 nonsmoking retired men, aged 61 to 81 years. Even half a mile daily was beneficial.
- ◆ Tomatoes contain the antioxidant lycopene, which can lower heart attack risk.
- ◆ Potassium, high in fruits (especially oranges and bananas) and vegetables, helps lower blood pressure.
- ◆ Deep breathing and walking are great for control of anger. Counting to 10 is not much help—you often blow up when 10 is reached.
- ◆ If you make your own hamburgers or chili, use extra-lean beef. Costs more, but has only about 10 percent fat. (Still a lot of fat for steady use.)
- ◆ Your heart weighs about one pound. It beats about 100,000 times a day. Your body contains about 5 quarts of blood, and your heart has to pump (without rest) about 80 million gallons of blood in a lifetime. If it stops for even five or six minutes, you either get severe brain damage or enter the *Hardwood Hilton* (“kick the oxygen habit”). So, take **real good care** of your heart by developing a healthful lifestyle.
- ◆ Monounsaturated fat (such as found in canola oil and olive oil) is said to cut the rate of breast cancer in half. Also **helps prevent heart disease**.

Note: The views and recommendations made in this article are those of the author and not necessarily those of the Federal Aviation Administration.

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