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Aviation Safety Through Aerospace Medicine

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

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HEADS UP

Deputy Federal Air Surgeon Selected

James R. Fraser, MD, is the new Deputy Federal Air Surgeon, according to an announcement by the Federal Air Surgeon, **Frederick E. Tilton**, MD, who became the Federal Air Surgeon earlier this year [FASMB, Vol. 44, No. 1, p. 1].

Dr. Fraser has managed the Medical Specialties Division at FAA Headquarters for the past two years, and he was 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.

Leadership ability is a "plus" for the new deputy, stated Dr. Tilton: "His strong skills as a manager, joined with his aerospace medicine expertise, and his FAA experience will make the Office of Aerospace Medicine much more effective."

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QUICK FIX

They're "Invitation Letters," NOT "Delinquency Letters"

By Richard "Dick" Jones, MD

PROBLEM: We send invitation letters to AMEs within one year of their needing refresher training if they are practicing near the location of an upcoming Theme Seminar, as a reminder training is coming due and in an attempt to save them travel costs. We also notify International AMEs who will need training within a year of domestic seminars, even though past practice has permitted them to request equivalency credit for local training similar to ours, since we want them to know we prefer to train them and many of their employers will not fund a trip to the U.S. without an invitation. Unfortunately, some AMEs are misinterpreting our letters as notifications of training delinquency. The latitude we have had to give equivalency for non-FAA International courses is likely to end soon, so a secondary purpose of this article is to suggest that International AMEs heed our warnings to train, even though they may not have needed to do so in the past.

RESULT: Some AMEs are attending specific seminars when they might have preferred to pick one at a different time or place, and some are not availing themselves of distance learning when it would be a cheaper, more convenient option. Our staff members are spending inordinate amounts of time addressing questions for which AMEs should already know the answer. In all, everyone is frustrated.

SOLUTION: All AMEs should be aware that FAA Order 8520.2E, *The Aviation Medical Examiner Program*, specifies each AME must attend a refresher seminar at least every six years and will either perform distance learning

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Thanks...

The Federal Air Surgeon's Column

By Fred Tilton, MD

I **FREQUENTLY SPEAK** at aviation medical examiner (AME) seminars, and when I do, I always take the opportunity to thank you for the excellent work that you do. I go on to say that we could not possibly manage the business of medically certifying more than 600,000 airmen without you.

In fact, you do such outstanding work that we are planning to expand your role to allow some of you to make initial special issuance or waiver decisions. At the moment, we tentatively plan to call these AMEs "Super-AMEs."

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Secretary of Transportation
Norman Y. Mineta

FAA Administrator
Marion C. Blakey

Federal Air Surgeon
Fred Tilton, MD

Editor
Michael E. Wayda

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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

It will take us a while to make that happen because we will have to make regulatory changes before we can delegate that authority. So, if you have an interest in expanding your function, be watching for the rule-making notice in the Federal register.

Those of you who eventually become Super-AMEs will be our very best and most reliable AMEs. However, because you have the authority to render such decisions does not mean that you will be expected to do so in a vacuum. We would much rather have you call us if you have questions than to issue a certificate in error.

As you may recall, in my first editorial I wrote about calling your regional flight surgeon or the Aerospace Medical Certification Division if you had questions or concerns. As a Super-AME, it will be even more important for you to keep the communication lines open because you will have the authority that currently is held only by Federal Aviation Administration physicians.

Even if you do not wish to be a Super-AME, we will continue to rely on you to use good judgment so that we do not have to reverse any of your decisions. When we have had to do so in the past, it was often due to mistakes in issuing certificates to airmen who were taking inappropriate medications. Unfortunately, we recently became aware of more than 100 airmen that had been issued certificates while they were taking selective serotonin reuptake inhibitors, or SSRIs.

These and other antidepressants are unacceptable medications! We have published articles on SSRIs in the *Federal Air Surgeon's Medical Bulletin*, they are clearly identified as disqualifying in the *AME Guide*, and they are covered in virtually every AME seminar.

We have had to spend hundreds of hours dealing with these inappropriate issuances. Airmen have been inconvenienced, and they are naturally angry. Appropriate corrective action has been taken against those AMEs who issued these certificates, and those who remain AMEs are not likely to be selected to be Super-AMEs in the future.

Antidepressants are not the only disqualifying medications and, often as not, the underlying diagnosis is disqualifying as well. I realize that only a few AMEs are responsible for these mistakes, but these events are so serious that I believe it makes sense to remind everyone to be careful. We are in the safety business, and poor decisions can have disastrous results.

So, pay attention to the articles in the *Bulletin*, read the *AME Guide*, keep up with your required AME training, and — by all means — call us when you have questions.

I will close the way I started by thanking all of you for your service. We couldn't do it without you.

— Fred

Certification Update

Information About Current Issues

By Warren S. Silberman, DO, MPH

FAA MedXPress

We have been telling you that we were going to do it, and now FAA MedXPress is a reality. This new MedXPress system is another initiative towards making the Aerospace Medical Certification Division (AMCD) paperless.

Here's how the new Internet-based program works: Airmen with E-mail address can submit their FAA medical history via the Internet, receive a confirmation number, go to their aviation medical examiner's (AME's) office and, providing they are otherwise qualified, be issued their medical certificate without any intervening paperwork!

Applicants will go to the FAA's Web site (https://medxpress.faa.gov), where they will sign up and be E-mailed their username and password. They can then go online and complete the front portion of their examination Form 8500-8. Upon clicking the SUBMIT button, they will receive a confirmation number.

Each applicant is advised to print off a copy of the 8500-8 (which is in PDF format and appears just like the current 8500-8) and take it to an AME's office for a physical exam. The applicant will give the AME this confirmation number. You will pull up the completed history form, go over the responses, complete the physical examination, and submit that to the AMCD, just as you are doing now.

We should encourage our airmen applicants to complete their examinations this way for two very good reasons. Using MedXPress will:

- reduce the amount of paper that is sent into the AMCD and speed up the scanning process. This is a rate-limiting step, meaning that there are fewer documents to be scanned.
- speed up the applicant's office visit with you.

We plan for the next version of MedXPress to accommodate airmen with previous examinations stored in our computer system. We can populate the fields so airmen will only need to modify the items that have changed since their last examination. In the first version of MedXPress, if an airman clicks the number by the specific item he/she will be linked to the instructional sheet that normally is attached to the hard-copy Form 8500-8. In a future version, we plan to link the item to the online *Guide for Aviation Medical Examiners.*

Airmen that submit their examination via MedXPress enable you to add your comments to the history, and the computer will track (for legal purposes) which comments were made by the applicant and which were made by you.

Currently, you will need to take a hard copy 8500-8 and use the certificate number on the form for the electronic version. You may also tear off the medical and/or student pilot medical and use that for your airman. You are being instructed not to send this blank form to the AMCD, but rather save it in the airman's file or destroy it. In the future, we plan to have the computer automatically issue a certificate number, so you do not have to use the hard copy form, and that will save some more money.

We have not yet perfected the ability to print out the medical certificate for you to issue to your airmen. We have heard your voices on the necessity of doing this, and this is a logical step in the process, but the problem is obtaining the funding to accomplish this task.

While we do not want to tell you how to manage your office procedures, we would like to suggest ways to best utilize the MedXPress program (incorporating AME suggestions):

1. Obtain the copy of the front side of the 8500-8, either from the applicant or from the confirmation number,
2. Use a blank piece of paper to record the physical exam results,
3. Copy the back portion of the current 8500-8; after the airman departs, input (by you or your office personnel) the examination results, much like most AME offices do now.
4. Set up a computer terminal in your waiting area or in the examination room and have the airman go online to complete, submit, and obtain a confirmation number. You could then pull up the 8500-8, input it into the AMCS, and complete the examination on the spot.

We strongly encourage you to participate in MedXPress. However, this process is not mandatory for airmen. They can choose to use the new MedXPress system or continue to complete the hard copy form as they have always done.

For more information, go to the AMCS support site for a slide presentation that portrays the screens that the applicants will see and demonstrates to you the screen that you will use to save the questionnaire into the AMCS:

www.faa.gov/other_visit/aviation_industry/designees_delegations/designee_types/ame/amcs/

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

Dr. Fraser from page 1

Dr. Fraser has more than 20 years of professional experience in Aerospace Medicine. He retired from active duty with U.S. Navy in September 2003 as Captain and Command Surgeon, Naval Safety Center, Norfolk, Va., where 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, at 18 Naval Air Station Branch Medical Clinics and for over 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 deployed.

Dr. Fraser graduated from the University of Oklahoma, earning BA, MPH, and medical degrees. He is licensed to practice medicine in Oklahoma and is board-certified in both Family Practice and Preventive Medicine (Aerospace Medicine).

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AME TIPS: *HYPERTENSION*

High BP readings are usually examiners' main problem, and we also see it in our office. I have partially solved, I think, much of this problem. The pilots were getting really tense doing the eye exams (Titmus equipment and so on). I now have our assistant do the BP readings *before* the eye exams. The results have been amazing, but it is too soon to be sure. In any event, we will always do the BPs before doing the eye exam. Some of the pilots almost get a hernia trying to read the eye charts.

— Glenn R. Stoutt, Jr., MD
Senior AME, Louisville, Ky.

Quick Fix from page 1

or attend a seminar within three years of the last seminar. We put the dates of last seminar training and last distance learning, respectively, called "Last Class Training Date" and "Last Self-Training Date" on each AME's annual Individual Performance Summary Report, so everyone should have these dates available to them.

Therefore, no AME should be confused about whether or not to interpret an invitational letter as a mandate. Your regional office and this division will continue to inform you of upcoming seminars and to remind you of an impending training delinquency, but it is the AME's responsibility to train at the expected frequency. If your training becomes overdue, you risk termination of your designation when your Regional Flight Surgeon struggles with the decision on whether or not to retain your services.

Please note, FAA Order VS1100.2, *Managing AVS Delegation Programs*, specifies that termination of a designation for failure to train is not subject to appeal.

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

Guide for Aviation Medical Examiners Internet Address Changes

Some things never change, unless we're talking about Web site addresses for important, useful applications for aviation medical examiners. Decision-makers have found it necessary to change the directory where the popular *AME Guide* resides. The address is now www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/.

The old address will continue to be active through a temporary "redirect," so — at least for the time being — you will still be able to use your old bookmark to find the *Guide*.

AME Resources

Order Pilot Safety Brochures 3 Ways

Title

Alcohol and Flying: A Deadly Combination

Altitude Decompression Sickness

Carbon Monoxide: A Deadly Threat

Deep Vein Thrombosis and Travel

Hearing and Noise in Aviation

Hypoxia: The Higher You Fly, the Less Air in the Sky

Information for Pilots Considering Laser Eye Surgery

Medications and Flying

Physiological Training Courses for Civil Aviation Pilots

Pilot Medical Certification

Pilot Vision

Seat Belts and Shoulder Harnesses

Smoke!

Spatial Disorientation: Visual Illusions

Spatial Disorientation: Why You Shouldn't Fly By the Seat of Your Pants

Sunglasses for Pilots: Beyond the Image

When There are Questions About Your Medical Certification Application

To order, contact:
FAA Civil Aerospace Medical Institute
Shipping Clerk, AAM-400
P.O. Box 25082
Oklahoma City, OK 73125
(405) 954-4831
E-mail: Gail_Gentry@FAA.gov

To view these pilot safety brochures online, visit the Federal Aviation Administration's Web site:
www.faa.gov/pilots/safety/pilotsafetybrochures/

Physiological Training Classes for Pilots

If you are interested in taking a 1-day aviation physiological training course with altitude chamber and vertigo demonstrations or a 1-day survival course, learn about how to sign up for these courses that are offered at locations across the U.S. by visiting this FAA Web site:
www.faa.gov/pilots/training/airman_education/aerospace_physiology/index.cfm

Sarcopenia

Sarcopenia—muscle wasting—is the age - related loss of skeletal muscle mass, strength and function.

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

I WROTE A COLUMN in each issue of the *Federal Air Surgeon's Medical Bulletin* for five years, entitled like this one, "Just For the Health of Pilots." The last article, published in the Spring 2003 *Bulletin*, was about hip fractures.

But, good deeds do not go unpunished. Last summer, I was thrown off my riding mower, breaking my left hip at the top of the largest bone in the body, the femur. I was 76 then. Not good.

Surgery and rehabilitation entailed about eight weeks of mostly lying in bed or sitting in a chair. Every week of complete bed rest results in a loss of at least 10% of muscle strength. At first I was pleased that I had lost 23 pounds. Not a good thing, as the weight drop was *mostly loss of muscle, not fat.* Injury plus age: I had met sarcopenia face to face.

After intensive physical therapy and continuing strength training, I can now walk a mile (slowly), and am back in the office as an aviation medical examiner three days a week.

The medical literature on wellness now gives top priority to strength training—with resistance exercises and use of weights being emphasized as essential for healthful lifestyles and healthy bodies. Muscle is the heaviest system in the body, composing 40% of men's weight and 23% of women's.

Lean muscle mass is dependent upon innervation. If the nerves to muscles are injured or cause paralysis, muscle atrophy develops. But, e*xcluding injury, almost all sarcopenia is age-related and inevitable, with progressive replacement of muscle tissue by fat.* Human nerve cells have a predetermined life span. Signals go from the brain to muscle, and as nerve fibers decline, so do the muscle fibers they innervate. In older people, this loss of muscle mass and strength can lead to inability to climb stairs or get up out of chairs without holding onto the arms and causes a likelihood of falls.

Sarcopenia begins as early as age 20 or 25 and lean muscle mass decreases about one-half percent for every year of age up to about 60, when the loss accelerates. In our 70s, 80s, and 90s the loss is exponential. Here are convincing statistics: take the world records in running and swimming for the 100-, 200-, and 400-meter events. Men and women invariably had poorer performance times as their age progressed in 5-year increments.

While we can't regain our body of years ago, we can definitely lessen the effects of aging by exercise and muscle training

Skeletal muscle is a calorie-burning furnace. Lean muscle burns calories rapidly even in the resting state. Weight loss is rarely successful by diet alone. Muscular people can eat much more than obese ones. After weeks of disciplined strength training and reasonable dieting, a person may wonder why the bathroom scale readings have unchanged. The reason is that there has been fat loss but a much greater increase in the heavier muscle mass. Conversely, a man 65 who does not exercise may brag that he weighs exactly the same as the day he graduated from college. The truth is that he has had an increase in fat and a loss of lean muscle.

Nowhere is the rule "use it or lose it" more important than exercising our bodies. *Although sarcopenia cannot be stopped, it can be slowed or lessened by strength training. No matter what your age, you can strengthen any muscle mass you have.*

Flabby muscles can become much stronger. Exercise programs in nursing homes have produced dramatic increases in mobility and function—some patients were even able to discard their walkers or canes. Exercising also strengthens bones.

However, don't overdo it by joining the exuberant fitness fanatics who leave each workout in a state of self-satisfied exhaustion. For some sensible, current, and reliable answers to just about any questions about exercise, refer to the sidebar.

I recently told a friend that I still was not the person I used to be. He said, "You never were." But there was sense in his good-natured barb: We can't regain our body of years ago, but *we can definitely lessen the effects of aging by exercise and muscle training. It is absolutely the most effective intervention for loss of muscle mass, strength, and function.*

Yours for good health and safe flying,

Glenn Stoutt

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THE TWO FLAVORS OF EXERCISE

Cardiovascular or aerobic

These exercises include walking, jogging, running, swimming, biking, hiking and so on. There is sound evidence that running or jogging three times a week gives you all the cardiovascular protection you need. Any reasonably vigorous aerobic session of 30 minutes is adequate.

Strength exercises

- Either join a fitness center or get your own simple and inexpensive equipment for home workouts. For either choice, an absolute need is to get a competent instructor to teach you, from the day you start, the proper way to use the equipment. Good habits are as hard to break as bad ones. You want to be helped, not injured.
- Your home equipment can be as simple as four or five sets of dumbbells and maybe some elastic bands (light and portable).
- For dumbbells, select one you can lift only once, and then start your program with half this weight. So, if you can lift 20 pounds once, start building up to 10 slow, smooth repetitions with 10 pounds. Then gradually build up to three sets of 10 repetitions. After a few weeks, go up to 15 pounds and repeat the process.
- Muscle strengthening requires *progressive overloading*, so the weights must be gradually increased to what you think is your absolute safe maximum. An older person must be satisfied with lower goals.
- Never hold your breath when lifting a weight; this causes a marked increase in blood pressure. Breathe in or out slowly while you lift.
- Plan to do eight to ten exercises of all the major muscle groups. If you can do only your upper body in one session, do your abdominals and legs the next time.
- Allow 20 minutes for actual weight or resistance movement and 10 minutes for brief rest periods between exercises, making a total of about 30 minutes. Do strength training three times a week, and wait at least 24 hours before the next workout, giving your muscles time to rest and rebuild.

Severe Asthma in an Airline Pilot

Case Report

By R. Shane Day, DO, MPH

Asthma in the aviator poses a challenge to the aviation medical examiner because frequent or severe asthmatic symptoms can cause sudden incapacitation. An essential task of the AME, therefore, is to complete a thorough evaluation of the aviator with a history of asthma.

History. A 35-y-old black male commercial airline pilot with over 7000 hr presented to his AME for a routine examination to renew his first-class medical certificate. He had been going to the same AME for his aeromedical examinations for more than 10 y. At this examination, he indicted a history of asthma with no current medication use, and he denied any changes or problems. He also admitted a prior DUI conviction that he had failed to disclose for 2 y.

Three mo after his aeromedical exam, the pilot was noted by his flight crew to look disheveled and have alcohol on his breath just prior to a scheduled flight. He was reported and was asked to perform an alcohol breathalyzer test.

Reports state that he was physically unable to blow sufficiently into the apparatus due to a pulmonary condition. The airman was grounded, and the FAA began investigating his pulmonary condition.

His AME was contacted for further information, and all that was known was that the airman had claimed a history of asthma with no current problems or medication use. When the airman was subsequently questioned, he admitted that he did indeed have asthma and was currently using Advair and albuterol, as prescribed by his pulmonologist.

The airman also admitted to having been hospitalized for his asthma 3 mo earlier, just prior to his aeromedical exam. Hospital records stated that he had just returned from a foreign flight and was admitted complaining of sudden onset shortness of breath, wheezing, cough, and yellow sputum. He was found to be hypoxemic by arterial blood gas. When questioned by the pulmonologist, the airman stated that he had been taking oral prednisone 10 mg daily and Serevent for the past 3 y. He had also required daily bronchodilator use. Of note, he denied any use of alcohol. He was diagnosed with moderate, persistent asthma with exacerbation. He was treated with intravenous steroids, antibiotics, and beta-agonists and discharged the next day with prescriptions for Advair, prednisone (tapering), Proventil, Tequin, and albuterol. The following day, he revealed none of this to his AME during the exam.

Three days after the airman was "unable" to provide a breath specimen for his breathalyzer test, he was evaluated by a pulmonologist to verify his condition. On the day of this examination, the airman reported feeling completely asymptomatic. His pulmonary function test (PFT) revealed a forced expiratory volume (FEV1) in 1 s that was 0.98 L (29% of predicted for his age and weight) and a forced vital capacity (FVC) that was 3.31 L (80% of predicted values). These parameters improved to 44% of predicted FEV1 and 107% of predicted FVC after using albuterol.

ASTHMA

Asthma is defined as "a chronic inflammatory disorder of the airways in which many cells play a role, in particular mast cells, eosinophils, and T lymphocytes. In susceptible individuals, inflammation causes recurrent episodes of wheezing, breathlessness, chest tightness, and cough particularly at night and/or in the early morning. These symptoms are usually associated with widespread but variable airflow limitation that is at least partly reversible, either spontaneously or with treatment. The inflammation also causes an associated increase in airway responsiveness to a variety of stimuli (4)."

Decreased FEV1 and FVC on PFTs are the most indicative features of asthma. In general, a FEV1 80% of predicted values represents borderline obstruction. FEV1 values from 60 to 80% of predicted values represent mild obstruction. FEV1 values from 40 to 60% of predicted values represent moderate obstruction, and FEV1 values < 40% of predicted values represent severe obstruction.

Outcome. The specialist concluded that the airman had severe asthma and was concerned about the airman's lack of perception of his problem, so the airman remained grounded. Upon review, the FAA pulmonary consultant determined that the applicant had severe obstructive disease, but he should have been able to produce enough air to complete the alcohol breathalyzer test; his apparent inability was more likely a "refusal." The consultant recommended denial of a first-class medical certificate based upon the airman's severe pulmonary disease, compounded by his inability or unwillingness to recognize and take action to preserve his lung function. The FAA subsequently issued a general denial because of severe asthma.

Aeromedical Concerns. According to Drs. Gray and Pickard, "The aeromedical concerns with respect to asthma include the potential for sudden incapacitation with acute attacks, small airways dysfunctioning causing V/Q mismatching that aggravates situations of mild hypoxia, acceleration atelectasis with radial acceleration and lowered G-tolerance, and adverse effects of medications" (5).

Continued ➤

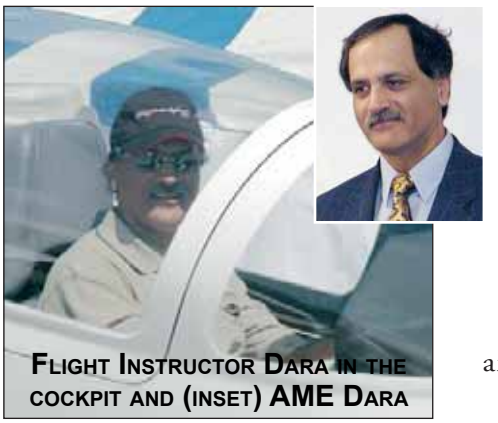
Aviation Medical Examiner Profile: **Parvez Dara, MD**

By Mike Wayda

"THE ART OF MEDICINE and the science of flight are managed by the AME in negotiating a tight path towards safety," says **Parvez Dara,** MD, FACP, an aviation medical examiner from Toms River, N.J., who is intimately involved in both aviation and medicine. He is an ATP-rated flight instructor (single- and multi-engine aircraft) and owns a Mooney Bravo. Dr. Dara is also an oncologist.

His philosophy of merging medicine and aviation safety is simple and effective. "As an AME, one has to make sure the airman has the physical, mental, and psychological wherewithal to navigate the airspace. As a flight instructor, FAA rules are tools to learn from others' mistakes."

He calls flight instruction a "give-and-take process" that incorporates "limiting observed and potential risks in flight." Dr. Dara advocates that pilots keep themselves "healthy, medicine-free, if possible, and fully alert while controlling the aircraft." He says flight rules were written "from the misfortunes of others," so he tells students to act accordingly.



FLIGHT INSTRUCTOR DARA IN THE COCKPIT AND (INSET) AME DARA

Dr. Dara believes that AMEs "must seize the opportunity to interact with the pilots, understand their needs, fears and concerns, and then help allay their anxieties and concerns." AMEs are in a "unique position," he says, to advance aviation safety by helping pilots achieve a "safe mental, physical, and anxiety-depleted environment."

"AMEs should seize the opportunity to interact with pilots..."

AMEs and flight instructors teach and share common goals —by "understanding both the whole and the part, hazard and risk, decision and result," so that students and patients will benefit.

For this aviation professional, "The composite of these three disciplines help teach the functions of the human mind – where failures are likely to erupt and where calmer minds stay a steady course. The flow of information is enhanced with the collaboration of these three disciplines— medicine, aeronautics, and the human condition."

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ASTHMA (continued)

To make an aeromedical disposition, the practitioner must first evaluate the extent and severity of asthma in the aviator. The history, physical exam, PFTs, and bronchial provocation tests with methacholine or histamine will help to determine the extent of the aviator's disease.

For all classes of medical certificates, airmen with only mild or seasonal asthmatic symptoms and infrequent attacks with no symptoms in flight may be issued a certificate by an AME (2). If the airman's symptoms are frequent or severe, the case must be forwarded to the FAA Aeromedical Certification Division (AMCD) for consideration of a special issuance (SI). For a third-class medical certificate, if an SI has been previously granted, the AME may be able to issue the medical certificate through the AME-Assisted Special Issuance program.

Upon review by the AMCD, the applicant may be granted an SI if his asthma is determined to be not severe, acute, or chronic with frequent exacerbations. When forwarding a case to the FAA, a current internal medicine or pulmonary specialist evaluation should be submitted to include PFTs. The treating physician should also submit a current status report, commenting on the cause of the asthma, severity of the condition, prognosis, medications used to control the asthma, and any adverse effects. In certain instances, like the airman described in this case presentation, the FAA may forward the case to a pulmonary consultant for review and recommendations.

Capt (Dr.) Day, MPH, USAF, MC, FS, was a resident in aerospace medicine when he wrote this case report at the Civil Aerospace Medical Institute.

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Post-Impact Seizures

Case Report

By Lynn K. Flowers, MD, MHA

This article discusses a case of post-impact seizure and issues related to aerospace medical certification.

History. An 18-y-old male presented for a student/third-class medical certification 6 mo after he was involved in a bicycle accident in which he struck a car and subsequently suffered a brief loss of consciousness with brief posttraumatic amnesia.

He had no recollection of the accident, but he did recall events in the ambulance shortly afterwards. Just after impact, he also experienced a self-limited seizure that was witnessed by a nurse at the scene of the accident. At a local hospital emergency department, a non-focal neurological examination noted a Glasgow Coma Score of 15l, normal CT brain scan, and no intracranial bleed. He was loaded with phenytoin (Dilantin) and started on a daily maintenance dose. An EEG was performed the following day with normal results. The patient continued daily doses of phenytoin for 6 mo without any recurrent seizures. His only significant medical history was a single admission for dehydration due to a viral infection. He had no history of seizures or of syncope episodes.

Aerospace Medical Concerns. An airman is ineligible for aerospace medical certification in the presence of any neurological condition or disease that may incapacitate. However, if the cause of the disturbance is determined and the risk of recurrence is low, medical certification may be possible with a special issuance.[6] In addition, use of medications used to treat seizures is unacceptable for certification. The timing and recurrence of seizures, along with the severity of head injury, are important factors to consider. The seizure that occurs immediately after a mild head injury is not believed to be epileptic, nor is it associated with structural brain injury. Therefore, these episodes represent impact seizures and are classified differently from posttraumatic seizures.[1]

Initial application for a medical certificate was denied in this case based on the disqualifying neurological condition of head injury, posttraumatic seizure, and medication use (Dilantin). Reconsideration was requested, and a neurologist's 1 y post-event evaluation was unremarkable, the airman was noted to be seizure-free, and a follow-up MRI and EEG of the brain were normal.

Aerospace Medical Decision-Making. The evaluation for aerospace medical certification of an individual diagnosed with epilepsy generally requires a seizure-free period of 10 y, no anti-seizure medication for the preceding 3 y, and a full neurological evaluation with a normal EEG. The consideration for an applicant with a single seizure depends on several factors. If the single seizure was a febrile seizure that had occurred between the ages of 3 mo and 5 y, then no evaluation would be required and certification is granted. If a single seizure was related to a known pathological condition and the cause has been corrected, then a 1-y recovery period is usually required. If the applicant has had a single unprovoked seizure, then the recovery period is usually 4 y with the preceding 2 y off all anticonvulsant medications. A complete neurological evaluation is required prior to medical certification.

Consideration of a single seizure associated with head injuries varies, depending on the timing of a single seizure post-event. A single seizure within 1 wk of a mild-to-moderate head injury generally requires a 2-y recovery period, no anti-seizure medications, and a complete neurological evaluation. Depending on the case, a neuropsychological evaluation may be requested

Continued ➤

Seizures

Head injury, the most common cause of symptomatic epilepsy in teenagers and adults, accounts for 4% of all cases of epilepsy.[1] Each year, there are about 5,000 new cases of post-traumatic seizures in the United States.[2] However, seizures that occur immediately after impact may not be due to an epileptic phenomenon.[1] It is important that patients with a single seizure should not be diagnosed with epilepsy because 2 or more are required to meet the definition of epilepsy. After a single seizure, the overall risk of recurrence is 30%, but with 2 or more seizures the recurrence rate is as high as 73%. Typically, seizures tend to recur.[3]

Patients with impact seizures have universally good outcomes without recurrent seizures and do not require seizure prophylaxis.[4] Overall, mild head injuries, defined as less than 30 min of loss of consciousness and/or post-traumatic amnesia, have a relatively low risk (1.5) for unprovoked seizures out to 5 y but no increased risk thereafter. Significant risk factors for later seizures are brain contusion with subdural hematoma, skull fracture, loss of consciousness for more than 1 d, amnesia for more than 1 d, and age greater than 65 y.[5] It is also important to note that approximately 50-75% of patients with late post-traumatic seizures will have their first seizure within 1 y, and 80-90% will occur within 2 y.[1,4]

prior to aeromedical certification. For a single seizure occurring more than 1 wk after the injury or in cases of more severe head injury, a 5-y recovery period may be required—without seizures and while off medications. A complete neurological evaluation is required (AMCD staff, personal communication, 11/12/2004).

Outcome. An FAA neurology consultant reviewed the case and determined that the applicant had suffered a mild concussion and a brief impact seizure, which do not carry an increased risk for chronic or recurrent seizures. Therefore, he was issued an unrestricted medical certificate.

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Dr. Flowers was a Wright State University resident in aerospace medicine when he wrote this case report at the Civil Aerospace Medical Institute. He is board-certified in emergency medicine.

Iraq and Turkey Participate in FAA International Exchange Visitor Program

The Office of Aerospace Medicine's Civil Aerospace Medical Institute (CAMI) is affecting aviation safety on the international front with the professional assistance of our colleagues from the Middle East. Three physicians, two from Iraq and one from Turkey, are participating in the FAA International Exchange Visitor Program at CAMI.

Iraqi physicians **Louai Sha'alan Al-Deleamy** and **Raad Jameel Abbas** are completing the final year of their PhD degrees. They were enrolled in an advanced-degree program when the Iraq war broke out, leaving their university in shambles. They were able to enroll in the FAA International Exchange Visitor Program at CAMI to gain knowledge and skills that they will use in their country when they return.

INTERNATIONAL EXCHANGE VISITORS. L-R: Drs. Al-Deleamy, Sen, and Abbas

Both men are also working with CAMI scientists on special projects, including translating FAA pilot safety pamphlets from English into Arabic, the dominant language of their culture. So far, they have converted six brochures into Arabic, a language that is spoken by more than 200 million people.

This endeavor is intended to reach not only pilots but physicians, youths interested in careers in aviation, and anyone needing information about physiological aspects of the flight environment.

Turkish Air Force physician Capt. **Ahmet Sen** is an instructor in the Department of Aerospace Medicine at the Gulhane Military Medical Academy and Turkish Aeromedical Center in Eskisehir. Dr. Sen is working on a research project at CAMI that will culminate in the publication an Office of Aerospace Medicine technical report. He is the third Turkish physician to participate in the International Exchange Visitor Program.

All three physicians have until December 2006 to complete their assignments before returning to their countries to share what they've learned at CAMI.

The Exchange Visitor Program

The FAA Office of Aerospace Medicine supports international programs that promote interaction between aviation medicine professionals, enable exchange of scientific information, and promote FAA's leading role in civil aviation medicine worldwide. The program allows qualified specialists from foreign civil aviation organizations to enter the U.S. to conduct studies and/or exchange information and expertise at FAA facilities at a minimum cost to the FAA.

Participants in this program at CAMI:

- learn the functions and responsibilities of the FAA Office of Aerospace Medicine as they relate to the promotion of global aerospace safety,
- participate in the day-to-day work activities at CAMI,
- share their specialized knowledge and skills with FAA's specialists in support of various operational programs, and
- receive the benefits of interacting with FAA professional and technical personnel at a leading civil aerospace medicine institute.

"We are very proud of our international program and our international students," says Melchor J. Antuñano, MD, CAMI's director. "We believe that working together will enhance aviation safety around the globe."

Dr. Boren Retires From AMCD

Dr. **Henry Boren** retired from the Aerospace Medical Certification Division on April 28, 2006, after 17 years of service.

Dr. Boren was instrumental in certifying tens of thousands of airmen; has conducted training for legal instrument examiners; has developed and maintained the Certification Reference Manual; developed training programs for aviation medical examiners; was the chairman of the Certification Working Group and the OAM Quality Assurance program; and he trained and mentored many staff medical officers.

He has helped produce AME training materials, and he is well known as "Billy Ray" for his video on the 15 specifically disqualifying medical conditions. Dr. Boren has served as an Air Force flight surgeon and is a Chief Flight Surgeon and Senior Medical Officer in the Oklahoma Air National Guard.

OAM NEWS

Office of Aerospace Medicine

AsMA Awards OAM Staff Physicians

James E. Whinnery, PhD, MD, was presented the 2006 Louis H. Bauer Award by the Aerospace Medical Association (AsMA) at their annual meeting in May. This is the highest award granted by the Association in honor of its founder and is given annually for the most significant contribution in aerospace medicine. Dr. Whinnery manages the Aerospace Medical Research Division at the Civil Aerospace Medical Institute.

David P. Millett, MD, MPH, Southern Regional Flight Surgeon, received AsMA's John A. Tamisiea Award. The Tamisiea is awarded each year to an aviation medical examiner or other individual who has made an "outstanding contribution to the art and science of aviation medicine in its application to the general aviation field."

Dr. Whinnery (l) with Dr. Michael Bagshaw, AsMA's president.

Dr. Millett (l) is congratulated by Federal Air Surgeon Dr. Fred Tilton at AsMA's Honors' Night.

2005 Aerospace Medicine Awards for Excellence and Achievement

Federal Air Surgeon **Fred Tilton**, MD, presented the 2005 Aerospace Medicine Awards for Excellence and Achievement and highlighted each individual's and team's contributions to the success of the organization. In addition, a "Friend of AAM" award was given to an individual outside of AAM who provides excellent support to AAM's work and mission. The 2005 winners are:

Outstanding Manager (tie)
Harriet Lester, MD
Eastern Region
Carol A. Manning, PhD
Civil Aerospace Medical Institute

Outstanding Leadership
Estrella M. Forster, PhD
Civil Aerospace Medical Institute

Outstanding Innovator
Dennis R. Rester
Civil Aerospace Medical Institute

Outstanding Team
CAMI Oxygen
Civil Aerospace Medical Institute

Administrative Excellence (tie)
Carmen D. Alejandro
Eastern Region
Lori D. Samuel
Civil Aerospace Medical Institute

The William E. Collins Publication Awards (tie)
Dana M. Broach, PhD
Robert D. Johnson, PhD
Alfretia L. Scarborough
Civil Aerospace Medical Institute

AAM Mission Support
Van B. Nakagawara, OD
Civil Aerospace Medical Institute

Outstanding Customer Service
Sandra L. Johnson, PA-C
Civil Aerospace Medical Institute

Friend of AAM
Brian A. Poole
Office of Accident Investigation

Flight Surgeon of the Year
Michael B. Miller, DO
Southern Region

Inspector of the Year
Paul G. Sanders
Washington Headquarters

Regional Employee of the Year (tie)
Margaret Acevedo
Great Lakes Region
Marcia Lynn Jarnevic
Central Region

AAM Office of the Year
Southwest Region Aerospace Medicine

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Perspectives of 'the New Guy' in AMCD

By Dennis Deakins, MD, PhD, MPH

The author recently joined the Aerospace Medical Certification Division as a medical officer and, energized by his on-the-job experience, offers insight and tips to assure prompt medical certification.—Ed

I (AND I AM SURE the other medical officers) often want to enter into dialogue with airmen or physicians who have offered a piece of their mind about various aspects of the medical certification process, but it isn't part of the way we do business. This is, in effect, that reply.

Reviewers. The medical review process is largely conducted by non-medical personnel, whose designation is *legal instrument reviewer*. Cases of concern are forwarded to *medical review officers*, aerospace medicine practitioners operating under guidelines established by the Federal Air Surgeon and the applicable Federal Aviation Regulations.

We medical review officers are sympathetic, consult one another, and hold regular internal review panels to discuss difficult cases. We have a wonderful opportunity to see the progress of modern medicine and the marvels that are accomplished daily in all parts of the country. Additionally, consultants in all specialties are available.

We strive to ensure that exams are expeditiously handled and avoid nitpicking. There is some inherent bureaucracy, but we are dedicated to aviation safety, customer service, and impartial uniformity of decision-making. We are committed to improving the certification process.

Delays. Far fewer than 1% of exams are ultimately denied. Additional documentation is often required to determine if an airman is safe to fly. Piecemeal submission of requested information usually results in significant delays.

Processing. Almost all review is done electronically, but a fair amount of actual telephonic consultation is done with AMEs and airmen. Currently, there is no backlog in the work flow, and most cases are worked within a day or two of receipt. The Document Imaging and Workflow System is working, and further improvements are imminent.

Documentation. The vast majority of medical examinations are handled without secondary review. Adequate documentation makes this straightforward and easy, but if the airman hasn't provided the AME with a good history and documentation from his treating physicians, and the AME has not made comments that resolve likely questions, we will need to request further information.

It is the airman's responsibility to document all medical conditions and that they are unlikely to cause concern for safety of flight. A brief note scribbled on a prescription pad allowing that he is OK for flying is not *adequate* documentation. We need a current, professional summary that states the diagnosis, progression, prognosis and plan, treatment, absence of significant side effects, and relevant lab or imaging studies.

When multiple conditions are addressed by multiple treating physicians, a tidy summary by the AME or one of the treating physicians is a good idea. The documentation should include physicians' notes, hospital records, op reports, path reports, and actual studies (in the case of Holter monitoring and stress testing). Our reviewers aren't interested in trying to practice medicine, but they do expect medical care to be documented. If someone is on a diuretic, a potassium level is good, and if on Coumadin, a table of INRs is nice.

There is an amazing number of "super-senior citizens" in their nineties still flying. This represents a significant pathology burden—paraplegics, heart attack and stroke patients, multiple sclerosis, cancer of every kind, mental health histories, criminal records, and even substance abuse and drug addiction. Most will be certified if they provide adequate documentation and meet certain guidelines.

Sport Pilots. Sport piloting is the newest way to fly. Flying with a driver's license rather than a 3rd class medical certificate is a special privilege carrying significant aviation safety responsibilities. However, rationalization is a part of human nature and a risky trap.

One recent submission had a newspaper article regarding an individual who was mid-80s, legally blind, nearly deaf, arthritic, but was nevertheless issued a driver's license by the state of domicile (where only an original vision test is required), stating that the individual was medically qualified for a Sport Pilot license. NOT SO!

14 CFR part 61.53 requires any pilot—certified or not—to not fly when medically unqualified for safe flight, and this is amplified in the Sport Pilot regulation under parts 61.23 (c) (2) (iv) and 61.303 (b) (2) (4).

Remember*: Sport Pilots must consider themselves safe to fly, consult their physician regarding any medical condition that might affect flight safety, and must be endorsed by a Sport Pilot flight instructor.* This is not an absence of medical certification for safe flight, but a triple tier that emphasizes autonomy and the inherent trust and special confidence reposed in aviators to responsibly pilot their aircraft in accordance with good common sense and the aviation regulations.

All pilots fly with part 61.53 as a prime consideration, and *their insurance may be voided* if they fail to abide by this and other regulations. The same

Continued on page 12

New Guy from page 11

is true of failing to disclose relevant information on the Form 8500-8, where the applicant offers medical and legal history to the FAA.

"Amnesia." A history of ADHD, mental health treatment, substance abuse, or DUI may seem easy to neglect, but failure to disclose it carries serious civil and criminal penalties; it also voids the exam and any certificate issued.

A surprising number of airmen who discover that a medical condition is disqualifying find another AME and omit the relevant information on the physical, which is almost automatically revealed when two exams of the same (or near) date are found. That is why it is important to promptly submit incomplete exams.

Vision. The 3rd-class vision standard allows pilots to be certified with 20/40 vision near and far. No pilot that can be corrected to better than 20/40 should fly without best visual correction. The AME should emphasize *that the minimum standard is not good enough*.

See and avoid is the doctrine, and 20/40 is less than half the avoidance distance for detecting other objects. Best visual correction may be 20/15 or 20/12, and with wave front technology in healthy eyes, even better.

Advocate Safety. Finally, encourage pilots to: fly with their best-corrected distant vision (use glasses or contacts); be mentally prepared to execute emergency procedures and are FIT TO FLY; assure their aircraft is airworthy; get a weather briefing; check applicable NOTAMs; and file a flight plan, if necessary.

Dr. Deakins is a medical officer in the Aerospace Medical Certification Division. He is Board-Certified in Preventive Medicine (Aerospace). For information about Dr. Deakins' background, see article, FASMB, Vol 43-4, p. 10.

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Aviation Medical Examiner Seminar Schedule

2006

September 11 – 15	Oklahoma City, Okla.	Basic (1)
September 22 – 24	Atlanta, Ga.	OOE (2)
December 11 – 15	Oklahoma City, Okla.	Basic (1)

2007

February 2 – 4**	San Diego, Calif.	NPN (2)
March 5 – 9	Oklahoma City, Okla.	Basic (1)
March 16 – 18	Bellevue, Wash.	CARDIO (2)
May 14 – 17	New Orleans, La. (AsMA)	AP/HF (3)
June 11 – 15	Oklahoma City, Okla.	Basic (1)
July 13 – 15	Oklahoma City, Okla.	NPN (2)
August 17 – 19	Washington, D.C.	OOE (2)
August 27 – 31	Oklahoma City, Okla.	Basic (1)
September 14 – 16	Savannah, Ga.	CARDIO (2)

****Note changed date.**

CODES

AP/HF Aviation Physiology/Human Factors Theme

CARDIO 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.

FAA Certification Notes

In a typical calendar year, the FAA:

- Receives more than ..... 435,000 airman exams
- Processes more than ..... 30,000 special case exams
- Receives more than ..... 175,000 telephone and written airman inquiries
- Generates more than ..... 75,000 individual letters to airmen
- Electronically processes ..... 90% of airman exams received