



Federal Air Surgeon's Medical Bulletin

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.



U.S. Department of Transportation
Federal Aviation Administration

Hooray!

New Rule Now In Effect

HELLO, EVERYONE. IT'S official: Effective July 20, individuals with a special issuance are no longer required to have their authorization letter with them while aviating. I realize that I informed you about this change in my last editorial, but this is such a significant change that I think it bears repeating.

The news may not amount to a hill of beans to many of the pilots you examine simply because most of them meet Federal Aviation Administration medical standards and do not require a special issuance (waiver). In fact, many of them may not even be aware that there are such letters, but they probably will be affected by this change as they get older and might require a special issuance of their own.

The requirement to carry the letter stemmed from an audit of the FAA by



The Federal Air Surgeon's Column

By Fred Tilton, MD

the International Civil Aviation Authority (ICAO) that took place in 2007. At that time, the auditor, without consulting the ICAO Medical Officer, insisted that ICAO International Standards and Recommended Practices (SARPS) required that we include all disqualifying medical conditions on an applicant's medical certificate.

While we vigorously pushed back, we could not convince the auditor that he was wrong. However, we were finally able to get him to agree that the disqualifying information was contained in the authorization letter, and that we could meet the intent of the SARPS by requiring the individual to carry the letter while flying.

Shortly after we announced the requirement to carry the letter, we began to get complaints from airmen and aviation organizations that the obligation to show it to inspectors was an unnecessary violation of the airman's privacy. We agreed with them and so did the ICAO Medical Officer, and he helped us get the ruling reversed. While it has taken a long time, we are finally there, but we still have a couple of issues to deal with.

The paper medical certificates and the computerized MedXpress certificates have a note on the back

that says: "A letter of authorization (or SODA) describing any such limitations must be kept with this certificate at all times while exercising the privileges of an airman certificate."

We are working on the programming changes necessary to modify MedXpress, but we cannot modify the paper forms because it would not be cost effective to do so before October 1.

We also do not plan to issue replacement certificates to everyone who has been issued a certificate with the obsolete language. So, for some time, individuals will be carrying certificates with the outdated language on the back.

I also want to make it clear that even though the entire note will go away, airmen with a SODA will still be required to have their SODA with them when they fly.

You may be asking yourself, *What can I do?* You might be surprised to know that you interact with airmen more than anyone else in the FAA. So if any of the airmen you examine have special issuances, please take a few extra minutes to explain these changes.

If you have questions about this issue or any other issue, call your Regional Flight Surgeon. He or she is "up-to-speed" on all of the latest information and is ready to help so that we can provide the best service to the airmen we support.

Thank you for your help with implementing these changes, and as always, thank you for everything you do for the airmen you take care of.

Cheers!

—Fred

CONTENTS

LETTERS TO THE EDITOR	2
THREE OAM STAFF HONORED BY ASMA	3
OAM PHYSICIANS ON CALL	4
POST-TRAUMATIC STRESS DISORDER	5
COMMON ECG ISSUES	6
ECG NORMAL VARIANT LIST	6
PILOT SATISFACTION SURVEY	7
TRANSVERSE MYELITIS	8
CARDIOVASCULAR DISEASE AND STENTING	10
WALLENBERG'S SYNDROME	12
FORM 8500-8 PHASE-OUT APPROACHING	13
AME SCHEDULE	14

GLAUCOMA CASE REPORT COMMENTS

Dear Editor,

The article... about Glaucoma [Case Report by Joseph A. Lopez, MD, *Federal Air Surgeon's Medical Bulletin*, vol. 50, no. 2, pg. 12] was informative and mostly correct. One glaring point that should be made is that the eye specialist should be an ophthalmologist. Not an optometrist. Optometrists may not have the training needed to properly evaluate a patient for the extent of glaucoma, usually needs supervision by an ophthalmologist, and cannot treat patients with laser or surgery if indicated. Also, annual exams for follow up of glaucoma is inadequate. The American Academy of Ophthalmology recommends follow up appropriate with the extent of disease, and certainly more frequent than annually.

Richard Nattis, MD
Long Island, N.Y.



Dear Dr. Nattis,

The Aerospace Medical Certification Division's general policy is that we prefer reports from a medical specialist who is knowledgeable in the treatment of such conditions and has experience with the clinical treatment and potential complications (glaucoma, in this case). Dr. Lopez' article mentions, more than once, that we require a report from a treating eye specialist, and does comment, in parentheses, optometrist or ophthalmologist (page 12). A summary of the potential multiple complexities of glaucoma (insert, page 13), is also mentioned. The AMCD will not accept unsatisfactory reports regarding history of glaucoma, or pre-glaucoma deemed necessary for treatment. Follow-up reports, for aeromedical purposes, are usually required annually, although the eye specialist may require more closely timed evaluations. The first-class pilot, then, will typically get a time-limited certificate for 12 months, even if the treating eye specialist is following more closely. The pilot jeopardizes timely certification if the eye report is vague, incomplete (for example, history is lacking), and as Dr. Nattis implies, the AMCD judges the medical report (glaucoma) to be inadequate—for example, if the doctor is not a medical specialist knowledgeable about the condition.

Richard Carter, DO
AMCD Staff Physician

BLANK CERTIFICATES TO PRINT?

Dear Editor,

Some concerns with the paperless record—which indeed is not paperless since we have to print out the certificate.

We have now introduced a number of complex systems into issuing the medical certificate—now we must have functioning computers (we will not even begin to express the frustration with the PC and its evolution and operating systems), Internet connections which where I practice go down with regularity, and of course printers and their limited life expectancy—with the “OLD” system if all else failed I could

issue a certificate and could type it on a 1929 manual Smith Corona typewriter—basic, primitive, but still very reliable—what if any of the above go down while examining an airman who needs his or her certificate to fly? Will we have available blank certificates to print in case of an above failure in any of the above chain of complex interfaces...?

A.J. Bogosian, MD
Anacortes, Wash.

Hello, Dr. Bogosian,

There is something to be said for the reliable 1929 Smith Corona typewriter; I have a healthy respect for them, as many are still in use today. However, the enhancements we are making to our technology infrastructure and our applications truly are for the benefit of AMEs and pilots. Our user community is more “computer savvy” than ever before; in fact, many believe we are “behind the power curve” when it comes to the use of technology.

In response to your question — yes, we will have a mechanism in place for you in the event of a failure that prevents you from accessing the AMCS. We are analyzing different solutions and will advise you of the solution prior to going “paperless.”

David Nelms
AMCD Program Analyst

HUNTINGTON'S DISEASE

Dear Editor,

Concerning the article on Huntington's disease in the recent *Bulletin* [“Huntington's Disease,” *Federal Air Surgeon's Medical Bulletin*, vol. 50, no. 2, p. 16], it appears that the pilot described had no disease or symptoms of disease; he only reported the genetic marker for potential (probable) illness in the future. What was the basis for potentially disqualifying this individual who presented no evidence of disease? Are we going to be requiring everyone who has a defined marker for future genetic disease to be extensively evaluated (as this individual was) prior to any evidence or symptoms of the disease?

George W. Jackson, MD
Associate Clinical Professor
Duke University

Continued on page 3

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Huntington's from page 2

Editor's Note: This is a very interesting case. We would not have been aware that the individual had tested positive for the gene for Huntington's disease if he had not voluntarily had himself tested. However, once we were informed, we had no choice but to ask for additional information to be sure that he was not symptomatic for the disease. We have not initiated a genetic screening program nor do we intend to do so.

In reply to: *Huntington's Disease: Case Report*, by Robert Craig-Gray, MD

I would like to thank Dr. Craig-Gray for reporting this case that demonstrates many of the concerns faced when evaluating potential sequelae of neurological diseases on aviator performance, as well as the complexities that aviation medical examiners must deal with when confronted by rare diseases or diseases usually managed under the care of specialized providers. Huntington's disease poses some particularly difficult challenges, as most individuals remain normal through much of their early life, with a wide range in the age of onset, and once the disease becomes manifest, progressive neurological and psychiatric problems ensue unrelentingly.

A medical status report was obtained from this airman's neurologist and revealed no detectable neurological disease or disability. It is encouraging that this aviator also presented with no abnormalities on neuropsychological testing; however, it is important to know that even in early disease,

subtle but potentially important cognitive deficits may develop before diagnostic threshold is reached [1].

I do wish to correct the statement: "Although only 50% of those testing positive for the disease actually develop symptoms, currently there is no further predictive capacity to determine who will become ill and who will remain disease-free." In fact, the disease has nearly 100% penetrance for those testing positive (>42 CAG repeats). As you mentioned, disease severity, and earlier onset is associated with greater number of CAG [cysteine-adenosine-guanine] repeats, and you may have intended to refer to the findings that 50% of the variability in disease severity and age of onset are explained by CAG repeat length [2].

The number of CAG repeats in humans is highly variable, but the normal range is 11-34 CAG copies, and more than 42 repeats indicates a confirmed genetic diagnosis of Huntington's gene in most labs. That being said, individuals with an "intermediate" number of CAG repeats (34-42 CAG repeats), still demonstrate a behavioral phenotype, with depressive features relative to normal healthy controls [3], and at the upper end of this range, the full Huntington's phenotype is incompletely penetrant. It would be of interest to know how many CAG repeats this airman had.

You mention that the airman should also report any changes in his medical condition immediately to the FAA and cease aviation operations per Title 14 CFR §61.53, which restricts operation of an aircraft with any medical [known] deficiency. One difficulty

with this approach is that individuals with neurodegenerative disease are often unaware of developing cognitive difficulties (anosognosia), and regular screening such as annual administration of Cogscreen-AE or equivalent neuropsychometric testing would help detect cognitive decline that would impair safe operation of an aircraft, potentially before the aviator or their peers may readily recognize a deficit.

Richard Ronan Murphy, MBChB

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Dr. Murphy is an AME, a board-certified neurologist, and is a fellow in mental health research with the Veteran's Administration Mental Illness Research, Education, and Clinical Center, with clinical faculty appointment to the University of Washington Neurology department.



Three OAM Staff Honored by the Aerospace Medical Association

IN AN UNUSUAL and welcome surprise, two Office of Aerospace Medicine staff members were elected Fellows of the Aerospace Medical Association (AsMA) and one received a prestigious national award during Honors Night celebrations at the AsMA 83rd Annual Scientific Meeting held last May in Atlanta, Ga.

Eastern Region Flight Surgeon **Harriett Lester** and her sister, **Benisse Lester**, the Chief Medical Officer for the Federal Motor Carrier Safety Administration (FMCSA) and a FAA senior aviation medical examiner (AME),

were both made Fellows of AsMA on the same night. The story gets even better. Aerospace Medical Education Division Manager **Brian Pinkston** and his wife, **Cheryl Lowry**—a U.S. Air Force Flight Surgeon—were also among the 24 AsMA Fellows elected for 2012.

"It was quite a surprise," said Federal Air Surgeon **Dr. Fred Tilton**. "I've never seen relatives elected before, and I've never seen a husband and wife elected before. And here we have Brian and his wife, and Harriet and her sister—who is basically my counterpart at FMCSA—all elected at once!"

Although not related or married to anyone else who received an AsMA award this year, CAMI's Research Physiologist **David "Andy" Self** received the AsMA Arnold Tuttle Award for original research, which investigated the physiological responses to altitude hypoxia. This information is used to address improvements in countermeasures and oxygen equipment design for commercial and general aviation. The research was published as an Office of Aerospace Medicine Report and in the *Aviation, Space, and Environmental Medicine Journal*.

—From AVS Flyer 6/7/2012

OAM Physicians On Call Part 1

Standing By To Help

By Richard Carter, DO, MPH

AVIATION MEDICAL examiners, we challenge you to limit unnecessary deferrals, which helps us to minimize the backlog of deferred exams. Key to this initiative is an appeal to you to issue certificates when you can.

The following two lists from the Office of Aerospace Medicine (OAM) should help you reduce the number of unnecessary phone calls to Aerospace Medical Certification Division (AMCD) in Oklahoma City for verbal authorizations. If you have an unusual case and need guidance, though, please call.

The medical officers (AMCD, Regional Flight Surgeons, and International/Military Regional Office) are available to you for such case discussions. A team effort is needed to make this process successful.

In Part 1 of this article, we address examples that do not require you to call us (see list this page). Print the list, and paste it in a handy spot for reference.

Calling AMCD/RFS is easy. Call our designated number (include Web link to AMCD and Regional Flight Surgeon phone numbers). You can call the AMCD or a Regional Flight Surgeon for verbal authorization.

Whom to call. We advise, in general, that third-class airman inquires should go to your Regional Flight Surgeon. The AMCD more commonly answers calls about first- and second-class pilots, and specifically detailed medical inquires (for example, central serous retinopathy, renal cancer). Many AMEs already do this. The AMCD number **405-954-4821/option 6**, links you to dedicated operators that will route you to the physician on call. Please follow operator instructions; you will be asked your AME number, PI or application ID number. If we are not immediately available, we will try to call back the same day. We may also ask for an after-hours call back number (usually your cell number), as we may call back after normal work hours.

Issue when you can. A phone call to the AMCD is not always required. The protocol section of the *AME Guide* lists conditions allowable for AME to initial issue (example, hypertension, diet/exercise control of diabetes). Complications can occur, and we invite you to call about abnormal labs, ECGs, etc. AMEs that do initial issue will need to send in medical reports. **DO NOT** mail, fax,

or otherwise send in duplicates of the same reports. Simply put, AMEs can issue cases that allow for an Eligibility Letter (see below list – note, this is not a complete list of conditions that qualify for an Eligibility Letter but a sample of typical questions/conditions AMEs frequently call about. See also the list of ECG Issues on page 6.).

Continued →

CONDITIONS THAT ALLOW THE AME TO ISSUE

- **Motion sickness** – resolved.
- **Myringotomy** – resolved.
- **Eardrum perforation** – resolved.
- **Esophoria/exophoria** – no adverse complications, no diplopia.
- **LASIK** – less than two years – we need 8500-7. If favorable, issue.
- **LASIK** – more than two years – comment *no adverse complications* (AME comments block 60), issue.
- **Acute nephritis**, 3 months status post, resolved, issue with favorable reports.
- **Kidney stone** history, no retained kidney stone.
- **Melanoma**, < .75 mm, favorable report, issue.
- **Hypertension** (see Hypertension Protocol).
- **Diet/exercise diabetes** (see Diet/Exercise Diabetes Protocol).
- **Multifocal intraocular lens** (see Protocol for Binocular Multifocal and Accommodating Devices).
- **Musculoskeletal injury** (see Musculoskeletal Protocol).
- **Benign prostatic hypertrophy/medication**, examples (note: AMCD does require comment in block 60 that the following medications are well tolerated):
 - ◆ Detrol (tolterodine): acceptable
 - ◆ Enablex (darifenacin): acceptable
 - ◆ Vesicare (solifenacin): acceptable
 - ◆ Avodart (dutasteride): acceptable
 - ◆ Santura (trospium): acceptable
 - ◆ Uroxatral (alfuzosin): acceptable
 - ◆ Flomax (tamsulosin): acceptable
 - ◆ Rapaflo (silodosin): acceptable
- **Ditropan** (oxybutynin); antispasmodic/anticholinergic: is **NOT** acceptable for aeromedical purposes.
- **Gout/medication**, examples (note AMCD does require comment in block 60 that medications are well tolerated):
 - ◆ Colcrys (colchicine): allowable.
 - ◆ Uloric (febuxostat): allowable.
 - ◆ Zyloprim (allopurinol): allowable.
 - ◆ Benemid (probenecid): allowable.
- **Erectile dysfunction meds**, example (note AMCD does require comment in block 60 that medications are well tolerated):
 - ◆ Viagra (sildenafil citrate): 6 hrs. no fly.
 - ◆ Levitra (vardenafil): 36 hrs. no fly.
 - ◆ Cialis (tadalafil): 36 hrs. no fly.
- **Asthma**, and medication, is rarely used.
- **Peptic ulcer** (see Peptic Ulcer Protocol).
- **Cholelithiasis**, asymptomatic: issue.
- **Traumatic pneumothorax**, 3 months status post, resolved: issue with favorable reports.

Example: The airman provides a summary report from the urologist, *history of kidney stones, now resolved*. The most recent imaging (kidneys, ureter, and bladder) demonstrates no retained kidney stone. The AME does issue, transmits the new exam, and faxes reports to the AMCD (fax 405-954-4300), with a coversheet. Do you need to call? The answer is **no**. *Again, do not mail, fax, or otherwise send in duplicate reports, as this creates delays in certification.*

Team effort. We need your help to limit unnecessary deferrals. Many complex medical conditions do eventually get a waiver (Special Issuance or Statement of Demonstrated Ability), and we will help you with the certification process.

Many thanks to the Regional Flight Surgeons that have assisted us with the on-call program. Have you experienced calling the AMCD in Oklahoma and been surprised to be talking to Dr. **Goodman** in California or Dr. **Lester** in New York? Regional Flight Surgeons have assisted us by taking calls for us, so we can balance our on-call workload with demands of our backlog of deferred cases waiting for review. Thanks to Drs. **Ray, Goodman, Salazar, Lester, Northrup, and Jones** for participating in this special certification project. The Aerospace Medical Certification Division medical staff, Drs. **Courtney Scott, Brian Johnson, Bill Mills, Ben Zwart, and Steve Schwendeman** all participate in the on-call process.

Good news. Dr. **Judy Frazier** is now fully trained and ready for calls, so you will be talking to her soon! The International AMEs communicate with the International Regional Flight Surgeon Office, Dr. **Brian Pinkston**, and International Program Analyst **Leah Olson**. We coordinate efforts with the International office to address International AME inquiries. Together, this team effort expedites the medical certification of pilots.

In Part 2 of this series, we will discuss details of the verbal authorization needed for Special Issuance.



Dr. Carter is a medical review officer in the Aerospace Medical Certification Division.

Post-Traumatic Stress Disorder

Case Report, by Nathaniel B. Almond, MD, MPH

Airmen may present for evaluation with a history of post-traumatic stress disorder (PTSD) or with ongoing symptoms of PTSD. A thorough history is important for confirming that symptoms have resolved and that the airman is not taking medication for PTSD. This article presents a case report of a first-class pilot applicant with ongoing symptoms of PTSD and includes a brief review of PTSD.

Background

A 32-YEAR-OLD MALE with 100 flight hours applied for first-class medical certification with ongoing PTSD due to a stressful event 8 years ago while in the military. During convoy operations in enemy territory, he drove a vehicle over an improvised explosive device (IED), causing it to detonate and the vehicle to catch fire. While escaping from the vehicle, he was shot multiple times in the arm and leg, but he did not sustain any head injury. He now admits to generalized anxiety, fear of meeting new people, and weekly nightmares and

Continued on page 7

POST-TRAUMATIC STRESS DISORDER ETIOLOGY

PTSD is an anxiety disorder that occurs after the experience or witnessing of a traumatic event. The person's response to the event must involve intense fear, helplessness, or horror. Symptoms vary but can be classified into three categories: 1) reexperiencing of the traumatic event, 2) avoidance of situations associated with the trauma and numbing of general responsiveness to keep from thinking about the event, and 3) symptoms of increased arousal. Symptoms from all three categories must be present for more than 1 month, and the disturbance must cause clinically significant distress or impairment in social, occupational, or other important areas of functioning. The many symptoms that people with PTSD may experience include anxiety, hyper-vigilance, hyper-arousal, avoidance, reexperiencing the event (e.g., nightmares, flashbacks, or intrusive thoughts), anhedonia, reduced ability to feel emotions, being easily startled, difficulty concentrating or completing tasks, bursts of anger, insomnia, and irritability (1,2).

PTSD is a common diagnosis: 6.8% of Americans will experience PTSD in their lifetime. It is particularly prevalent in those who have served in combat, including aviation personnel. (3) Thirty percent of Vietnam veterans have PTSD, while PTSD prevalence estimates in veterans from Iraq and Afghanistan has ranged from 6 to 20%. Depression and alcohol use are also common with PTSD. The onset of symptoms in relation to the event, as well as the duration of symptoms, greatly varies (1,2).

Treatment of PTSD includes cognitive behavioral therapy and anti-depressant medication (selective serotonin reuptake inhibitors). Policies and programs exist across many organizations to assist individuals exposed to stressful events in an effort to minimize PTSD symptoms. These programs range from Traumatic Stress Response within the Department of Defense to the Critical Incident Response Program by the Airline Pilots Association. For example, the Critical Incident Response Program works to mitigate PTSD through pre-incident education and post-incident accident crisis intervention through crewmembers who have received counseling training. Both primary prevention rapid response to victims is important in both the civilian and military settings of traumatic events (2,3,4).

10 Common Electrocardiogram Issues

...And What To Do About Them When Performing Certification ECGs

1. If an airman has a heart rate less than 50, have the airman exercise in place and repeat the ECG. If the heart rate goes up above 50, send us both ECGs (in case this happens again down the road), and you can clear the airman.
2. This also goes for a significant first-degree AV block. Exercise the airman in place, and if the block becomes less, you may clear the airman.
3. If an airman has a heart rate over 110—sinus tachycardia, perhaps—have the airman relax a bit and repeat the graph. If the rate drops below 110, send us the graph and clear the airman.
4. Two or more premature atrial contractions or ventricular contractions on an ECG requires the applicant to have a maximal nuclear stress test. If this has been previously worked up, you do not need to provide a new evaluation.
5. If the airman demonstrates new onset of complete RBBB (right bundle branch block); in other words, this has not been seen on previous graphs, then you are to have the airman undergo a maximal nuclear stress test. Note: All stress testing in first- and second-class airmen should be maximal nuclear stress testing (unless we specify otherwise in our letter to you).
6. An airman who has an incomplete RBBB pattern on previous electrocardiograms, and then demonstrates a complete RBBB, does not require an evaluation.
7. An airman with a new onset of a complete left bundle branch block is to provide a cardiovascular evaluation and a pharmacologic nuclear stress test. This is one of the conditions where we will accept a pharmacologic stress test. Airmen with a LBBB demonstrate what appears to be an area of ischemia in the septum, and the pharmacologic stress test helps better determine if there is actual ischemia.
8. An airman with left anterior or posterior hemiblock must demonstrate an absence of coronary artery disease, so a maximal nuclear stress test is required.
9. Limb lead III is the most variable lead. This lead sometimes is affected by respiration, which can falsely indicate that the airman had a previous inferior infarction. So if you have a small R-wave with a deep S-wave in that lead, and even perhaps in lead aVF, you need to perform an ECG in inspiration and again in expiration. If the S-wave disappears and you get a larger R-wave, you can clear the airman—but don't forget to provide us all these graphs.
10. An airman who has ST- and T-wave changes that suggest ischemia or left ventricular hypertrophy requires an evaluation if one has not been previously performed for this reason. These situations require a cardiovascular evaluation, perhaps an echocardiogram, and definitely a maximal nuclear stress test.

ECG Normal Variant List

These are considered normal ECG variants and not reasons to defer the applicant

- Sinus bradycardia. Age 50 and younger — if the heart rate is 45 or greater; age 50 and older — if the heart rate is 49 or greater
- Wandering atrial pacemaker
- Low atrial rhythm
- Ectopic atrial rhythm
- Indeterminate axis
- First-degree AV (atrioventricular) block with PR interval less than 0.21 in age 50 and younger
- Mobitz Type I Second Degree AV (atrioventricular) block (Wenckebach phenomenon)
- One premature ventricular contraction or atrial contraction on a 12-lead ECG
- Incomplete RBBB
- 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 VI or V2, ORS interval less than 0.12 msec R>S wave in VI without other evidence of right ventricular hypertrophy
- Sinus arrhythmia
- Sinus tachycardia: Any age — if the heart rate is less than 110
- Left atrial abnormality
- Short QT

Note: If a first-class airman does not have a current resting ECG on file but we have any type of stress test (pharmaceutical stress, Bruce stress, nuclear stress, or stress echocardiogram) that was accomplished within the last year, we can accept without writing out for a current resting ECG; however, we do need the tracings from any of these tests. A cardiac cath and a Holter monitor test are not acceptable in place of a resting ECG.

PTSD from page 5

flashbacks. He also admits to drinking heavily on and off in the years since the event. Currently, he does not drink alcohol. He is divorced. He currently has a 30% disability rating for PTSD from the Veteran's Administration. His psychiatric exam is notable for anxious affect but is otherwise normal.

Aeromedical Concerns

The primary aeromedical concern for this case is that the airman's ongoing symptoms of PTSD could compromise his ability to safely operate an aircraft. Specifically, his symptoms such as flashbacks and anxiety could decrease his ability to focus and concentrate on safely piloting and could be acutely incapacitating in the cockpit. Substance abuse associated with PTSD and fatigue resulting from nightmares may also compromise safe flying.

In addition to this airman's symptoms, other symptoms of PTSD could also affect flight safety. These include 1) numbing of general responsiveness, which could slow reaction times, 2) avoidance, which could affect behavior to make correct decisions, and 3) an autonomic hyper-arousal state, which could also degrade concentration, situational awareness, and the ability to manipulate controls. Anxiety might also originate as a fear of flying (5,6).

Under Title 14 of the Code of Federal Regulations (CFR) parts 67.107, 67.207, and 67.307, (c) No other personal-ity disorder, neurosis, or other mental condition that the Federal Air Surgeon, based on the case history and appropriate, qualified medical judgment relating to the condition involved, finds:

1. Makes the person unable to safely perform the duties or exercise the privileges of the airman certificate applied for or held; or
2. May reasonably be expected, for the maximum duration of the airman medical certificate applied for or held, to make the person unable to perform those duties or exercise those privileges.

In this context, PTSD would be considered a "neurosis or other mental condition" (in part c). Any airman with a history of ongoing PTSD symptoms or a history of PTSD should be deferred to the FAA for further consultation.

Outcome

The aerospace medicine residents discussed the case and decided more information was required regarding this applicant: specifically, additional evaluation of alcohol use and neuropsychological testing, as well as original documentation of the diagnosis of PTSD. The FAA denied the certificate until these documents are provided for further evaluation. If the applicant does indeed have ongoing PTSD symptoms, he would not receive a certificate.

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About the author

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Biennial Survey of Pilot Satisfaction Initiated

By Katrina Avers, PhD

THE OFFICE OF Aerospace Medicine is mailing invitations this month to a randomly selected sample of pilots to complete a survey regarding their experiences and satisfaction with the airman medical certification process.

The survey is a biennial survey we administer to be in compliance with Executive Order No. 12862, "Setting Customer Service Standards," and the

Government Performance and Results Act of 1993. The information obtained is used to evaluate the degree of customer satisfaction with Aerospace Medical Certification Services, identify areas in which the FAA may improve its services to airmen, and assess change in customer satisfaction as a result of those improvements. Invitees are in a unique position to provide the FAA valuable

feedback that will affect all pilots. We hope to get a large response so that we can get meaningful data to share with you in a future issue.

Dr. Avers is a research psychologist in the Civil Aerospace Medical Institute's Aerospace Human Factors Research Division.



Transverse Myelitis

Case Report

by Jonathan F. Stinson, MD, MPH

Transverse myelitis is a rare but potentially debilitating neurological condition caused by spontaneous, usually idiopathic inflammation of both grey and white matter of the spinal cord.

This case report evaluates an airline pilot with this disorder and the requirements necessary to return the airman to flying.

History

THIS CASE INVOLVES a 53-year-old airline pilot with approximately 16,000 hours, who was in his usual state of good health prior to this incident. He was admitted to the hospital with symptoms of progressive loss of light touch, vibratory, and position sense, starting in his feet and working its way up to the level of the chest, including upper extremities from hands to mid forearm. He had no signs of muscle weakness or reflex abnormalities.

A cervical MRI revealed a 6-mm lesion of the posterior part of the cervical spinal cord at the C5-6 level with some surrounding edema and swelling of the cord at that level. MRI of brain and thoracic cord was normal. Cerebrospinal fluid showed no evidence of inflammation, with no white cells and a normal protein of 54 mg/dl. Immunological studies were normal, as was an IgG index and 24-hour IgG synthesis rate. There were no oligoclonal bands seen, and CFS and Lyme disease antibodies were negative. Serum B-12, folic acid, and ESR were all normal.

The airman was admitted to the hospital and treated for five days with high-dose IV methylprednisolone, 1gm daily, followed by a six-day taper. At the time of discharge, all symptoms resolved, with the exception of residual numbness of the fourth and fifth digits of both hands.

ETIOLOGY OF TRANSVERSE MYELITIS

Transverse myelitis is a relatively rare neurological disorder caused by inflammation of the spinal cord, creating a demyelinating lesion, typically involving both sides of the cord, hence its transverse or bilateral nature. These lesions are usually at one level only but can occasionally exist at multiple levels. The resulting inflammation damages or destroys myelin, compromising conduction between the brain and muscles or sensory organs distal to the lesion. Symptoms of transverse myelitis can evolve over several hours to as long as several weeks. It often begins as a sudden onset of lower back pain, muscle weakness, or abnormal sensations in the toes and feet. However, it can rapidly progress to more severe symptoms, including paralysis, urinary retention, and loss of bowel control. Diagnosis is made by clinical history, physical findings, and a spinal cord lesion seen on MRI. Some patients may recover from transverse myelitis with minor or no residual problems, while others suffer permanent impairments that affect their ability to work or even carry out activities of daily living. The majority of cases involve single episodes, but some can have a recurrence of symptoms.⁽¹⁾

It is estimated that about 1,400 new cases of transverse myelitis are diagnosed each year in the United States, and approximately 33,000 Americans have some type of disability resulting from the disorder. It can occur in all age groups, but peaks occur in the 10-19 and the 30-39 age ranges. There appear to be no inherited, ethnic, or gender differences in incidence. One study estimated the incidence to be about 4.6 cases per million per year.⁽²⁾

Transverse myelitis can have many different etiologies. It is thought that about 45% are parainfectious or related to infections. Infectious agents suspected of causing transverse myelitis include varicella zoster, herpes simplex, cytomegalovirus, Epstein-Barr virus, influenza, echovirus, human immunodeficiency virus, hepatitis A, and rubella. Bacterial skin infections, *otitis media*, Lyme disease⁽⁵⁾ and *Mycoplasma pneumoniae* have also been associated with the condition. In the United States, up to 21% of cases can be a presenting sign of multiple sclerosis.⁽⁴⁾ It is also recognized as a complication of some autoimmune diseases such as systemic lupus erythematosus, Sjögren's, or sarcoidosis,⁽⁷⁾ post-infectious myelopathy, spinal cord infarct, and neuromyelitis optica.⁽²⁾ Some cases can be the result of spinal cord infarct or be a presenting sign of multiple sclerosis. In about 21% of cases, the etiology remains unknown, even after a long-term follow-up.⁽³⁾

Treatment is dependant on determining a specific etiology and may be directed at an underlying infectious etiology, if discovered. Generalized treatments such as corticosteroids are of use in cases secondary to the autoimmune disorders, but there is some debate over their effectiveness in idiopathic acute transverse myelitis.

Neurology follow up at six months revealed a stable neurological exam, with only the residual sensory deficits noted before. His MRI showed improvement, with decreasing gadolinium enhancement of the C5-6 lesion and no evidence of new lesions. After reviewing his case, his aviation medical examiner deferred for special issuance, which was granted for 12 months contingent upon

submission of MRI cervical spine results and a satisfactory current status report.

Aeromedical Concerns

These can be divided into three categories: acute disease concerns, prognostic concerns about the risk of recurrence, and concerns about residual disability.

Continued on page 9

Acute Concerns. Acutely, the condition is obviously disqualifying under Title 14 of the Code of Federal Regulations parts 67.109, 67.209, and 67.319, where it states neurologic standards are:

(a) No established medical history or clinical diagnosis of any of... (3) A transient loss of control of nervous system function(s) without satisfactory medical explanation of the cause.

(b) No other seizure disorder, disturbance of consciousness, or neurologic condition that the Federal Air Surgeon, based on the case history and appropriate, qualified medical judgment relating to the condition involved, finds...

(1) Makes the person unable to safely perform the duties or exercise the privileges of the airman certificate applied for or held; or (2) May reasonably be expected, for the maximum duration of the airman medical certificate applied for or held, to make the person unable to perform those duties or exercise those privileges. Essentially, airmen need to have full control of sensory and motor function to safely operate an aircraft.

Prognostic Concerns. Once the condition has resolved or stabilized, the concern is directed to the likelihood of recurrence and what, if any, residual disability is present. Up to 21% of idiopathic acute transverse myelitis cases in the U.S. may be the presenting sign of multiple sclerosis, which implies a high likelihood that neurological symptoms will recur. If multiple sclerosis has been ruled out, the risk of recurrence is very low.

Residual Disability Concerns.

Recovery from transverse myelitis usually begins between two and 12 weeks following onset of symptoms and may continue for up to two years in some patients, many of whom are left with considerable disabilities. Approximately one-third will recover, with minimal to no disability; about one-third with have significant residual recovery, and the remainder will never show signs of recovery. Following stabilization, the airman must be assessed by a neurologist for residual deficits and, if significant, medical flight testing may need to be considered. A Statement of Demonstrated Ability may need to be issued.

Outcome

This airman was fortunate to have a reversible case of idiopathic acute transverse myelitis. He was effectively treated with corticosteroids, and his symptoms rapidly disappeared. Six months after the incident, he had only minimal intermittent numbness of his fourth and fifth digits, no loss of strength, or any other neurological symptoms. He was found ineligible for medical certification under 14 CFR parts 67.113, 67.213, and 67.313 but was granted an authorization for special issuance for one year. This was contingent upon meeting the maintenance requirements of his current medical certification and providing a current status report from his neurologist, including interim history, prognosis, follow-up plan, medications (including type, dosage, and side effects), current MRI of the cervical spine, and the results of any other studies that are deemed appropriate.



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About the Author

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Back To Basics: Cardiovascular Disease and Stenting

Case Report, by
Valerie Johnson, MD, MPH

Introduction

Coronary artery disease (CAD) is a significant cause of death and permanent disability in America. This condition may have an insidious onset but will most certainly always progress to become symptomatic or precipitate a cardiac event. Treatment entails medical therapy alone or a combination of revascularization procedures and medications. This report will review the case of an airman with CAD who underwent a percutaneous transluminal coronary angioplasty with stent placement; and the subsequent ramifications on flight safety of this condition.

Background

A 46-YEAR-OLD COMMERCIAL pilot presents to his aviation medical examiner (AME) for his annual second-class medical exam. He has flown over 8,000 hours and has been healthy until a year ago, when he felt burning and pressure in his chest while working in his backyard. His symptoms continued intermittently over the weekend and did not seem to improve with rest. He has been an avid runner most of his adult life and his medical history is significant only for hyperlipidemia for 12 years. He was seen by his primary physician and was initially treated for gastroesophageal reflux. However, his chest pressure and burning did not completely abate over the next 6 weeks; hence, he was finally referred to a cardiologist. His family history is significant for hypertension, hyperlipidemia, and diabetes in his parents who are both still alive at age 74.

During his cardiology evaluation, his left anterior descending artery

(LAD) was 100% occluded, with his distal myocardium supplied solely by collateral circulation. Additionally, his right coronary artery (RCA) had a 40% lesion. Therefore, an angioplasty was performed, and a drug-eluting stent was inserted into his LAD. This procedure was performed about 11 months ago. He had an unremarkable recovery and is back to walking/running 2-3 miles a day, 5-6 days a week. His medications include ramipril (Altace), clopidogrel (Plavix), Aspirin, atorvastatin (Lipitor), and esomeprazole (Nexium).

The month prior to his presentation to his AME's office, the airman completed a maximal-graded test without exercise-induced symptoms and normal exercise ECG response. He achieved 100% of his predicted maximum heart rate, and his left ventricular ejection fraction (LVEF) was 62%. His status report from the cardiologist and labs were favorable. A requirement for all first- and second-class airmen is to provide the FAA with a six-month post-event treatment coronary angiogram. In the current case, the airman had a catheterization that demonstrated a patent LAD stent and no progression of the RCA disease. The airman asked his AME if this medical history and evaluation were acceptable to the FAA and whether he would be allowed to continue with his primary occupation.

Aeromedical Concerns and Role of the AME

The aeromedical concern related to coronary artery disease is the possibility of a severely incapacitating event that would gravely impact the performance of flying duties.³ This may manifest as sudden cardiac death, myocardial infarction, angina, or ventricular dysrhythmias. The occurrence of such catastrophic events, both in a single-piloted plane or commercial aircraft, could result in dire consequences on the airman's health and on public safety.

Coronary artery disease is disqualifying for first-, second-, and third-class medical certificates per Title 14 Code

of Federal Regulations (CFR) 67.111, 14 CFR 67.211, and 14 CFR 67.311, respectively. Stents are dealt with in a similar fashion as myocardial infarctions, coronary angioplasty, and coronary artery bypass graft. A six-month post-event recovery period is necessary before consideration can be made by Medical Appeals. The airman needs to provide the hospital admission and discharge summaries, cardiac catheterization report, and any operative reports from whatever corrective surgical procedure is performed.

Required information includes a current status report from the treating physician. This should address a current performance assessment of the airman, as well as an estimate of his exercise program and capacity. It should comment on the modifiable risk factors for coronary heart disease such as smoking history, diet, physical inactivity, obesity, presence of hypertension, diabetes, and hyperlipidemia. Weight, height, (BMI), and blood pressure measurements should also be indicated.

A current list of medications with any explanation for changes in doses or drugs should also be forwarded. Any laboratory data related to this condition is required for submission; this list will include the following at a minimum: fasting blood sugar, total cholesterol, LDL/HDL cholesterol, and triglycerides. For third-class medical certification, a maximal stress test (Bruce protocol) must be performed. Ideally, this test should be completed to 100% of the airman's predicted maximal heart rate.

For first- and second-class airmen, a maximal nuclear stress test is required. Extenuating circumstance precluding adherence to these guidelines may be considered on a case-by-case basis. Note that the Aerospace Medical Certification Division will require the airman to submit all of the ECG tracings for inclusion in their AMCD medical case file (W. Silberman, personal communication March 18, 2010).

Continued →

Outcome

After the airman and his AME completed all the requirements listed above, his case was processed. He subsequently received a Special Issuance authorization, valid for 12 months.



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About the Author

Lt Col Valerie Johnson, MD, MPH, is a Flight Surgeon serving in the United States Air Force. She is currently completing the USAF's Residency in Aerospace Medicine in the USAF School of Aerospace Medicine at Brooks City-Base in San Antonio, Texas. This case report was written during her rotation at the FAA's Civil Aerospace Medical Institute.

ETIOLOGY OF CARDIOVASCULAR DISEASES

Cardiovascular diseases (CVDs) continue to be a leading cause of death in the United States, according to the American Heart Association.¹ In fact, CVDs have accounted for more deaths annually than any other major cause of death since 1900, except for 1918. In 2006, the U.S. prevalence of coronary artery disease was 7.9% (17.6 million Americans), and CAD deaths were estimated at over 425,000. Airmen are required to possess a strict standard of health in order to fly; hence, they may be considered to be healthier than the general population. However, it would be naïve to assume that they are immune to this insidious disease. Consequently, the significance of CAD in public health and aviation safety cannot be overlooked. Military and commercial aviation have long recognized the role of sudden cardiac death as a (preventable) cause of loss of life and aircraft.² Coronary artery disease is usually progressive; new lesions continually develop, and established lesions become narrower. Its true, natural history is not completely known because most diagnosed patients are treated with medications or revascularization. Moreover, the data to predict the natural history of aviators with CAD are lacking. However, compared with the general population, airmen are typically healthier, are less symptomatic, and have fewer risk factors. Aeromedical dispositions for CAD are based on clinical population data and may not be completely applicable to aviators. There are studies that show that the severity of the anatomic CAD strongly predicts survival and other clinical events.² This fact allows for regulatory bodies to consider aviators with varying degrees of CAD to maintain their licenses, albeit often restricted.

The risk of recurrence of a cardiac event that would compromise the safety of the airman and the safety of the public should be considered each time a medical certification is requested by the affected flyer. Epidemiologic studies and long-term follow-up of healthy civilian personnel, as well as patients with normal coronary arteries, as evidenced by angiography, have been performed and have established 10-year annual coronary event rates of up to 0.65%.³ A review of healthy USAF aviators revealed a five-year yearly coronary event rate of 0.15% in the oldest age group (45-54 year-olds).⁴ These "normal" rates may then be compared to those airmen with CAD in an attempt to estimate their risk. Moreover, a five-year study of second-generation stents identified factors such as the presence of diabetes and multivessel disease as predictors of both restenosis and non-restenosis events. Five-year mortality was predicted by older age, reduced LVEF, and length of index lesion.⁵ Some of these variables can be followed as potential markers of disease progression.

Several modalities can be used to manage patients with CAD. This report will only comment on revascularization. Coronary artery revascularization procedures include percutaneous coronary intervention (PCI, catheter-based techniques such as angioplasty and stent insertion) and coronary artery bypass graft surgery (CABG). These methods are considered palliative due to the progressive nature of CAD. In cases of successful revascularization after short-term follow-up (6-12 months), future cardiac events will likely result from progression of CAD in another vessel. Novel, clinically significant lesions ($\geq 50\%$ occlusion) may develop at other sites at annual rates of 7-15% within two years of interventional procedure.⁶ In a USAF database, 122 former military aviators who underwent revascularization without prior cardiac events were followed for occurrence of an additional event. Approximately half underwent a PCI (mostly angioplasty), and the other half received a CABG. No cardiac deaths were observed within five years, and only two developed a myocardial infarction (both past two-year follow-up). After the exclusion of repeat revascularizations within six months of the index event, the average annual event rates were 1.0%, 2.7%, and 3.6% per year, at one, two, and five years, respectively.⁷

Wallenberg's Syndrome

Case Report, by

John J. Venezia, DO, MPH

Abstract

Wallenberg's syndrome is a neurological condition caused by a brain stem stroke. It is also known as lateral medullary infarction or posterior inferior cerebellar artery infarction. The constellation of presenting symptoms helps to identify the location of the infarction. Imaging is vital to the diagnosis and cardiovascular investigations are as essential as they are with any stroke patient. Treatment is based on the relief of symptoms, which can include a wide array of therapies from invasive to rehabilitative. The size and location of the lesion affects the prognosis, which may have transient to long-lasting neurological effects. Aeromedical considerations are based on recovery from neurological deficits that would negatively affect safe aviation.

History

A 46-YEAR-OLD MALE pilot applied for a second-class medical certification. During the year before requesting certification, he visited a hospital with the single complaint of vertigo. Magnetic resonance imaging (MRI) was accomplished but did not reveal any abnormal lesions. The next day, he went to another hospital with the same complaint, but now his symptoms included left facial numbness and swallowing disturbance. In addition to the numbness, he had sensation of heat on the left side of the face. He had no significant medical history or noted trauma. On physical exam, he had nystagmus to the right and deviation of the uvula to the left. There was no deviation of his tongue. His left finger-to-nose test was poor. His left-sided ataxia-induced gait disturbance made tandem gait testing impossible. His muscle strength was reported as normal. MRI showed a high intensity region, indicating a tiny infarct lesion in the dorsolateral aspect of the left medulla oblongata. Magnetic resonance angiogram showed a string-shaped stenosis of the region of the proximal portion of the left posterior inferior cerebellar artery (PICA) with the periphery of the left PICA fed by retrograde pooling from the anterior inferior cerebellar artery.

He was diagnosed with Wallenberg's syndrome. He was treated conservatively and released 10 days later with ataxia and swallowing disturbances fully recovered. Six months later, he had a normal otoneurologic exam and a follow-up MRI that was negative for new lesions. However, residual left facial numbness continued up until the time of medical certification application.

WALLENBERG'S SYNDROME

Wallenberg's syndrome is a neurological condition caused by a brain stem stroke. This is also called lateral medullary infarction or posterior inferior cerebellar artery infarction. It is due to a disruption of the flow blood through the vertebral or posterior inferior cerebellar artery. This can be by a thromboembolic event or the dissection of the artery through aneurysm or trauma.² The symptoms that manifest are a result of where the disruption of blood flow occurs and can include:

Symptoms

- Vestibulocerebellar vertigo, difficulty sitting/standing due to pulling sensation, tilting or swaying, hypotonia of the upper extremity, blurred vision/diplopia, nystagmus (very common, especially in patients complaining of vertigo), or limb ataxia (usually ipsilateral to the lesion).

- Sensory pain or unpleasant feeling in the face (heat sensation), loss of pain and temperature in the contralateral trunk/limbs due to spinothalamic tract damage, and decreased corneal reflex ipsilaterally.

- **Bulbar Muscle Weakness:** affecting nucleus ambiguus resulting in paralysis of ipsilateral plate, pharynx, and/or larynx manifesting as dysphagia or dysphonia, contralateral uvula deviation.

- **Autonomic Dysfunction:** Horner's syndrome ipsilaterally; cardiogenic effects to include tachycardia, orthostatic hypertension, and/or intermittent bradycardia.^{3,4}

Diagnosis

Correlation of signs and symptoms with imaging studies.

Treatment

Relief of symptoms and rehabilitation to recover function and/or deal with neurologic loss.

Prognosis

Dependant of the size and location of the area of the brain stem damaged by the stroke. It can be transient or it can be a neurological deficit that lasts years.²

Continued →

Aeromedical Issues

As with all pathophysiological conditions, the primary aeromedical concern is the risk for incapacitation (sudden or subtle) during flight, creating an unsafe aviation environment. The airman's continued neurological deficit is concerning in this particular case. Title 14 of the Code of Federal Regulations, part 67, Item 46 (Neurologic) states, "Symptoms or disturbances that are secondary to the underlying condition and that may be acutely incapacitating include pain, weakness, vertigo or incoordination, seizures or a disturbance of consciousness, visual disturbance, or mental confusion."¹

Although this airman's residual paresthesia might not be specifically included in the above statement, his persistent deficit could still be aeromedically hazardous. Non-incapacitating neurological deficits can be just as dangerous in-flight if it is distracting from safe operation of the aircraft and needs to be considered. The *AME Guide* also states, "chronic conditions may

be incompatible with safety in aircraft operation because of long-term unpredictability, severe neurological deficit, or psychological impairment."¹ It is the unpredictability of this condition that requires a more extensive workup be accomplished following an adequate recovery period. In most cases involving stroke, a two-year recovery period from neurologic deficits is required before consideration for an airman medical certificate.

A complete neurological evaluation must be provided at the end of this recovery period. Considerations are more likely to be in favor of the airman if the cause could be identified and successfully treated.

Outcome

The case was reviewed and issued a Final Denial due to transient loss of nervous system function that is not resolved. Reconsideration may be given if current full neurologic and cardiovascular exams are provided two years from the time of incident.

About the Author

John J. Venezia, DO, MPH, CPT, USA, MC, FS, was a Resident in Aerospace Medicine when he wrote this report while rotating as a Resident in Aerospace Medicine at the FAA's Civil Aerospace Medical Institute. He has recently completed a residency in Occupational Medicine and is currently serving at the United States Army School of Aviation Medicine.

Form 8500-8 Phase-Out Deadline Approaching

By Brian Pinkston, MD

AS A REMINDER, MedXPress will be mandatory for airmen to use after 1 October 2012. Currently, more than 43% of all medical applications are being conducted using MedXPress, and users are enjoying the ability to review their applications for medical certificates with their AMEs prior to the aviation medical examination visit. Using the summary page provided by MedXPress to the airman, the aviation medical examiner can let the airman know what type of information may be needed for the appointment in order to expedite medical certificate issuance.

MedXPress provides four distinct advantages over the paper system:

- Reduced filing—there is no requirement for the AME to keep a copy of the Form 8500-8 or the medical certificate information since it is kept in the Aerospace Medical Certification Subsystem (AMCS).
- Decreased AME errors—an AME cannot inadvertently issue a certificate for an airman who may have a recent exam pending or have an administrative action that would preclude immediate issuance.
- Increased communication—communication between AME and airman is enhanced by the ability to discuss the airman's case before a formal application is sent to the FAA.

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Dr. Pinkston manages the Aerospace Medical Education Division.

Aviation Medical Examiner Seminar Schedule FAA Civil Aerospace Medical Institute

2012 Seminars		
August 10–12	Washington, D.C.	Neurology Theme (1)
August 23–26	Berlin, Germany	EUSAM (2)
October 4–6	La Jolla, California	CAMA (3)
October 29–November 2	Oklahoma City, Oklahoma	Basic (4)
November 16–18	Denver, Colorado	Ophthalmology-Otolaryngology-Endocrinology Theme (1)
2013 Seminars		
January 25–27	Tampa, Florida	Cardiology Theme (1)
February 25–March 1	Oklahoma City, Oklahoma	Basic (4)
March 15–17	Dallas, Texas	Neurology Theme (1)
May 13–16	Chicago, Illinois	AsMA (5)
July 15–19	Oklahoma City, Oklahoma	Basic (4)
August 9–11	Washington, D.C.	Ophthalmology-Otolaryngology-Endocrinology Theme (1)
September 26–28	Orlando, Florida	CAMA (3)
October 28–Nov. 1	Oklahoma City, Oklahoma	Basic (4)
November 15–17	Sacramento, California	Cardiology Theme TENTATIVE (1)

NOTES

- (1) A 2½-day theme aviation medical examiner (AME) seminar consisting of aviation medical examiner-specific subjects plus subjects related to a designated theme. Registration must be made through the Oklahoma City AME Programs staff, (405) 954-4831.
- (2) This seminar is sponsored by EUSAM, the European School of Aviation Medicine, and is sanctioned by the FAA as fulfilling the FAA and the JAA recertification training requirement. For more information and to register, see the EUSAM Web site: www.flugmed.org. Once there, click on EUSAM, then click on Refresher FAA/JAA (from the left menu).
- (3) 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 website: www.civilavmed.com.
- (4) A 4½-day basic AME seminar focused on preparing physicians to be designated as aviation medical examiners. Call your Regional Flight Surgeon.
- (5) A 3½-day theme AME seminar held in conjunction with the Aerospace Medical Association (AsMA). This seminar is a new Medical Certification theme, with 9 aeromedical certification lectures presented by FAA medical review officers, in addition to other medical specialty topics. 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.