



Federal Air Surgeon's Medical Bulletin

Aviation Safety Through Aerospace Medicine

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2012-1

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

Moving Away From Paper

HAPPY NEW YEAR, EVERYONE, I hope that 2012 is a great year for you.

I am pleased to announce that the Office of Aerospace Medicine is taking a big step toward becoming paperless. Effective October 1, 2012, pilots must use FAA MedXPress to complete an electronic application for an Airman Medical Certificate or Airman Medical and Student Pilot Certificate, FAA Form 8500-8.

When I originally announced MedXPress back in the spring of 2007, I explained that it was our intention to eventually make the entire process paperless, but we wanted to offer a transition time to give pilots the opportunity to get accustomed to automating the process.

While MedXPress has proven to be an excellent tool, we need to significantly increase its use. Beginning October 1, everyone will be required to use the MedXPress system.



While some individuals will say, "The paper system works just fine, and I do not wish to change," it is important to understand why this change is so important for all of us.

In short, the paper system allows for too many errors, leads to storage problems and creates security risks. The paper form was the only way for pilots to provide us with their history in the "non-electronic" age, but it was far from perfect. Poor handwriting, spelling errors, and items left blank gave us incomplete records and massive storage and retrieval issues. We corrected some of these problems when we introduced our first electronic system in 1992, but that system was voluntary for AMEs who were designated before its introduction, and we still had to contend with large amounts of paper records.

Our next step toward "paperless" took place in 1999 when we introduced the Document, Imaging, and Workflow System (DIWS), and the Aerospace Medical Certification Subsystem (AMCS). These two systems virtually eliminated our problems with storage and poor penmanship, but we still had to contend with the other problems associated with the paper 8500-8. The AMEs still had to deal with the handwriting and spelling problems and had to dedicate resources to transfer the histories from paper to electronic form.

In this era of belt-tightening, the paper 8500-8 also costs more than \$150,000 a year to print, store, distribute, and mail. On occasion, the paper forms have been lost in the mail, and we are concerned that this poses unnecessary risks that the documents could be used inappropriately.

This list just scratches the surface of our challenges with the paper 8500-8. We are confident that MedXPress eliminates all of these issues and also allows us to enhance the certification process. We cannot make these changes if we are still using a paper system.

We need your help.

One of the planned enhancements would establish a tracking program so that pilots and AMEs can query the system and electronically determine the status of applications. We also want to make the process easier on applicants by developing a feature that automatically transfers information that does not change so that the applicant is not required to re-enter information at subsequent examinations. We can only make these changes and other important enhancements if we move to an electronic system.

As many of you know, the Federal Government is taking steps across the board to become more efficient and reduce costs, and our move to electronic records is consistent with those initiatives. They include the "Government Paperwork Elimination Act" of 1998, and Executive Order 13589, "Promoting Efficient Spending," which President Obama signed last November.

I hope I have convinced you that this is the time to take the critical next step toward electronic records. It markedly reduces or eliminates most of the problems associated with a paper system,

Continued on page 2

CONTENTS

- 2 INAUGURATING YEAR 52 OF NEWSLETTER PUBLISHING
- 3 A NEW HORIZON
- 4 'DOCTOR SUPERMAN' RETIRES
- 5 CERTIFICATION POSITION OPEN
- 6 COLOR VISION TESTING FOR PILOTS
- 8 CERTIFICATION OF AIRMEN WITH BREAST CANCER
- 10 IDIOPATHIC SYNCOPAL EPISODES
- 12 PERSISTENT ESOPHORIA FOLLOWING GUILLAIN-BARRÉ SYNDROME
- 14 AEROSPACE MEDICAL EDUCATION NEWS
- 15 AME SEMINAR SCHEDULE
- 16 INDEX OF ARTICLES PUBLISHED IN THE BULLETIN DURING 2011

MedXPress from page 1

it reduces costs, and I believe many pilots will find it easier to submit their applications.

In addition to this editorial, we will be announcing this initiative in the Federal Register, at AME seminars, through pilot advocacy organizations, in April at EAA Sun n'Fun, in July at AirVenture, and pilot safety meetings.

Our plan is to also transition air traffic control specialists (ATCSs) to MedXPress in the future, after internal FAA coordination and some modifications to the ATCS certification system.

Thanks for "listening," and thanks again for all you do for the FAA and our airmen.

—Fred

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Secretary of Transportation
Ray LaHood

FAA Administrator (Acting)
Michael Huerta
Federal Air Surgeon
Fred Tilton, MD

Editor
Michael E. Wayda

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

Inaugurating Year 52 of Newsletter Publishing

Name Changed but Mission Remains the Same

THE GRANDPARENT OF the *Federal Air Surgeon's Medical Bulletin* was first given life by the Bureau of Aviation Medicine in April 1960, but the newborn newsletter was christened the *Medical Newsletter* (see reproduction below).

The Federal Air Surgeon was then known as the *Civil Air Surgeon* (Dr. James L. Goddard at the time); "FAA" stood for *Federal Aviation Agency*, and the "Bureau" eventually became the *Office of Aerospace Medicine*. Physicians designated as pilot medical examiners were then called *aviation medical examiners*—oddly enough, the title as appropriate today as it was in 1960.

In 1960, the stated purpose of the newsletter was to "bring to your attention any medical news of interest pertinent to the well-being and safety of airmen and the public" and was intended "to keep you informed of progress made in this

field, our plans for the future, and any problems that may arise."

Initially, the plan was to publish the newsletter monthly, but this optimistic scheme was soon discontinued and was replaced by the current, more realistic quarterly timetable.

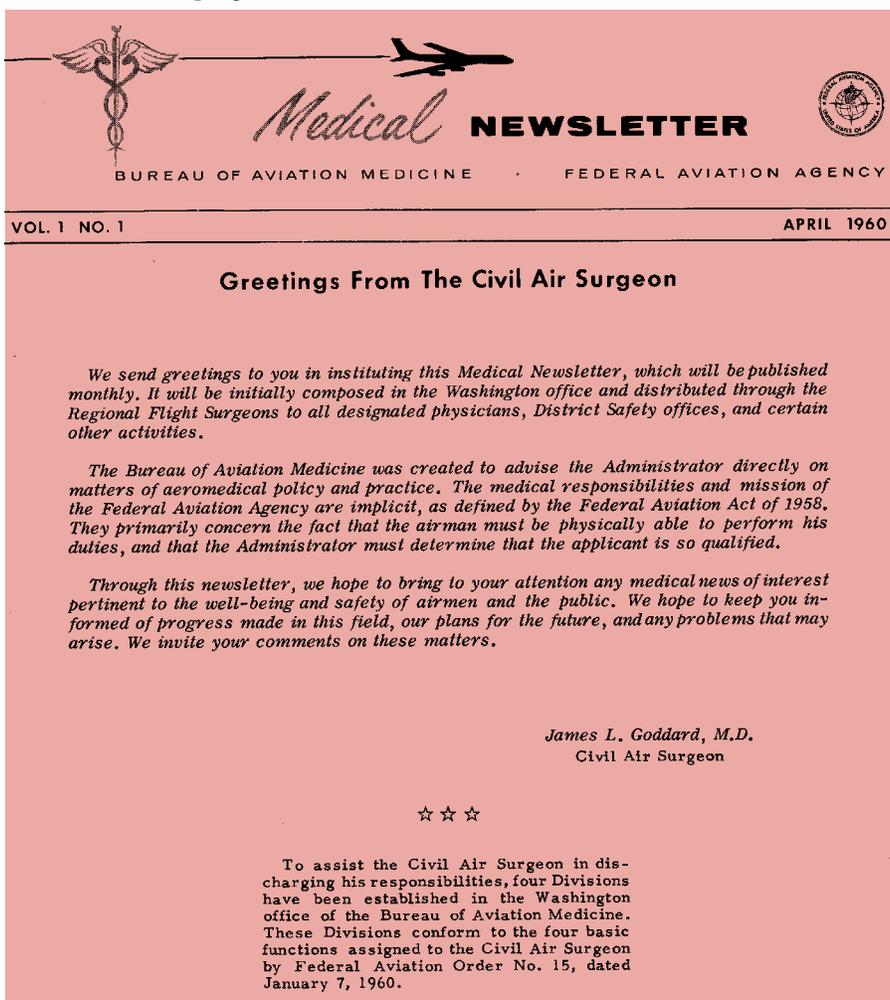
Thus the newsletter celebrates its fifty-second year, with the same mission in life—to proclaim news of interest pertinent to the well-being and safety of airmen and the public.

As Dr. Goddard said in 1960, "We invite your comments on these matters," so please send them (no cards and letters, please) via e-mail to:

Mike.Wayda@faa.gov

Look for an e-mail message on April 30, 2012, announcing the delivery of your next online edition of the *Federal Air Surgeon's Medical Bulletin*.

—Ed.



A New Horizon

Saying "Good-Bye" Isn't Easy

By Warren S. Silberman, DO, MPH



I WASN'T GOING to do this, write another article, but Mike Wayda, the wonderful editor of this fine educational *Bulletin*, asked me last week to do one more! When I first came to CAMI back in June 1997, I made a promise to myself that I would write an article in EVERY *Federal Air Surgeon's Medical Bulletin* that comes out.

Well, I know that I have kept that promise to myself. I saw that there was a paucity of information for the aviation medical examiner to provide a better examination and a waiver packet to the Aerospace Medical Certification Division (AMCD). I am going to spend these last words as the Manager of the AMCD telling you some things about the future and reminding you all what you should be doing to better serve your airmen when you perform an exam.

The fine people at Northrop Grumman who have built the new electronic medical records system have spent almost the last two years converting our system from being server-based to Internet-based. That is the best thing, they tell us. It is supposed to be completed by April 2012. Knowing these folks as well as I do, it will be completed just as they said. It should be relatively transparent to you all, but they say after it is completed the system will be more reliable. Well, we'll see. After that, they can resume working on the projects that they placed on hold. One of them being a new way for the AMCD examiners to maintain notes on each airman's case. It will be along the disease/problem-oriented model.

As for the future, I have had some thoughts about ways to improve capabilities for you all. We need to be able to allow your airmen and the office staff to view the status of a case and perhaps the authorization for special issuance process. The developers originally told me that having the Document Imaging and Workflow System broadcast capability (where we send out e-mail messages for you to read when you log into AMCS) would set the stage to allow this to occur.

I expect that the airmen may be encouraged (politically correct term for forced) to use MedXPress. For those of you that do not keep up, this is the ability for an airman to go into the system and complete the front side of the Form 8500-8 online, prior to visiting the AME.

I would also like for you all to have the capability to scan documents that the airman provides you and for these documents to go directly into the airman's central file. We would then be alerted that something new has arrived and review the information.

We had begun the process of developing the capability to have the system reject for review only the medications that we know to be unacceptable. This was also placed in a holding pattern pending the system conversion. When they resume the work on this, they should also provide the capability for the system to warn you that a particular medication that is written in Block 17a. is unacceptable.

There is one thing that the FAA cannot do—and that is legislate how to better perform your function as an AME. We here have always said that this whole process would not work if it weren't for you all. That is a fact. But, if you all take the time to do a great exam for us and advocate for your airman, you would speed the process up tremendously. All the articles that I have written were so that you could learn from other's mistakes and have the information freely available to do a good job.

If I had to list the Top Ten things that an AME could do to help their airmen and the FAA speed the certification process, I would say this (I can probably think of more than ten, but this sounded good!):

1. Go over each question in the completed exam and make sure that you have provided us with all the information we need. The "yes" responses should be fully answered.
2. If you receive the Validation Warning when you are ready to submit, don't just issue, call us or your Regional Flight Surgeon to find out what the airman has done to cause this.
3. When a new medication comes out, just don't assume that we will accept it. I think I have given you all enough background information to know what might be acceptable or not. Call someone to check. Don't just ass-u-me!
4. Those of you who are Senior AMEs, please interpret those first-class electrocardiograms! If the ECG is abnormal, have the airman get a workup. See the most recent *Bulletin* ["Electrocardiogram Problems," FASMB Vol. 49, No. 4, p. 4] for my exhortations on that topic.
5. Read the Online Guide for Aviation Medical Examiners at least every couple of months. Read this *Bulletin*, as well!
6. Attend the mandatory training sessions each six years. Go more often if you can.
7. Advocate for your airmen! This doesn't mean to tell them not to place certain information on an exam because it is disqualifying.
8. Help your airmen get their examinations, required tests, and medical records together to provide a complete waiver packet.
9. Attend aviation fly-ins, safety seminars, the AOPA's Summit, EAA's Sun n' Fun and AirVenture Oshkosh. *Why did you get into this business?* I hope it is, partially, because you have a love for flying and the people who work in this industry, hobby, passion.

Dr. Silberman retired as manager of the FAA Aerospace Medical Certification Division on December 30, 2011, after a distinguished Federal Aviation Administration career that spanned 13½ years. An aviation enthusiast, private pilot, and communicator with numerous articles published in aviation magazines, this article is the 68th that he has contributed to this newsletter. Dr. Silberman starts a new career as an aviation medical practitioner in Tulsa, Okla., and no doubt will continue to advocate for airmen and aviation safety. —Ed.

10. If you have a question about something, call or e-mail the AMCD or your Regional Medical Office. They will get back to you.

Finally, I thank the many hard-working people who toiled with me in Certification. My salute to Chief **Steve Smiley**, Manager of Review and Appeals, his supervisors, and QA folks; **John Simmons**, Manager of the Medical Systems Branch, who started with me back in '97 and went through the aggravation of getting the electronic medical records system up and running; **Courtney Scott**, DO, MPH, the new Manger of the Medical Review Officers and soon to be Acting AMCD Manager; **David Nelms**, one of the most hard-working, most computer-savvy, most co-operative, and one of the nicest people I have ever met in the U.S. government; CAMI Director **Melchor Antuñano**, MD, MS; and his Deputy **Robert Johnson**, MD, MPH, who have been my friends and advocates since the beginning; all the Regional Flight Surgeons, my associates and friends; my great Secretary **Kathy Crosby**; my Administrative Officer and prior Secretary, **Diana Lozada**, who has also helped me stay out of Leavenworth; my Congressional Liaison, **Leslie Downey**; and all the special headquarters people in Washington, D.C.: Federal Air Surgeon **Fred Tilton**, MD; his deputy, **James Fraser**, MD; Manager of the Medical Specialties Division **Mike Berry**, MD, my great friend and associate; and the Manager of Medical Standards and Policy Branch **Arleen Saenger**, MD, MPH. Oh, I would be remiss not to mention my Commander (my wife), **Yvonne Silberman** and our daughters **Carly** and **Jenna**!

It has been a joy getting to meet you all, and I shall see you at the AME seminars because I am not "retiring." I am just going to do something else! My best wishes and love to you all!

Have fun, and take care of yourselves.



CAMI Director Melchor Antuñano, MD, speaks at ceremony honoring career of Dr. Silberman, shown with wife Yvette. Dr. Courtney Scott, Acting AMCD Manager (left) presides.

Certification Manager Retires

By Melchor J. Antuñano, M.D., M.S.

ON BEHALF OF our FAA Civil Aerospace Medical Institute (CAMI) team, it gives me great pleasure to express our heartfelt appreciation to Dr. Warren Silberman for his 14 years of dedicated service in support of the civil aviation pilot community.

Dr. Silberman's dedication, commitment, and passion to support the aeromedical certification needs of pilots and "keep them flying" has been exemplary.

In addition to fulfilling his administrative responsibilities as manager of the Aerospace Medical Certification Division (AMCD), Dr. Silberman directly contributed to the division's productivity by personally processing an average of 3,000 applications for airman medical certificates annually. All of these applications involved pilots with a variety of complex medical conditions that required special medical issuances (waivers).

Dr. Silberman supported numerous requests submitted by chief medical

officers from civil aviation authorities around the world to provide his expert advice on aeromedical safety criteria to grant medical waivers to foreign airmen with pathology. He contributed to the Office of Aerospace Medicine's goal to "Support foreign requests for assistance in civil aviation medicine and aviation human factors, which help promote aviation safety by discussing FAA medical standards, policies, and procedures with professionals in foreign countries who are involved in the organization and development of their own civil aviation programs."

Dr. Silberman promoted flexibility in the airman medical certification process through the practical application of scientific advances in medical knowledge, therapy, and rehabilitation.

His most significant accomplishments during his FAA career involved his leadership and team approach in the design, development and implementation of organizational and infrastructure changes to improve the

Continued →

effectiveness and efficiency of the airmen medical certification program. Some of these accomplishments included: 1) The Aerospace Medical Certification System and Digital Imaging Workflow System (AMCS & DIWS), 2) Aviation Medical Examiner Assisted Authorization for Special Issuance Process, 3) MedXPress System, 4) monthly medical certification teleconferences, and 5) and the AMCD re-organization .

Dr. Silberman's interest in supporting post-graduate training of the next generation of aerospace medicine specialists has been exceptional. He was a very active and enthusiastic instructor at FAA aviation medical examiner seminars, and personally taught airman medical certification to *all* residents in aerospace medicine (RAMs) from the USAF (since July 2003) and the U.S. Navy and Army (since July 2005). He also instructed RAMs from Wright State University School of Medicine, the University of Texas Medical Branch, and the National University of Colombia School of Medicine. In addition, he personally instructed many medical officers (flight surgeons, aviation medical examiners, aeromedical consultants) from foreign governments, including Brazil, Chile, China, Colombia, Ecuador, Egypt, France, Iraq, Israel, Mexico, Panama, Turkey, the UK, and others during their participation in post-graduate training rotations at CAMI.

He was a regular guest speaker at annual conferences and meetings organized by aviation organizations, including the Airline Pilots Association, Experimental Aircraft Association, Aircraft Operators and Pilots Association, National Agricultural Aviation Association, and the National Warbirds Association. He was also a guest speaker representing the FAA at international scientific events in aerospace medicine in foreign countries, including Brazil, Canada, China, Germany, Macau, Mexico, Portugal, and The Netherlands.

Dr. Silberman's achievements in aerospace medicine are exemplified by the professional awards and



Federal Air Surgeon Fred Tilton, MD, speaks at the retirement event for Dr. Silberman. Numerous others praised his work supporting aviation safety.

recognitions he received, including the Civil Aviation Medical Association President's Commendation (2002), the FAA Office of Aerospace Medicine Flight Surgeon of the Year Award (2003 & 2007), USAF Residency in Aerospace Medicine Field Instructor of the Year (2005, 2006, & 2007), Airline Pilots Association President's Commendation (2004), Aerospace Medical Association's Boothby-Edwards Award (2009), and the Aerospace Medical Association's Theodore C. Lyster Award (2010).

His honesty, straightforwardness, trustworthiness, professionalism, experience, commitment to teamwork, caring attitude, and mentorship abilities have been great assets in support of CAMI, the FAA, and the civil aviation community.

I take this opportunity to express my personal appreciation to Dr. Silberman for his commitment to professional excellence, making him a great colleague to supervise; his loyalty to CAMI and willingness to fully accept and embrace delegated authority made him an exemplary advocate for the Certification Division and CAMI.

His easy-going personality and attitude at work made it easy for us to discuss and resolve challenging issues over the years. Throughout his entire professional career, Dr. Silberman has always kept all his focus and energy directed towards aviation safety and "in support of the flyer." I will miss him!

We, the entire CAMI team, wish him the very best as he moves on to explore other interests during his retirement.

Dr. Antuñano is the Director of the FAA Civil Aerospace Medical Institute



FAA EMPLOYMENT OPPORTUNITY

Aerospace Medical Certification Manager Position Open

Outstanding applicants are now being sought to fill the lead management position of the FAA Office of Aerospace Medicine's Aerospace Medical Certification Division, located in the Civil Aerospace Medical Institute in Oklahoma City, Okla.

Major responsibilities include:

- Serves as the chief aerospace medicine certification advisor to the Federal Air Surgeon, the Civil Aerospace Medical Institute Director, and Regional Flight Surgeons.
- Manages a professional, technical, and clerical staff of 88 in the centralized system that processes, reviews, evaluates, and stores about 430,000 new applications for medical certificates each year from nearly 600,000 active airmen.
- Analyzes medical and aircraft incident/accident records to determine the effectiveness of current medical certification standards and examinations.

Minimum qualifications:

Office of Personnel Management Individual Occupational Requirements for Medical Officer, 602 series. Must possess Doctor of Medicine or Doctor of Osteopathy degree from a school in the United States or Canada approved by a recognized body in the year of the applicant's graduation.

Salary Range: \$141,444 - \$179,700

For more information, call Wanda Witten at (405) 954-3969 or email to wanda.witten@faa.gov

How to apply: To receive consideration, you must apply online at: <http://www.usajobs.gov/Get-Job/ViewDetails/306079500>

Deadline: Your application must have a status of "Submitted" by 11:59 p.m. Central Time on Feb. 16, 2012.

Color Vision Testing for Pilots

Explaining Ophthalmology for Non-Ophthalmologists

By Richard E. Carlson, MD, MSS

For about 40 years, I have taught “Ophthalmology for the Aviation Medical Examiner.” The standards set forth in the Federal Aviation Regulations (FAR) being met, we issue the appropriate certificate; if not we either defer, or ideally, call the Regional Flight Surgeon (RFS) or the Civil Aerospace Medical Institute (CAMI) for possible phone permission to issue. My challenge has been to explain ophthalmology to non-ophthalmologists in physician’s language.

COLOR VISION HAS become a complicated issue. The FAR requires “the ability to perceive those colors necessary for the performance of airman duties.” I do not like the term color *blind*. I prefer color *deficient*. The problem is genetic and lies on the Y chromosome and is found in some 8% of males.

There are degrees of deficiency. The FAR is somewhat ambiguous or has been until a few years ago. As AMEs, we are tasked with screening airmen for color deficiency. The *Guide for Aviation Medical Examiners* specifically spells out which examination equipment is and is not permitted. It also spells out allowable error rates for this equipment, which may differ from the manufacturer’s specs. Use those in the online Guide: www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/app_process/exam_tech/item52/amd/

All of the FAA-approved equipment has equal standing, and if an applicant passes any of the tests, we are allowed to issue the appropriate certificate. There have been examples of airmen being able to pass by taking another approved test after failing an AME-administered test. This recently was reported with an airman successfully passing the Farnsworth lantern after failing color plates. Should he fail on your equipment, he is free to try any other approved equipment, and should he pass, you should obtain written documentation and issue the certificate. Should he fail your test and not desire to seek further AME testing, you may issue the appropriate certificate with the dual limitation of “not valid for night flight *or* under color signal control.”

At this point, while you are technically done, we should try to break down the misperception of a flight surgeon as being a barrier and, instead, be an advocate. Explain that this restriction will not keep the student pilot from advancing to his private rating. Inquire as to what his aspirations are in aviation so you can issue the proper class certificate. He will, at some point, have to fly with an FAA inspector for a check ride. This also would be an appropriate time for the airman, through prior arrangements with the Flight Standards District Office (FSDO), to undergo testing to remove the restrictions (see the diagram, Fig. 5-153-A, which is an excerpt from FSDO instruction book).

Please note that the FAA is now in charge. The airman started the process by requesting his Regional Flight Surgeon/Civil Aerospace Medical Certification Division to contact the



FSDO and arrange for the testing. Advise the airman to seek a FSDO that has *newer* LED equipment (some FSDOs have older light systems, while some have new LED lights that are easier to see). He is free to go to any FSDO and should identify such. There is a new operational color vision test (OCVT) that all applicant classes must take. This includes daytime signal light testing (SLT), various chart reading, and other testing as the FSDO inspector may request. Having passed the OCVT, classes I and II airmen must take a color medical flight test (CVMFT), which is done in the aircraft and in flight. The content of both the OCVT and the CVMFT is outlined in FAA Order 8900.1 and in the AME Guide: www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/app_process/exam_tech/item52/amd/

See the diagram, Fig 5-153-A, an excerpt from FSDO instruction book, FAA Order 8900.1. This is an excellent flow chart for those who like algorithms. It was developed by the Federal Air Surgeon’s Office to clarify the color testing process.

Please note: Once the applicant has started this process and has *failed any portion of the OCVT or the CVMFT, the color vision restrictions remain on the certificate*. He cannot go back, reapply, and try another screening AME color vision test in an attempt to get the restriction removed. Airmen have failed the FSDO testing. The FAA policy is to deny requests for retesting after failing OCVT or CVMFT.

Scenarios

The following examples describe circumstances and general guidelines for color vision policy and procedures that you may encounter:

I. Circumstance: Airman passes approved screening test.

Solution: He/she is issued the appropriate certificate. He and all airmen must be screened on each follow-up exam.

II. Circumstance: Airman fails your screening test and does not wish to pursue the matter further.

Solution:

He is issued with the dual restriction and can fly as restricted. This airman must be rescreened, as are all other applicants, on subsequent exams.

III. Circumstance: Airman fails your screening test, but passes another doctor's Farnsworth lantern or other approved test, and obtains written evidence.

Solution:

Issue without restriction. Give the airman the original documentation; copy to AMCD or RFS, and to chart. He must be retested with the test he passed, whatever it was, on all subsequent exams. In other words, if the airman is able to pass any of the AME color vision screening tests, then on subsequent exams he should be tested using that test. The

eye doctor that does this particular color test, for example, will provide a report of a color test for each application.

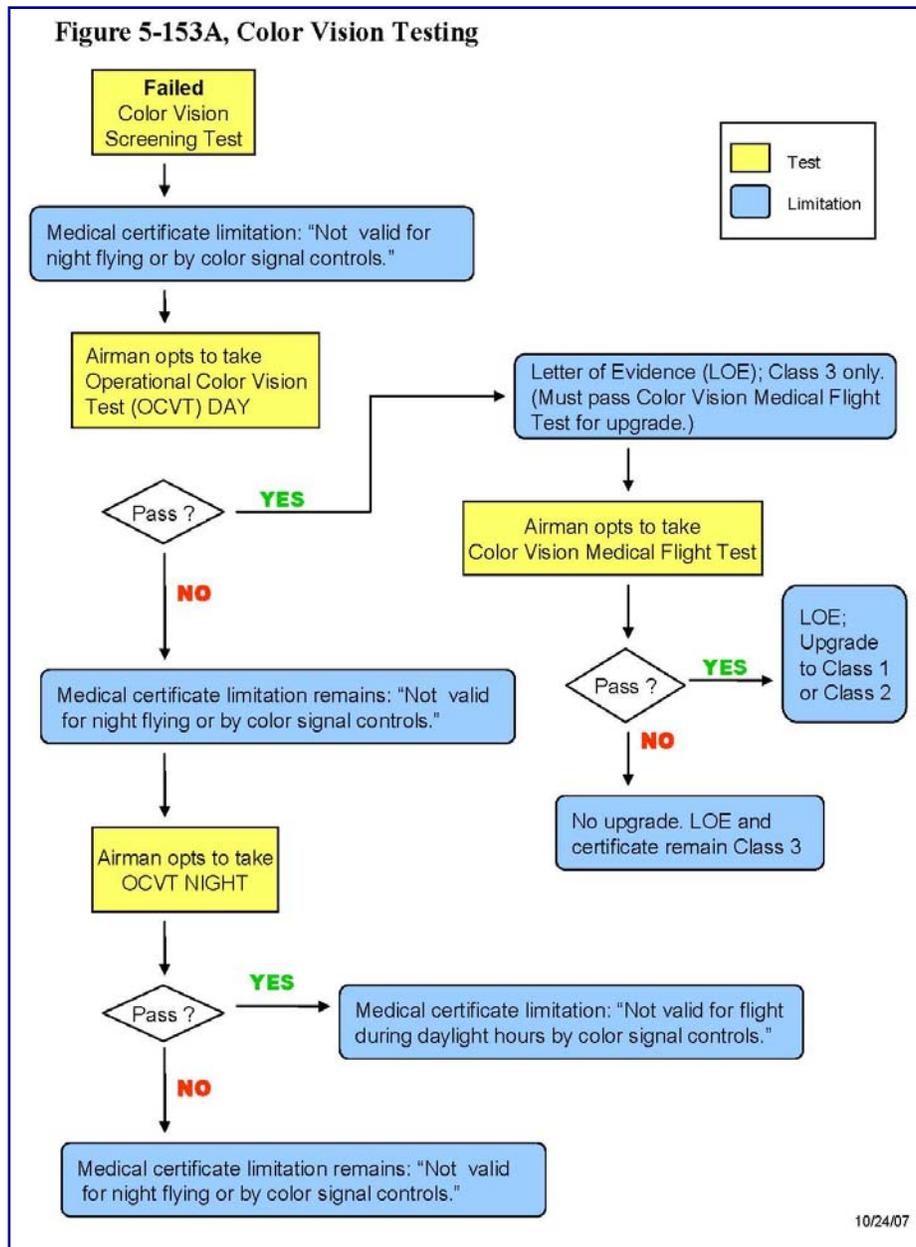
IV. Circumstance: Airman fails screening test(s) but passes required FAA testing (FSDO).

Solution: Restrictions are removed and the airman is issued a Letter of Evidence (LOE). This LOE is not a waiver for color vision.* He, as above, is rescreened on subsequent exams, and the date and class of LOE are noted in Item 60, as you would report a SODA. DO NOT EXCEED CLASS.

V. Circumstance: Airman fails screening for Class III and SLT daylight, and wants to have the night flying restriction removed.

Solution: In this case, the SLT is given at night and the applicant passes. No LOE is given. Restriction: Not valid for flight during daylight hours by color signal control.

Figure 5-153A, Color Vision Testing



*A waiver indicates the airman was not able to fulfill some aspect of the FAR but demonstrated to the FAA that he is capable. These are given for many reasons, color deficiency being the most common. Others would be monocularity, loss of a limb, etc. Such conditions are permanent and expected to be stable. The misconception is that a waiver might be detrimental on applying to be a pilot for a new company. A LOE is just a written document that the airman has passed the color vision requirements of the FAR. In medical terms, our screening tests have given a false positive and the FAA has felt that he does, in fact, meet the FAR and has generated a written document to this effect. This is very recent (1998).



Acknowledgments. Thanks to the following Office of Aerospace Medicine staff members for their assistance and review of this article:

- Arleen M. Saenger, MD, MPH
- Courtney D. Scott Jr., DO, MPH
- Richard Carter, DO, MPH
- Benton Zwart, MD, MPH

About the author. Dr. Carlson is a board-certified ophthalmologist who graduated from Loyola's Stritch School of Medicine. He is an adjunct faculty member at Embry Riddle, where he has taught Aviation Safety, Human Factors, and Flight Physiology. He is an Associate Fellow of AsMA. He has served the FAA for more than 35 years by teaching at basic and recurrent AME seminars and is the consultant to the Federal Air Surgeon in ophthalmology. Dr. Carlson practices in Norfolk, Va., and can be reached at fleyedoc@earthlink.net.

Medical Certification of Airmen With Breast Cancer

Case Report, by Theresa B. Goodman MD, MPH

Breast cancer is the second-most frequent cancer of women and is also present, although rarely, in men. Familiarization with the stages of breast cancer, its severity, and its likelihood for remission and recurrence will help the aviation medical examiner advise the airman on the requirements for medical certification and the likelihood of obtaining that certification.

History

A 49-YEAR-OLD FEMALE commercial airline pilot presented to her aviation medical examiner for renewal of her first-class medical certificate after undergoing treatment for breast cancer over the previous 18 months. Her exam was basically unremarkable, other than her post-surgical anatomy and some vague symptoms of fatigue surrounding her medication administration.

Review of the airman's treatment reveals that her cancer was discovered when a screening mammogram showed microcalcifications in both breasts that warranted follow-up testing. She underwent a stereotactic core biopsy of both breasts, which showed evidence of ductal carcinoma in situ (DCIS) in the left breast and benign findings in the right. Initial treatment consisted of conservative lumpectomy and lymph node biopsy, which revealed a 0.7-cm diameter section of ductal adenocarcinoma (completely excised), extensive lymphangitic spread with DCIS foci present in all analyzed sections, and 7 of 10 lymph nodes that were positive for metastatic ductal carcinoma. Given initial lumpectomy and lymph node results, the airman had a completion mastectomy of the left breast which, again, revealed lymphangitic spread of DCIS within the remaining tissue and metastatic disease in 4 of 5 additional lymph nodes. Immunohistochemical studies revealed this airman's cancer to be estrogen- and progesterone receptor-positive (ER+/PR+) and HER-2 oncogene-positive as well.

Radiographic staging (full body bone scan and positron emission tomography (PET) scan, as well as computed tomography (CT) and magnetic resonance imaging (MRI) of the brain, chest, abdomen and pelvis), failed to demonstrate any local or distant disease. She chose to have a prophylactic right breast mastectomy (benign tissue), as well as a bilateral oophorectomy to minimize hormonal stimulation to any remaining cancer cells.

The airman completed multiple cycles of chemotherapy (cyclophosphamide, doxorubicin, and paclitaxel). She also had adjuvant radiation therapy, which was completed without significant sequelae. At the time of her medical exam,

Breast Cancer Etiology

Breast cancer is the second-most common cancer of females (second only to non-melanoma skin cancer) and is also the second-most common cause of cancer deaths in women. A woman's lifetime risk of being diagnosed with breast cancer is 1 in 7, with the vast majority of cancers occurring after age 55 (two-thirds of diagnosed cases, with one-half occurring after age 75).³ Breast cancer is 100 times more likely in women than in men, but for a given stage of disease, the mortality rate is roughly equivalent for both men and women.⁴

Non-invasive breast cancers are referred to as ductal carcinoma in-situ (DCIS) and lobular carcinoma in-situ (LCIS), often seen on mammogram as a cluster of microcalcifications and can usually be treated with a conservative lumpectomy and tamoxifen (a selective estrogen receptor modulator) treatment. On the other hand, LCIS tumors occur more diffusely in the breast tissue, more often occurs bilaterally, and is rarely seen on mammography. Current literature estimates a 20% chance of LCIS becoming invasive cancer within 15 years of diagnosis.⁵ Treatment for LCIS includes use of tamoxifen, watchful waiting, or bilateral prophylactic mastectomy.

The most common types of invasive breast cancer are ductal adenocarcinoma (80% of diagnosed breast cancer) and lobular carcinoma (15% of diagnosed breast cancer).⁶ Staging of cancer severity and treatment are basically the same for both histologic types.

Prognosis and treatment are decided by the cancer's overall stage at diagnosis. The staging system for breast cancer is determined by the TNM (Tumor size, lymph Nodes involved and Metastases) classification system (see Table 1).

Immunohistochemistry also plays a role in the prognosis of breast cancers. Receptors that are estrogen- and progesterone-positive (ER and PR+) tend carry a more favorable prognosis. If HER-2/neu marker (a growth-signaling molecule on the surface of breast cells) is positive, the cancer tends to have a worse prognosis.

Five-year relative survival rates (relative to survival rates of the general population) by Stage are listed in Table 2.⁷

In general, SERMs, such as tamoxifen or letrozole, are used when cancers have ER/PR+ markers to help prevent recurrence. When the HER-2/neu marker is present, it is recommended that the patient be treated with trastuzumab (monoclonal antibody designed to interfere with the HER-2/neu receptor) to decrease the likelihood of recurrence.⁸

the airman was taking letrozole (Femara, a selective estrogen receptor modulator), a bisphosphonate, and she was also receiving trastuzumab (Herceptin) infusions every 3 weeks.

Aeromedical Concerns

The aeromedical concerns associated with breast cancer mostly surround the presence of brain metastases or the side effects of chemotherapeutics and adjuvant therapies.¹ Unfortunately, some of the best medications to improve survival and decrease recurrence also carry with them side effects that are unacceptable for flying. Trastuzumab is one of these medications and is currently non-compatible with flying due to its significant cardiac toxicity.²

If an applicant has completed treatment for cancer, a brain MRI is negative for positive axillary lymph nodes, and the applicant is not on any disqualifying medications (e.g., trastuzumab), then full treatment records can be presented to the FAA, and the applicant is likely to receive an Authorization for Special Issuance in accordance with 14 CFR 67.401. The requirements for recertification are annual status reports and MRI of the brain.

Outcome

This airman progressed through treatment and is considered to be in remission. Her need for continued treatment with trastuzumab is unacceptable until she no longer requires the medication. She was issued a general denial for breast cancer

but instructed that, should her treatment no longer require use of trastuzumab, she could re-accomplish her medical exam with recent (within 90 days) clinical follow-up for cancer (to include brain MRI) and be reconsidered for first-class medical certificate with authorization for special issuance.

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Stage	T	N	M
Pre-cancerous			
1	T-1	N-0	M-0
2	T-1	N-1	M-0
	T-2	N-0 or N-1	
3	T-3	N-0	
	T-Any	N-1	M-0
	T-3	N-0 or N-1	
4	T-4	N-0	
	T-Any size	N-Any status	M-1

T = Tumor Size: T1 = 0-2 cm, T2 = 2-5cm, T3 = >5cm,

T4 = ulcerated or attached

N = Node Status: N0 = clear, or negative nodes, N1 = cancerous, or positive nodes

M = Metastasis: M0 = no spread of tumor, M1 = tumor has spread

[‡]About.com (2009). Breast cancer. Online at: http://breastcancer.about.com/library/blbc_stages_3.htm. Accessed 14 Mar 2010.

Table 2. Breast Cancer Survival Rates

Stage	5-year Relative Survival Rate
0	100%
I	100%
II	86%
III	57%
IV	20%

About the Author

Theresa B. Goodman, MD, MPH, Maj, USAF, MC, FS, was a Resident in Aerospace Medicine when she wrote this case report at the Civil Aerospace Medical Institute. Currently, she is a Resident in Occupational Medicine.



Idiopathic Syncopal Episodes: Saving Your Scalp Only to Lose Your Head

Case Report, by William Klorig, MD, MPH

This case report reviews idiopathic syncopal episodes experienced by an otherwise healthy airline pilot. A comprehensive neurological and cardiac evaluation failed to find any abnormalities or explain these non-positional related occurrences. On a post work-up visit, the airman admitted to using over-the-counter minoxidil (Rogaine) for hair loss. After discontinuing this medication, he had no further syncope or loss of consciousness. This review illustrates the hazards that a seemingly benign, over-the-counter topical medication can have on flight safety.

History

THIS CASE REPORT describes a 40-year-old male commercial airline and private pilot with flight engineer, flight instructor ratings, a first-class medical certificate, and nearly 10,000 flight hours. The pilot suffered two brief idiopathic episodes of near-syncope and one episode of syncope within a one-week period. These episodes were accompanied by feelings of “dizziness,” “light-headedness,” and a tunneling of vision. The near-syncopal incidents occurred while standing, but the episode of syncope, lasting a few seconds, happened while driving and caused him to swerve off the road. He recovered quickly enough to avoid an accident and pulled off to the side of the road. He was evaluated by EMS at the scene and released after an examination showed normal vital signs and blood sugar, as well as normal cognitive and motor functions.

The airman was initially evaluated by his family physician, who noted an absence of hypertension, cigarette abuse, diabetes, hyperlipidemia, or positive family history of premature coronary disease. His medical history was noncontributory, and he did not have a history of alcohol use or abuse. He did not have any waivers (special issuances, Statement of Demonstrated Ability) or known allergies and denied taking any medications or recreational drugs. On physical exam, his height was 73 inches, weight 220 lbs, and blood pressure 118/84, pulse 72. He had a normal chest X-ray, urinalysis (negative for both albumin and glucose), and metabolic, thyroid, and liver function labs were also normal. His last electrocardiograph, a month prior to the evaluation, showed a normal sinus rhythm. No abnormal physical findings were noted.

He completed a comprehensive neurology syncope evaluation, including a sleep-deprived electroencephalogram, brain magnetic resonance imaging (MRI) with and without contrast, and a carotid duplex ultrasound study. In addition,

this airman completed a comprehensive cardiac evaluation with a cardiovascular exam, treadmill nuclear stress testing (radionuclide 201 thallium exercise and GXT Tc 99m Myoview myocardial perfusion study with gated SPECT), electrocardiography, echocardiography with Doppler studies, and 24-hour Holter with 30-day event monitoring. All studies and specialist exam findings were normal. During a follow-up cardiology consult visit, the airman admitted to using Rogaine (minoxidil) for hair loss. The product instructions indicated twice-a-day dosing, but, due to perceived inconveniences, he had been doubling the recommended dose and applying it once a day immediately following his morning shower. The syncopal episodes occurred after re-starting intermittent topical use of minoxidil.

Aeromedical Concerns

Syncopal episodes, even the brief events described in this case report, present a serious hazard while performing aircrew duties. Previous case reports have been written discussing vasovagal episodes among commercial airline pilots. A clouded sensorium or loss of consciousness can result in pilot errors, with catastrophic consequences. This danger is greater in private or single-pilot operations and can be exacerbated by environmental, g-force, and individual health stressors. In a commercial flight setting, if an airman fails to recognize prodromal symptoms early enough to alert other crewmembers, altered consciousness may occur before aircraft control can be safely transferred (Van Dijk, 2003). The same loss of consciousness experienced by this airman while driving, resulting in his swerving off the road, could result in a disastrous outcome were it to occur on short final or take off. In-flight medication-induced hypotension and near-syncope could mimic the effects of hypoxia with similar concomitant loss of judgment and sensory cues. Under Title 14 CFR 67.113 (a)(1)(c)(1) and 14 CFR 67.109 (a)(2)(b)(1), syncopal episodes and unexplained loss of consciousness are disqualifying for a first-class medical certificate (CFR, 2009).

Outcome

The current FAA aeromedical certification reference manual prohibits the issuance of any class of medical certificate unless an “acceptable medical explanation has been documented” (ACRM, 2010). If an adequate explanation cannot be determined, a two-year recovery period is mandated; issuance of a medical certification can be reconsidered if no other incidents occur during the interval (ibid).

In this airman’s case, no abnormalities were found on his comprehensive syncope evaluation. A review of medical records showed that he tended toward a low-normal baseline systolic blood pressure, and it was hypothesized that he had suffered vasovagal syncope hypotensive episodes as a result of inappropriate intermittent use of topical minoxidil. This

MINOXIDIL SYNCOPE

There are many causes and factors for syncope and altered sensorium in the aviator that have been thoroughly discussed in previous *Bulletin* case studies. Among the many possible causes for syncope, neurological and cardiac etiologies rise to the top of the differential diagnosis list (Sharma, 2003). This case is unique in that it involves an airman with no significant medical history or prescription medications using topical over-the-counter minoxidil and experiencing possible vasovagal hypotensive syncope side effects with potentially serious aviation safety ramifications.

Minoxidil is a powerful peripheral vasodilator with persistent effects that has been used to treat hypertension unresponsive to other antihypertensive medications (Jett, 1988). Minoxidil acts on the peripheral vasculature and does not hamper orthostatic reflexes or central nervous system function (Miller, 1980). Primate animal studies have demonstrated the profound vasodilator hypotensive effect of minoxidil at doses of 20mg/kg (Pals, 1983). The usual dose for topical minoxidil is 1ml of 2% (20mg minoxidil) or 5% (50mg minoxidil) strengths applied to the scalp twice a day. The maximum recommended oral therapeutic dose of minoxidil is 100mg daily (MacMillan, 1993). By doubling the topical dose, it is possible that a significant percentage of minoxidil, approaching the maximum daily oral dose, could be absorbed through the scalp. The product instructions provided by the Physicians Desk Reference Web site suggest that if "you miss a dose or forget to use your medicine, apply it as soon as you can. If it is almost time for your next dose, wait until then to apply the medicine and skip the missed dose. Do not apply extra medicine to make up for a missed dose" (PDR health, 2010). The product insert provides warnings for allergic reactions: "Itching or hives; swelling in your face or hands; swelling or tingling in your mouth or throat; chest tightness; trouble breathing; chest pain; dizziness or fainting; lightheadedness; facial hair growth; fast or irregular heartbeat; severe itching, burning, or redness of scalp; sudden unexplained weight gain; swelling of face, hands, or feet; dry, flaking, or red skin; increased hair loss; loss of interest in sex" (Medline, 2010). Significant on this list are the reactions related to hypotension: dizziness, fainting, and lightheadedness. These symptoms are most pronounced when starting the medication and tend to resolve over time with continued regular use (MacMillan, 1993). Scalp application of minoxidil after showering could increase systemic absorption; using a large dose early in the morning could potentiate a stronger hypotensive response when combined with possible lowered vagal tone or vascular volumes.

proposed etiology was strengthened when no further syncopal episodes occurred after discontinuing minoxidil. Given the prompt resolution of all syncopal episodes and the negative comprehensive evaluation, this airman was granted his first-class medical certificate and returned to flying with a letter of warning to report any recurring symptoms.

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About the Author

CDR Klorig is a U.S. Navy Resident in Aerospace Medicine serving at the Naval Aerospace Medicine Institute, Naval Air Station Pensacola, Fla. He authored this case report while training at the Civil Aerospace Medical Institute in Oklahoma City, Okla.



Persistent Esophoria Following a Diagnosis of Guillain-Barré Syndrome With Miller Fisher Variant

By Kimberly P. Toone, MD, MPH

A phoria is a latent deviation of an eye, present, at least to a slight degree, in nearly 100% of the human population. Patients who manifest a deviation of more than 8 diopters of phoria are likely to experience a decrease in stereoacuity, difficulty with fusion, and/or diplopia.¹ The Federal Aviation Administration standards for first- and second-class certificates set the limit for both exo- and esophorias to 6 diopters and specifically require the absence of diplopia.² This case highlights the case of an airman with an acquired excessive esophoria after a bout of Guillain-Barré syndrome with Miller Fisher variant and the aeromedical concerns regarding his third-class certificate.

Case Presentation

IN APRIL OF 2006, a 53-year-old male third-class airman noted the sudden onset of blurred vision while driving and had to cover his left eye to continue driving. These symptoms were followed by the onset of double vision with noted improvement upon looking up. He eventually called an ambulance and reported a decrease in his visual symptoms with the administration of oxygen during transport to the local hospital. During this time, the airman noticed the onset of unsteady gait associated with the blurred vision. There was a perceived improvement in his gait when he attempted to walk with his eyes closed. There was also note of intermittent paresthesias over his lower extremities, described by the patient as feeling “weak in the knees.”

On admission to the hospital, he was noted to be alert and oriented and appeared comfortable. External eye exam was described as normal. Cranial nerves appeared intact with an “apparent deficit of the left ocular muscles that resolved when looking up.” No visual fields or other functional tests were performed at this time nor are there any records of additional ophthalmologic evaluation during his hospitalization. Musculoskeletal exam revealed normal muscle tone throughout, without evidence of tremor. Neurologic exam was significant for the absence of deep tendon reflexes in both upper and lower extremities. Sensory exam noted only the subjective paresthesias without objective deficit. Radiologic evaluation revealed a normal head CT and MRI. Lumbar puncture revealed cerebrospinal fluid (CSF) findings consistent with Guillain-Barré syndrome, and he was subsequently started on intravenous immunoglobulin infusion (IVIg). On this therapy, the airman’s gait improved significantly and, after 10 days, he was cleared for discharge to home and physical therapy.

GUILLAIN-BARRÉ SYNDROME AND THE MILLER FISHER VARIANT

In 1916, Guillain, Barré, and Strohl described an acute postinfectious paralytic illness in two soldiers, followed by spontaneous recovery. Although Landry reported a similar case in 1859, the disease process came to be known as Guillain-Barré syndrome (GBS).³ A variant of GBS, the Miller Fisher syndrome (MFS), first described in 1956, is a triad of ophthalmoplegia, ataxia, and areflexia. Similar to GBS, it was first recognized by someone else, namely Collier in 1932.⁴ Guillain-Barré syndrome is a common cause of neuromuscular paralysis worldwide, with an annual incidence of 1.2 to 2.3 per 100,000. Incidence increases linearly with age, and men are 1.5 times as likely to be affected compared to women.³ Miller Fisher syndrome accounts for 19-25% of GBS in Eastern countries and approximately 1-5% in Western countries.⁵

Miller Fisher syndrome, as with GBS, is usually preceded by an acute infectious process, most commonly respiratory in nature. There is also an association noted between *Campylobacter jejuni* enteritis and MFS, with 13-18% of MFS cases being seropositive for *C. jejuni*.⁵ The acute illness, independent of type, usually precedes the onset of paralytic symptoms by 2 to 4 weeks (of note, the patient discussed here had a *C. jejuni* infection approximately 1 month prior to presentation). This temporal pattern is the basis for a molecular mimicry hypothesis linking GBS to certain pathogens and a few vaccines (e.g., tetanus booster and influenza).⁶

Miller Fisher syndrome most frequently presents as diplopia but can also present as ataxia alone or in combination with the diplopia. Other presenting symptoms include dysesthesia of the limbs, dysphagia, blepharoptosis, and photophobia.⁷ Miller Fisher syndrome may overlap with GBS, causing limb or respiratory muscle weakness but more commonly is seen as primarily an ophthalmologic issue.⁵ Treatment for GBS includes intravenous immunoglobulin (IVIg), but studies, mostly retrospective, have noted that MFS improves with or without the use of IVIg.³ Overall, MFS is considered a benign, self-limiting condition with the ataxia typically resolving within 12 to 15 days. The ophthalmoplegia generally takes a bit longer to resolve, with the mean recovery being 32 to 88 days. The areflexia can persist with some patients not exhibiting full recovery for more than 270 days. But again, the natural course of MFS is characterized by a good recovery.⁷

However, the external ophthalmoplegia with symptomatic diplopia persisted for an additional 10 months. These symptoms eventually resolved, noting a residual esophoria of 12 diopters with correction and 14 diopters without correction. The esophoria has persisted through his most recent aeromedical evaluation (May 2009). The remainder of his

eye exam was normal, with near and distal visual acuity for both eyes correcting to 20/20, fusion maintained with red filter, no obvious tropia noted, and extra ocular movements were full OU.

Aeromedical Concerns

Excessive tropias and phorias are frequently associated with defective stereopsis and/or diplopia, which can be a devastating state if it occurs during a critical phase of flight.^{8,9} However, the main concern is diplopia. A phoria is a latent deviation of ocular position that it is not apparent unless fusion is broken. The natural resting position of the eyes for a phoric patient is not straight; however, when the patient is visually active (i.e., awake and alert), the power of fusion keeps the eyes straight. If fusion is broken, the eyes move to their natural resting positions, which can be eso, exo, or hyper (in, out, or up/down). On the other hand, a tropia is a manifest deviation, meaning that the deviation is readily observable. For this patient, fusion is either not possible or the eye musculature is not strong enough to overcome the deviation.¹⁰

Specifically, an excessive phoria requires the airman to exert a large neuromuscular effort to maintain fusion and binocular vision. Individuals with excessive phorias often break fusion during extreme fatigue or when flying at night secondary to loss of external fixation points. Also, added stressors may induce a breakdown in fusion, as with a student attempting to learn rapid instrument scanning or even an experienced airman flying in a degraded situation.^{8,9} Stereopsis is generally not considered to be a factor in perception beyond 200m as monocular cues prevail beyond this point.¹¹ Stereopsis can, however, be an issue with formation flying, low-level flight profiles, and taxiing. Additionally, phoria and subclinical tropia patients may be reluctant to divulge a history of double vision or decreased acuity in the affected eye, leading to decreased aeromedical awareness of this safety concern.

Outcome

Eighteen months after the onset of his symptoms, the airman was granted an Authorization for Special Issuance of a third-class medical certificate due to the history of Guillain-Barré syndrome. He may not operate an aircraft when new symptoms/adverse changes occur or when medication and/or treatment is required. The airman is also required to wear corrective lenses while operating an aircraft. The aviation medical examiner was instructed to caution the airman regarding operating an aircraft during times of fatigue, as this may contribute to loss of stereopsis, dizziness, or diplopia.

As an AME, if you see an airman with excessive phoria, you need to have the airman complete a Form 8500-7, with attention paid to the onset of tropias and diplopia. If the airman develops diplopia with the examination, then certification is questionable, and you should defer the decision to the Aerospace Medical Certification Division. The FAA has permitted the use of prism lenses that can adjust for the phoria under certain circumstances. Of note, a similar case was outlined in the February 1975 edition of *Aviation, Space, and Environmental Medicine*. That case paralleled this one, with the exception of no residual ophthalmologic pathology. The airman from 1975 was also returned “to full flight duties” after an observation period of 2 years.¹²

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About the Author

CDR Toone is currently the senior medical officer on the aircraft carrier USS *George H.W. Bush*. She was a Resident in Aerospace Medicine rotating at CAMI when she wrote this article.



Aerospace Medical Education News

By Brian Pinkston, M.D., Manager of the Aerospace Medical Education Division (AMED)

CAMI WELCOMES TURKISH PHYSICIAN



Dr. **Brian Pinkston** (left) announces the arrival of Dr. (Capt.) **Erdinc Ercan**, an International Exchange physician from Eskisehir,

Turkey. Dr. Erdinc arrived in Oklahoma City on Dec. 13, 2011, and will be staying for one year. He is an Aerospace Medicine Specialist at the Turkish Air Force Fliers' Health, Research, and Training Center.

During his time at the Civil Aerospace Medical Institute he will assist the AMED with courses, translating Airman Education safety brochures into Turkish, and developing new training materials.

He is an expert in the use of fatigue counter-measures in long-range missions. He is currently participating in educational activities with Residents in Aerospace Medicine rotating at CAMI, as well as with medical students from Brazil.

The International Exchange Visitor program allows qualified foreign specialists to enter the US for up to three years to conduct studies and exchange information at FAA facilities. The Office of Aerospace Medicine supports all international programs that promote interaction between aviation medicine professionals, enable the exchange of scientific information, and promote the FAA's prominence in civil aerospace medicine.

UTILIZING FAA MEDXPRESS

Did you know that you can only review past examinations for a particular airman that you have performed? This limitation is not a huge issue for you because as an AME, you are only responsible for the history that the airman provides to you.

However, if your airmen use FAA MedXPress to provide their history, MedXPress will save you time and give you a more comprehensive look at their history. Here's how it will save time:

- Once the airman completes the MedXPress history, it will provide the airman with a summary of medical history that would be pertinent to your exam. This means that you or your staff can go over the airman's history prior to the appointment, so you may request the airman to bring additional information or previous studies that may expedite your issuance of a certificate.

- When the airman completes the MedXPress history, he or she is provided an individual identification number that will automatically populate the history section for you when entered into AMCS.

MedXPress provides you a more comprehensive view of the airman's history. When you enter the airman's MedXPress identification number into AMCS, this system will allow you to see a summary sheet of the airman's entire history that has been previously provided to the FAA. You cannot do this with paper 8500-8s.

This function can improve your overall situational awareness for this airman's medical history, as well as allow you to help the airman remember historical events that he or she may have inadvertently neglected to include on the current history.

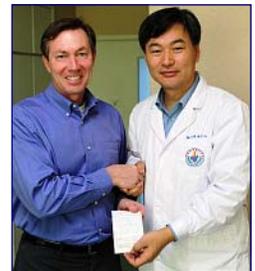
Another interesting component of MedXPress is that if the airman does not provide the identification number to you within 60 days, the history is automatically discarded from MedXPress. This is not an option if the airman completes an 8500-8, since you must send it to us if it is marked on by the airman.

MedXPress is a powerful tool that can help you and your airmen to have a more efficient interaction. AMEs who require their airmen to use MedXPress commonly say that they are far more prepared to discuss the airman's case since they have an opportunity to learn about the airman prior to the visit.

To quote a recent MedXPress convert: "Try it, you'll like it!"

CHINESE AMES TRAINED

The first official Federal Aviation Administration flight physical ever conducted in China was received by an FAA employee, Senior Representative for North Asia **Pat Power** (left). The examination was conducted by Dr. **Zuoming Zhang**, the first of three Chinese physicians and staff members trained over the past several years through a cooperative program made possible by the FAA's Civil Aerospace Medical Institute.



Mr. Power, who holds an air transport rating and is based in Beijing, China, successfully underwent his medical examination, and Dr. Zhang signed off on his second-class medical certificate on December 15, 2011.



Letter to the Editor

AGING BRAIN

Dear Editor,

I just finished reading the excellent article "The Aging Brain, Cognition, and Aeromedical Concerns" by Richard Murphy [FASMB, Vol. 49, p. 1]. I'm sure he is aware of the large and growing body of literature on physical activity, fitness, and cognition in the aging population. Physical activity and fitness have been shown to delay and slow cognitive decline and the onset of dementia and its progression. This might be worth another article encouraging pilots to stay as physically fit as possible to keep their minds

sharp (as well as their bodies). There is also growing evidence that physical activity and fitness enhance cognition at all ages which would appear to be beneficial to all pilots.

David L. Weldy, MD, PhD
Toledo, Ohio

Dear Dr. Weldy,

Thank you for your comments. You may have motivated Dr. Murphy to write another article on aging airmen. —Ed.

Aviation Medical Examiner Seminar Schedule

2012 SEMINARS		
February 3–5	Charlotte, North Carolina	OOE (2)
March 5–9	Oklahoma City, Oklahoma	Basic (1)
March 30–April 1	Albuquerque, New Mexico	CAR (2)
May 14–17	Atlanta, Georgia	AsMA (3)
June 18–22	Oklahoma City, Oklahoma	Basic (1)
August 10–12	Washington, D.C.	NEU (2)
October 4–6	La Jolla, California	CAMA (4)
October 29–November 2	Oklahoma City, Oklahoma	Basic (1)
November 16–18	Denver, Colorado	OOE (TENTATIVE)

CODES

CAR Cardiology Theme

NEU Neurology Theme

OOE Ophthalmology-Otolaryngology-Endocrinology Theme

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

(2) A 2½-day theme AME seminar consisting of 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.

(3) 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.

(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 Web site: 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.

Index of Articles Published in the Bulletin During 2011

HEADLINE	AUTHOR	ISSUE	PAGE
Addison's Disease (Case Report)	Hans Bruntmyer, DO	4	8
Aeromedical Research: Protecting the Safety of All Who Fly (FAS editorial)	Fred Tilton, MD	4	2
Aging Brain, Cognition, and Aeromedical Concerns	Richard Murphy, MBChB	4	1
Alaska Team Scores Safety Success	Kevin Williams, PhD	2	4
Altitude Trainer Validated	Brian Pinkston, MD	2	1
AME Updates: Web-Based Training Revised	Brian Pinkston, MD	1	5
Aortic Valve Replacement (Case Report)	David Rogers, MD	2	6
Autism Spectrum Disorders (Case Report)	Helen Wright, MD	2	12
Baldness & Finasteride (Letter to the Editor)	Howard Keller, MD	1	11
Brief Psychotic Disorder (Case Report)	J.D. Haines, MD	1	8
Certificate Eligibility Warning: Don't Ignore	Harriet Lester, MD	4	10
Color Vision Testing (Letter to the Editor)	Randy Martin, MD	1	11
Computer Security Issues (FAS Editorial)	Fred Tilton, MD	3	2
Davis, Audie: FAA Remembers	Mike Wayda	4	10
Decompression Sickness With Permanent Neurologic Impairment (Case Report)	John Swanson, IV, MD,	1	6
Disqualifying Conditions, Airman Medical & Student Pilot Cert. (FAS Editorial)	Fred Tilton, MD	2	2
Dunn, Marvin: Obituary	James De Voll, MD	2	4
ECG Question, Night Vision Goggles (Letter to the Editor)	Edwin Rathbun, MD	1	11
Electrocardiogram Problems (Certification Update)	Warren Silberman, DO	4	3
Error Rate Drops	Brian Pinkston, MD	3	1
HLA-B27 Arthropathy and Uveitis (Case Report)	Todd Huhn, DO	3	8
Internal Carotid Artery Dissection (Case Report)	Bret Heerema, MD	2	10
It's Your Neck (Letter to Editor)	Michael Zittle, DO	2	5
Laser Hazards Brochure Published	Mike Wayda	1	9
Lewis, Leigh; Frazier, Judy: Join OKC Certification Division (photo)	Courtney Scott, DO	4	1
Love of Aviation and Medicine	Mike Wayda	3	1
Medications, Part III (Certification Update)	Warren Silberman, DO	1	3
MedXPress: Most Underutilized 'App' of Our Time (FAS Editorial)	Fred Tilton, MD	1	2
Methotrexate: Is Use Approved for Pilots? (Letter to Editor)	J. Spooner	2	5
Monocular Vision From Traumatic Optic Neuropathy (Case Report)	Arthur Cajigal, DO	3	10
Monocular Vision Question (Letter to Editor)	Robert Greer, DO	4	10
Nadler, Neal; Garofalo, James: Obituary	M. Zalcmán, H. Lester, MD	3	4
Newsletter Printing Discontinued (Letters to Editor)	Various	3	6
Personnel Changes & Practice Cases (Certification Update)	Warren Silberman, DO	3	3
Prolonged QT Interval (Case Report)	Jonathan Strobel, DO	3	12
Questions and Answers (Certification Update)	Warren Silberman, DO	2	3
Refresher Training Software Upgraded	Susan Buriak, MS	1	10
Schall, David: New Great Lakes Regional Flight Surgeon (photo)	AVS Flyer	1	10
Scott, Dr. Courtney: New Deputy in Certification Division (photo)	Mike Wayda	1	10
Site Visits: Coming Your Way:	Harriet Lester, MD	1	1
Sleep Apnea (Letter to the Editor)	Martin Long	1	11
Sleep Apnea Follow-Up (letter to editor)	Marty Litchfield, PA	2	5
Tetralogy of Fallot (Case Report)	Geoffrey Ewing, DO	4	11
Transverse Myelitis (Case Report)	Blaine Powel, DO	2	7
Web Site Shortcuts	David Nelms	2	9
Web Site Shortcuts Implemented	David Nelms	1	9
Wilson, Larry; Berry, Daniel: Central Region Personnel Changes	Fred Tilton, MD	3	2
X-Ray Backscatter Security Scanners at U.S. Airports	Brian Pinkston, MD	1	1