



# Federal Air Surgeon's Medical Bulletin

## Aviation Safety Through Aerospace Medicine

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

Vol. 51, No. 3

2013-3

*Federal Air Surgeon's Medical Bulletin*

From the Office of Aerospace Medicine  
Library of Congress ISSN 1545-1518

Federal Air Surgeon  
**Fred Tilton, MD**

Editor  
**Michael E. Wayda**

The *Federal Air Surgeon's Medical Bulletin* is published quarterly for aviation medical examiners and others interested in aviation safety and aviation medicine. The Bulletin is prepared by the FAA's Civil Aerospace Medical Institute, with policy guidance and support from the Office of Aerospace Medicine. Authors may submit articles and photos for publication to:

FAA Civil Aerospace Medical Institute  
P.O. Box 25082, AAM-400  
Oklahoma City, OK 73125  
Attention: Editor, FASMB

Email: [Mike.Wayda@faa.gov](mailto:Mike.Wayda@faa.gov)

### CONTENTS

FROM THE FEDERAL AIR SURGEON: CONSEQUENCES	2
JOINT STEERING COMMITTEE'S LETTER TO GA PILOTS	3
TAKE CARE OF YOURSELF	4
NEW PUBLISHED REPORT COVERS AME SURVEY RESULTS	5
AVIATION MEDICAL EXAMINER INFORMATION LINKS	5
PITFALLS TO AVOID	6
AEROSPACE MEDICAL EDUCATION ICON REMEMBERED	7
LETTER TO THE EDITOR	8
CERTIFICATION DELAYS	8
WASHINGTON, D.C., SEMINAR NEWS	8
AME ALERTS	9
CERTIFICATION OF PILOTS WITH CERVICAL DYSTONIA	10
CAMI DEPUTY DIRECTOR TO RETIRE	12
OAM PHYSICIANS EARN ASMA AWARDS	13
AME AGE STUDY UPDATED	13
MALIGNANT NEUROCARDIOGENIC SYNCOPE IN A PILOT	14
MEDICAL CERTIFICATION OF A PILOT WITH HEMOPHILIA A	16
2013 AME SEMINAR SCHEDULE	18



Page 4



Page 7



Page 12



Page 13



from the Federal Air Surgeon's  
**PERSPECTIVE...**

BY FRED TILTON, MD

## CONSEQUENCES

*Over the last decade impairing medications were present in 12 percent of fatal general aviation accidents.*

Hello, Everyone,

The purpose of this editorial is to remind you about the consequences of taking medications that could directly affect an individual's ability to safely fly an airplane. I know most of you will think, "This is old news. I discuss this issue with the airmen I examine during every periodic aviation medical examination." If that is true in your case, then I congratulate you and I urge you to continue the practice.

Good aviators never stop learning and honing their flying skills, and it never hurts to remind them that they are the most complex "component" of the man-machine combination. Unfortunately, many aviators have not digested and internalized the message.

Perhaps it was because they never received it, or they ignored it, or they have just forgotten it, or maybe they have been fooled into believing they were immune from the effects of a particular drug by the wording on warning labels.

Typical wording advises individuals not to drive or operate heavy machinery until they know how the drug affects them. The problem with that statement is that individuals who have taken a sedating medication have been cognitively compromised, so why would anyone expect that they could accurately assess themselves?

Diphenhydramine is a perfect example. Scientists have compared the effects of a single 50-mg. oral dose of diphenhydramine to the effects of a corresponding blood alcohol level of 0.1 g/100 ml. (0.08 g/100 ml. is considered legally intoxicating in most states). Their conclusion was that diphenhydramine may have "...an even greater impact than does alcohol on the complex task of operating a motor vehicle."

*Diphenhydramine may have "...an even greater impact than does alcohol on the complex task of operating a motor vehicle."*

It stands to reason that diphenhydramine and other sedating medications would have similar effects on aviators, so it is very disquieting that over the last decade impairing medications were present in 12 percent of fatal general aviation accidents.

This issue is such a significant problem that the General Aviation Joint Steering Committee (GAJSC), a joint industry-government committee, recently released a letter to all pilots informing them about the subject and asking them to take appropriate steps to mitigate the risk of impairment when flying. (GAJSC letter and a link to the FAA Fact Sheet attached on page 3). I hope when you discuss medical examination results with your pilots that you will take the opportunity to include this very important topic.

So, what should you be telling your airmen? The first message should be that if they are "sick" enough to need medication, then perhaps they should stand-down until they no longer need the medication. If for some reason they need to fly after taking a sedating medication, then they should wait for a period of time that equals five times the max dosing interval on the drug label. **NOTE:** Five half-lives is a better number, but it is often difficult to determine the half-life from a drug label.

And, as always, thanks again for the great service you perform for the Federal Aviation Administration and your pilots. You positively influence the safety of the National Airspace System.

—Fred

# GENERAL AVIATION JOINT STEERING COMMITTEE'S LETTER TO PILOTS

## *Dangers of Using Medications, Risks of Impairment When Flying.*

Dear Pilot,

We all want to ensure that flying is as safe as possible and we should always remain on the forefront of such efforts. One area where we can make improvements to safety is ensuring personal awareness of the effects of some medications when flying. Medications currently prohibited by the FAA are found to be present as causal or contributory in approximately 12 percent of fatal general aviation accidents according to joint analysis by industry and FAA of data from the past decade.

Industry and government both share concerns that some general aviation pilots are taking impairing medications while operating aircraft without fully understanding their adverse effects. We are also concerned that pilots might not be aware of the ubiquitous presence of sedating antihistamines in many over-the-counter (OTC) treatments for common allergies, coughs, colds and sleep aids. Further, we are concerned that pilots may not be afforded the opportunities to discuss the side effects of prescription medications with fellow airmen and their treating doctors.

How can pilots reduce their personal risk of medication-induced impairment?

Become an educated pilot and health care consumer. Read all medicine labels, talk with your doctor, and

Determine if the conditions being treated or the medications being consumed could affect your ability to think clearly and safely perform highly complex tasks, like operating an aircraft.

After using any medication with impairing side effects, follow the current recommendations provided in the FAA's online Medications and Flying Brochure. After the symptoms of an illness have resolved, "do not fly after taking the medication until at least 5 maximal dosing intervals have passed." For example, if the directions say to take a medication every 4 to 6 hours, wait until at least 30 hours (5 x 6) after the last dose before piloting an aircraft.

Always use the personal readiness **IM SAFE** checklist to ensure that you are physically and mentally safe to fly, not being impaired by – **I**llness, **M**edication, **S**tress, **A**lcohol, **F**atigue, **E**motion prior to every flight. If using impairing medications, your personal assessment of how well you are functioning may not always be correct. Use the expert guidance provided by your designated FAA Medical Examiner or aviation support organization to help guide you to decide when it is safe to fly following the use of medications.

Personal risk management is the responsibility of all licensed airmen. As we start the summer 2013 flying season, we urge you to take the appropriate steps to mitigate the risk of impairment when flying.

*Signed by:*

Ed Bolen | National Business Aviation Association  
Peter J. Bunce | General Aviation Manufacturers Assoc.  
Paula R. Derks | Aircraft Electronics Association  
Craig Fuller | Aircraft Owners and Pilots Association  
Thomas L. Hendricks | National Air Transportation Assoc.  
Michael Huerta | Federal Aviation Administration  
Robert Meder | National Association of Flight Instructors  
Jack J. Pelton | Experimental Aircraft Association  
Ed Scott | United States Parachute Association  
Doug Stewart | Society of Aviation Flight Educators  
Thomas P. Turner | American Bonanza Society  
Matt Zuccaro | Helicopter Association International

To read the complete three-page document, go to  
<http://www.faa.gov/pilots/medical/>



## DON'T BE LIKE MOST AMERICANS: TAKE CARE OF YOURSELF

By JAMES FRASER, MD, MPH

Deputy Federal Air Surgeon Dr. **James Fraser** routinely speaks with FAA employees encouraging them to take better care of themselves. Following are some of the healthy and unhealthy behaviors he discusses. —Ed.

**A**LL OF US work hard. We all work 40 hours or more each week but we also have family activities and other obligations that can sometimes result in long and stressful days. We often get so busy and pre-occupied with work and other activities of daily living that we sometimes forget to take care of ourselves.



The author prepares for a brisk bike outing.

**Sleep well.** I would like to start by discussing a behavior with which many of us struggle. It is important to get seven to eight hours of sleep each night. Sophisticated neurocognitive studies have shown that individuals have improved executive functions (planning, memory, attention, problem-solving and multi-tasking) when they get adequate sleep.

If you want to be at the top of your mental capability, it's important to maximize your executive functions. But the downside of inadequate sleep extends beyond mental fatigue and diminished executive functions. There is also an association with medical conditions such as obesity, diabetes, and heart disease, as well as an increased incidence of anxiety and depression.

You may not know many adults that actually get seven to eight hours of sleep per night. That's not surprising because we are a sleep-deprived society. We all live in a 24/7 world. Because so many of us are sleep deprived, we come to accept the effects of chronic sleep deprivation as a normal consequence of daily living, despite the adverse health consequences.

Good sleep hygiene is increasingly recognized as a very important factor in maintaining your mental and physical health. Sadly, tragically, most Americans do not get adequate sleep. So, don't be like most Americans.

**Eat well.** We should all eat healthfully. I am sure all of you know that America is experiencing an epidemic of obesity. Obesity is a significant risk factor for Type 2 diabetes and a multitude of medical problems such as hypertension, coronary artery disease, stroke, dyslipidemia, sleep apnea, osteoarthritis, gall bladder disease, and some cancers such as endometrial, breast, and colon.

There are thousands of diets to choose from, but most medical experts agree the best diet is one that you can stick with. Typically recommended diets are rich in fruits and vegetables. They include whole grains, low-fat dairy, and healthful protein, while limiting refined carbohydrates and saturated fats. Most Americans either eat too much or eat unhealthful foods that can lead to obesity. So don't be like most Americans.

**Stop...** If you smoke—stop! If you have quit before and then resumed smoking, don't give up. Former smokers often quit multiple times before finally quitting for good.

If you drink alcohol, you should do so moderately.

**Exercise well.** We should all engage in a regular exercise program. People who exercise regularly have a lower incidence of heart disease, lung disease, diabetes, some forms of cancer, and hip fractures. People who exercise regularly consistently score higher on quality of life surveys. They experience a lower incidence of fatigue, anxiety, depression, and dementias, such as Alzheimer's. People who exercise regularly have fewer sick days, work longer if they choose to do so, and retire healthier. In fact, low fitness is a stronger predictor of premature death than any singular risk factor, including high blood pressure, elevated cholesterol, diabetes, and smoking.

How much exercise do you really need to reap all of these health benefits? The good news is, not as much as you might think. Studies have shown that as little as 30 minutes per day of exercise equivalent to at least a brisk walk will give you 80 percent of the health benefits. Exercise beyond 30 minutes gives you some additional protection, but 80 percent of the benefits are achieved in just 30 minutes. And it doesn't have to be 30 minutes of continuous exercise. It can be 30 minutes accumulated in five- and ten-minute increments by walking on breaks, at lunch, and taking the stairs instead of the elevators.

Sadly, tragically, most Americans don't get this minimal level of regular exercise. So, don't be like most Americans.

**Sitting kills.** However, a daily dose of exercise is not the end of the story. Even though the health benefits of regular exercise are well known, research is also mounting that too many hours of sitting is a negative health risk factor.

Unfortunately, this remains the case, even if you get in a daily dose of moderate or intense exercise. After an hour of sitting, the production of enzymes that burn fat and glucose in the body declines by as much as 90 percent. Sitting for long periods of time doubles your risk of cardiovascular disease, diabetes, and premature death.

All of us should endeavor to decrease the amount of time we sit throughout the day by simply moving around more. For those who work in cubicles, this can mean standing and walking in place, desk stretches, standing while on the phone, strolling while talking to a colleague, standing at meetings, and using your breaks and lunch times to get a brisk walk.

Sadly, most American's sit too much, at work, at home and in cars. So, don't be like most Americans.

**Live well.** Take care of yourself. Be a good example for your family, friends, and colleagues and you will be happier, healthier, and more productive.



—Information provided by AVS Flyer.

## NEW PUBLISHED REPORT COVERS AME SURVEY RESULTS

A NEW REPORT BY Civil Aerospace Medical Institute researchers provides interesting details about how AMEs responded to a satisfaction survey conducted in 2012. The report is entitled *Aviation Medical Examiner 2012 Feedback Survey: Content Analysis of Recommendations*, and was written by Dr. **Brenda Wenzel**, Dr. **Katrina Avers**, and **Joy Banks**.

Some findings include:

- AME feedback regarding development of organizational services identified needs for: training, real time/anytime access to FAA physicians, specific information, timely communication and specific content in correspondence, speedier FAA decisions, reduced costs, quality interactions with FAA personnel, and an increase in FAA staff. Feedback regarding enhancements to systems/tools included need for new capabilities, ready and stable access, end user support in effective and efficient task performance, easier to use and read interfaces and printouts, and adjustment to existing capabilities.
- Feedback regarding changes to medical certification processes and policies addressed requirements for transmission of reports, records, and documents to the FAA; airmen applications; exam appointments; issuance decisions; printed certificates; and AME rules.
- Some of the recommended improvements may not be feasible due to operational, financial, or regulatory constraints. Results provide a programmatic view of AME-recommended improvements and can be used to inform future OAM decisions regarding medical certification services.

The report is published online at:

[www.faa.gov/data\\_research/research/med\\_humanfacs/  
oamtechreports/2010s/2013/](http://www.faa.gov/data_research/research/med_humanfacs/oamtechreports/2010s/2013/)



### CHANGING ADDRESS OR EMAIL?

Please notify Your Regional Flight Surgeon's office to update your email or address. If you are unsure about the phone number or website, go online to:

[www.faa.gov/go/rfs](http://www.faa.gov/go/rfs)

## AVIATION MEDICAL EXAMINER INFORMATION LINKS

AME Guide

[www.faa.gov/go/ameguide](http://www.faa.gov/go/ameguide)

AME Training Information

[www.faa.gov/go/ametraining](http://www.faa.gov/go/ametraining)

AMCS Online Support

[www.faa.gov/go/amcssupport](http://www.faa.gov/go/amcssupport)

Regional Flight Surgeon Contacts

[www.faa.gov/go/rfs](http://www.faa.gov/go/rfs)

Pilot Safety Brochures

[www.faa.gov/go/pilotsafetybrochures](http://www.faa.gov/go/pilotsafetybrochures)

Multimedia Aviation Medical Examiner  
Refresher Course (MAMERC):

[www.faa.gov/go/ametraining](http://www.faa.gov/go/ametraining)

Medical Certification Information

[www.faa.gov/go/ame/](http://www.faa.gov/go/ame/)

MedXPress Login & Help

<https://medxpress.faa.gov>

MedXPress Video Page

[www.faa.gov/tv/?mediaId=554](http://www.faa.gov/tv/?mediaId=554)

FASMB Archives

[www.faa.gov/go/fasmb](http://www.faa.gov/go/fasmb)

CAMI Library Services

[www.faa.gov/go/aeromedlibrary](http://www.faa.gov/go/aeromedlibrary)

Airman Education Programs & Aerospace Physiology  
[www.faa.gov/pilots/training/airman\\_education/aerospace\\_physiology/](http://www.faa.gov/pilots/training/airman_education/aerospace_physiology/)

# AME ORDER 8520.2G AND PITFALLS TO AVOID

By HARRIET LESTER, MD

**AME** ORDER 8520.2G WENT into effect on 5/19/11. When the Order's guidance is not correctly followed, the AME will receive a warning or even termination. Sometimes the AME is simply unaware that they have not followed the Order. To help you avoid unnecessary problems, here are some common issues others have had and how you can keep from making the same mistakes.

## Examinations: 10 b (2) (c) (page 5)

► *Medical examinations must be personally performed by an AME at an established office address that has been approved by the appropriate RFS [Regional Flight Surgeon] or the Manager, AMED [Aerospace Medical Education Division].*

Aside from the obvious meaning that all AME examination sites must be approved in advance by the FAA, this also means that only the AME approved at the site may perform an FAA exam. Other AMEs may NOT perform drop-by exams at a location they are not approved at, with the rationale that the site is approved for another AME. This has happened, and it is not acceptable.

► *When completing FAA Form 8500-8, either on paper or electronically, the AME shall personally review and provide definitive (not just "no change" or "previously reported" comments in Item 60 on all positive entries and all physical findings...*

Take a few extra minutes and explain positive findings. Do not assume that the FAA has been previously or adequately informed, even if the pilot assures you.

► *(v) All applications must be electronically transmitted to the Agency within two calendar weeks...*

Since our ISO9001 certification, we have put additional emphasis on compliance with timeliness. All late transmissions are reported nationally through our quality assurance process, even short delays. All delayed transmissions cause problems (flags).

Another part of the Order specifies that:

► *AMEs who transmit more than 60 days after the date of examination will be considered for termination.*

After 60 days, the FAA can no longer reverse a wrongful issuance without initiating a legal action, so exams that are very late are a safety issue—and the AME may be terminated as a result. If you do have a late transmission, develop a preventive action in your office, and be prepared to advise us of your action.

► *(vi) An AME may not perform a self-examination for issuance of a medical certificate to him/herself, or issue a medical certificate to themselves or to an immediate family member.*

Some AMEs do not realize they cannot perform examinations on family members because one loses objectivity. Refer yourself and your family members to another AME. We recently became aware of an error of this nature on a high-profile case.

## Facilities and Equipment. 10 b (2) (e) (page 6)

► *The applicant must be engaged in the practice of medicine at an established office address that has been approved by his/her RFS or the Manager, AMED.*

This means that any site where you wish to perform FAA exams must be approved BEFORE, and not after you begin to perform FAA exams. This is a problem that some established AMEs have made. It is a mistake to perform examinations at a new or second location before we approve the site. Every site must be cleared with us *before* any FAA exams may be performed.

## Office Address, Telephone Numbers, and Electronic Mail Address 10 b (2) (h) page 6

► *It is the AME's responsibility to ensure that at least one accurate address and telephone number where they can be promptly reached are on file...*

"Promptly" does not mean repeated calls or multiple day delays before we reach a human being. You must be reachable.

► *The AME is required to promptly advise the responsible Regional office of any change in office location, telephone numbers, electronic mail addresses and any other pertinent contact information.*

Communicate anticipated changes in advance, and be reachable in a timely manner. Give us numbers and email addresses that you regularly respond to. And again, do not change an office location without clearing the change and getting approval from your RFS or the AMED manager.

These are a few of the items that we have found cause difficulty. Some of these errors are easily prevented, and others require ongoing work to comply with the Order. Thank you for your cooperation, and we value the service you provide to the FAA and the safety of the National Airspace System.

*Dr. Lester is the Eastern Regional Flight Surgeon. She was assisted by Eastern AME and SPA analysts Mindy Zalcman and Carty Wilson.*



# AEROSPACE MEDICAL EDUCATION DIVISION ICON REMEMBERED

By MIKE WAYDA

**J**AMES L. HARRIS, the original division manager of the Civil Aerospace Medical Institute's Aerospace Medical Education Division, passed away in June 2013 after a brief illness. He was the first FAA person to organize and lead the Federal Aviation Administration in formally training aviation medical examiners to conduct airman examinations.



Along the way, he established what has become the Aerospace Medical Education Division—comprised of training programs for aviation medical examiners and pilots, and he also organized the CAMI library and the medical illustrations/publications department.

Long-time AMEs (selected from 1958-1990, the year Mr. Harris retired)—and there are about 1,100 of them still in the business—will remember Mr. Harris for his innovative ideas and hard work. He organized and held the first training seminar for AMEs in 1960, held in Washington, D.C.

Aviation medical examiner Dr. **James R. Almand, Jr.**, from Grand Prairie, Texas, remembers Mr. Harris as being his FAA mentor for 30 years: “Jim Harris was a significant force back in 1960, helped me in getting my AME certification by directing me to the correct course...Jim helped establish the continuing education program for aviation medical examiner physicians and certified me as an AME in 1960! Since then, he was a go-to person with questions about the FAA (especially when changes became effective).”

Dr. Almand, by the way, is still active and ranks fifth in longevity of current examiners.

Mr. Harris retired in 1990 after 35 years of federal service. He was then hired by the Civil Aviation Medical Association (CAMA) as its executive vice-president and held the position for nearly 18 years. After retiring from CAMA, he continued to be active in medical education.

Basic and recurrent seminars are now held nationally and internationally by the Aerospace Medical Education Division AME Program staff. Team Lead **Jan Wright** remembers how Mr. Harris was enlisted to provide background information for the continuing medical education recertification. “I first got to know Mr. Harris when I was new to the FAA in 2007, long after he had retired. I was tasked with creating the documentation package for continuing education accreditation that included a ‘history of the program’ component,” she said.

“Thrilled to discover that I could actually talk to the AME seminar founder on the telephone, Mr. Harris provided all the information we needed. Later on, as I started going to CAMA meetings, he was always there, sharing stories, information, or showing me his latest bolo tie. He loved to teach, he loved to learn, and it was apparent in everything he did,” she concluded.



Early (c. 1962) AME seminar held at the Aeronautical Center in OKC. Mr. Harris (right front & inset) in favored Southwestern attire.



Airman Education specialists prepared educational displays to graphically demonstrate the many physiological dangers lurking in the aviation environment. These early displays informed pilots and others about how to avoid the avoidable.



## LETTER TO THE EDITOR

*Dear Editor,*

The Civil Aerospace Medical Institute, as all AMEs know, houses the Certification Division of the FAA's Aerospace Medical Institute. Many, but not all AMEs, know about CAMA. CAMA is the Civil Aviation Medical Association, a voluntary organization of aviation medical examiners (AMEs) that grew out of the Airline Medical Directors organization more than 50 years ago.

The mission of CAMA is both scientific and fellowship and enhancing public safety by helping to guide our pilots successfully through the process of regular and Special Issuance certification. Dr. **Fred Tilton**, in "The Federal Air Surgeon's Perspective" in the most recent Federal Air Surgeon's Medical Bulletin, recently laid out plans for the decommissioning of a number (18) of medical conditions that previously required *initial CAMI approval* before moving to the AME's responsibility for subsequent issuance via the AASI (AME Assisted Special Issuance) process. The protocol for approval and medical certificate issuance in the initial group of diagnoses has been posted in the *AME Guide*, with the second set to follow in due order.

CAMA supports this plan of shifting *initial responsibility* for certification of carefully selected medical conditions to the AME. Our organization promotes communication and networking among AMEs, which improves the likelihood of success in achieving timely certification when these medical conditions arise. CAMA's network of consulting specialists and our good working relationship with the FAA and CAMI has been a valuable part of this success. Furthermore, this good working relationship has resulted in the FAA authorizing training credit for AMEs attending our annual scientific meeting, in addition to obtaining CME credits.

CAMA, like the FAA, is experiencing fiscal restraints, but the officers and Board of Trustees of CAMA do restate our commitment to continue to provide a quality annual scientific meeting, and through our organization's website, online publications, and networking processes, continuing support of aviation medical examiners and the FAA. Our plan relies on increasing our membership and sponsorship.

We invite unaffiliated AMEs to visit our website,  
[www.civilavmed.com](http://www.civilavmed.com)

call a CAMA member, or our Executive Vice-President (770-487-01000), and to consider attending our annual scientific meeting, held in conjunction with FAA medical leadership, in September in Orlando, Florida.

*James L. Carpenter, M.D.*

St. Charles, Mo.

V.P. Communication and Representation, CAMA  
314-616-7321



## CERTIFICATION DELAYS

*Thanks for your patience*

As most AMEs know by this time, in March of this year, the Federal Aviation Administration has fielded a new information technology support system for the aerospace medical certification process. As is often the case, the change has brought turbulence. While progress has been slow, we are making headway towards getting back up to full speed in certification. Unfortunately, the backlog is substantially increased over our usual with a resultant increase in the average processing time for deferred applications.

We in the Aerospace Medical Certification Division would like to express our appreciation to the AME community for exercising patience during this period of transition. It is fortuitous that, at approximately the same time the IT support changed, we were able to revise medical policy so that a number of conditions no longer require special issuance. Please be sure you take advantage of this opportunity to help your airmen receive their certificates in a timely manner.

—Courtney D. Scott, Jr, DO, MPH

Manager, Aerospace Medical Certification Division  
405-954-8097

## WASHINGTON, D.C., SEMINAR NEWS

*Registrations Higher Than Usual*

BY JAN WRIGHT

IT'S THE FIRST of August and the tradition of an AME seminar in our nation's capitol continues this year. Always a popular location, the number of registrations this year has surpassed our expectations for the August 9-11 seminar.

That's the good news. The bad news is that at the same time, our meeting space has shrunk! This double whammy may be a little uncomfortable but not to worry, everyone who needs training will be allowed to attend.

The AME Education team has been working with Regional program analysts, the hotel venue, and you as AMEs to find the best solution. While space may be limited, enthusiasm is not. We'll be there with some new and exciting things to tell you about.

We are planning a roster of several of your favorite speakers along with some you may not have seen. You will hear from our FAA medical officers about new protocols for certain conditions you can now certify. The recent Pilot's Bill of Rights will be discussed by our legal counsel representative. This seminar promises to be informative and a great opportunity to meet with your fellow AMEs and FAA personnel.

See you there!

*Ms. Wright is the Aerospace Medical Education Division Team Lead for AME Education.*



*(Page revised 8/2/13)*

## AME ALERTS

By BRIAN PINKSTON, MD, MPH

BY NOW, MOST of you have heard of a group of conditions that previously required special issuance by the FAA but now are Conditions that Aviation medical examiners Can Issue under certain circumstances (aka CACI). If you haven't, please read the article by Dr. **Tilton** in the last issue of the *Federal Air Surgeon's Medical Bulletin* ["11 Medical Conditions No Longer Require Special Issuance," *FASMB*, 2013-2, p.2].



Dr. Pinkston

Currently, 11 of the 18 conditions have been finalized and are outlined in the *Guide for Aviation Medical Examiners*. Some important facts to know about these policy changes include:

- The only true *Guide for Aviation Medical Examiners* exists online. Updates to policy may occur on a daily basis.
- Links to CACI worksheets may be found in the aeromedical disposition table for the condition in the online *Guide for Aviation Medical Examiners*.
- Policy updates may be transparent to you. Although many of the CACI conditions have a worksheet that outline the parameters under which a regular issuance for the condition may be given, some do not. A great current example of the latter situation is the case of prostate cancer. An AME may now give a regular issuance for prostate cancer if the airman's case meets the criteria, but there is no worksheet. It is laid out in the aeromedical dispositions table in the *Guide for Aviation Medical Examiners*. A current list of CACI worksheets and their web links may also be found using the *AME Guide* online NAVAIDS link.
- Future CACI changes and other updates to the *Guide* can be found in the Modifications and Archives section of the *AME Guide*.
- When a CACI condition is encountered, the worksheet or policy is meant to be applied every time an exam is performed. If a condition is to be followed for a period of time and then considered "cured" if meeting certain criteria, the *Guide* will define those parameters.

- If a condition meets the CACI criteria, always cross-check for disqualifying medications prior to issuing for the condition.
- Airmen with current special issuances or AME-Assisted Special Issuances are not automatically converted to a regular issuance. Currently, when an airman on a special issuance arrives for an examination with an AME, the AME should apply the worksheet and comment in Block 60 that the airman had a previous special issuance and currently meets CACI criteria, if applicable. Based on this examination, the AME will issue a regular issuance if the airman meets the criteria and the Aerospace Medical Certification Division will issue a Letter of Eligibility to the airman.

Although these policy changes have been colloquially been termed *Conditions AMEs Can Issue*, these changes are now FAA policy. This means that AMEs are intended to utilize the *Guide for Aviation Medical Examiners* and issue a certificate if, in the judgment of the AME, the airman's condition meets the CACI criteria.

More information can be found on CACI criteria at [www.faa.gov/go/ame](http://www.faa.gov/go/ame). Look under videos for the CACI video. It is extremely informative and is only 22 minutes long. Good luck and enjoy the increased ability to assist your airmen directly with these conditions!

### GO AME!

I AM EXCITED TO announce that we have a new web page that points to important information for AMEs. It can be found at [www.faa.gov/go/ame/](http://www.faa.gov/go/ame/)

This web page is designed to consolidate information on the FAA website that is important to AMEs and their staff. In addition to links to the *Guide for Aviation Medical Examiners* and FAA Forms order page, it has links to educational videos, brochures, and a myriad of other helpful tools.

This is an adaptation from a great idea from Dr. **Stephen Goodman** (Western Pacific Regional Flight Surgeon), and it is a living site. This is your page, so we need inputs on improvements and frequently used tools that are missing. Let us know what you think at

[brian.pinkston@faa.gov](mailto:brian.pinkston@faa.gov)

or

[mike.wayda@faa.gov](mailto:mike.wayda@faa.gov)

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



(page revised 7/31/13 3:55 p.m.)

# MEDICAL CERTIFICATION OF PILOTS WITH CERVICAL DYSTONIA

CASE REPORT, BY DANIEL H. MURRAY, MD

*Cervical dystonia is a debilitating condition with a variable course that is difficult to manage. It presents significant aeromedical challenges to certification. This article is a case report of a third-class airman who developed this condition.*

## HISTORY

A 51-YEAR-OLD MALE THIRD-CLASS pilot with 1,139 hours of flight time applied for a medical certification renewal and reported a one-year history of progressive involuntary movement of the head to the right, increasing in frequency and intensity over the previous six months. Though it had started as largely a nuisance, it was beginning to interfere with his ability to engage in mountain biking and swimming. It was also beginning to affect his ability to work as a computer programmer. He reported that touching his face could break the involuntary movements and that wearing his headset when he flies helped to inhibit the movement. He denied any specific triggers, but alcohol, exercise, and relaxation seemed to make it worse—so much so that the airman had begun to avoid these activities. In fact, he reported that he does not drink at all and further denied smoking or other drug use. He was taking no medications, and his family history was unknown as he is an orphan.

The airman had been evaluated by two separate neurologists some months earlier and was diagnosed with idiopathic cervical dystonia. He was informed that his condition would likely progress in severity over about 5 years and then likely plateau. He was also told that 10-20% spontaneously remit but only temporarily. Though treatments were discussed—including physical therapy, Botox, medications, and surgery—the patient refused treatment. He was released to the care of his primary physician who prescribed carbidopa-levodopa (Sinemet), but after two months, he discontinued the medication as it caused him headaches.

## AEROMEDICAL ISSUES

Cervical dystonia (CD) results in involuntary muscular contractions that could cause painful incapacitation and uncontrolled head movements. This may lead to distraction or even contribute to or cause spatial disorientation in some circumstances. Further, it may cause an inability to perform required movements in the cockpit; an inability to adequately scan to clear airspace; an inability to keep fixed gaze, which is required for critical phases of flight (i.e., take off and landing); it may result in adverse control inputs at critical times that may result in loss of control or disorientation in flight.

The aviation medical examiner needs to assess the degree of functional impairment that these uncontrolled, involuntary movements cause and assess the frequency and severity of these movements. Though sensory tricks may be used to overcome dystonic movements, this action may be a significant distraction or may not be possible in certain circumstances or phases of flight. Relying on such strategies is not compatible with safe flight. Many medications used to treat CD may themselves be disqualifying due to side effects or direct effects on cognition. Botulinum toxin use is not necessarily incompatible with flight operations if the patient does not have any adverse reactions. Any

## CERVICAL DYSTONIA (CD)

Also called spasmodic torticollis) is the most common adult onset focal dystonia. It is a chronic, incurable condition that may have transient periods of remission but usually recurs. It is usually primary (idiopathic), but it may also be secondary to lesions of the basal ganglia.<sup>1</sup> Its hallmark is involuntary posturing of the head due to spasms, jerks, or tremors of the neck muscles. The spasms may be significantly painful and reduce functionality and quality of life.

CD has multiple variants that are named by the resultant effect on the head. More than 50% CD is rotational torticollis. Laterocollis and retrocollis (backward movement of the head) are also common. Anterocollis (forward movement) and complex forms (no predominant movement direction) are less common. Usually, the movements of CD are exacerbated by stress and improved with relaxation or depressants.<sup>2</sup>

The prevalence is about 5.9/100 000, with a mean age of onset in the fourth decade.<sup>3</sup>

Treatments include medications including anticholinergics, neuroleptics or dopamine affecting agents, though these medications in general have minimal effects. Botulinum Toxin is generally the treatment of choice and significantly improves quality of life while having a good safety profile. In severe forms surgical options include selective peripheral denervation, thalamotomy/pallidotomy, and deep brain stimulation.<sup>4</sup>

treatments that are used will require that the airman demonstrate normal function and capability in the flight environment. Surgical interventions would have to result in full recovery, cognitively and functionally, prior to returning to the cockpit.

## ROLE OF THE AME

Title 14 Code of Federal Regulations, Part 67.109(b), 67.209(b); 67.309(b) states that the airman must have: (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.<sup>5</sup>

Continued →

A careful history should address the impact of the dystonic contractions on the quality of life of the airman as well as any impairment of the airman to perform normal activities, including hobbies, work, and activities of daily living. The aviation medical examiner should also elicit a history of triggers, exacerbating or ameliorating factors, and any sensory tricks or coping strategies that the patient uses, including medications, herbal supplements, or physical interventions or therapies (exercise, chiropractic, etc). The *AME Guide* outlines the standard examination procedures for the evaluation of the musculoskeletal and neurologic systems. The AME should note any abnormal or involuntary movements, along with their frequency and severity.

### OUTCOME

The AME deferred the airman to the FAA, which requested the medical records from the neurologist and his primary care manager. The PCM sent a short letter to the AME, stating the patient was on disability from work but had been able to drive and fly by using his sensory trick of touching his face and wearing headphones to control head movements. He stated the airman should be allowed to fly.

The FAA issued a letter of general denial for failure to meet medical standards for the diagnosis of cervical dystonia. The airman quickly appealed to the Federal Air Surgeon and requested an extension to get another neurologic consultation.

The neurologist consultant mentioned that the patient failed. With this information, the FAA examiner requested a neurologic consult for final denial. The neurology report provided the opinion that, at the time due to the uncertainty of the course of the disease and progression over the previous two years, the airman could not “safely manage an aircraft.”

A final denial was issued by the Federal Air Surgeon. However, the letter stated that he would reconsider medical certification with the submission of clinical treatment records and the results of an occupational functional performance assessment documenting stable resolution of the focal CD sufficient to perform all regular daily activities (including driving) without reliance on sensory tricks or temporary strategies.

After several months, extensive documentation was provided of an occupational therapy driving evaluation. Though the airman reported occasional pain/tightness in his posterior right shoulder, he denied any other significant symptoms. The thorough assessment established the airman had:

- adequate driving experience and legal capacity to drive
- adequate endurance, strength, ROM, sensation, coordination, and balance
- ability to perform activities of daily living (dressing, bathing, grooming, financial management, and transportation) without difficulty
- ambulation without assistance and ability to transfer in and out of the vehicle

- visual screening within certification standards for a third-class pilot with intact visual fields
- normal additional visual testing in the areas of pursuit (tracking moving target); ability to maintain gaze without deviation with no overshooting/undershooting when shifting gaze and no increased time to shift gaze
- cognition, orientation, memory, and reaction time were excellent
- full scanning capability on driving assessment
- all vehicle control skills and driver interaction skills were appropriate
- no use of sensory tricks through two driving evaluations and several hours of testing

The occupational therapist felt the patient could operate a vehicle with low risk, and no unsafe behaviors were noted.

An occupational functional capacity evaluation was also performed. The airman provided his flying history and that he had returned to full work after his short-term disability. He also reported resuming his mountain biking and swimming activities. In the assessment, he was able to look over both shoulders without difficulty, though a slight deviation of the head to the right was noted on extension at the neck. Weight handling, designed to provoke his symptoms, was performed without difficulty up to 75 lb. The therapist noted that the airman was “free of functional limitations related to his CD.”

A final neurology follow-up stated that the airman had mild cervical dystonia not requiring sensory tricks, and the exam was otherwise normal. He offered the opinion that the applicant’s CD should not limit him in any way. Accordingly, the FAA granted a third-class certificate four years after the airman presented with this unusual condition.

### REFERENCES

- Defazio G, Berardelli A, Hallet M (2007). Do primary adult onset focal dystonias share aetiological factors? *Brain* 130: 1183-93.
- Colosimo C, Suppa A, Fabbrini G, et al. (2010). Craniocervical dystonia; clinical and pathophysiological features. *Eur J Neurol* 17 (Suppl.1): 15-21.
- Defazio G, Abbruzzese G, Livrea P (2004). Epidemiology of primary dystonia. *Lancet Neurol*, 11: 673-8.
- Ferreira J, Costa J, Coelho M, Sampaio C (2007). The management of cervical dystonia. *Expert Opinion Pharmacother* 8 (2):129-40.
- Code of Federal Regulations, Title 14, Part 67 Medical Standards and Certification Sub Part B,C,D.* (2011, May 2). Retrieved 5/2/11 from Electronic Code of Federal Regulations: <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr;sid=a38312c970b703123de3e1213c7ef9b1;rgn=div5;view=text;node=14%3A2.0.1.1.5;idno=14;cc=ecfr#PartTop>

### ABOUT THE AUTHOR

*Lt Col Daniel H Murray, MD, was a Family Medicine-trained Senior Flight Surgeon and Resident of Aerospace Medicine at the USAF School of Aerospace Medicine at the writing of this case report at the FAA’s Civil Aerospace Medical Institute and was assigned as the Chief of Aerospace Medicine at Vandenberg, Air Force Base, Calif.*



## CAMI DEPUTY DIRECTOR TO RETIRE

By MELCHOR J. ANTUÑANO, MD, MS



Dr. Johnson

**ROBERT JOHNSON, MD, MPH, MBA,** will retire from his position as the Civil Aerospace Medical Institute's Deputy Director, effective September 20, 2013. Dr. Johnson has worked at CAMI for five years.

Prior to coming to CAMI, he was a military flight surgeon, a civilian aviation medical examiner, an administrator, and an academician.

He has had extensive clinical aerospace medicine and leadership experience at the USAF Armstrong Laboratory, the USAF School of Aerospace Medicine, Wilford Hall USAF Medical Center, and the University of Texas Medical Branch. He was a co-editor of the 4<sup>th</sup> edition of the textbook, *Fundamentals of Aerospace Medicine*.

During his five years at CAMI, Dr. Johnson made many significant contributions, including:

- Increasing the outreach and educational mission of CAMI by developing a Memorandum of Understanding (MOU) with the new Mayo Clinic Fellowship in Aerospace Medicine, revising the MOU with the University of Texas Medical Branch Aerospace Medicine Residency Program, and developing a MOU with the University of Oklahoma Health Science Center.
- Managing a multi-year program for the complete renovation of the CAMI building. This complex construction process had little effect on CAMI's major mission areas due to his planning and coordination skills. This 6-year, \$20M renovation program was completed in 2012 and substantially improved the work environment for CAMI employees.

During the highly charged and difficult budget impasse-mandated furlough in 2011, Dr. Johnson and his team expertly provided timely guidance and proactively provided information to our 85 Federal research employees furloughed for two weeks.

His managerial oversight of the Quality Management System (QMS) program ensured that CAMI's multiple ISO 9001 Internal Audits, Surveillance Audits and Re-Certification Audit went smoothly.

His effective leadership of the Safety Management System (SMS) staff at CAMI created and delivered foundational documents and policy for the OAM SMS program and produced the following products that positively affected SMS throughout the Office of Aerospace Medicine (OAM):

- OAM Certification Statistical Handbook, which is a compilation of the professional and demographic description of our AME designee workforce and an in-depth description

of the airmen medical certification program in 2010. It was praised by AAM-1 as a significant step forward to characterize the major effort of medical certification, and it has been used to provide information to congressional staff, DOT, FAA Headquarters, and to all the groups served by OAM.

- The SMS Team investigated and delivered a descriptive summary of the Civilian Accident Risk relating to pilot proficiency and flight hours reported on the FAA Form 8500-8. In short, this project resulted in the safe "retirement" of 11,787 backlogged records from the Surveillance Program Analysts work queue and redefined the workload to a manageable workflow so the backlog should be avoided in the future.

Other leadership achievements include:

- Revising the "CAMI Employee of the Year" program by establishing 9 new employee recognition categories. This is an employee-focused recognition program, with employee participation in the nomination and selection process.
- Managing the Aerospace Medical Education Division for 8 months as the interim Division Manager while still continuing as the CAMI Deputy Director.
- Leading the OAM effort on the AVS Designee Steering Group, which developed the FAA Office of Aviation Safety-wide management system for AMEs.
- Managing the Aerospace Medicine Research Division for the last 6 months as the interim Division Manager and initiated a team effort to improve the organizational structure of this division to improve supervisory-employee oversight and functional integration.

In addition to his work at CAMI, his personal/professional development was a bonus: He was elected President of the American Society of Aerospace Medical Specialists, he was selected as a member of the International Academy of Aviation and Space Medicine, and he was selected to other prestigious professional posts.

Dr. Johnson stated that he is leaving with "mixed emotions" because he is "totally dedicated to our mission and to my fellow colleagues. At CAMI, we are fortunate to be well led, and I am grateful for the support from the regions and headquarters." However, he was offered a "very enticing" position in San Antonio, Texas, at Humana Tricare (military) as the Clinical Innovations Medical Director. Adding to the attractiveness of San Antonio: His children and grandchildren live there.

Dr. Johnson has been a great asset to the Federal Aviation Administration, the Office of Aerospace Medicine, and the Civil Aerospace Medical Institute. On behalf of the entire CAMI team, I wish him the best in the next phase of his professional career and his personal life.

*Dr. Antuñano is the Director, Civil Aerospace Medical Institute*



## OAM PHYSICIANS EARN ASMA AWARDS

*Two Office of Aerospace Medicine Physicians Recognized by Aerospace Medical Association for Exceptional Accomplishments*

**Harriet Lester, MD**, Eastern Regional Flight Surgeon, received the **Marie Marvingt Award** for “significant aerospace medicine programs and initiatives that have improved safety and promoted organizational excellence.” Among the accomplishments she is recognized for are originating new approaches and programs, and applying creative methodologies to a variety of aerospace medicine safety problems.



Dr. Lester was appointed Eastern Regional Flight Surgeon in 2001. Her responsibilities include the medical certification of 66,000 pilots and 2,700 FAA air traffic controllers, as well as the oversight of 370 aviation medical examiners.



**Nick Webster, MD**, received the **Harry G. Moseley Award** for “the most outstanding contribution to flight safety.” Achievements cited included co-founding and managing the Civil Aerospace Medical Institute’s Aircraft Accident Medical Case Review and Hazard Analysis Program in conjunction with the Medical Research and Autopsy Program Teams, and evaluating all fatal civil aviation accidents and high-profile incidents that occurred in United States for aeromedical hazards.

Dr. Webster also provides ongoing aerospace medical support to the FAA, the National Traffic Safety Board, and the General Aviation Joint Steering Committee Safety Analysis Team.

## AME AGE STUDY UPDATED

*2013 Numbers Graphed*

BY MIKE WAYDA AND DAVID NELMS<sup>1</sup>

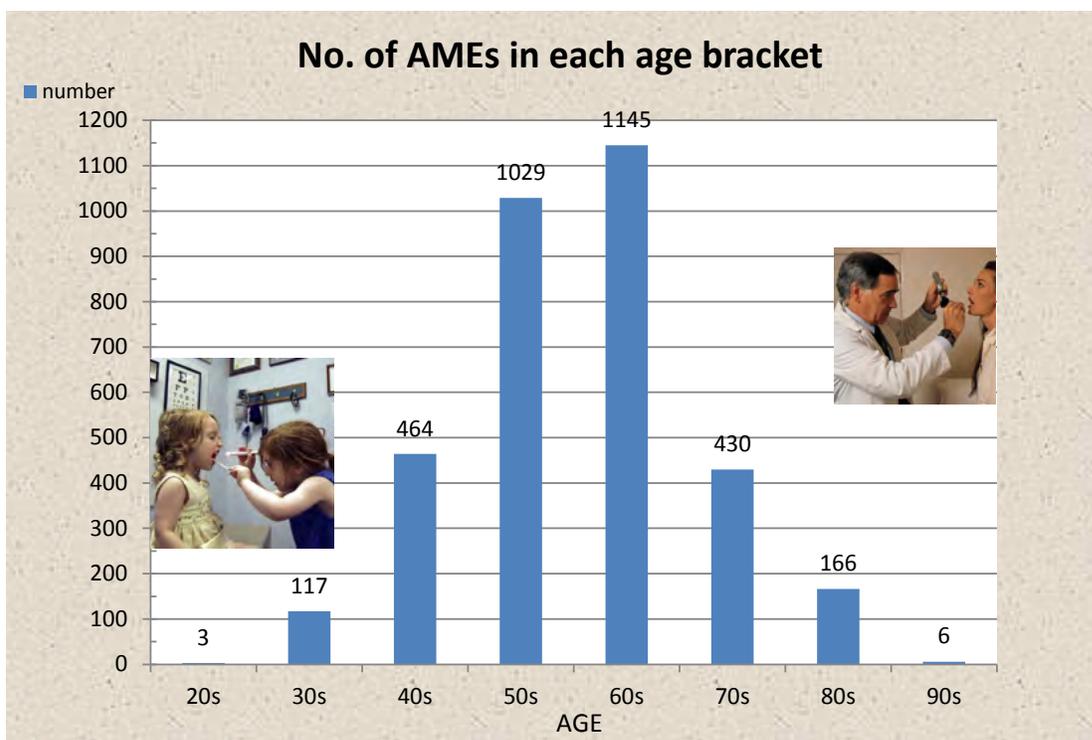
We have recently updated statistics regarding the age distribution of aviation medical examiners. This is a report of the findings (see graph below).

Comparing the statistics from July 2013 with the previous report (2011), the major differences this year<sup>2</sup> are:

- Increases were seen on both ends of the scale—examiners in their twenties increased by 200%; those in their nineties went up by 50% (but misleading because the actual number of examiners increased by only two in both cases.)

- The number of examiners in their fifties declined by 14.5%.
- Most (34%) are in their sixties (up 8.3% from 2011).
- 82.6% are 50 or more years old (up about 1% from 2011).
- The total number of examiners (3,360) declined by 4.5% since 2011.
- The average length of service is 18.5 years, and the longest currently serving examiner is 54.8 years.<sup>3</sup>

The number of aviation medical examiners in each age group is shown in decades, e.g., the number of AMEs in their twenties (20s) equals 3.



<sup>1</sup> Statistics courtesy of David Nelms, AAM-300

<sup>2</sup> As of July 1, 2013

<sup>3</sup> As of July 29, 2013

# MALIGNANT NEUROCARDIOGENIC SYNCOPE IN A MEDEVAC HELICOPTER PILOT

CASE REPORT, BY CHRISTOPHER C. NAGLE, MD, MPH, MS

*Syncope is a relatively common problem and may be a life-threatening event in the cockpit. Differentiating benign forms of syncope from so-called “malignant” forms is a critical challenge for aviation medical examiners and the FAA. By example of an experienced helicopter pilot with a severe, recurrent form of neurocardiogenic syncope, this report examines the assessment and decision-making process in the evaluation of syncope.*

**HISTORY.** A 38-YEAR-OLD female medevac helicopter pilot experienced dizziness while climbing stairs; she lowered herself to the floor and lost consciousness. The episode prompted her to see a cardiologist for evaluation. She reported to him that she has had multiple episodes of fainting as an adult and as a child, with the last episode one year ago. Prior episodes usually occurred while in the shower and were preceded by characteristic prodromal symptoms.

The pilot's only other reported health condition is hypothyroidism for which she takes 150 mcg of levothyroxine daily. She denied any history of smoking or illicit drug use and reported minimal alcohol use. Her physical exam was within normal limits. The cardiologist placed the pilot on a cardiac event monitor and ordered a battery of tests.

Thirty days of monitoring revealed premature atrial contractions associated with palpitations. Laboratory blood work and chest X ray were normal. A stress echocardiogram revealed a normal electrocardiogram response to exercise with no ischemic changes and normal left ventricular wall motion and thickening. The cardiologist concluded that the airman had been experiencing neurocardiogenic syncopal episodes by her history of symptoms and negative workup. Concerned over the risk of her incapacitation as a pilot, he recommended she undergo pacemaker implantation. The airman sought a second opinion.

The second cardiologist ordered a tilt-table test. After the second dose of nitroglycerin in the pharmacological portion of the test, the patient experienced bradycardia and hypotension, followed by syncope, then 20 seconds of asystole and a brief seizure. The cardiologist concurred that her loss of consciousness episodes are neurocardiogenic syncopal episodes; however, he recommended that she not undergo pacemaker implantation and educated her on preventive measures she could take with the onset of prodromal symptoms.

A month after the recent syncopal episode, the airman reported the medical issue and related cardiologists' findings to the Regional Flight Surgeon. She had grounded herself after the recent episode in accordance with 14 CFR 61.53 (prohibitions on operations during medical deficiency), informed her employer, and anxiously awaited her return to flight. On her most recent AME evaluation for a second-class medical certificate, 9 months prior to the most recent syncopal episode, she had reported her history of hypothyroidism and medication therapy but failed to report the history of “fainting spell” (item 18b, FAA Form 8500-8). The pilot had served previously as an Army helicopter pilot and held an ATP certificate with ~3,500 total civilian pilot hours.

**Aeromedical Concerns.** Any experience of a syncopal episode requires that an airman immediately self-ground and report the episode to his/her AME and/or the FAA. An AME may issue a medical certificate to an airman with an *isolated* syncopal episode, of *clear etiology*, which poses *no foreseeable risk of recurrence in the aviation environment*. If the airman presents with *recurrent* syncope or if the *etiology is unclear* or if there remains a *foreseeable risk of recurrence in the aviation environment*, the AME must defer the decision to the FAA. If the AME defers, the AME should instruct the pilot to obtain a cardiovascular evaluation (CVE) to include: 1) an assessment of personal and family medical history, 2) clinical cardiac and general physical examination, 3) an assessment and statement regarding the applicant's medications, functional capacity, modifiable cardiovascular risk factors, 4) motivation for any necessary change, 5) prognosis for incapacitation, and 6) blood chemistries (serum glucose and lipid profile) within the previous 90 days (5). In addition to the CVE, the airman will need an echocardiogram, a 24-hour Holter monitor study, and a bilateral carotid ultrasound. The FAA will consider each case on an individual basis, usually in consultation with a specialist, with the focus of ensuring aviation safety. The FAA will examine the circumstances and nature of the airman's syncopal episode in terms of the risk of in-flight incapacitation. A syncopal episode arising in the context of an acute, severe, dehydrating gastrointestinal illness or in response to a blood draw at the doctor's office presents a low likelihood of recurrence in the aviation realm (4); however, if the syncopal episodes occur abruptly with little or no prodrome or are associated with profound bradycardia or asystole or other arrhythmia, they represent a potential threat to aviation safety. The latter forms of syncope are termed “malignant” neurocardiogenic syncope relating to the increased risk of injury—pilot incapacitation in the aviation realm (7).

**Outcome.** In this case, the Regional Flight Surgeon consulted a cardiologist to review the records. He commented as follows: “The clinical episodes have been reproduced with tilt-table testing even leading to asystole, syncope, and seizures. Despite the fact that some training and maneuvering may mitigate the syncope once and if the patient experiences prodromal symptoms, this is not a situation that would be safe should it occur in the cockpit. I recommend that she be denied flying privileges for all classes.” The Regional Flight Surgeon disqualified the airman for any class of medical certificate and requested that she surrender her unexpired medical certificate promptly. In turn, the pilot appealed her case to the Federal Air

Continued—→

Surgeon. He determined that her condition is incompatible with aviation safety and that she is ineligible for airman medical certification under Sections 67.113(b), 67.213(b), 67.313(b)—first-, second-, and third-class, respectively (general medical condition).

#### References

1. ACC expert consensus document. Tilt table testing for assessing syncope. *J Am Coll Cardiol* 1996; 28(1): 263-75.
2. Arnaout R, Thorson A. Late recognition of malignant vasovagal syncope. *Card Electrophysiol Clin* 2010; 2: 281-3.
3. Connolly SJ, Sheldon R, Thorpe KE. Pacemaker therapy for prevention of syncope in patients with recurrent severe vasovagal syncope. *JAMA* 2003; 289(17): 2224-9.
4. Dijk NV, Colman N, Dambrink JHA, Wieling W. Pilots with vasovagal syncope: Fit to fly? *Aviat Space Environ Med* 2003; 74: 571-4.
5. Federal Aviation Administration. Guide for Aviation Medical Examiners. [www.faa.gov/ameguide/](http://www.faa.gov/ameguide/). Viewed 11/23/11.
6. Manen O, Perrier E, Genero M. Ground vasovagal presyncope and fighter pilot fitness: Aeromedical concerns. *Aviat Space Environ Med* 2011; 82: 917-20.
7. Peterson MEV, Chamberlain-Webber R, Fitzpatrick AP, Ingram A, Williams T. Permanent pacing for cardioinhibitory malignant vasovagal syndrome. *Br Heart J* 1994; 71: 274-81.
8. Rayman RB, Hastings JD, Kruyer WB, Levy RA. *Clinical Aviation Medicine* 3rd ed. New York: Castle Connolly, 2001.
9. Raviele A, Brignole M, Sutton R, Alboni P. Effect of etilefrine in preventing syncopal recurrence in patients with vasovagal syncope. *Circ* 1999; 99: 1452-7.
10. Strickberger SA, Benson DW, Biaggioni I, et al. AHA/ACCF scientific statement on the evaluation of syncope. *Circ* 2006; 113: 316-27.

**About the Author.** Christopher C. Nagle, MD, MPH, MS, is board certified in aerospace medicine and is currently working as a USAF contract flight surgeon. He wrote this case report while rotating at the Civil Aerospace Medical Institute as a NASA/WSU resident in aerospace medicine. Comments may be directed to his attention at [vx11ram@gmail.com](mailto:vx11ram@gmail.com).



#### DISCUSSION

Of the general population, 3% of people experience syncope during a 25-year period; the recurrence rate is 30% after an initial event. The most common form of syncope in the general population is neurocardiogenic (also known as vasovagal) (1). Syncope remains idiopathic in 35% of cases (8).

The pathophysiology of neurocardiogenic syncope has not been definitively established. One common theory of the mechanism is that a decreased venous return results in a reflexive tachycardia; the tachycardia induces overstimulation of ventricular mechanoreceptors with poor diastolic filling; in turn, the mechanoreceptors trigger electrical feedback to the brain resulting in an increase in vagal tone; this induces bradycardia and decreased venous tone, further decreasing cardiac output and blood pressure to the point of syncope.

The diagnosis of neurocardiogenic syncope is established by the history of symptoms and circumstances of the event, along with exclusion of other causes of syncope (with specific focus on cardiac, neurologic, hematologic, electrolyte, and volume status). The exclusion of other causes is important as syncope may be a prelude to a sudden death event in individuals with underlying heart disease (10).

Why is neurocardiogenic syncope waived in some airmen with a special issuance and not in others? Though syncopal episodes are considered on an individual basis with attention to the particular circumstances, syncopal episodes are generally categorized as benign or malignant. A benign neurocardiogenic syncope case is more likely to receive a special issuance than a malignant neurocardiogenic syncope case. In a benign syncopal episode, prodromal symptoms lead to a loss of consciousness with bradycardia, followed by a quick return to consciousness. A malignant neurocardiogenic syncopal episode is one in which the cardio-inhibitory parasympathetic tone induces asystole or causes loss of consciousness abruptly, without the warning prodromal symptoms. The malignant form has greater likelihood of causing injury or, in the case of a pilot, incapacitation (2,6,7). With aviation safety in mind, additional questions to consider are: What are the syncopal triggers? What are the warning symptoms? How likely is the syncope to recur? The FAA performs an individual assessment towards answering this one question: How likely is the syncopal episode to recur *in the cockpit*?

Management of benign neurocardiogenic syncope typically entails teaching the airman preventive measures and coping skills. Preventive measures include good sleep habits, regular meals, exercise, good hydration, avoidance of caffeine, etc. Coping involves recognition of pre-syncopal symptoms and prevention of the progression of the phenomenon to syncope; the airman can learn to salt load, hydrate, contract leg muscles, and lower the body to elevate the heart above the head to prevent syncope. Management of malignant neurocardiogenic syncope involves the use of all of the techniques for the benign form but may also employ medications (e.g., beta blockers, alpha agonists, anticholinergics) and/or pacemaker implantation. The FAA has not deemed any of these treatments as an acceptable mitigating measure for Special Issuance. The studies of interventional therapy of malignant neurocardiogenic syncope yield mixed results. The VASIS trial revealed no benefit in terms of a reduction of recurrence of syncopal episodes with the use of an alpha agonist (9). A British, uncontrolled study of a group of 37 patients who each underwent pacemaker implantation revealed a significant reduction of recurrent syncopal episodes (7). In contrast, the Vasovagal Pacemaker Study (VPS II), a double-blind, randomized, controlled trial, revealed no significant reduction in syncopal episodes in patients who suffer recurrent episodes (3). Effective therapy is challenging as the hypotension induced by syncope results from both bradycardia and decreased vascular tone; correction of one contributing factor (e.g., venous tone) might not offset the other (e.g., bradycardia).

# MEDICAL CERTIFICATION OF A PILOT WITH HEMOPHILIA A

CASE REPORT, BY CHRISTOPHER S. WALKER, MD, MPH

*Hemophilia A is a genetic disease that is inherited in an X-linked recessive manner. It causes a decrease in the production of Factor VIII, which in turn causes a reduced ability of the body to form stable blood clots. This article presents a case report of a first-class airman applicant with a history of severe hemophilia A and includes a brief review of the current treatment, as well as aeromedical issues associated with this disease.*

## History

A 23-year-old airman requested a first-class student pilot certificate and was his first application for a medical certificate. The airman has a history of severe congenital hemophilia A.

The airman has severe hemophilia A, which was identified shortly after birth. Throughout every year of his life, he has had numerous bleeding episodes. In the past few years, he reported more than 20 bleeds into each elbow every year. Whenever he had a bleeding episode, he treated them with infusions of recombinant Factor VIII. He has never been on a prophylactic treatment regimen with the recombinant Factor VIII. As is often the case with patients with hemophilia, the bleeding episodes into the joints left him with some damage to the joints. He has had radionuclide synovectomies performed to both ankles to address the consequences of this damage.

The airman applicant was noted on exam to have musculoskeletal issues. He was noted to have some loss of motion in both elbows and ankles. His left elbow demonstrated moderate swelling medially with loss of bony landmarks and moderate crepitus. The right elbow had slight swelling and crepitus. Both knees showed slight patellofemoral crepitus. His ankles had evidence of more severe disease with severe swelling posteriorly and over both malleoli. He had severe crepitus in both ankles and reported that he had pain in the ankles much of the time.

## Aeromedical Concerns

There are several aeromedical concerns with this airman applicant. The first concern is that he could have a bleeding episode while performing his aviation-related duties. For a patient with hemophilia, these can occur spontaneously. There is also the risk that he could become injured while flying. A minor laceration for a pilot who does not have hemophilia could become a major issue for a pilot with hemophilia. When a patient with hemophilia has a bleeding episode, the only treatment is an infusion with Factor VIII, either through a transfusion of plasma or, more likely, the intravenous administration of recombinant Factor VIII. It is not likely that an airman would be able to continue to fly and take care of this medical situation.

A second concern for an airman with hemophilia is the joint damage that can occur as the result of bleeding into the joints. As

## HEMOPHILIA A

Hemophilia A is a genetic disease that is caused by a decreased total level or decreased activity of the Factor VIII protein. The gene that codes for Factor VIII is called *F8* and is located on the X chromosome. In hemophilia A, there is a mutation in this gene that is passed on in a recessive manner. This makes it much more likely that this disease would affect males, as they have only one copy of the X chromosome. It is estimated that one in every 5000 to 7000 live male births is affected.<sup>1</sup> Females are much more likely to be carriers and not have the actual disease, unless they inherit two copies of the mutated gene. Severity of the disease is determined by the level of Factor VIII activity. The majority of patients with hemophilia A fall into the severe category of disease, with a Factor VIII activity level less than 1%.

Factor VIII is a key component of the coagulation cascade. In the coagulation cascade, it functions as a cofactor with Factor IXa. When the conditions are right, the Factor VIII/Factor IXa complex converts Factor X to Factor Xa, which is vital in the formation of stable clots. The end result of the coagulation cascade is a clot that is stabilized by fibrin cross-linking. In hemophilia, the deficit in the coagulation cascade causes a lack of fibrin cross-linking, which leads to an unstable clot. When performing laboratory testing on patients with hemophilia A, they will have a normal prothrombin time (PT) test, and abnormally long partial thromboplastin time (PTT) test, normal bleeding time, and normal platelet counts.

Current therapy for patients with hemophilia A focuses on the replacement of Factor VIII. In the past, this was accomplished using plasma concentrate Factor VIII. Because of the frequent need for blood product transfusions, patients with hemophilia were at high risk for blood-borne infections, including HIV and hepatitis. With the current screening of the blood donated in the United States, this risk has been greatly reduced, and with the advent of recombinant Factor VIII products, this risk has essentially been eliminated. Recombinant Factor VIII is produced in cell cultures that are free from infectious diseases that can be passed to the recipients. For patients with milder forms of hemophilia, the Factor VIII can be given after bleeding episodes. Those with severe hemophilia are required to receive Factor VIII after bleeds, and they also take it prophylactically before medical and dental procedures that could lead to bleeding. Dosing amounts vary according to the severity of the underlying hemophilia and the procedure that is being considered. There is evidence that the use of regularly scheduled doses of Factor VIII rather than episodic treatment may prevent some of the damage to the joints caused by repeat bleeds into the joints.<sup>2</sup>

Continued →

has been previously mentioned, this bleeding can cause damage to the joints themselves. The airman with hemophilia would need to have a thorough evaluation of his extremities, especially his joints, to ensure that he would meet the FAA standard that airmen not have any defect in the musculoskeletal system that would make them unable to safely perform the required duties. This airman is a perfect example of these issues. He already has limitation in motion and deformities of his elbows and ankles; had this been a different condition, it would likely require a medical flight test. A third major concern for the AME is the risk of intracranial bleeding. The risk is highest for this condition in infancy, but it does not go away in adulthood. Most of the time these intracranial bleeds are the result of trauma, but sometimes they can occur spontaneously.<sup>3</sup>

### Role of the AME

The general medical standards for medical certification annotated in Title 14 of the Code of Federal Regulations Parts 67.113, 67.213, and 67.313 include no functional limitation that makes a person unable to safely perform the duties or exercise the privileges of an airman.<sup>4</sup> Aviation medical examiners are authorized to examine airmen to determine if they meet the medical standards.

The *Guide for Aviation Medical Examiners* does not give specific guidance when it comes to evaluating an airman with hemophilia. A careful history looking for significant bleeds in the past would be necessary, especially when searching for a history of intracranial hemorrhage. Additionally, the AME would be looking for sequelae from the disease that may cause the airman to not be fit for aviation duties. The *AME Guide* gives guidance when it comes to evaluating an airman with a musculoskeletal condition. When examining the affected joints, the AME should note pain, weakness, paralysis, motion coordination, deformity, amputation, and prosthesis.<sup>5</sup> Restricted range of motion would be of particular concern for an airman with hemophilia A due to the joint damage caused by repeat hemarthrosis. The disposition guidance in the *AME Guide* indicates that the AME should submit a current status report to include functional status such as range of motion and pain. The AME should also report on any medications that the airman may be taking, with comments on any side effects. All pertinent medical reports should be submitted. For all classes of airman certificates, the decision to issue rests with the FAA.<sup>5</sup>

### Outcome

The case was reviewed by the FAA's hematology consultant, who recommended that the airman be granted a first-class medical certificate, with the stipulation that he would need to prophylactically administer Factor VIII prior to flying. However, it is not the FAA Aerospace Medical Certification Division's practice to direct treatment, even though many times the airmen will have their physicians modify their treatment to enable medical certification. Therefore, due to this airman's frequent bleeding episodes and the manner of his treatment, along with the joint damage he has already suffered, he was denied medical certification.

### References

1. Roberts HR, Escobar M, White GC II, Hemophilia A and hemophilia B. In: Beutler E et al., eds. *Williams Hematology*. McGraw-Hill 2006.
2. Manco-Johnson MJ, Abshire TC, Shapiro AD, et al. Prophylaxis versus episodic treatment to prevent joint disease in boys with severe hemophilia. *New England Journal of Medicine* 2007 Aug 9;357(6):535-44.
3. Hanley JP, Ludlam CA: Central and peripheral nervous system bleeding. In: Forbes CD, Aledort L, Madhok R, eds. *Hemophilia*. London: Chapman & Hall, 1997:87.
4. Federal Aviation Administration (2011). Guide for aviation medical examiners. Online at: [www.faa.gov/go/ameguide/](http://www.faa.gov/go/ameguide/) Accessed 1 May 2011.
5. Federal Aviation Administration (2011). Aerospace Medical Dispositions. Online at: [www.faa.gov/about/office\\_org/headquarters\\_offices/avs/offices/aam/ame/guide/app\\_process/exam\\_tech/item42/amd/](http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/app_process/exam_tech/item42/amd/) Accessed 1 May 2011.
6. Manco-Johnson MJ, Abshire TC, Shapiro AD, et al. Prophylaxis versus episodic treatment to prevent joint disease in boys with severe hemophilia. *New England Journal of Medicine* 2007 Aug 9;357(6):535-44.

### About the Author

*Lt. Col. Christopher S. Walker, MD, MPH, is board-certified in Family Medicine and Aerospace Medicine. He serves on active duty in the U.S. Air Force and is currently the Chief of Aerospace Medicine at the 27<sup>th</sup> Special Operations Medical Group at Cannon AFB, N.M. He wrote this report during a clinical rotation at the FAA's Civil Aerospace Medical Institute while a resident in the Aerospace Medicine program at the USAF School of Aerospace Medicine.*



## 2013 AME SEMINAR SCHEDULE

August 9–11	Arlington, Va.	OOE (3)
September 26–28	Orlando, Fla.	CAMA (4)
October 28–November 1	Oklahoma City, Okla.	Basic (2)
November 15–17	Sacramento, Calif.	CAR (3)

## 2014 AME SEMINAR SCHEDULE

February 21-23	Atlanta, Ga.	NEU* (3)
March 24-28	Oklahoma City, Okla.	Basic (2)
May 12-15	San Diego, Calif.	AsMA (1)
July 14-18	Oklahoma City, Okla.	Basic (2)
August 8-10	Bethesda, MD	CAR* (3)
October 9-11	Reno, Nev.	CAMA (4)
October 27-31	Oklahoma City, Okla.	Basic (2)
November 21-23	San Antonio, Texas	TBD*

\* SEMINAR IS TENTATIVE

### NOTES

- (1) 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.
- (2) A 4½-day basic AME seminar focused on preparing physicians to be designated as aviation medical examiners. Call your Regional Flight Surgeon.
- (3) 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. NEU= Neurology, OOE= Ophthalmology-Otolaryngology-Endocrinology, CAR= Cardiology.
- (4) 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](http://www.civilavmed.com).

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

