



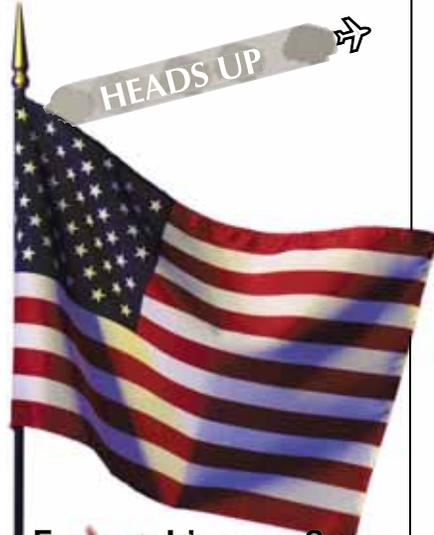
# Federal Air Surgeon's Medical Bulletin



Vol. 46, No. 3  
2008-3

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

U.S. Department of Transportation  
**Federal Aviation Administration**



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## QUICK FIX

### FAA Form 8500-8 New GG-Series – We Need Your Help!

By Dick Jones, MD

**PROBLEM:** In the last issue of this *Bulletin* (Vol. 46, No.2, p.2), Federal Air Surgeon Dr. Fred Tilton informed you that a new GG version of the FAA Form 8500-8 (Application for Airman Medical Certificate or Airman Medical and Student Pilot Certificate) is being revised. We thought we could get these on the street by mid-August, but our

printing office now tells us it could take until mid-September, due to difficulties in making the special paper on which the form is printed. The problem is that we may not have enough of the old FF-Series to last the extra month under our present usage pattern and we can't get a small printing done due to the same paper problem. **We need your help!**

*Continued on page 10*

## Ordering Forms Tidbits for Satisfaction

By Gary Sprouse

THE CURRENT FORM 8500-8 (Medical/Student Pilot Certificate) will soon be replaced by the new "GG" series form. The new GG form is to be available mid-September. With this change looming, I thought it a perfect opportunity to pass along a few tidbits to better your ordering experience.

Many AMEs aren't aware that orders can be placed online (see link below). This on-line ordering format is simple, quick, and inexpensive (free). Best of all, you get a conformation number for your order. These orders are transmitted directly to my desktop for immediate processing. Why then, you ask, does it take so long to receive supplies? Supplies are mailed via the U.S. Postal Service at the "Library Rate," which can take up to three weeks to deliver, so please plan accordingly.

Orders for the 8500-8 that do not exceed four packages (50 per pack) are filled in-house, so this can be relatively quick. Larger requests, however, are

forwarded to our warehouse for processing and will likely take the full three weeks to deliver. Once orders are passed to the USPS, we have no say-so as to when they'll arrive.

Finally, you can make copies of the following forms: 8500-2, -7, -14, -19, and -21. However, you may continue to order them by calling the Aerospace Medical Education Division (405) 954-4831 or, better yet, use the preferred on-line method. Now that you have the ability to order on-line, the AC 8500-33 (Medical Forms Request) is no longer available. If you have large quantities of this form, you may continue using it to replenish your supplies of forms.

To order forms online, use this link:

[http://ame.cami.jccbi.gov/form\\_and\\_brochure/medicalform.asp](http://ame.cami.jccbi.gov/form_and_brochure/medicalform.asp)

More good news: You will soon be able to order brochures on-line in much the same way as forms. Look for the on-line link soon.

*Gary Sprouse is the Aerospace Medical Education Division's shipping clerk. You can contact him at Gary.Sprouse@faa.gov or (405) 954-4831.*

## It's on the Street

### New Rule in Effect

**H**ELLO, EVERYONE! A final rule entitled, "Modification of Certain Medical Standards and Procedures and Duration of Certain Medical Certificates," became effective on July 24, 2008. You'll need to know what the changes were and how they affect medical certification.

#### WHAT HAS CHANGED?

- **Certificate wording.** We modified the wording on the certificate back to make it consistent with the new rule.
- **Duration periods of first- and third-class certificates for airmen who were under age 40 at the date of their examinations.**
  - ▶ **First class.** First-class medical certificates are now valid for one



year. For example, if an individual's date of birth was August 10, 1968, and the date of his first-class examination is August 9, 2008 (obviously one day shy of age 40), his certificate will be valid for one year.

▶ **Third class.** Third-class medical certificates are now valid for five years.

- **Previously issued certificates.** The new rule also affects previously issued certificates. A first-class certificate issued seven months before the effective date of the rule will be valid for an additional five months; and a third-class certificate issued three years before the effective date of the rule will be valid for an additional two years.

#### WHAT REMAINS THE SAME?

- **Duration period for second-class certificates:** one year, regardless of age
- **Duration periods for first and third classes after age 40:** First class, six months; and third class, two years.
- **Lapsing:** Certificates will continue to lapse to lower classes as they have in the past.
- **Expiration at the end of the month:** Duration periods will continue to end on the last day of the month. For example, a second-class examination performed on June 1,

2009, will be valid for second-class operations until June 30, 2010, and it will then lapse to a third-class certificate.

#### NEW MEDICAL CERTIFICATES

We had hoped to have new forms available when the rule became effective, but we encountered some administrative delays. We elected to publish the rule without having the new forms on hand. We knew that this decision might cause some confusion, but we reasoned that the benefits the public gained by changing the duration periods as soon as possible outweighed any inconveniences that might be caused by issuing forms with the outdated wording.

The new forms will be available in about a month, but in the meantime, it will be necessary for you to use the outdated certificates. Once the new forms are available, we will distribute them to you. However, we do not intend to replace certificates that have already been issued because we do not have the resources to do so.

We are doing our very best to disseminate this information to the public, but you may get questions from airmen regarding the new rule or requests to do physicals from airmen who do not require them under the new standards. If you get such questions or requests, I hope you will discuss the new rule with your airmen, explain the new duration periods to them, and tell them that their certificates are valid for the new duration periods, regardless of what it says on the back of the form.

#### I NEED YOUR HELP!

I have said many times that we cannot do it without you, and once again, I am asking you to help us as we implement this new rule. Thanks, in advance, for your assistance on the implementation of the new rule, and thanks again for all you do for us.

—Fred

### Federal Air Surgeon's Medical Bulletin

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## On Testing

Dear Editor:

I would like to comment on Dr. Dick Jones' article concerning educational practices in the FAA training courses [Quick Fix, FASMBV.46-2, p.1]. Apparently, some FAA auditor attended a training course where he felt that instructors were "giving test question answers to the students." It seems as if the FAA auditor is holding to a very antiquated educational philosophy. For many years, teachers, especially in college courses, felt that if too many students earned A's, it was a sign of a poor instructor, or one who was "too easy." The classroom environment eventually degenerated into one where the instructor taught from one book, carefully avoided teaching the material he would test on, and then wrote up a test using another textbook. As a Harvard student critique sarcastically commented a few years ago: "Professor X's course was very comprehensive, what wasn't covered in class was covered in the test."

In fact, educational specialists will tell you that it is entirely proper, and indeed necessary, to "teach the test." Here is the way an instructor should organize a course.

- ▶ The instructor decides what facts and concepts the students should learn.
- ▶ The instructor should then devise a testing tool which will measure whether the students have learned the material he, the instructor, felt was important for them to know.
- ▶ Then, the instructor should *teach the test*.
- ▶ If it's all done correctly, all the students should get an A.

After all, the answers to the test questions are comprised of the material the instructor feels the students should learn. How can he avoid specifically addressing, in detail, this information? For fear of "teaching the test?" The absurdity of this attitude is obvious in view of the above process.

During an FAA course, the test should be handed out in the beginning of the course. Then, each lecture should specifically address the subjects dealt with in the questions. If any student has to raise his or her hand and ask the instructor to address a specific question, that instructor has failed in his task. And furthermore, he should correct his error by addressing the question. Once again, if the test asks a question, it is presumably because it is felt that the information is important for the student to know. There is no room in education for guessing games, trick



questions, or other subterfuges previously used to keep the grade average low. Notice the following sentence in Dr. Jones article: "Therefore, since aviation medical examiners are designees, we will no longer be able to give AME's specific answers to test questions until after the answer sheet is turned in." The enormity of that statement is stupefying. We think this information is important for you to know, and we will ask you for this information on the test, BUT WE CAN'T TELL YOU WHAT IT IS!!! It reminds me of the comment that experience is a terrible teacher, it gives you the test first, and the lesson later. That's a completely correct statement. Experience is a *terrible* teacher. Do we want our instructors in formal didactic presentations to be terrible teachers too?

I feel the FAA should not kowtow to every whim that comes from the auditor's office, and the FAA should not scramble now, trying to rudely unhinge every educational program so painstakingly developed. The FAA should challenge the auditor's finding, and demand a formal evaluation from qualified educational specialists.

Carlos R. Diaz, MD  
Milton, Fla.

Dear Dr. Diaz:

**I am very sorry my writing was not clear to you. I did not mean to give the impression we would test on material we have not taught. We attempt to teach about what we test and try not to make questions into guessing games to trick you, because we want to ensure you correctly understand our policies and procedures before you leave a seminar. While you may be right about education principles, the public would probably not understand not testing AMEs on material that had just been taught.**

**Despite following the four teaching principles you outlined in your letter, we have about five physician test failures a year at our seminars.**

**When I said we would not give aviation medical examiners answers to specific questions, I meant we will no longer respond to the question, "What**

**is the answer to number 3?" with "The answer is 'b.'" We will continue, until directed otherwise, to give the test out at registration. During the introductory session, we will instruct AMEs to ask for clarification of test questions by asking questions that relate to the content of test questions. This way, we can ensure understanding of the correct answer.**

**As for "kowtowing to every whim that comes from the auditor's office," I feel compelled to remind you that the audit in question was an International Civil Aviation Organization COMPLIANCE audit. We are a United Nations Charter signatory, and the auditor's observations were direct applications of ICAO guidance.**

Dick Jones, MD  
Manager, Aerospace Medical  
Education Division

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## Magnetic Strip on Pilot License?

Dear Editor:

I am a senior aviation medical examiner in Texas and daily am asked what the "magnetic strip" on the Pilot License contains and what it is or will be used for....It would be helpful if you would publish this information in your next issue of the *Federal Air Surgeon's Medical Bulletin*.

Sincerely,  
William Henry Krass, DO  
Bedford, Texas

Dear Dr. Krass:

According to Harold Everett, Manager, Airmen Certification Branch, the paperwork for certificates (licenses) is examined and processed in Oklahoma City and the information to print the certificate is sent to a contractor in California. The "strip" helps ensure that the contractor in California matches the certificate with the correct card carrier that is mailed with the certificate. The strip contains a sequence number and card type, and the "unique identifier" number. The strip contains no personal information—no Social Security Number or any other personal information.

—Editor

Continued on page 11



## Certification Update

Information About Current Issues

By Warren S. Silberman, DO, MPH

**T**HERE ARE FIVE medical conditions that an aviation medical examiner may issue an airman a medical certificate at the time of the examination:

- 1) hypertension
- 2) diabetes mellitus (controlled by diet)
- 3) kidney stone
- 4) duodenal ulcer
- 5) asthma

That is—if the airman provides the AME with the proper medical reports/testing. Here are five cases that demonstrate these conditions:

**1** An 80 y/o applicant has decided to start flying lessons for his eightieth birthday. His only medical problem is hypertension, for which he is prescribed lisinopril and a small dose of hydrochlorothiazide. He has been hypertensive for 20 years. His AME informs him that, since he has been hypertensive for so long and is “controlled” (his BP was 180/80 at the time of his FAA examination), he does not need any testing and issues the applicant a medical certificate. Was this proper medical certification procedure?

**Answer.** No it was not. Even if a prospective airman has had a medical condition for a long time and is applying for FAA medical certification for the first time, the same testing is required as if the condition were brand-new! Also, this applicant had a BP in the AME’s office of 180/80. The maximum that one is permitted to have at the time of an FAA exam is 155/95. The AME should have repeated the BP, and if it

was still elevated beyond the standard, have required him to undergo a three-day BP check. If, after having morning and afternoon BPs for three days, the average of these pressures is less than 155/95, the AME may issue. For an “initial” hypertension evaluation, the applicant is also required to provide a cardiovascular status report that includes: a list of medications prescribed (and side effects, if any), immediate family history, and mention of any cardiac risk factors. The applicant should also provide a current (within the previous 90 days) lipid panel and fasting blood sugar. And, in the case of our 80 y/o applicant, serum potassium level, as he is taking a diuretic. A current 12-lead ECG is also required for this “initial” evaluation. A stress test is only required if the applicant relates a history of angina-like pain or has a significant cardiac risk factor profile. The AME may issue if the airman provides these test results, all findings are negative, and the BP is 155/95 or less in the AME’s office.

**2** A 60-y/o airman who flies corporate jets desires a second-class medical certificate. He has developed diabetes mellitus, but fortunately at this stage, he manages to control his condition with diet. He goes to his AME, who annotates this on the FAA medical examination form. Being a “strict detail man,” the AME recalls the lecture that Dr. Silberman gave at the Basic Aviation Medical Examiner seminar and asks the applicant for a statement from his treating physician that explains how long he has had this condition and what diet was recommended. He also requested a current hemoglobin A1C level. The applicant provides this information (HgA1C level was 7.2), so the AME issues him an unrestricted second-class medical certificate. Was this the correct decision?

**Answer.** Yes, this was absolutely the way this type of diabetes treatment is to be managed by an AME!

**3** A 30-y/o first-class airman is a flight instructor for a company that specializes in upset recovery training. He had passed a kidney stone three months ago after being seen in a local emergency room. He had a complete workup at the time. He had never passed a kidney stone before, but when he was admitted to the ER, he was writhing in pain, necessitating an intravenous injection of morphine sulfate. He was given a urine strainer and hydrocodone for analgesia; that evening, he passed a small stone. An X-ray performed in the ER revealed a stone in the distal LT ureter with some hydronephrosis. There were no other stones observed, and his serum calcium and uric acid studies were negative. The stone analysis was calcium oxalate.

The airman took the emergency room paperwork and laboratory results to his AME when he went for his FAA examination. The AME told him that he could not issue for this situation, but the airman, being a detail person, had gone into the Aircraft Owners and Pilots Association’s Web site, where he learned that if he provided a medical history showing that there were no other “retained kidney stones” and confirming that this was his first such event, he could be issued by his AME. When he showed the AME information that he had printed from the Web site, the AME issued him an unrestricted medical certificate. Was this a correct decision?

**Answer.** This AME was also correct; a solitary kidney stone that has passed, and with proof that there are no retained stones, can be issued by the AME—as long as the airman provides the proper documentation.

**4** An airman had a history of a perforated duodenal ulcer that had required surgery just four months prior to presenting for his third-class FAA medical examination. The airman’s medical condition had resolved, with no further symptoms.

*Dr. Silberman manages the Aerospace Medical Certification Division.*

*Continued* →

## CERTIFICATION from page 4

He completed the medical history for the FAA medical examination and even provided the admission history, physical examination and discharge summaries, and a favorable letter from his treating surgeon. His current hemoglobin was 13.9 grams. The AME issued the medical certificate. Was this a correct decision?

**Answer.** No, it was not a correct issuance. An AME may issue only if the peptic ulcer has healed and is not in any way complicated. If the ulcer has perforated (as it was in this case), bled, or is cancerous, then one should defer to the Aerospace Medical Certification Division. We prefer an esophagogastro-duodenoscopy study to demonstrate that the ulcer has healed, but we will also accept an upper GI series.

**5** A 20-y/o airman with a history of exercise-induced asthma applied for a first-class medical certificate. When he was initially diagnosed with asthma, he was seen in the local emergency room, when running at a high school track event had caused breathing problems. He was eventually seen by a pulmonologist, who diagnosed him with “exercise-induced” asthma. The applicant wrote this on his FAA medical examination form. His AME, who knew the FAA policy on asthma that is uncomplicated, made sure the applicant had a current status report from his pulmonologist. The report was favorable, so he issued a first-class medical certificate. Was this a correct decision?

**Answer.** Yes, it was correct. As long as an applicant is well-controlled on medications, the AME may issue an unrestricted medical certificate for asthma. All medications, with the exception of prednisone (or its equivalent > 20 mg. daily), are acceptable to the FAA for the treatment of asthma. *Well-controlled* means that the airman should not be making frequent emergency room visits or hospital stays and not

having an acute exacerbation at the time of the FAA medical examination.

### Follow your *Guide*

Make sure you follow the guidance provided in this article and the *Online Guide for Aviation Medical Examiners* to avoid unnecessary deferrals. This will make your airmen happy when they depart your office with a medical certificate.



## Normal ECG Variants

Give your technician or ECG provider a copy of this chart of normal variants.

- ▶ Sinus bradycardia rate between 50 and 59
- ▶ Sinus arrhythmia
- ▶ Wandering atrial pacemaker
- ▶ Low atrial rhythm
- ▶ Ectopic atrial rhythm
- ▶ Indeterminate axis
- ▶ First-degree atrioventricular block
- ▶ Mobitz Type I Second Degree AV block (Wenckebach phenomenon)
- ▶ One premature ventricular contraction or atrial contraction on a 12-lead ECG
- ▶ Incomplete RT bundle branch block
- ▶ Intraventricular conduction delay
- ▶ Early repolarization
- ▶ Left ventricular hypertrophy by voltage criteria only
- ▶ Low voltage in limb leads (may be a sign of obesity or hypothyroidism)
- ▶ Left Axis deviation less than or equal to -30 degrees
- ▶ ‘rSR’ in leads V1 or V2, ORS interval <0.12 msec
- ▶ R> S wave in V1 without other evidence of right ventricular hypertrophy

## Three-Year Designations for AMEs

### New Change Enacted

By Dick Jones, MD

We increased the duration of your designation from one to three years effective July 24, 2008. Each of you will shortly receive a new AME identification card from your region with a date calculated to be three years from the date of your last designation. There is no need to send anything back to us, just sign the new card and destroy the old one.

If you receive a card that is only valid for one year, don't panic, your revised three-year card will arrive soon. The next time your designation becomes due, we plan to have a streamlined electronic system that will eliminate all mailings. All you will have to do is electronically sign a statement similar to the one on the old re-designation form, and then print your new card. Hooray for progress!



## Are You Inactive?

By Jana Weems

Recently, the Aerospace Medical Certification Subsystem (AMCS) support staff has received several phone calls from aviation medical examiners whose AMCS accounts have been suspended. An AME whose status is inactive will not be able to log on to AMCS.

An inactive AME (or a member of that AME's staff) attempting to log on to AMCS will be presented with a “Notice of Account Suspension.” If your AMCS account has been suspended, you will receive the following message:

**Your account has been suspended:  
All AMCS accounts for AME number  
xxxxx are currently suspended.  
Please contact your FAA Regional  
Office representative for instructions  
on how to submit an FAA  
Application for Airman Medical and  
Student Pilot Certificate.**

If you receive this error message in AMCS, you are no longer in an active AME status. You will need to contact the AME Analyst in your region to resolve this issue. For all other login issues, you may continue to contact the AMCS Support Staff.



# An Aviator With Completed Therapy for Osteogenic Sarcoma: Aeromedical Implications

Case Report, by Paul H. Nelson, MD, MPH

**H**ISTORY. A 26-year-old male student pilot presented to his aviation medical examiner (AME) in August 2003 requesting a third-class medical certificate. His application was deferred to the Aerospace Medical Certification Division for further consideration due to a history of osteogenic sarcoma treated with chemotherapy and tumor resection, and for having diminished function of his left upper extremity.

The airman initially presented to his primary physician in August 2001, complaining of a two-month history of an enlarging, painful mass above his left elbow. The pain was aggravated by lifting with the arms. Plain films showed a destructive lesion with a moth-eaten appearance, a speculated periosteal reaction, and new bone formation at the margins of the soft tissue mass. A CT scan showed involvement of the elbow with associated joint

destruction. A biopsy confirmed the diagnosis of osteogenic sarcoma. Chest radiography and a CT scan ruled out lung metastases.

The airman completed neoadjuvant chemotherapy with methotrexate, cisplatin, ifosfamide, and doxorubicin. He initially showed good response to chemotherapy, with decreased pain and serum alkaline phosphatase levels. The airman then underwent surgery to resect the tumor. The limb was felt to be amenable to the newer limb-sparing procedures, and a custom elbow endo-prosthesis was fitted. Study of the resected tumor indicated a high degree of necrosis from chemotherapy, an excellent prognostic feature.

The airman progressed well after surgery. Following occupational rehabilitation therapy, he was able to use his left upper extremity and drive his car. He continued to be asymptomatic for nearly two years after surgery.

## OSTEOGENIC SARCOMA

Osteogenic sarcoma is second only to multiple myeloma as the most common primary bone tumor. It most often presents in the first and second decade of life. Cases occurring later in life are frequently associated with either radiation therapy or transformation of a pre-existing condition. It is more common in males and tends to affect the metaphyses of long bones. It frequently presents with a painful, enlarging mass on the extremity. Plain films show a "moth-eaten" destruction of bone, with a "sunburst" pattern representing a periosteal reaction. "Codman's Triangle," a cuff of new bone formation at the margins of the soft tissue mass, may also be present. While CT or MRI may be used to further define the margins of the tumor, definitive diagnosis rests with biopsy. Once the diagnosis of osteogenic sarcoma is established, plain chest films and a CT scan should be done to screen for lung lesions, the most frequent location for metastatic disease. Neoadjuvant chemotherapy is now common, and tissue response to chemotherapy is a good prognostic indicator. Traditional surgical approaches frequently resulted in amputation and had poor survival rates. However, newer techniques combining chemotherapeutics with surgery are now able to salvage the limb in or over 80% of patients, and long-term survival for patients with osteogenic sarcoma approaches 70%.

*Osteogenic sarcoma is the second most common primary bone tumor. The prognosis for patients with osteogenic sarcoma is much better than in the past, with long-term survival now approaching 70% because of advances in chemotherapy and limb-sparing surgery. This case illustrates the aeromedical considerations and certification procedures for an aviator who, after completing therapy for osteogenic sarcoma, presents to the Aerospace Medical Certification Division for consideration of a medical certificate.*

According to his oncologist's narrative, he has had no radiographic evidence of primary tumor recurrence, and repeated chest CTs one and two years after primary diagnosis showed no evidence of metastatic disease.

**Related History.** The airman's medical, family, and social history were all non-contributory.

**Physical Exam.** The airman presented to the AME as a well-appearing Caucasian male, 69 inches tall, weighing 210 pounds, with normal vital signs. His physical exam was entirely unremarkable and within Federal Aviation Administration third-class standards, with the exception of the left upper extremity, which showed a well-healed surgical scar and decreased range of motion in the left elbow. The AME stated in the comments section (Block 60 of the FAA Form 8500-8) that she felt the airman's physical condition would likely not interfere with his ability to safely control an aircraft.

**Aeromedical Disposition.** As directed by FAA medical guidance, either the diagnosis of cancer or of decreased range of motion or loss of limb function

*Continued* →

is disqualifying for any class of medical certificate. The AME appropriately deferred this case to the AMCD for consideration of a special issuance medical certificate. In her referral, she included all copies of relevant medical notes and tests related to the diagnosis, initial management, and definitive medical and surgical treatment of this airman's case. Further, she included a narrative summary from the airman's oncologist documenting the airman's current status, as well as a statement of physical ability from the occupational therapist who assisted with rehabilitation. Recommendations for further monitoring, along with prognosis and a recent CT report of the chest showing no evidence of metastatic disease to the lungs, were included by the AME.

Based upon guidance found in 14 CFR, part 67.401, the AMCD granted the airman a time-limited (12-month) special issuance for history of osteogenic sarcoma with no evident of local recurrence or metastatic disease. For at least the first five years, the AME should, on behalf of the airman, submit an annual narrative of the airman's current status from his treating physician. Further, the airman's package should include an annual chest CT scan and any other testing deemed necessary to follow his clinical condition.

This special issuance was contingent on the ability of the airman to pass a medical flight test because of the decreased range of motion in the affected limb. The airman was referred to the Flight Standards District Office, where he successfully demonstrated his ability to use all aircraft controls safely. Based upon these results, the AMCD granted a Statement of Demonstrated Ability (SODA) for this airman. As with all SODAs, this is valid for an unrestricted period of time as long as the SODA-related disability does not change. The airman was notified of this in writing and was warned to immediately report any change in his condition to his AME. Follow-up applications for certification

submitted to the AMCD should reference this SODA number.

**Discussion.** This case illustrates several important considerations for the AME when evaluating an airman for certification.

- This airman did not meet unrestricted standards due to the diagnosis of a general medical condition (14 CFR part 67.113, 213, 313).
- The AME was correct to defer judgment to the AMCD, rather than to deny this airman because of the potential for a special issuance.

The AMCD looked favorably upon this case for special issuance for several reasons. First, the airman was 12 months distant from an active cancer diagnosis. He had no evidence of untreated or metastatic disease, and no active side effects from the chemotherapy. With monitoring of the condition, as specified in the authorization for special issuance, the AMCD should be able to evaluate the risk of tumor recurrence. The loss of function of the limb is also a disqualifying defect, prompting the referral from the AMCD to the FAA flight examiner because the airman demonstrated the potential to pass a medical flight test.

This case also provides several examples of excellent case management by the AME.

- She included a complete and up-to-date narrative current status exam, as well as appropriate testing (in this case, a CT scan) to document that the airman had no evidence of clinical disease at the time of the initial aeromedical examination.
- Her proactive support of this airman's case cut processing time for this special issuance to weeks from months or longer.
- This case also illustrates the distinction between a time-limited special issuance (in this case, granted for 12 months) and a SODA, which has no time limit as long as the condition for which the SODA was granted does not change.

- Finally, this case reinforces the shared responsibility that both the airman and the AME have to report any condition related to this or any other problem in the future that could render this airman disqualified for his medical certification, thereby ensuring flight safety.

*Note: Certain administrative details of this case were changed to protect patient confidentiality, as well as to better illustrate key points in the certification process.*

## References

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**About the author:** *Major Paul Nelson was a resident in Aerospace Medicine at the USAF School of Aerospace Medicine at Brooks City Base, Texas. He based this article on review of cases evaluated while rotating with Dr. Warren Silberman at the Aerospace Medical Certification Division at the Civil Aerospace Medical Institute. Dr. Nelson wishes to thank Dr. Silberman and Mr. Michael Wayda for their assistance in preparing this manuscript.*



## Migraine With Aura

Case Report, by Craig Packard, MD, MPH

**H**ISTORY. A 34-year-old first-class commercial airline pilot with 7,300 hours of flight time was seen in a local emergency room. He complained of an episode of visual disturbances and hemiparesis while flying the previous day. While preparing to land, the instrument panel displayed “squiggly lines that connected together and were pulsating” and gradually grew toward the center of his vision in both eyes. This lasted about 20 minutes and then disappeared, leaving him somewhat lightheaded.

After landing, he noticed an episode of left arm numbness that then spread to his upper and lower lips and throat. He had no dysarthria. At the same time, he noted his hearing was affected: Everything sounded like he was in a tunnel with an echo-like quality. All of these symptoms lasted about 10-15 minutes. He then felt relatively normal for about two hours until an intense headache occurred with pressure in his forehead, eyes, and the back of his head. He took some Motrin and went to bed.

Upon awakening, all of the symptoms had resolved, but he still reported to the local emergency room. Neurological exam, laboratory studies and a non-contrast head CT were all normal, and he was sent home with a probable diagnosis of migraine and warned not to fly until being evaluated by a neurologist.

Further history elicited by the neurologist included a sister with migraines, but the airman had no personal history of severe headaches or transient neurologic deficits. He did not smoke or drink, was on no medications, and there were no new environmental or food exposures prior to the event. The neurologist agreed with the diagnosis of probable migraine variant but, given the first occurrence of these symptoms (which typically first present at a younger age) and the fact that the headache seemed to be particularly delayed in onset after

the aura, he ordered a head MRI with contrast to rule out an inciting arteriovenous malformation. This, too, came back normal. Two months after the event, the airman was denied reinstatement of his medical certificate due to the diagnosis of migraine variant with disturbance of vision and neurological manifestations.

### Aeromedical Concerns

The obvious aeromedical implications for flying involve the risk of sudden incapacitation of an airman due to severe headache pain associated with nausea and possibly vomiting. Even with lesser pain, distraction could detract from safe aircraft operation. In addition, the neurologic deficits associated with some auras, especially the visual aberrations, could affect safe flight. A third concern involves the many traditional pharmacologic treatments that are not compatible with safe flight due to their side effect profiles. These include the triptans, ergotamine alkaloids, tricyclic antidepressants, SSRIs, and anticonvulsants. Prophylactic treatment with calcium channel blockers or beta-blockers could be compatible with safe flying after a judicious observation period to assure efficacy and lack of side effects.

Many factors contribute to deciding whether or not to medically certify an airman with migraines. One factor would be if the airman experienced a prodrome (a generalized, non-specific feeling or premonition occurring up to several hours prior to an attack) that would provide adequate warning not to fly or to land prior to an impending attack. Precipitating exposures that are easily avoidable or an aura that does not affect safe operation of an aircraft would also argue favorably towards medical certification. Obviously, the frequency of attacks, their severity, rapidity of onset, and ease of treatment (along with efficacy and lack of medication side effects) would also be important for the AME to include in any narrative.<sup>2</sup>

*Migraines are episodic headaches with a hereditary predisposition that are often triggered by specific stimuli. They can have many variants, occurring with or without focal neurologic symptoms and with or without warning. They can afflict up to 10% of men and 17% of women.<sup>1</sup> Although there is still debate over the exact pathogenesis of migraines, many effective treatments are available. Unfortunately, only a few of these pharmaceuticals are potentially compatible with safe flying. This article presents a case report of a first-class airman diagnosed with a migraine headache with aura. It includes an overview of migraines, their treatment, and the aeromedical implications.*

Airmen with well-controlled migraine headaches may be eligible to get their medical certificates through the AME-Assisted Special Issuance (AASI) program, after a favorable history has been submitted by their AME. See the FAA Website, [www.gov/about/office\\_org/headquarters\\_offices/avs/offices/aam/ame/guide/](http://www.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/) for required documentation.

### Outcome

Six months after the migraine, the airman remained asymptomatic without treatment of any kind and applied for reconsideration of his medical denial. His case was then referred to an FAA neurologic consultant. Of greatest concern to the consultant was the aura of vision aberrations and left arm numbness that had occurred during a critical phase of flight. Since migraine is liable to recur without warning, the consultant's recommendation was to indefinitely deny all classes but offered

*Continued on page 10*

## MIGRAINE

### Clinical Manifestations

Migraines are divided into several classes.

**Common migraines** are those that occur without an aura. They are unilateral in 60-70% of cases and are often accompanied by photophobia, phonophobia, nausea, vomiting, and prostration. The headache is dull, deep, and steady when mild but can crescendo to a throbbing or pulsatile character.

**Classic migraines** are similar but are preceded by a visual aura — sparkling lights, kaleidoscopic colored patterns, central scotomas, fort-like aberrations, or wavy or zigzag lines or patterns — are the most common and vary from individual to individual. Numbness and tingling of the lips, lower face, and fingers of one hand are the second most common aura. Hemiparesis, hemiparesthesia, and aphasia can also occur.

**Migraine equivalents** are episodes of aura but without a concurrent or subsequent headache. These can often be confused with transient ischemia attacks.

**Complicated migraines** are those attacks associated with prolonged or even permanent neurologic symptoms.<sup>2</sup>

Factors that can precipitate migraines in predisposed people are highly individualized but include stress, certain medications, menstruation, lack of sleep, strobe lights, hunger, and head trauma. Aged cheeses, red wine or other foods containing nitrites, glutamates, or aspartate have also been implicated in some individuals. Migraines sometimes are precipitated by other environmental triggers like smoke, perfumes, or organic solvents.

### Pathogenesis

The exact etiology of migraines is not fully understood and many

theories abound. The traditional theory, probably an oversimplification, holds that the headaches are caused by blood vessel dilatation, while the auras are caused by vascular constriction.<sup>3</sup> Rather, the vascular changes appear to be secondary to an imbalance of excitation and inhibition at various levels of the nervous system that leads to neuronal dysfunction and a sequence of intracranial and extracranial changes. Both migraine headache and aura are linked to cortical spreading depression, a self-propagating wave of neuronal and glial depolarization that spreads across the cerebral cortex, activating trigeminal nerve afferents, which in turn, cause inflammatory changes in the pain-sensitive meninges.<sup>4</sup> Serotonin most probably also plays an important role that is mediated via its direct action on cranial vasculature, its function in central pain control pathways, and through cerebral cortical projections to brainstem serotonergic nuclei.<sup>5</sup> It is believed that many of the prophylactic antimigraine drugs act via centrally modulating serotonergic neuronal networks, while abortive medications modulate attacks via direct effects on intra- and extracranial vasculature.<sup>6</sup>

### Diagnostic Criteria

According to the International Headache Society (IHS), the diagnostic criteria for migraine headache are as follows:<sup>7</sup>

- the headache lasts 4-72 hours
- the headache has at least two of the following characteristics: unilateral location, pulsating quality, moderate-to-severe intensity, and is aggravated by physical activity
- during the headache, at least one of the following occurs: nausea with or without vomiting, photophobia, and phonophobia

- at least 5 attacks with the above criteria
- history, PE, and neurologic exam reveal no underlying organic disease

A migrainous aura can be diagnosed by meeting 3 of the following 4 criteria:

- 1 or more fully reversible aura symptoms indicating focal cerebral, cortical, and/or brainstem dysfunction
- At least 1 aura symptom that develops gradually over at least 4 minutes
- no aura symptom lasting greater than 60 minutes
- headache follows the aura with a free interval of less than 60 minutes but may begin before or concurrent with the aura

### Treatment

Regular exercise, relaxation, stress management, and avoidance of known triggers are key factors in the management of migraines. Having the patient keep a diary of the headaches may assist in the identification of these individual triggers. Pharmacologic therapy is divided into two types: abortive, and prophylactic. Abortive medications taken after the symptoms appear include NSAIDs, Acetaminophen, triptans (serotonin<sub>1B/1D</sub> receptor agonists), and ergot alkaloids. All abortive treatments are most effective if taken as soon as possible after the symptoms or aura appear. Prophylactic medications, by contrast, are taken regularly to prevent occurrence of migraines and include calcium channel blockers, tricyclic antidepressants, selective serotonin reuptake inhibitors (SSRIs), beta-blockers, and anticonvulsants. Individuals will have varying success with each of these classes of medications and even medicines within each class.<sup>8</sup>

## MIGRAINE from page 8

the possibility of granting a limited second-class certificate (two-pilot operation required). The FAA Aerospace Medical Certification Division granted the limited second-class certificate and will reconsider the first-class medical at the two-year mark if the airman remains symptom-free.

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*About the author:* LtCol. (Dr.) Craig Packard, MD, MPH, FAAFP, USAF MC, SFS, is a board-certified family physician and was a resident in the USAF Residency in Aerospace Medicine program at Brooks City-Base, Texas. He wrote this case report during a clinical rotation at the Civil Aerospace Medical Institute.



## QUICK FIX from page 1

### SOLUTION

Please use these forms sparingly. Some hints follow:

▶ You now have the capability to print medical certificates directly on your office printers, so you should no longer need to “waste” a whole form just to use a certificate. See the *Certification Update* article by Dr. **Silberman** in the last issue of this *Bulletin* (page 4) for information on printing certificates.

▶ We strongly recommend you ask airmen when scheduling their appointments to use MedXPress to do their history or give them an opportunity to do so at your office. Using MedXPress allows a paperless examination, if you record any notes on photocopies of the back of an AME WORKCOPY of the form. Remember, the only time you should need to use an actual form is when an airman insists on completing a medical history in handwriting on the front of the FAA ORIGINAL COPY of the form.

▶ Until the GG forms are available in mid-September, be reasonable when ordering additional forms by being realistic about the quantity you will need. We will immediately start giving out quantities of less than a package of 50 forms at a time to those requesting smaller numbers.

▶ Search your office for misplaced sets of forms; these are often found in staff offices or behind/under other things in the storage area.

Thank you for your help and understanding.

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*Dr. Jones manages the Aerospace Medical Education Division.*



## QUICK FIX

### Medical History Forms

By Dick Jones, MD

### PROBLEM

Some AMEs are not mailing the FAA ORIGINAL COPY of the FAA Form 8500-8 (Application For Airman Medical Certificate or Airman Medical Certificate and Student Pilot Certificate) to the Aerospace Medical Certification Division (AMCD), as required by FAA Order 8520.2F, Aviation Medical Examiner Program. These AMEs claim to have never been told they must mail these to us, despite being taught this requirement in every Basic Seminar and the need for them to be familiar with the Order.

The Office of the General Council insists we receive these forms to archive as they contain the airman's signature certifying the information is accurate. Without this signed copy, we cannot prove the history transcribed by the AME for electronic transmission is the airman's history if there should be a question of whether or not the AME accurately represented the history.

### SOLUTION

Those AMEs not already doing so are asked to immediately forward all FAA ORIGINAL COPIES in their possession to the AMCD. All AMEs should strive to send these to us at least monthly, so they may be scanned into our system. We are considering tracking compliance with this requirement and making the results part of each AME's performance report, so be forewarned.

**Note, this does not apply to histories completed by the airman in MedXPress, as these histories are electronically signed by the airman, and there should be no paper copy.** This is another good reason to encourage airmen to use MedXPress.



## New England Region Selects New Deputy

By Christine Youngclaus

New England Regional Flight Surgeon, **Paul H. Clark, MD**, announced the recent selection of New England native **Erin Robertson, MD**, as the new Deputy Regional Flight Surgeon.

Dr. Robertson is residency-trained in family practice from the University of Pennsylvania and, most recently, in emergency medicine from Albert Einstein Medical Center, Philadelphia's busiest Level-I trauma center. She is an alumnus of Wellesley College and the University of Michigan Medical School-Ann Arbor.



Dr. Robertson

As an award-winning Chief Medical Officer for the Department of Defense Military Entrance Processing Command, Dr. Robertson screened military applicants for all branches of the Armed Forces in northern New England. Dr. Robertson possesses a strong biomedical research foundation, with several journal article co-authorships written during fellowships at Harvard's Brigham & Women's Hospital and the National Cancer Institute in Bethesda, Md.

Dr. Robertson says she is honored to be joining the New England Region Aerospace Medicine Division.



### LETTERS from page 3

*Dear Editor:*

Recently, an airline pilot was found on his Class I exam to have a blood pressure of 165/98. On all of his previous examinations, he had been normotensive. He had been taking some herbs his wife had given him to "clean out his liver." I advised him to stop taking the herbs and his BP was normal 5 days later. He was advised that his liver did not need to be "cleaned out" and to avoid herbs in the future.

## Aviation Medical Examiner Seminar Schedule

2008		
August 21 – 24	Wiesbaden, Germany	(1)
October 8-11	Oklahoma City, Okla.	CAMA (2)
November 3 – 7	Oklahoma City, Okla.	Basic (3)
November 14 – 16	Reno, Nev.	N/NP/P (4)
2009 (PARTIAL)		
February 20 – 22	Orlando, Fla.	OOE (4)
March 2 – 6	Oklahoma City, Okla.	Basic (3)
May 3 – 7	Los Angeles, Calif.	AsMA (5)
June 5 – 7	San Antonio, Texas	CAR (4)
July 20 – 24	Oklahoma City, Okla.	Basic (3)
October 14 –17	Rochester, Minn.	CAMA (2)
November 2 –6	Oklahoma City, Okla.	Basic (3)

### CODES

**AP/HF** Aviation Physiology/Human Factors Theme

**CAR** Cardiology Theme

**N/NP/P** Neurology/Neuro-Psychology/Psychiatry Theme

**OOE** Ophthalmology-Otolaryngology-Endocrinology Theme

(1) This seminar is being sponsored by the German Society of Aviation and Travel Medicine (DGLRM) and is sanctioned by the FAA as fulfilling the FAA recertification training requirement. For more information, see the DGLRM Web site: [www.dglrm.de/xp/seite3/seite3-3-8.html](http://www.dglrm.de/xp/seite3/seite3-3-8.html).

(2) This seminar is being sponsored by the Civil Aviation Medical Association (CAMA) and is sanctioned by the FAA as fulfilling the FAA recertification training requirement. Registration will be through the CAMA Web site: [www.civilavmed.com](http://www.civilavmed.com).

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

(4) 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.

(5) 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.

The herb bottle was labeled as being an extract of artichoke hearts. I can find no reference in the literature to artichokes containing hypertension inducing chemicals. However, herb preparations are sometimes laced with large amounts of the *ephedra* herb (ma huang), from which comes ephedrine. This makes the imbiber feel energized and believe they are receiving a

therapeutic benefit. I believe this was the cause of his hypertension, as happened in the case of another non-pilot adult patient who became hypertensive when taking an herb preparation actually labeled as containing *ephedra*.

*Harry J. Wander, MD, FAAP  
Yuba City, Calif.*



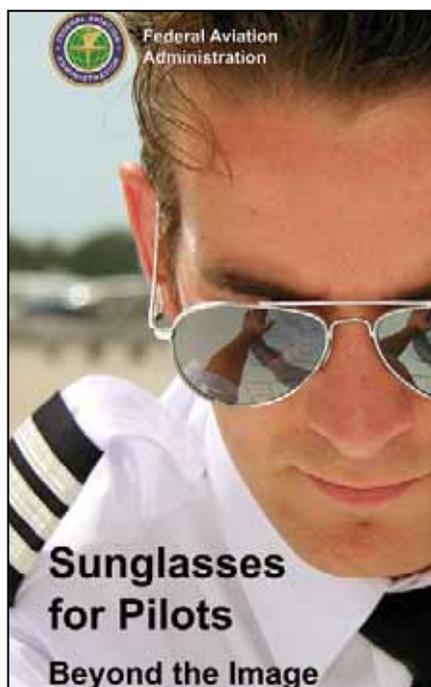
## Pilots Are Welcome Here

By Fred Tilton, MD

*This article was reprinted from the July/August issue of FAA Aviation News and was intended for use by pilots. AMEs are encouraged to make the article available for their aviators. —Ed.*

**T**HOSE ARE THE bold-type opening words on an FAA Civil Aerospace Medical Institute (CAMI) brochure entitled *Physiological Training Courses for Civil Aviation Pilots*. The phrase certainly applies to the courses that are the subject of the brochure, but it also applies to the entire range of resources that CAMI's Airman Education Program creates and makes available, free, to pilots at [www.faa.gov/pilots/safety/pilotsafetybrochures/](http://www.faa.gov/pilots/safety/pilotsafetybrochures/).

You are welcome to take advantage of the many resources that the CAMI Airman Education Program has created to help airmen better understand the unique characteristics of the aviation environment.



Cover of popular pilot safety brochure, available online at: [www.faa.gov/pilots/safety/pilotsafetybrochures/](http://www.faa.gov/pilots/safety/pilotsafetybrochures/)

### Protecting Your Eyesight

Let's start with a subject that is timely for summer flying in general. Protecting your eyes from exposure to harmful solar radiation. The medical certification process has long accommodated the reality that very few are blessed with perfect vision. Unless you are among those fortunate few, the "limitations" portion of your medical certificate will clearly state the requirement for use of corrective lenses when you fly.

Wearing glasses or contact lenses when you fly meets the legal requirement, but corrective lenses are not enough. Because infrared and ultraviolet radiation from the sun can damage your eyes, you also need protective lenses. The right sunglasses can help protect your eyes from exposure to harmful solar radiation. Sunglasses also reduce the effects of harsh sunlight, decrease eye fatigue, and protect your eyes from the risk of impact with objects (such as flying debris from a bird strike).

### Beyond the Image

Sunglasses have long been part of the "cool pilot" image. When you are selecting your next pair of aviation sunglasses, though, be sure to consider function along with fashion. Here are a few tips from *Sunglasses for Pilots: Beyond the Image*:

- Wear sunglasses that incorporate 99 to 100% UVA (ultraviolet-A) and UVB (ultraviolet-B) protection.
- Weigh the pros and cons of the most common lens materials in use ("crown" glass, monomer plastic (CR-39®), and polycarbonate plastic).
- Choose a tint that screens out only 70 to 85% of visible light, and does not appreciably distort color.
- Avoid polarized lenses, which can reduce or eliminate the visibility of instruments with anti-glare filters.

For more information, go to: <http://www.faa.gov/pilots/safety/pilotsafetybrochures/>

In the meantime, good health and safe flying!



### AME RESOURCES

#### Pilot Safety Brochure Titles

- Alcohol and Flying
- Altitude Decompression Sickness
- Carbon Monoxide: A Deadly Combination
- Civil Aerospace Medical Institute, The
- Deep Vein Thrombosis and Travel
- Fatigue in Aviation
- 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
- Oxygen Equipment
- Physiological Training Courses for Civil Aviation Pilots
- Pilot Medical Certification: Information for the Aviation Community
- Pilot Vision
- Seat Belts and Shoulder Harnesses: Smart Protection in Small Airplanes
- Smoke!
- Spatial Disorientation: Visual Illusions
- Spatial Disorientation: Why You Shouldn't Fly By the Seat of Your Pants
- Sunglasses for Pilots: Beyond the Image

#### To order, contact:

Gary.Sprouse@faa.gov  
(405) 954-4831

*Dr. Tilton received both an MS and a MD degree from the U. of New Mexico and an MPH from the U. of Texas. During a 26-year career with the U.S. Air Force, Dr. Tilton logged more than 4,000 hours as a command pilot and senior flight surgeon flying a variety of aircraft. He currently flies the Cessna Citation 560 XL.*