



Federal Air Surgeon's Medical Bulletin



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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



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Love of Aviation and Medicine

Why Do So Many AMEs Remain Active After Age 65?

By Mike Wayda

My doctor is old. I've known him when I was a kid. I moved away for a while, but when I came back, I went back to him. He's well into retirement age, but he keeps seeing me and his other patients. Why? Precisely BECAUSE he's old....He has his friends, but they're also old. So he remains a doctor, because that's what keeps him active and happy.

—Unidentified blogger

A STUDY RELEASED in 2011 by the Canadian Institute for Health Information of Canadian physicians found that one-third of physicians age 65 and older were still working full-time (1). This trend may be apparent in the aviation medical examiner community because there are 218 AMEs with 40 or more years of service, which is 6.2 percent of the total number of examiners.

Is it financial reward that causes these examiners to remain on the job? Hardly,

according to Dr. **Stanley Mohler**, stating in a 1990 *Aviation, Space, and Environmental Medicine* article, that “Physicians who see pilots generally state that significant income is not derived from their examiner duties.” Dr. Mohler concludes that, “as a career, the physician should be basically motivated by a love of aviation and medicine” (2).

Perhaps it's because aviation medical examiners tend to form close
Continued on page 5

Education Report Error Rate Drops

By Brian Pinkston, MD

I AM VERY pleased to congratulate you on a job well done! If you recall from your aviation medical examiner (AME) seminars, our certification process is under constant quality review utilizing many indicators. One of these indicators, AME error rate, encompasses everything from clerical errors to inappropriate issuance of a certificate, which could result in AME termination.



Dr. Pinkston

Quality assurance for AME examinations is the bread and butter for Dr. **Raad Abbas** in the Aerospace Medical Certification Division at CAMI. Dr. Abbas has recently announced that AME error rate from June-December 2010 was at a low of 3.5%—down from 6.3% for the previous six-month period.

He attributes that low rate to your attention to detail and commitment to continuing education in knowledge of the *AME Guide* and FAA policies.

Of note, the most common reasons for errors were

1. unreported ECG findings or incomplete ECGs,
2. incomplete evaluation of hypertension, and

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Computer Security Issues

Hello, Everyone,

IHOPE YOU are aware that the Airman Medical Certification Subsystem (AMCS) was audited by the Department of Transportation's Office of Inspector General in 2010. They identified several deficiencies in the equipment owned and maintained by the Federal Aviation Administration (FAA) that required our attention. We devoted a lot of resources in the effort to eliminate those discrepancies, and we have now completed that work.

One finding directly affects you as an aviation medical examiner. For security reasons, your computer display must be locked out after 15 minutes of computer inactivity. Many of you probably already



have such a function activated on your computer, but for those who do not, you must implement the screen lockout feature on any computer in your office used to access the AMCS by September 30, 2011. It is very important that you take this action so as to protect the personally identifiable information (PII) of the FAA medical certification applicants you examine.

This initiative is so important that I am dedicating this editorial to remind you to make these changes. By the time you read this article, you should already have:

- ◆ received a letter and an E-mail directing you to make these changes; and
- ◆ noted that the AMCS login page has been modified so that you are forced to acknowledge this requirement on a one-time basis.

To assist you with the installation of this feature on your computer, we have provided instructions on two FAA Web sites:

www.faa.gov/go/ame
and
www.faa.gov/go/amcssupport

I have also found that you can access AMCS by using your favorite Internet search engine. All you have to do is type in *aerospace medical certification subsystem*, and it takes you to a link to the online directions you need to make the modifications.

Please note that the instructions provided are operating system-specific, so you will need to know the operating system used on your computer. If you use an operating system not covered by these instructions or if you have problems with this reconfiguration, you should call the Office of Aviation Safety's National Service Desk at (877) 287-6731 for assistance.

I apologize if this requirement has caused or causes you any inconvenience. However, the modification is essential to help protect our examinees' data.

Once again, as always, thanks so much for all you do for the FAA and our airmen.

—Fred

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Secretary of Transportation
Ray LaHood

FAA Administrator
J. Randolph Babbitt

Federal Air Surgeon
Fred Tilton, MD

Editor
Michael E. Wayda

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Authors may submit articles and photos for publication in the Bulletin directly to:

Editor, FASMB
FAA Civil Aerospace Medical Institute
AAM-400
P.O. Box 25082
Oklahoma City, OK 73125
E-mail: Mike.Wayda@faa.gov

Personnel Change in Central Region

Federal Air Surgeon Dr. **Fred Tilton** recently announced that Dr. **Larry Wilson** has taken a new position in the Office of Aerospace Medicine's Medical Specialties Division. Dr. Tilton said that he plans to take advantage of Larry's strong experience in medical certification to help standardize medical policy.

Named as acting Central Regional Flight Surgeon is **Daniel K. Berry**, DO, who was formerly the Central Region's Deputy Regional Flight Surgeon.

PERSONNEL CHANGES

TWO PERSONNEL MOVES in the Aerospace Medical Certification Division will affect your interaction with us when you call in and request to speak to one of our physicians. Dr. **Arnie Angelici** has left to take on the position of the physician responsible for the air traffic control specialists in the Southern Regional Office.

Then, in early January 2012, Dr. **Roger Bisson** will retire to join his wife at Lakenheath AFB in the United Kingdom.

Both of these departures are going to result in a huge void in our Division. We currently are awaiting the list of eligible candidates for Arnie's position, and if there are several good candidates, we may be also able to hire someone to replace Roger as well. As you know, a significant training period will be necessary to bring the new physicians up to speed. Our regional associates will assist, but the loss of two physicians may result in some delays. Those of you who call on the (405) 954-4821 line, please bear with us. If you end up having to leave a voicemail message, rest assured that we respond in the order we receive them.

It will help if you have all the medical information for your airmen ready for our return call so we do not take up much of your time while you search for the answers to our questions. Thanks again for your constant understanding!

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

CERTIFICATION UPDATE

Information About Current Issues



By Warren S. Silberman, DO, MPH

PRACTICE CASES

I am now going to pick up where I left off in the last *Bulletin* with more case vignettes.

1 THIS IS the initial visit to your aviation medical examiner office for an airman who is applying for a student pilot/medical certificate. He is a 46-year-old male with a history of HIV on antiviral therapy, with a single episode of pneumocystis carinii pneumonia, now seven months in remission. So, by definition, the airman has had an AIDS-defining illness. First question: Can you issue this airman a medical certificate prior to his departing your office? Next, would you need to provide anything to the AMCD for him to be considered for medical certification?

ANSWER: **HIV** ON antiviral medication with an AIDS-defining illness is a disqualifying medical condition. However, with favorable results and review by AMCD, the airman may be able to obtain an Authorization for Special Issuance. As the AME, you either must defer or obtain the required records and testing and phone the Regional Flight Surgeon or the AMCD for verbal permission to issue a waiver. If an airman with HIV has only one AIDS-defining illness they can be considered for medical certification after they have been six months in remission from the illness. In the case of this airman, he has been seven months in remission. To be considered, the FAA will need to see:

- An evaluation by a physician trained in managing such cases with current list of medications and mention of side-effects,
- A current HIV viral load,
- A current CD4+ lymphocyte count,
- Current CBC, FBS, and renal and liver function studies,
- If there has been a history of cytomegalovirus retinitis, a completed FAA Eye Form 8500-7, and
- Current COGSCREEN-AE or neuropsychological testing.

2 A 40-YEAR-OLD airman requesting third-class medical certification reports a history of passing a calcium oxalate kidney stone six months previously. He provides a report and films from a spiral CT scan of the kidneys that showed a 4-mm stone in the left lower renal pole. Can you issue the medical certificate?

ANSWER: **THE** airman has a retained kidney stone and cannot be issued by an AME. This will require an Authorization or waiver. It is unlikely that a stone in the lower pole will pass, but it does require a waiver. The AMCD needs to follow the retained stone with serial films to evaluate whether the stone moves or grows in size. This is a condition where AMCD can grant an AME-Assisted Authorization for Special Issuance where the AME may issue if nothing has changed.

3 A 50-YEAR-OLD female first-class pilot presents to your office for her current FAA medical examination. She relates a history of deep venous thrombophlebitis and even provides medical records. This occurred two months ago, after she drove cross-country to visit relatives. She was worked up for a hypercoagulable state and it was negative. She even had a repeat Doppler of her lower extremity that showed clearance of the clot. She remains on warfarin (Coumadin). There was no report of pulmonary embolus. Her physicians

Continued on page 4

Certification from page 3

report that she is to remain on anticoagulation for another two months. She really would like her medical certification, as she needs to work. Can you issue the medical certificate?

ANSWER: THIS condition will require an Authorization. As the AME, you will need to obtain medical records, the X-ray or ultrasound results of the lower extremities, proof of a hypercoagulable workup, and as many INR levels they can round up.

4A PRIVATE pilot has a LASIK procedure, thinking that he will be able to ultimately not be required to wear corrective lenses. He does well post-operatively, not having any glare or halos at night. However, on his most recent eye examination, he is only able to correct to 20/50 in each eye near vision. He comes into your AME office for a third-class examination. What should you do?

ANSWER: As you know, it is always possible refractive surgery does not always provide the desired results. For third-class, you should know that an airman must see 20/40 in each eye separately to meet our vision standards. This person obviously does not meet our standards. The easiest (but not very helpful) approach is to defer the decision to the FAA. However, a “good AME” will tell the airman that he needs to provide a current FAA Eye Examination, if he had not already obtained one, for the purpose of getting certified after the refractive procedure. The airman will need to obtain a medical flight test from the Flight Standards Office to gain a medical certificate. The AME can call the regional office or AMCD to have them make the arrangements, or have the airman write the FAA and request the medical flight test. The AMCD will send the airman our permission to take the test.

5A SECOND-CLASS applicant checks “yes” to question 18v. This is the question that asks if the airman has ever had an arrest, any conviction involving driving while intoxicated by, while impaired by, or while under the influence of alcohol or a drug or any of the above to include an administrative action involving an offense which resulted in the denial, suspension, cancellation, or revocation of driving privileges or which resulted in attendance at an educational or a rehabilitation program. Knowing that the FAA takes positive responses to this question very seriously, the AME questions the airman and finds out that he had been arrested for a DUI offense just two months before coming in for his FAA exam. What should you do?

ANSWER: UNDER our current policy, you may not issue until you have confirmed what the airman’s blood alcohol level was. Recall that a refusal is considered a positive and is an automatic deferral. You need to have the airman obtain the “police report” of the arrest. When you ask most airmen for the court documents, they will provide copies of the documents they were issued at the time of their court date. However, most of time these documents have nothing in them—especially the results of the blood alcohol testing. What we need is the report of the arresting officer: how the airman was detained, their reaction to the stop, and whether they refused to submit to blood alcohol testing (or the level when they did). If the level was 0.15 (or greater) or the airman refused to be tested, you are to defer. The airman will be required to obtain a current substance abuse evaluation. If the level was less than 0.15, you may issue. Keep in mind that you need to transmit the examination within 14 days. Remind the airman that in all such cases, they must separately notify the AMC-700 Security Division in Oklahoma City within 60 days of the above (regulation 61.15 (e)).



FAA Remembers Neal Nadler and James Garofalo—Pillars of the Aviation Community *AMEs Had Served (Combined) Nearly a Century*



Dr. Nadler



Dr. Garofalo

We observe the recent passing of two neighboring senior aviation medical examiners with parallel careers who had served many thousands of airmen on behalf of the FAA and celebrate their contributions: **Neal Nadler**, MD, and **James Garofalo**, MD, were aviation medical examiners with a combined total of 93 years. Each was an Air Force flight surgeon, and each practiced internal medicine, as well as aerospace medicine in the adjacent New Jersey counties of Essex and Morris.

A comment from Captain **Jayson Baron**, Airline Pilots Association International and Continental Newark Captain Representative, sums up Dr. Nadler’s standing among aviators: “Dr. Nadler was not only a huge friend to many Continental pilots, but also to countless other local airline pilots, from every airline imaginable, and additionally to a huge clientele of corporate and general aviation pilots. The best way to describe a visit to Dr. Nadler’s office was, well, ‘an experience.’ It was frequently a mix somewhere between a comedy club and a who’s who of who he knew in pilot land.”

Dr. Garofalo served in the U.S. Air Force as a pilot and flight surgeon, and he was also in the U.S. Coast Guard Reserve. He loved flying and was an active member of the Aircraft Owners and Pilots Association and the Experimental Aircraft Association.

Both will be missed by the aviation community they served.

—Contributed by *Mindy Zalzman*, Eastern Region Program Analyst, and *Harriet Lester*, MD, Eastern Regional Flight Surgeon.

Nadler photo credit: Courtesy of the Parsippany, N.J., Daily Record

Garofalo photo credit: FAA Photo by Carty Wilson, AME Surveillance Program Analyst

AME Longevity from page 1

relationships with their pilot applicants. Numerous examples exist of pilots bonding with their examiners, but this one was delivered online when Dr. **Neal Nadler**, an Eastern Region physician, passed away recently: “I will never find another doctor like you. It was like going to visit a friend you always had a story to tell and everyone listened. Doc you will be missed.”

At 89, aviation medical examiner Dr. **James E. Crane**, loved to fly. Although no longer an active pilot because of health problems, he enjoyed flying with his pilot friends and rarely turned down the opportunity to go flying. “They just call me and say, ‘Hey Jim, let’s go flying,’ and I’m apt to take advantage of the offer.” (*FASMB* 2003-2, p.6). When interviewed in 2003 for an article in the *Federal Air Surgeon’s Medical Bulletin*, he was the FAA’s most senior AME, still practicing after 57 years, still working hard, and still enjoying the work.

However, as much as one enjoys working, retirement is inevitable. Dr. Crane acknowledged that, although he loved aviation and working with pilots, the day would come when he would reluctantly give up his thriving aviation medicine practice and settle down to retirement. Whenever hints got around about Dr. Crane’s pending retirement, his pilots would plead with him to stay active: “Jim, please don’t retire,” and “Stay in business and let’s go flying.”

However persuasive his friends were, Dr. Crane retired as an AME two years later in October 2005.

And then there’s semi-retirement, with limited work but the full satisfaction of remaining in a cherished

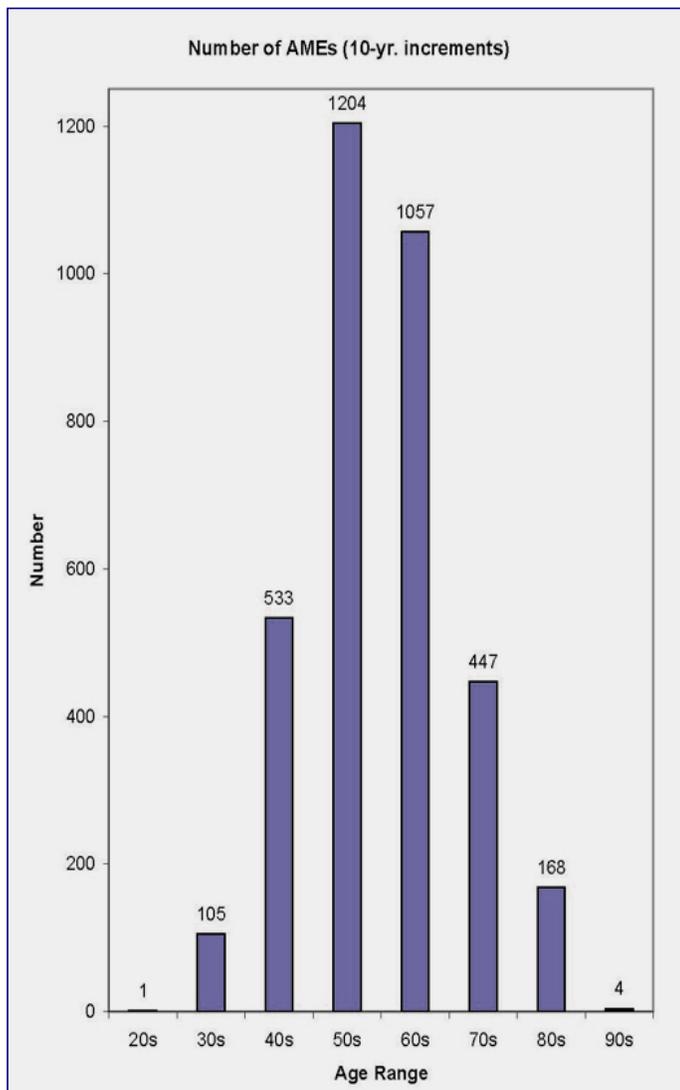


Figure 1. Aviation medical examiners in age brackets.

profession with an established clientele. Dr. **Louis Moore**, a Naples, Fla., AME since 1960, adjusted to the inevitable challenges of aging. “My AME workload is about half of what it was five years ago—almost all repeat business,” he said.

Much of the decline, though, was brought about by a downturn in the economy and fewer people learning to fly because of the expense. Dr. Moore is content to operate “a very lazy practice—limited to aviation physicals and hypnosis.” He has downsized his practice to a one-room office, no employees, and no insurance. He works one day a week, sometimes two.

The graphic (Fig. 1) shows the number of examiners in each 10-year age bracket. For example, there is only one aviation medical examiner under the age of 30, and 1,204 in their fifties (50-59).[†] Interestingly, four are still actively working into their nineties. In fact, the most senior of the senior examiners is 93 years old.

His “lazy” practice allows an hour for a physical, and since most of it is for repeat pilots, he gets very specific in his work-up: “I have time for conversations—flying, health, safety, sex, prostate cancer, and whatever else bubbles up,” he said, concluding, “I put a lot of pressure on weight, blood pressure, cholesterol, and blood sugar, since most of my pilots are past 50 years old.”

As stated earlier, about 33 percent of Canadian physicians are working past age 60. Our current AMEs track the same trend as the Canadians, but nearly half (47.6%) of the FAA examiners are working beyond age 60 (1,676 of 3,519).

Apparently, the love for aviation and medicine is hard to turn off.

References

1. From: www.cbc.ca/news/health/story/2011/04/07/doctors-retirement-staying-on.html. Accessed 7/14/11.
2. Careers as an aviation medical examiner. Mohler, Stanley: *ASEM* 1990 May; 61:501.

Data provided by **David Nelms**, Aerospace Medical Certification Division program analyst.

[†]Data current to July 19, 2011.



Your Comments on Discontinuing Printed Newsletters



Funding shortages meant that, starting with the last issue, we could not send hard copies of the *Federal Air Surgeon's Medical Bulletin* to our subscribers. Instead, they were notified via E-mail that the newsletter was online and available to read. Aviation medical examiner reaction to online delivery vs. print media was swift. Here are some of these comments (received by E-mail).

—I enjoyed reading the *Bulletin* today and I'd encourage you to continue this method, and save some money.

Tom Carlstrom, MD
Des Moines, Iowa



—Personally, the *Bulletin*, as an email attachment, is just fine. As a matter of fact, I'd rather have it via email than snail mail.

Thanks,

A. Stephen Casimir, MD
Endicott, N.Y.



Hello!

—Thank you for sending this electronically. Please always do so in the future. We do not need to kill more trees or waste resources with printing and mailing! Thank you!

Jitka Lom, MD
Hagatna, Guam



—Thanks for the email. Its the way of the future....save some money!!

RMBIMD



—I would prefer to get my *Bulletin* this way; faster, easier to read, and I don't lose it.

Anonymous



—Thank you. Actually this is a preferred method of receiving the *Bulletin* especially if it is saving government money!

Anonymous (via Blackberry)



—Good morning, Mike
I actually prefer to receive this publication online. Thanks!

Gregory L. Bono, MD, MPH
Kansas City, Kan.



—Tell the Boss he does not need to apologize for the online distribution—it works—it is cheaper and if I can work thru it, every AME should be able to. Again, you guys are doing a great job out there and have always been a big help to me. I wish a few other branches of the Gov't would do as well....

Louis S. Moore, MD
Naples, Fla.



—MIKE I CERTAINLY HOPE WE GET BACK TO THE PRINTED FORM OF PRESENTATION. I'VE BEEN DOING THIS 50+ YEARS NOW AND ALWAYS LOOKED FORWARD TO PRINTED BULLETIN. I WOULD PUT IT IN MY POCKET AND READ WHEN I COULD. I'VE KEPT UP WITH AND THINK MOST OF THE NEW INNOVATIONS ARE GREAT--THIS ONLINE FORM IS ONE EXCEPTION I DON'T LIKE. I KNOW STORAGE AND RETRIEVAL IS GREAT, ON THE COMPUTER, BUT I FOR ONE VOTE FOR PRINTED FORM.

James F. Cooper, MD
Bryan, Texas

PS--IS THERE ANYWAY WE CAN FIND OUT HOW WE ARE RANKED TIME WISE AS AME'S--OR YEARS IN SERVICE? I BELIEVE I WAS FIRST DESIGNATED IN 1960. THANKS jfc

Dear Dr. Cooper,

Thanks for your comments. While you have been an aviation medical examiner for a remarkable period, you are number 18 in seniority, with 51.1 years of service.

Your question got us to wondering about just how many examiners have been working for 50 or more years. The answer might surprise you—31. (For more AME longevity information, see "Love of Aviation and Medicine" on page 1 of this issue.)

Thank you for all the valuable services you have provided to airmen during your long tenure.

To quote Federal Air Surgeon Dr. Fred Tilton, "I want to repeat how much I appreciate what you do for the FAA and the airmen you examine. Throughout their career, pilots see you more often than any FAA employee. Make sure you take a few minutes to talk with them about flying, aviation safety, airplanes, and preventive health measures. You play a crucial role in the safety of the National Air Space System."

—Editor



Error Rate Drops from page 1

3. there were a number of instances in which airmen were treated with unapproved medications.

For more information related to these issues, please refer to previous articles written by Dr. **Warren Silberman** in archived copies of the *Bulletin*, located online at:

www.faa.gov/library/reports/medical/fasmb/archives/

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	2011-1, Vol 49-1, p 3

Please call your team at the Aerospace Medical Certification Division or Regional Flight Surgeon's office for answers to any questions you may have, especially those regarding hypertension workups, approved medications, or ECG findings. Let's keep the error rate as low as we can to better serve our aviators!

Thanks for all you are doing to improve the safety of our National Airspace.

Dr. Pinkston manages the Civil Aerospace Medical Institute's Aerospace Medical Education Division.



Aviation Medical Examiner Seminar Schedule

2011 Seminars		
August 26–28	Washington, D.C.	CAR (1)
October 6–8	Tucson, Ariz.	CAMA (2)
October 31–November 4	Oklahoma City, Okla.	Basic (3)
November 18–20	Portland, Ore.	NPN (1)

CODES

CAR Cardiology Theme

NPN Neurology/Neuro-Psychology/Psychiatry Theme

(1) A 2½-day theme AME seminar consisting of 12 hours of aviation medical examiner-specific subjects plus 8 hours of subjects related to a designated theme. Registration must be made through the Oklahoma City AME Programs staff, (405) 954-3831 or -4830.

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

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

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

Medical Certification of Pilots With HLA-B27 Arthropathy and Uveitis

Case Report, by Todd Huhn, DO, MPH

HLA-B27 antigen is a relatively common finding that can predispose an aviator to several aeromedically significant conditions, including ankylosing spondylitis and uveitis. Although these conditions respond well to steroid- or immune-modulating medications, the initial and long-term complications may significantly limit an airman's ability to perform in-flight duties.

HISTORY

A 28-YEAR-OLD MALE commercial pilot with 1,500 flight hours had developed worsening pain and stiffness in his lower back. He attributed the pain to an increase in flight duties and saw his chiropractor, who took spinal X-rays, diagnosed him with multiple lumbar subluxations, and started bi-weekly adjustments.

One morning approximately six weeks later, the pilot awoke with blurred vision in his right eye, which was also painful and red. He drove himself to the local acute care clinic, where the PA found significant photophobia with a limbal flush and acuity of 20/100 in the affected eye. Concerned, he sent the pilot to the ER, where the staff ophthalmologist diagnosed him with anterior uveitis and prescribed topical steroids and a cycloplegic. The airman recovered over the next several weeks.

With his vision improved, he enrolled in a racquetball tournament but had to withdraw before the first match, with his left knee swollen, red, and tender to the touch, although he couldn't recall injuring it. His doctor initially suspected a ligamentous injury, but the knee appeared intact on exam. Concerned about pseudo-gout, he ordered laboratory tests, which showed normal joint fluid and normal serum uric acid levels but an elevated CRP, elevated ESR, and a positive HLA-B27 antigen. Armed with these results, the

doctor ordered lumbar spine X-rays, which showed inflammation in the SI joint and early changes consistent with ankylosing spondylitis. The pilot was referred to a rheumatologist who started a course of high-dose steroids for the acute symptoms, and the knee pain quickly resolved. After completing the steroid burst, the pilot was started on weekly Enbrel (etanercept) injections. His back pain resolved with Enbrel, and he had no further flares of joint or ocular pain.

AEROMEDICAL ISSUES

There are three aeromedical issues at the core of this case. The first is the pain and stiffness in the lower back due to ankylosing spondylitis. The FAA *Guide to Aviation Medical Examiners* notes that ankylosis or other deformity of the spinal column must not interfere with the performance of airman duties (1). This is a rather broad statement, and the AME must consider not only potential distraction due to pain, but also whether the airman possesses sufficient agility to manipulate controls or address an in-flight emergency. The design of the flight deck plays an important role, and the manipulation of overhead flight controls or breakers in a commercial airliner may require more mobility than in a small general aviation aircraft.

The second concern is the anterior uveitis (iritis) since an acute flare may

HLA B27 Background Information

HLA B27 is a surface antigen which presents microbial antigens to T-cells, with roughly 1.4-8% of the general population positive for HLA-B27 antigen. Men are affected more than women by a ratio about of 3:1, and it is more common in North Americans and Scandinavians. It is associated with several systemic conditions, most notably in nearly 90% of patients with ankylosing spondylitis and in 50% of those with anterior uveitis (2).

The classic ankylosing spondylitis patient is an 18-30 year old male who develops pain and stiffness in the lower back, which improves with exercise but worsens with rest. However, because ankylosing spondylitis is insidious and may take years to manifest, the presenting complaint may be an acutely swollen and painful major joint such as the knee. Ocular inflammation is common among ankylosing spondylitis patients and 25% may develop uveitis (2).

Uveitis is an inflammation of the uveal tract, which most commonly presents as anterior uveitis, an inflammation of the iris (iritis) or anterior part of the ciliary body (cyclitis). Anterior uveitis is the most common type, afflicting approximately 8/100,000 people annually, followed by intermediate uveitis (pars planitis), in which the anterior vitreous and vitreous base are inflamed (6). Although 50% of anterior uveitis cases are idiopathic in nature, it may be also caused by trauma, intraocular tumors, medications, herpes, or be lens-induced. Posterior uveitis, in which the retina and/or choroid layers are affected, is the least common and is usually caused by an infectious agent.

Continued →

present with significant pain, as well as degraded vision. Of significance, roughly half of all patients with anterior uveitis test positive for HLA-B27, and the uveitis tends to recur more in this population than in those lacking the antigen (2). Steroids are the mainstay of treatment for anterior uveitis, and cycloplegics may be used for patient comfort. It generally responds well to treatment, but recurrences are common, so any underlying diseases that may have triggered the event must be treated to establish long-term control, but treatment of the underlying condition will not resolve the iritis unless it is infectious in nature. Non-steroidal anti-inflammatories, systemic steroids, or immune modulators are often used to control an underlying immune disease, if one is present, but may also be used if topical therapy is insufficient (2).

Finally, the medications, both acute and chronic, must be taken into consideration. During the acute phase of reactive arthritis, a course of high-dose systemic steroids is often necessary, but a 20-mg dose of prednisone (or its equivalent) is not compatible with FAA aviation duties (1). However, if the dose is lowered and the applicant still shows good control of symptoms with no side effects, the applicant may be granted a special issuance, despite chronic steroid use. Enbrel (etanercept), a non-steroidal, monoclonal antibody injection that does not carry the same side effect profile as steroids do, is an alternative to chronic steroid use and may also be granted special issuance if the airman has no side effects (3,4).

In a case like this, the AME must remember to address all three of these aeromedical concerns. The *AME Guide* outlines specific examinations to evaluate an airman's musculoskeletal system, including documentation of "degree of impairment as measured by strength,

range of motion, pain" (sic)(1). While AMEs or primary physicians could perform such testing in their office, it is worth considering a physical therapy functional evaluation in more difficult cases. Providing the FAA with a quantifiable range of motion and muscle strength testing from a functional evaluation will improve the airman's chances of obtaining a special issuance in complex conditions. Anterior uveitis must be considered not only in the acute phase but also the potential development of long-term complications. Uveitis may cause a formation of anterior or posterior synechiae, which block the flow of aqueous humor and can lead to increased intraocular pressure and secondary glaucoma, so airmen may be required to submit intraocular pressure examinations as part of their special issuance or subsequent examinations (2,5). A thorough slit lamp examination from an optometrist or ophthalmologist should be included in the initial evaluation, in addition to visual acuity testing. Finally, side effects of medication and the ability to self-administer injections should be addressed in the special issuance request. These tests are not specifically required in the *AME Guide*, but preemptively addressing potential concerns will smooth the path for a special issuance.

CASE OUTCOME

Because of the airman's history of spinal disease, as well as visual problems, his AME requested a thorough ophthalmologic evaluation, along with a functional assessment of his lower back. The airman was referred to a physical therapist, who noted excellent muscle tone with only slightly decreased mobility in the lumbar region and no other significant findings. The ophthalmologist noted his vision to be 20/20 with

a quiet anterior chamber and normal intraocular pressure. Slit lamp examination showed a clear anterior chamber with no cells or flare in either eye. His lenses were clear, with pigmentation of the anterior capsule and no current synechiae. He showed a normal foveal reflex with clear vitreous with no cells. There were no side effects from his weekly Enbrel injections, and his case was presented to the FAA for special issuance of a first-class certificate. Based on the results of his functional evaluation and the low likelihood of recurrence of his visual symptoms, the airman was given a special issuance, with caveat to undergo annual glaucoma screening.

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ABOUT THE AUTHOR

LtCol Todd Huhm, DO, MPH, is a USAF flight surgeon who is board certified in family medicine and aerospace medicine. He is a graduate of the USAF School of Aerospace Medicine in San Antonio, Texas. He wrote this report while rotating at the FAA's Civil Aerospace Medicine Institute.



Monocular Vision as a Result of Traumatic Optic Neuropathy

Case Report, by Arthur B. Cajigal, DO, MPH

Traumatic optic neuropathy (TON) is an injury to the optic nerve resulting in partial or complete visual loss.^{1,2} The prognosis is poor for patients with no light perception, concomitant orbital fractures, and penetrating trauma.³ Steroids and optic nerve decompression have been advocated for management of TON, but the standard of care is still being debated.^{1, 2,4,5} This case report discusses the experience, aeromedical concerns, and disposition of an airman who suffered complete loss of vision in his right eye from indirect TON.

History

A 41-YEAR-OLD male presents to his aviation medical examiner requesting a first-class medical certificate after suffering blunt facial trauma causing indirect injury to his right optic nerve with loss of all useful vision in his right eye.

Five months prior, the airman received a severe injury to his eye in a back-yard accident at his home. Fortunately, there was no direct contact with the airman's right eye.

He was taken by air ambulance to a large academic medical center for care. Upon arrival, the airman stated that he was able to see only movement and light with his right eye. Examination of his right eye revealed the following: non-reactive pupil, hyphema in the lateral aspect, and a laceration below the eye that extended upward to the right lid at the medial aspect. Initial computed tomography (CT) showed a small amount of subarachnoid hemorrhage in the anterior hemispheric fissure, right lamina papyracea fracture, and thickening of the posterior right globe with a small focus of air. The globe appeared intact. Neurosurgeons and ophthalmologists were consulted to further evaluate the airman.

The airman was taken to the operating room later that evening for right inferior and superior canalicular laceration repair with silicone tube intubation, repair of multiple lacerations around

his right eye, and right globe exploration (no open globe was found). He was placed on high-dose oral steroids tapered over 20 days.

Approximately 10 days after this incident, he had a follow-up evaluation by an ophthalmologist. His visual acuity at that time was minimal light perception in the right eye and 20/15 in the left eye. He also had a right afferent pupillary defect. Dilated funduscopic exam showed some intraretinal and subretinal hemorrhage at the temporal aspect of the optic nerve and extensive subretinal hemorrhage in the macular area. In addition, there was some mild dispersed vitreous hemorrhage. A magnetic resonance imaging of the orbit showed subtle enhancement of the right optic nerve near the insertion on the globe, which reflected hyperemia from partial injury. No frank optic nerve avulsion or loss of volume was seen.

An ophthalmologist continued to follow the airman monthly until he presented for his medical certificate. There was no change in his visual acuity.

Aeromedical Concerns

The general medical standards for medical certification annotated in Title 14 of the Code of Federal Regulations (CFR) Parts 67.113, 67.213, and 67.313 include no functional or structural disease, defect, or limitation that makes the applicant unable to safely perform the duties or exercise the privileges of an airman.

Concerns with an airman who has useful vision in only one eye include loss of stereopsis, decreased peripheral vision, and loss of vision in the remaining eye.¹¹ Binocular and monocular cues allow for depth perception. Stereopsis is the most important but only one of three binocular cues.¹² In most flying situations, stereopsis is not necessary since the distance at which it is useful is only up to 200 meters.¹² Adapted monocular pilots use other visual cues successfully to perceive depth. As for decreased peripheral vision, many monocular pilots compensate with experience and improved scanning techniques.^{13,14} Finally, it is important to ensure the residual eye meets visual acuity standards and is free from pathology that can cause sudden loss of vision in flight.

Sympathetic ophthalmia is a uveitis of both eyes that occurs following trauma to one eye. It occurs in less than 1% of cases involving traumatic injury to an eye or intraocular surgery. The panuveitis generally occurs two weeks to two months after the injury but has occurred as late as 60-plus years following the incident.¹⁵ This is not a significant concern with this airman because the right globe was not perforated and, presumably, uveal tissue was not injured.

Since the monocular condition is acquired, the airman will require a six-month recovery and adaptation period. In addition, his remaining eye must meet visual acuity standards for the class of certificate desired. Finally, a medical flight test (MFT) for a Statement of Demonstrated Ability (SODA) is required for medical certification.

Outcome

This airman sought a first-class medical certificate five months after the incident. Distant and near visual acuities were 20/15 and 20/60, respectively, in his left eye. The airman had no vision in his right eye (no light perception at this point), and any degree of improvement was unlikely. He was otherwise physically qualified.

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TRAUMATIC OPTIC NEUROPATHY (TON)

Traumatic optic neuropathy is an acute, traumatic injury to the optic nerve causing partial or complete loss of vision. The force can be transmitted indirectly (through facial bones or motion of the globe) or directly (penetrating) on the optic nerve.^{1,2} The pathophysiology of TON is multifactorial. In indirect TON, optic nerve fibers and/or its vascular supply are disrupted by shearing forces. In addition, the optic nerve can swell after the injury, causing compression, which further worsens ischemia.^{1,6} Fractured facial bones can lead to compression or laceration of the optic nerve.⁶

TON is a clinical diagnosis.¹ The patient must have a history of trauma. Visual acuity in the affected eye is typically 20/400 or worse. In some instances, visual acuity will need to be recorded in terms of hand motion perception, light perception, or no light perception.⁷ There must be an afferent pupillary defect seen on pupil examination (swinging flashlight test) to diagnose TON.^{1,7} On fundoscopic examination, the optic nerve can appear normal at initial presentation but can show diffuse pallor indicating atrophy 3–4 weeks after the trauma. There may be blood seen in the posterior vitreous body. A CT scan can reveal optic nerve sheath hematoma, optic canal fractures, subperiosteal hematoma, and orbital emphysema.^{1,7}

High-dose corticosteroids and surgical decompression of the optic canal, alone or in combination, have been used for the treatment of TON.^{1,2,4-6,8,9} The rationale for using high doses of corticosteroids was borne from studies and clinical practice in the management of brain and spinal cord injuries.^{1,2} However, studies have shown that high-dose corticosteroids provide no benefit to the treatment of TON and can cause harm to the optic nerve.⁹ Surgical intervention can be used to decompress the optic nerve at the site of injury and reduce the ensuing vascular compromise that can occur.⁷ However, there is no conclusive evidence that surgical decompression is beneficial for most patients.⁷ There is no treatment for an optic nerve that has been completely transected or avulsed.⁵

Up to half of patients with TON can have improvement in visual acuity, regardless of whether they were treated, but improvement is not significant.⁷ TON from penetrating trauma, presence of no light perception at initial presentation, orbital fracture, loss of consciousness, age over 40 years, and absence of visual improvement after two days of corticosteroid treatment are variables associated with poor prognosis.^{3,10}

The airman was given a First-Class Medical Certificate Valid for Student Pilot Purposes Only, so he could continue with his flight training during the six-month recovery and adaptation period. He underwent a medical flight test in accordance with FAA Order 8900.1, Volume 5, Chapter 8, Section 5-1526, paragraph E4, nine months after the incident. The airman's performance on the MFT was satisfactory, and he was subsequently given a SODA with a limitation that he must have corrective lenses available for near vision.

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About the Author

LTC Arthur B. Cajigal, DO, MPH, is board-certified in General Preventive Medicine and Public Health and serves on active duty in the U.S. Army. He is currently an Aerospace Medicine resident at Naval Air Station Pensacola, Fla. This report was written while rotating at the FAA's Civil Aerospace Medical Institute. Contact: Arthur.Cajigal@med.navy.mil; Arthur.Cajigal@us.army.mil



Airmen With Prolonged QT Interval

Case Report, by Jonathan Strobel, DO, MPH

A prolonged QT interval is a common finding on EKG that an aviation medical examiner can encounter during a medical exam, especially when reviewing an EKG on a first-class airman, which can lead to a diagnosis of long QT syndrome (LQTS). Long QT syndrome affects an estimated 1 in 2,500 people, and its presentation can vary from asymptomatic to sudden death (4). It is up to the aviation medical examiner to determine if a prolonged QT interval is due to a primary congenital syndrome or acquired secondarily from a wide variety of causes (9). This case report focuses on the physiology, medical work-up, aeromedical concerns, and treatment options available for airmen diagnosed with LQTS.

Introduction

LONG QT SYNDROME (LQTS) is a rare genetic ion channel disorder that causes a delayed repolarization of the heart and is associated with an increase risk of incapacitating events. These events include syncope, polymorphic ventricular tachycardia, and sudden death, despite a normal cardiac morphology. Incapacitating episodes may be provoked by a variety of stimuli, depending on the genetic subtype. Currently, there are hundreds of mutations that have been identified in 10 genes that are linked to LQTS (8). The diagnosis of LQTS is difficult to make, since 2.5% of the population have a prolonged QT interval, and 10-15% of the LQTS patients have a normal QT interval (6). Aeromedical concerns are related to the possibility of sudden incapacitation and death without prodrome.

Case Presentation

A 40-year-old private pilot presented to his aviation medical examiner for first-class medical recertification. During his age 40 medical evaluation, an EKG was performed as part of his airman medical certificate application and showed sinus rhythm at 56 beats per minute, a normal axis, and a prolonged QT interval of 472 with a QTc of 456. Prior to this evaluation, the airman had enjoyed a life of significant athleticism—he had been an avid cyclist, runner, and swimmer for many years. His medical history was unremarkable, except for uncomplicated photorefractive keratectomy for myopia at the age of 29. A review of systems reveals that he enjoyed excellent endurance without history of chest pain, dyspnea on exertion, orthopnea, stroke, or syncope. He denied family history of sudden cardiac death and was not taking any medications or supplementations. Social history reveals that he has never been

LQTS PATHOPHYSIOLOGY

Long QT syndrome is a genetic potassium ion channel disorder that causes an abnormal repolarization of heart myocytes. The disorder causes differences in refractory periods that lead to a lethal re-entrant arrhythmia (torsade de pointes), which is associated with an increase risk of incapacitating events and sudden cardiac death. Suspected cases usually present in asymptomatic airmen with a prolonged QTc interval upon medical evaluation (QTc >440 ms in males and > 460 ms in females by Bazett formula). The identification of a prolonged QT interval that has been corrected for heart rate (QTc) in an airman should be evaluated further for possible incapacitating events and the diagnosis of long QT syndrome (1). However, caution must be taken by the AME when evaluating the QT interval, as measurements can vary. U-waves are a normal variant in young people and should not be included in interval measurement because including a U-wave can overestimate the QTc by 80-200 ms and lead to misdiagnosis of LQTS (4). Diagnostic workup for patients with suspected LQTS include an EKG, a 24-hour Holter monitor, an exercise stress test, an echocardiogram, a cardiovascular evaluation of first-degree relatives, and possible genetic testing in consenting individuals (1). The risk of an airman with LQTS having an incapacitating event can be predicted from their genetic mutation type, gender, and QTc (2). Management strategies for LQTS include two treatment options: arrhythmia prevention and arrhythmia termination. Arrhythmia preventions are lifestyle changes, medications (beta-blockers), and left cardiac sympathetic denervation surgery. Arrhythmia termination management is through the utilization of an implantable cardioverter-defibrillator.

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a smoker, did not consume alcohol to excess, and did not use illicit drugs. The remainder of the medical evaluation was unremarkable.

Aeromedical Concerns

Although risk of LQTS can be mitigated through the use of pharmaceutical agents like beta-blockers or an implantable defibrillator when pharmaceutical agents fail, the underlying medical condition continues to pose an ominous threat of sudden incapacitation. Low-risk LQTS patients, with a prolonged QT EKG but no personal or family history, have an annual event rate of 0.5% for syncope or sudden cardiac death. This is in contrast to high-risk LQTS patients, with a prolonged QT interval and positive personal or family history, who have approximately a 5% annual event rate (9). Even though QTc intervals of >440 ms in males and >460 ms are frequently utilized as cut-off points for prolonged QT syndrome, these upper limits continue to be a topic of much debate. An increasing number of asymptomatic individuals, that are genetically positive for LQTS, demonstrate normal QTc on resting EKG by Bazett's formula (10). Additionally, it has been demonstrated that the current QTc upper limits of 440 ms/460 ms are present in greater than 25% of normal individuals and are not meaningful cut-off values (10). It is also important to emphasize that the Bazett formula is clinically useful at normal heart

rates but begins to underestimate and overestimate the cardiac repolarization duration at extreme rates (4). Aeromedical disposition must take into consideration the potential for incapacitating arrhythmic events, the medical class the airman is requesting, and the type of intervention that is being utilized. If prolonged QT intervals are found on EKG during routine exam with no prior events and a negative family history, an airman may be considered for restricted flying duties. (9).

CASE OUTCOME

After initial presentation, this 40-year-old airman underwent significant cardiovascular evaluation to determine if he had LQTS. A thorough personal and family history—including history of medication use, endocrine disorders, substance use, and sudden death—failed to identify any causative factors for the prolonged QT interval. The airman was also subjected to both an echocardiogram, which demonstrated normal heart function, and a 24-hour Holter monitor, which did not record any electrical abnormalities. Expensive genetic testing was not required, because the cardiovascular evaluation failed to identify the diagnosis of LQTS. Therefore, the airman was recertified with a first-class medical certificate.

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About the Author

CPT Jonathan M. Strobel, DO, MPH, is a board-certified aerospace medicine specialist serving on active duty in the U.S. Army with the 4-101st Airborne Division at Fort Campbell, Ky. He was an Aerospace Medicine resident at the Naval Aviation Medical Institute in Pensacola, Florida. Dr. Strobel wrote this report while rotating at the FAA's Civil Aerospace Medicine Institute.

