



# Federal Air Surgeon's Medical Bulletin



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

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



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WORKING TO REDUCE THE CERTIFICATION BACKLOG. Dr. Silberman (pointing to monitor) briefs some of the Tiger Team members on a case being reviewed. Shown are (l-r): Drs. Angela Gomez, Michael Jordan, Diego Garcia, John Barston, Arnold Angelici, Warren Silberman, Dan Berry, and Gonzalo Mendez .

## Tiger Team Pounces on Backlog

*Combined Effort Generates 1,217 Medical Review Decisions*

By Richard Carter, DO, MPH

The *Tiger Team* is a special project initiated by Dr. Warren Silberman, manager of the Aerospace Medical Certification Division (AMCD) to improve customer service by reducing the backlog of certification cases. Previous Tiger Team efforts have been successful, so Dr. Silberman again called on selected FAA medical officers to jointly process a backlog of complex certification cases.

This time, a *virtual* Tiger Team online combined with a team of medical officers at work in the new AMCD conference room in Oklahoma City. The purpose of the team was to again attack a backlog of medical certification cases.

Members of this Tiger Team communicated by teleconference 7-11 Dec 2009 with Internet coordination.

Team members included Drs. Willis Simmons, Alaskan Regional Flight Surgeon; Denise Baisden, Southwest Regional Deputy Flight Surgeon; Kim Christensen, Salt Lake City Center Flight Surgeon, Byron Baker, Albuquerque Center Flight Surgeon, John Barston, Southern Regional Deputy Flight Surgeon; Denise Baisden, Southwest Regional Deputy Flight Surgeon, Dan Berry, Central Regional Deputy Flight Surgeon; Stephen Goodman, Western

*Continued on page 4*

## The Medical Certificate and Privacy Concerns

Happy New Year everyone. I hope you all had a great holiday season.

In the past few months, I have received several complaints from airmen with respect to one of the changes we made on the back of the medical certificate, FAA Form 8500-9.

Specifically, we have added a requirement that says,

“Comply with any statement of functional, operational, and/or time limitation issued as a condition of certification. (14CFR § 67.401) (Note: A letter of authorization (or SODA) describing any such limitations must be kept with this certificate at all times while exercising the privileges of an airman certificate.)”

The airmen who complained told me they see no need for this new statement and, further, that it violates their right



to privacy. The purpose of this editorial is to explain the reasoning behind this new requirement so that you can remind your airmen about it and help explain to them why we made this change.

In 1944, the United States and many other countries met in Chicago at the Convention on International Civil Aviation (Chicago Convention). The Chicago Convention created a new organization, the International Civil Aviation Organization (ICAO), and they reached agreements on many issues in order to harmonize international aviation travel regulations. Article 39 of the Chicago Convention states:

“Any person holding a license who does not satisfy in full the condition laid down in the international standard relating to the class of license or certificate which he holds shall have endorsed on or attached to his license a complete enumeration of the particulars in which he does not satisfy such conditions.”

Based on Article 39, ICAO Annex 1 to the Convention on International Aviation paragraph 1.2.4.8 (c) states: “the license is endorsed with any special limitation or limitations when the safe performance of the license holder’s duties is dependent on compliance with such limitation or limitations.”

Historically, the Federal Aviation Administration (FAA) and many other aviation authorities have not been in compliance with this requirement. The

only indication on our certificates that a person did not meet medical standards was the phrase in the limitations section that stated:

(Not valid for any class after a given date).

ICAO audited the FAA in 2007 and cited us for noncompliance. Their recommended corrective action stated, “...the FAA should establish and implement a mechanism to ensure that any license holder who does not satisfy in full the ICAO standards with respect to the class of the holder’s license or certificate has to have the license endorsed or have attached to the license complete details regarding the failure to satisfy the relevant conditions, as specified by the Article 39 of the Chicago Convention.”

ICAO has been citing other regulatory authorities for the same issue. The FAA could have responded to this finding by changing our process and inserting all of the necessary medical information in the “limitations” section. Some countries have chosen to comply in that manner.

However, in almost every case, the limitations would not fit in the allotted space, and we would have had to develop a new attachment to the form. So, we chose to comply by adding the note on the back of the form.

I understand why this change has created such concern for our aviators with medical limitations. Nevertheless, we had to make the change to be in compliance with ICAO standards.

This change will also help protect airmen flying internationally because other ICAO countries could have grounded them for noncompliance with ICAO standards.

I hope you now understand the reasons for these changes and that you will take some time to discuss these changes with your airmen when you are examining them.

And, as always, thanks so much for all you do for the FAA and your airmen!!

—Fred

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## Privacy Problems Arise With Customs Inspection

*International Scrutiny Leads to  
Alarms Going Off in OKC*

Recently, a female relative of an international aviation medical examiner entered the United States through Customs, and inspectors discovered a packet of completed FAA examinations (the original Form 8500-8's) in her possession. There were 12 examinations with first-class airmen from several European countries and several from the U.S.)

Fortunately, the customs officials made copies of all of them and passed them along to the Flight Standards District Office in that area. We were then notified the next morning. The story that the woman gave was that since the mail delivery was so slow in her country, several local AMEs gave her these examinations to mail when she came over to visit in the States.

## Certification Update

*Information About Current Issues*



By Warren S. Silberman, DO, MPH

### Privacy Act

For the benefit of the international AMEs and those of you here in the USA, we have regulations guiding our treatment of medical records. The basis of these protections is the Privacy Act. Perhaps our workshops do not adequately teach the principles of the Privacy Act, so here it is in a nutshell (see sidebar below):

#### THE PRIVACY ACT

Broadly stated, the purpose of the Privacy Act is to balance the government's need to maintain information about individuals with the rights of individuals to be protected against unwarranted invasions of their privacy stemming from federal agencies' collection, maintenance, use, and disclosure of personal information about them. The historical context of the Act is important to an understanding of its remedial purposes: In 1974, Congress was concerned with curbing the illegal surveillance and investigation of individuals by federal agencies that had been exposed during the Watergate scandal; it was also concerned with potential abuses presented by the government's increasing use of computers to store and retrieve personal data by means of a universal identifier -- such as an individual's social security number. The Act focuses on four basic policy objectives:

- (1) To restrict disclosure of personally identifiable records maintained by agencies.
- (2) To grant individuals increased rights of access to agency records maintained on themselves.
- (3) To grant individuals the right to seek amendment of agency records maintained on themselves upon a showing that the records are not accurate, relevant, timely, or complete.
- (4) To establish a code of "fair information practices" which requires agencies to comply with statutory norms for collection, maintenance, and dissemination of records. (Source: Privacy Act: [www.justice.gov/opcl/1974polobj.htm](http://www.justice.gov/opcl/1974polobj.htm))

How this act applies to our FAA medical records is that the FAA "owns" the FAA medical examination Form 8500-8. When you work on a hard-copy medical examination, that is like signing a blank check! The airman has a "right" to know what is being written on that exam form. He/she signs Block #20, which states that everything above that is true and correct, and for those airmen, it gives the FAA permission to search the National Driver Registry for DUI offenses. As the AME who completes the examination, you should not give out an airman's medical information without the airman's permission (and I would get this permission in writing).

In the case example above, it may have been different if the woman had been one of the administrative employees or nurses of the AMEs and carried a written document from the AME that explained what she was doing with those examinations. Also, the examinations should have been in a sealed envelope (it turns out they were, but the customs agents opened it).

We were concerned that the examinations could have been modified or perhaps even stolen from the AMEs' offices. In this case, there was no way, without comparing each examination to the electronically transmitted version (the examinations had not been transmitted at that point) to know that the examinations had not been modified. I trust that Aerospace Medical Education would understand that the mail service in many countries to the U.S. is slow and forgive any delays.

As long as you have electronically transmitted the examination, you protect the airman against a ramp check by a Flight Standards Safety Inspector. I am not sure that you are aware that all of the September 11, 2001 terrorists did have FAA medical examinations.

On another point to make, I have heard stories that, when airmen asked AMEs for a copy of their examination, they refused to do so. Recall that the

*Continued* →

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

## Certification from page 3

third copy of the current 8500-8 is a copy of the medical history of the current examination. It was created for you to give to the airmen so they can recall during their next visit what their responses had been. Also, it is perfectly “legal” to give the airman a copy of the physical examination portion of the examination. The FAA, though, is the “true system of airman medical records,” and should the airman need what we call a “certified true copy” of medical records, that can only be accomplished by the AMCD in Oklahoma City. You may not give out an airman medical examination, even a copy, to anyone without written permission (preferably, for your protection) of the individual.

To finish the story, one of the international AMEs sent us an explanatory E-mail, so we called off the investigation, and the airman medical examinations were transmitted. Later that week, the examinations arrived here in Oklahoma City and were scanned into the airmen’s medical case files.

Now let’s get back to our “What Would the FAA Do?” for medical conditions not mentioned in the *Online Guide for Aviation Medical Examiners*.

## Tiger Team from page 1

Pacific Regional Flight Surgeon; **Stephen Griswold**, Deputy Western Pacific Regional Flight Surgeon; **Paul Clark**, New England Regional Flight Surgeon; **Chris Taylor**, Northwest Mountain Regional Deputy Flight Surgeon; **Michael Jordan**, Long Island Center

### What Would the FAA Do?

**Depression.** I am not going to get into a discussion of potentially granting medical certification to airmen taking selective serotonin uptake inhibitors (SSRIs). We have yet to receive permission to do so. What I am going to discuss is the very meager documentation that we get from physicians who treat an airman for depression and are requested to provide us with medical information. The fact that an airman was taking an SSRI and now has been off the medication for the required 90 days and doing well is not enough! We need to know why the airman was placed on the medication, the duration, and what were the symptoms at the time therapy was initiated. We would also appreciate a statement as to whether the airman had any suicidal thoughts or actions. All of these facts will influence our determination.

### Orthopedic Surgical Procedures

**Herniated Nucleus Pulposus:** Pain and neurologic sequelae of a disc extrusion would be disqualifying until the airman is without these symptoms, taking non-narcotic pain relief, can sit for longer periods, and has strength enough to manipulate the rudder pedals or, in the case of a cervical nerve root, the flight controls. Once asymptomatic, the airman or you as the AME can submit a request for clearance.

**Rotator Cuff Surgery.** Much the same goes here. As one who may have had such a procedure, you know that postoperative the shoulder is immobilized in an elaborate sling device. Once again, until the sling is removed, the airman has full range of motion and adequate strength and is no longer taking analgesic medications (the narcotic variety and tramadol are also unacceptable); he/she must be grounded. This condition will not require an authorization for special issuance, and you may issue if they provide us with the documentation. The same goes for herniated nucleus pulposus (above).

**Total Joint Replacement.** The FAA allows all types of joint replacement. Generally, once we receive all the proper documentation, an authorization for special issuance is not required. We need to know why the joint was replaced and when the procedure was done (provide us the Operative report). When the treating physician and the airman feel he can return to flying, the FAA needs to know the range of motion and strength of the involved joint. It would be ideal if whoever generates this report addresses whether the airman can function in the aviation environment. As mentioned above, the airman cannot be taking any analgesics on a regular basis.



Flight Surgeon; **Harriet Lester**, Eastern Deputy Flight Surgeon; **Dominick Zito**, Eastern Regional Deputy Flight Surgeon; and AMCD Medical Officers **Arnold Angelici**, **Roger Bisson**, **Bill Mills**, **Benton Zwart**, **Richard Carter**, and **Steve Schwendeman**.

Dr. Silberman directed all elements of the team, as well as working cases. He also used the Tiger Team experience as an educational opportunity for visiting Colombian international residents in Aerospace Medicine **Angela Gomez**, **Diego Garcia**, and **Gonzalo Mendez**.

This intensive, five-day effort highlights the FAA’s commitment to improving its safety oversight of airman medical certification. The virtual Tiger Team generated 650 medical review decisions for airmen pending needed medical authorizations to fly. The entire team cleared 1,217 airmen. →

#### TIGER TEAM

The term *Tiger Team* refers to governmental agencies designating an elite team of highly qualified, experienced experts to tackle a problem of critical significance that is time sensitive. This project emphasizes consistent application of medical certification guidelines and the integration of medical certification standards. The continued telephonic and online interaction of Regional Flight Surgeons and AMCD medical officers created a professional atmosphere where the certification objective was high-quality, expedited service for the airmen.

## ECG Normal Variant List

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

- Sinus bradycardia. Age 50 and younger — if the heart rate is 45 or greater; Age 50 and older — if the heart rate is 49 or greater
- Wandering atrial pacemaker
- Low atrial rhythm
- Ectopic atrial rhythm
- Indeterminate axis
- First-degree AV (atrioventricular) block with PR interval less than 0.21 in age 50 and younger
- Mobitz Type I Second Degree AV (atrioventricular) block (Wenckebach phenomenon)

- One premature ventricular contraction or atrial contraction on a 12-lead ECG
- Incomplete RBBB (Right Bundle Branch Block)
- Intraventricular conduction delay
- Early repolarization
- Left ventricular hypertrophy by voltage criteria only
- Low voltage in limb leads (may be a sign of obesity or hypothyroidism)
- Left axis deviation, less than or equal to -30 degrees
- rSR' in leads VI or V2, ORS interval less than 0.12 msec R>S wave in VI without other evidence of right ventricular hypertrophy
- Sinus arrhythmia
- Sinus tachycardia: Any age — if the heart rate is less than 110
- Left atrial abnormality
- Short QT

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



## Driving While Intoxicated

*Dear Editor:*

I am confused by Dr. Silberman's article in the last Medical Bulletin ["Understanding the New DUI Policy," *FASMB* Vol. 47, No. 4, page 3] concerning how to treat a history of DWI. I recently attended the AME Seminar in Seattle where we heard that we should defer for any DWI conviction in the last five years and for any blood alcohol level of .15 or more even in the remote past. Dr. Silberman's article states that we must obtain court documents and defer if the blood alcohol level is 0.15 or above OR A POSITIVE ALCOHOL TEST. Does this mean any blood level or even a positive breath test?

What about the airman who has had one or more certificates issued since a DWI conviction? Does a history of 0.15 or above before these were issued rate a deferral now?

George Higgins, MD  
Presque Isle, Maine

*Dear Dr. Higgins:*

1. **This only applies to a new offense, meaning a new applicant who now reports a first DUI (driving under the influence) event.**
2. **If this is a new student pilot and reporting a single DUI, you only need concern yourself with the event — if it was within the previous five years.**
3. **As an aviation medical examiner, you need to obtain the police reports, court documents, etc., from the event (in the past, we were not picky if an AME did not obtain these documents from a single DUI, as long as it was indicated in Block 60 that it had been discussed with the airman).**
4. **If, when you obtain these documents, you note that whatever way the sample was obtained, the level was  $\geq 0.15$ , you defer issuance of the medical certificate. If the level was less than this, you may issue and tell us about your actions in Block 60.**

5. **If you obtain these documents and note that the airman "refused" to submit for testing, this is considered positive for us, and you should defer the issuance.**

6. **In the instances where you end up deferring, you can inform the airman that it will be necessary to obtain a substance abuse evaluation from someone knowledgeable in doing such evaluations.**

## Pseudo SSN Revisited

*Dear Editor:*

Sometimes when we open a pilot's 8500-8 there is a pseudo SSN [Social Security Number] listed. When entering the data for the current 8500-8 should we leave that number in the SS block or change it to the actual SSN?

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

*Dear Dr. Wander:*

The reason for the pseudo-SSN is that the airman sometime has opted not to use their own SSN. Please keep this number as the airman's SSN. If you insert their real SSN, it creates a second medical file on that airman, and it becomes a real problem for them, especially if we have information on the prior file and we receive new medical information. We would not know that the previous information existed.

Warren Silberman, DO, MPH  
Manager, Aerospace Medical Certification Division

→

# Phakic Intraocular Lenses for Myopia

Case Report, by Mark L. Jacques, MD, MPH

*Phakic intraocular lenses (PIOLs) are gaining popularity as an alternative to wearing spectacles for correction of myopia in patients who are not appropriate candidates for traditional corneal refractive surgery (CRS). Although the visual outcome of such a procedure is at least equivalent to traditional CRS (i.e., PRK, LASIK), the risks and complications are different. This risk profile must be considered when evaluating an airman with PIOLs for medical clearance. This case involves an otherwise healthy applicant for Class-I medical certification who has had these lenses implanted for the correction of myopia.*

## Background

This case involves the initial application for Class-I medical certification of a 26-year-old male. Other than an uncomplicated appendectomy at age 13, the only issue discovered during his medical history and examination was the implantation six months prior of bilateral posterior chamber phakic intraocular lenses to correct myopia. Prior to the lens implantations, he had a refractive error of  $-10.5$  diopters in the right eye and  $-11.0$  diopters in the left eye.

Prior to the surgery, his uncorrected visual acuity was 20/400 bilaterally, and his corrected visual acuity was 20/30 bilaterally. The implantation of the lenses was uncomplicated. He had regular follow-up with his ocular surgeon and has provided all documentation from the surgeon. At the time of his flight physical, his uncorrected visual acuity was 20/20 bilaterally for both distance and near vision. He denied any night vision distortions such as halos and starbursts. The remainder of his visual testing was all within FAA standards for Class-I medical certification.

## Aeromedical Concerns

As a bit of background, it should be noted that the Federal Aviation Administration accepts the following Food and Drug Administration approved refractive procedures for visual acuity correction:

- Radial Keratotomy (RK)
- Epikeratophakia
- Laser-Assisted In Situ Keratomileusis (LASIK)

- Photorefractive Keratectomy (PRK)
- Conductive Keratoplasty (CK)<sup>1</sup>

The visual outcome resulting from the use of PIOLs for the correction of myopia has been shown to be at least as effective as traditional forms of CRS.<sup>4</sup> Therefore, post-insertion visual acuity within FAA vision standards is a high likelihood with the use of current FDA-approved PIOLs. Therefore, the aeromedical concerns, with regards to PIOLs, primarily involve the possible complications of their use.

The physical stability of the lens in the aviation environment has been raised as a concern. However, both the FAA and U.S. military allow pilots to fly with similar lenses in place under aphakic conditions (i.e., as part of cataract correction with removal of the natural crystalline lens). There have been no reports of these airmen having problems with the lenses' stability or dislocation during flight duties. There are military pilots flying high-performance aircraft under high-G conditions with these lenses in place. Again, no difficulties have been reported in these circumstances. In fact, to speak to the stability of these lenses, there was a case of a U.S. Army Infantry soldier, with PIOLs in place to correct his visual myopia. He was subsequently subject to a grenade blast within very close range of his head and face. Despite a blast severe enough to cause intracranial bleeding and intraocular shrapnel, the lenses remained intact and in place. His vision

was unaffected by the impact.<sup>3</sup> This case supports the idea that the physical stability of these lenses should not be of concern.

Various studies have demonstrated retinal detachment occurring rarely after the insertion of PIOLs.<sup>2,6</sup> However, it must be noted that these studies involved patients who were not appropriate candidates for traditional CRS, usually because of the high degree of myopia present (refractive errors as high as  $-22.0$  diopters). Patients with myopia have a baseline increased lifetime risk of retinal detachment over emmetropic patients, the risk increasing as the degree of myopia increases. Therefore, the few patients who sustained retinal detachment after undergoing this procedure for correction of myopia were already at an increased risk of retinal detachment whether or not the lenses were implanted.

The risk of cataract formation following the implantation of PIOLs has, like retinal detachment, been rarely demonstrated in recent studies monitoring these lenses. A large portion of these opacities were considered "visually insignificant" (small, with no effect on visual acuity) and were only discovered through slit lamp examination. Also, as with retinal detachment, a higher degree of myopia (and age above 40) appeared to be a significant risk factor for cataract development post-implantation.<sup>5</sup>

Increased IOPs following implantation of the lenses has also been shown to occur rarely. When this occurred, it was usually transient and immediately post-operatively. The IOPs returned to normal during the first couple months of follow-up. The likelihood is that should there be an increase in IOP, patients would still be under the close observation of the ocular surgeon at the time, thereby minimizing risk.

Finally, the loss of corneal endothelial cells following implantation of PIOLs continues to be a topic of debate. If the endothelial cell count drops too low, vision becomes compromised. Corneal

*Continued* →

endothelial cells do not regenerate, so any loss of these cells, as several studies show following PIOL implantation, raises concerns. However, it must be noted that as we age, we normally lose a portion of these endothelial cells. Also, measuring the endothelial cell count or density is somewhat difficult. This can result in a wide variation in measurements any time endothelial cell counts are considered.<sup>2,6</sup> It should also be noted that since these lenses have been utilized in the United States, no case was found where implantation of PIOLs ultimately resulted in a need for

corneal transplant from a decreasing endothelial cell count.

Ultimately in examining the risks and of PIOL insertion, it must be noted that none of the complications appear to be suddenly incapacitating in flight. These complications are slowly evolving and are easily detected through routine eye examination and appropriate follow up.

In conclusion, we must ask ourselves if enabling an airman to have improved, unaided vision outweighs the small associated risk of the use of PIOLs, since these can provide a beneficial option

for airmen who might otherwise be restricted to the use of undesirable spectacles for the correction of their myopia.

### Outcome

The airman was granted Class-II medical certification.

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**About the Author.** Major Mark Jacques is board-certified in Pediatrics and Aerospace Medicine. He serves on active duty in the U.S. Army as a Flight Surgeon and is currently stationed at Fort Campbell, Ky. He recently completed residency training at the Army's Aerospace Medicine training program at Naval Air Station Pensacola, Florida. This report was written in March 2009 while on rotation at the FAA's Civil Aerospace Medical Institute.



### ETIOLOGY

Phakic intraocular lenses are growing in popularity as a means to correct myopia (in addition to other visual defects such as hyperopia and astigmatism). They have been implanted in the U.S. for more than 10 years, and the first PIOL received Food and Drug Administration approval for the correction of myopia in 2004.<sup>4</sup> The term *phakic* denotes a condition where an artificial lens is inserted into the eye while the normal crystalline lens of the eye remains in place. This is in contrast to an *aphakic* condition where an artificial lens is inserted after the natural crystalline lens has been removed (such as during a cataract correction). This type of vision correction involves the surgical insertion of a synthetic optical lens via a corneal incision into either the anterior or posterior chamber of the eye. The ultimate location of the lens depends upon the lens design. There are currently FDA-approved lenses of both the anterior and posterior chamber design. The use of these lenses is an attractive alternative for myopic patients who are inappropriate candidates for traditional CRS.

Because traditional corneal refractive surgery involves ablation of the corneal epithelium and because there needs to be a minimum residual corneal thickness post-surgery, patients with thin corneas or very irregular corneas may be poor candidates for CRS. Likewise, those with very high refractive errors may also be poor candidates for CRS, as more corneal tissue must be ablated to correct these larger refractive errors. These patients, while inappropriate candidates for traditional CRS, may be appropriate candidates to have the insertion of PIOLs to correct their myopia.

Freedom from the use of corrective spectacles can be very beneficial to the airman. This has been explored in a number of studies, particularly in military aviation.<sup>7</sup> The spectacles themselves can be the cause of *image jumping*, distracting light reflections, and *image minification*. Image jumping is the visual effect of an image shifting or moving as it is alternately viewed through spectacles and then around the edge of the spectacles. Image minification is the visual effect of objects appearing significantly smaller than they actually are when viewed through a spectacle lens. Both image jumping and image minification become more exaggerated in spectacles required to correct higher degrees of myopia (i.e., in the same patients who may not be appropriate candidates for traditional CRS).

**Complications.** There are some complications associated with the insertion of PIOLs. As the efficacy of these lenses is generally well accepted, many recent studies involving these lenses have specifically focused on examining the complication rates. Complications, while rare, include increased intraocular pressure, retinal detachment, loss of corneal endothelial cell mass, and cataract development.

# Sublingual Immunotherapy for Allergic Rhinitis

Case Report, by MAJ Steven Gaydos, MD, MPH, FS

*The prevalence of allergic rhinitis in the U.S. is significant, and the aeromedical risks to the airman with disease are many. Initial management usually includes the use of anti-histamines and topical nasal steroids, yet many still remain poorly controlled with persistent symptoms despite aggressive pharmacotherapy. Immunotherapy is warranted in many of these cases, and it remains the only treatment modality known to alter the underlying disease cascade. Instead of allergy shots, a relatively new modality is sublingual immunotherapy (SLIT), which entails the delivery of allergen extracts under the tongue. SLIT has been demonstrated to reduce allergic symptoms and lower the use of medication for disease management.*

## Introduction

Allergic rhinitis (“hay fever”) is reported to affect between 10-30% of the adult population, and annual estimates for direct and indirect costs are well into the billions of dollars (1). Approximately half of patients with allergic rhinitis experience symptoms for more than four months per year, and about 20% have symptoms for more than nine months (1). Symptoms often include sneezing, watery eyes, nasal congestion, and rhinorrhea. Allergic rhinitis occurs when inhaled allergens interact with IgE antibodies in the nasopharynx and airway. In addition to issues of quality of life, aeromedical concerns include risk of eustachian tube dysfunction, ear and sinus barotrauma, fatigue, performance degradation, and prolonged grounding for complications secondary to the disease process (8).

## Case Presentation

A 31-year-old commercial pilot presented to his aviation medical examiner for his annual second-class medical exam. He has a history of long-standing hay fever with symptoms especially prevalent during the summer months, but he was otherwise healthy. His previous treatment regimen included a non-sedating antihistamine and topical corticosteroid spray, yet his symptoms remained only moderately well controlled. Sometimes he was unable to fly secondary to complications like acute sinusitis. This year, his primary

care physician sent him for allergy testing that revealed he was strongly sensitized to grass pollen. His allergist recommended allergy shots. Due to his busy schedule as a pilot, however, he was unable to comply with the required regular visits to the allergist for shots. His allergist proposed sublingual immunotherapy (SLIT), instead, as a viable alternative. He is interested in proceeding with the treatment but questioned his AME if this is acceptable to the Federal Aviation Administration.

## Case Discussion

The FAA permits the use of injection immunotherapy for treating allergies. The restrictions would be that the airman should observe a short (approximately one half-hour) period of self-grounding after an injection.

SLIT may indeed be an attractive therapeutic option for this airman with a predominant sensitization to one allergen and who remains poorly controlled on conventional pharmacotherapy. Without better symptom control, the airman clearly remains at risk for many aeromedical complications and safety of flight issues because of allergic rhinitis. SLIT has been widely adopted in many European countries and is administered by some allergists in the U.S. (5, 6); however, the only form of specific immunotherapy approved by the Food and Drug Administration (FDA) at this time is injection immunotherapy—and therein lies the crux of this case.

*Continued* →

## PATHOPHYSIOLOGY AND DISEASE MANAGEMENT

Allergic rhinitis is a type-I hypersensitivity response to inhaled allergens. Allergen-specific IgE antibodies bind to receptors on the surface of effector cells (mast cells, eosinophils, and basophils), releasing histamine, leukotrienes, and various cytokines and chemokines causing vascular dilation, endothelial leak and mucosal swelling, mucus production, and irritation of sensory nerves, among other effects (1,5). Diagnosis is generally made on the basis of history and physical exam alone. History should include type and severity of symptoms, seasonality of symptoms, annual reoccurrence, inciting causes (if known), and any concomitant disease such as chronic sinusitis, asthma, or nasal polyps. Although patients can present with a variety of symptoms, the physical exam will often demonstrate conjunctivitis, rhinitis, nasal congestion, and postnasal drainage. The most common seasonal allergens include pollens and molds, whereas perennial allergens are often attributed to dust mites, molds, cockroaches, and animal dander (1).

Management strategies generally entail allergen avoidance, along with pharmacotherapy. Classes of medication for management include oral and nasal antihistamines, nasal corticosteroids, leukotriene-receptor antagonists, mast-cell stabilizers, alpha-adrenergic agonists, systemic corticosteroids, and some ophthalmic preparations, depending upon type and severity of symptoms (9).

Note that not all medications are necessarily compatible with flight. First-generation antihistamines should be avoided because of their anticholinergic and sedative effects, for example. Various treatment algorithms exist. Allergen avoidance should always be considered, if possible. Initial medication choice includes an oral second-generation antihistamine and/or an inhaled nasal corticosteroid, with other medications reserved for resistant symptoms (9).

## SUBLINGUAL IMMUNOTHERAPY

Immunotherapy is indicated for patients with evidence of IgE sensitivity who continue with inadequate symptom control despite therapy, who have unacceptable side effects from pharmacotherapy or who have concomitant disease such as asthma (3, 9). In general, allergen immunotherapy involves the repeated administration of continually escalating doses of culprit allergens. Traditional immunotherapy (subcutaneous) entails a regimen of shots that are generally given at a physician's office on a weekly basis until maintenance dose is achieved, and shots are administered at two- to six-week intervals thereafter (9). Hay fever controlled by desensitization is allowed for airmen, provided there are no unacceptable medications used in addition to the therapy (e.g., high-dose systemic corticosteroids, first-generation antihistamines) (4).

Adherence to the schedule of weekly doctor office visits and the discomfort of repeated injections can dissuade some patients away from the allergy shot regimen. In contrast, sublingual immunotherapy entails the application of the allergen directly to the sublingual mucosa instead of via parenteral route (3). In most cases, the allergen is held under the tongue for a few moments before swallowing. The mechanism of action seems to entail a progressive shift of naïve T-cells away from type-2 helper T-cells (that promote IgE production and stimulate effector cells) to T-regulatory cells that suppress type-2 helper T-cells and promote the production of IgG and IgA (4). SLIT has been demonstrated to reduce allergic symptoms and lower the use of medication for disease management, and it confers many distinct advantages, including convenience of patient self-administration, minimal adverse effects, and an excellent safety profile (3, 5, 6, 10). The World Health Organization deemed SLIT a viable alternative to the injection route of immunotherapy in 1998, and SLIT has been adopted in many European countries (2, 6).

## Case Outcome

Since this mode of treatment has yet to be approved by the FDA, it would not be acceptable at this time to the FAA. The FAA changed its policy for consideration of medication prescribed for non-FDA recommended use (i.e., "off label use") in 2005, allowing for the use of oral hypoglycemic agents for dysmetabolic syndrome (7). However, there is no such consideration under review at this time for SLIT.

There is one SLIT agent for the treatment of grass pollen allergy (commercially available in Europe) that is currently under review by the FDA (5). SLIT remains a very promising treatment regimen, and FDA certification may be soon forthcoming. However, the AME should advise the airman that SLIT is not yet a viable option for certification purposes at this time and communicate with his primary care physician and allergist regarding improved disease management.

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## Diverticulitis

Case Report, by Christopher Hudson, MD, MPH

*Diverticulitis is increasing in prevalence and more common with age. This case report focuses on the evaluation and various treatment alternatives for diverticulitis and the respective requirements to clear airmen for flying duties.*

### History

A 47-yr-old male civilian airline pilot presents to his civilian primary care physician (who is also his aviation medical examiner) with the complaint of abdominal pain for the past 48 hours. In addition to the abdominal pain, the patient reports nausea, fever, diarrhea, and anorexia. His medical history is significant only for mild gastro-esophageal reflux disease (GERD) for which he takes a proton pump inhibitor (PPI) with good results. His only surgery was a vasectomy ten years ago.

His family history is positive for hypertension, hyperlipidemia, and adult-onset diabetes mellitus. He has no known drug allergies and takes only a multivitamin in addition to his PPI. He denies any trauma or previous history of similar symptoms and reports no significant changes in his diet. He states that the symptoms began as isolated abdominal pain and then progressed to his current condition.

Physical examination revealed an overweight male (BMI = 29), who appeared acutely uncomfortable. His blood pressure was 138/88 mmHg, pulse 96 beats per minute, temperature 100.7 degrees F. His abdomen was mildly distended with hypoactive bowel sounds, abdominal tenderness to palpation in the left lower quadrant, with some guarding but no rebound. The patient stated that he could keep down clear liquids. His aviation medical examiner suspected diverticulitis, as the patient exhibited the classic signs

### ETIOLOGY OF DIVERTICULITIS

Diverticular disease is nearly exclusive to Western developed countries. The disease pattern occurs mostly in the left side of the colon, with more than 90% of patients having sigmoid and descending colon involvement.<sup>6</sup> The descending, transverse, and ascending portions of the colon are involved in decreasing order of frequency. Diverticulosis is rare in undeveloped and Asian nations, with the distinction of being a predominantly right-side disease.<sup>12</sup> Population-based studies have shown that diverticular disease has a less than 5% incidence in persons under 40 years but becomes rapidly more common thereafter. Approximately 60% of the general population develop disease by the age of 80.<sup>11</sup>

More recent studies indicate an increasing prevalence of diverticular disease, especially in patients under the age of 50.<sup>8</sup> In addition to low dietary fiber intake, elevated BMI and physical inactivity have been linked to diverticulitis.<sup>10</sup>

The pathogenesis of diverticular disease requires defects in the colonic wall caused by increased intraluminal pressure. This is commonly seen in Western diets that are low in fiber and high in fat. This translates to less bulky stools and higher intraluminal pressures. There are two types of diverticula. The most prevalent are the pseudodiverticula that occur in the sigmoid colon. The prefix "pseudo" indicates that they are not complete herniations of the bowel wall, but rather, small protrusions of the colonic mucosa through openings in the circular muscle layer where the nutrient blood vessels penetrate the colon wall. Right-sided lesions are true diverticula and are much less common.

Diverticulosis is asymptomatic in 80% of individuals. The remaining 20% can be divided into two categories: symptomatic diverticulosis and diverticulitis.<sup>4</sup> Symptomatic diverticulosis is characterized by episodic pain, altered bowel habits, and a lack of inflammation. In this regard, symptomatic diverticulosis may mimic irritable bowel syndrome. In cases with hematochezia or melena, symptomatic diverticulosis can also mimic diverticulitis and must be differentiated from other causes of rectal bleeding such as carcinoma. Once the acute episode resolves, colonoscopy is recommended to rule out neoplastic disease.

Treatment is based on the overall health of the patient and the severity of the disease. Stable, uncomplicated patients who can tolerate clear liquids can be treated as outpatients on oral antibiotics. Older patients, those with comorbid conditions, and anyone unable to tolerate oral fluids should be hospitalized with IV antibiotics and IV fluids. Those with complications such as perforation, abscess formation, fistulization, sepsis, or partial obstruction should be hospitalized for medical and/or surgical treatment. About 10% of hospitalized patients require surgical treatment. Analgesics should be avoided but, if necessary, non-opioid medications are preferred, as morphine may increase intracolonic pressure.

and symptoms of diverticulitis: nausea, abdominal pain, left lower quadrant tenderness, and fever.

His laboratory findings were significant for a leukocytosis. The CT scan revealed colonic diverticula, pericolic inflammation, and bowel thickening in the sigmoid colon. He was then diagnosed with acute, uncomplicated diverticulitis and was sent home on a clear fluid diet and amoxicillin with clavulanate. His symptoms gradually resolved over the next three days, and

he was able to advance to a normal diet and activity.

The patient was scheduled for a colonoscopy. At his follow-up appointment later that week, he expressed concern about the possibility of having a similar attack and whether or not he should have the affected part of his colon removed prophylactically, because he was concerned about being able to maintain his first-class medical certificate.

*Continued* →

## Aeromedical Concerns

While the aeromedical literature reports little risk of in-flight incapacitation due to diverticular disease,<sup>1,9</sup> there are multiple aeromedical issues of concern following a bout of diverticulitis. After the first episode of acute diverticulitis, approximately 25% of medically treated cases experience a recurrence.<sup>12</sup> With each additional recurrence, the risk of further recurrence and complications increases. In addition to a high-fiber diet, physicians have stressed the avoidance of nuts, seeds, and popcorn to reduce the risk of recurrent disease. Recent studies have refuted this notion as a cause of diverticular complications, and these dietary restrictions are no longer recommended.<sup>13</sup> Historically, surgical resection of the affected colon was recommended after the second uncomplicated episode of acute diverticulitis in those over 50 and after the first episode in those under 50. This was based on studies that showed younger patients to have more virulent disease and a greater overall risk of recurrence because of a longer lifespan. However, new data have called these assumptions into question, and the decision to perform an elective hemi-colectomy should be determined based on each patient's own set of circumstances and treatment preferences. Patients should be counseled on the risks and benefits of accepting or declining elective hemi-colectomy for diverticular disease. Several studies have shown that up to 25% of patients experienced persistent symptoms after elective surgery.<sup>2,7</sup>

For patients with complicated diverticulitis requiring hospitalization, as well as those patients seeking prophylactic colectomies, several surgical options are available. Percutaneous drainage of abscesses can obviate the need for open colectomy in the acute setting. For those requiring colostomy, laparoscopic colon resection has shown to be safe and effective, with fewer

complications and shorter hospital stays.<sup>5</sup> The need for staged procedures with initial colostomies is also being questioned, with primary anastomosis now viewed as a safe and acceptable option in some cases.

## Role of the AME

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. Before requesting medical certification, individuals should have complete resolution of symptoms and be taking no medications that are incompatible with flying. Patients having hemi-colectomies should have returned to a normal diet, with normal bowel function, and resumption of full activities before they can be considered for medical certification. Full reports of any surgical interventions should be forwarded to the Federal Aviation Administration for review. While FAA policy does not specifically list diverticular disease as disqualifying,<sup>3</sup> AMEs should consider all the ramifications of the illness when considering medical certification. If AMEs have any questions about clearing the airman for flying duties, they should discuss the case with their Regional Flight Surgeon.

## Outcome

In an effort to return to flying as soon as possible, this applicant returned to flying after having a normal colonoscopy, approximately six weeks after his initial attack of diverticulitis. Over the next two years, he experienced two recurrences, one of which required hospitalization and a hemi-colectomy. He subsequently returned to flying after the colostomy was reversed.

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## Suicide Attempt

Case Report, by David Hardy DO, MPH

*The overall rate for suicide within the general U.S. population is 10.9 per 100,000 people. An estimated eight to 25 attempted suicides occur per every suicide death.<sup>1</sup> One concern regarding pilots and student pilots is the risk of suicide by airplane. Contributors to suicidal ideation include distressing life circumstances, recent significant losses, a history of suicide in a family member or close associate, feelings of hopelessness or helplessness, substance abuse, or the presence of almost any psychiatric disorder. This case report discusses the aeromedical and certification issues with a student pilot attempting to earn his Class-I Federal Aviation Administration pilot license following a diagnosis of a suicide attempt four years earlier.*

In June 2005, a 22-year-old student pilot with six flying hours presented to his aviation medical examiner (AME) requesting issuance of his student medical certificate and Class-I medical certificate. His case was forwarded to the Aerospace Medical Certification Division for disposition.

**Background.** In 2001, the airman was a high school senior with no previous psychiatric history of suicidal attempts or ideation. He reportedly took 15 Tylenol 325 mg capsules after a fight with his parents about his desire to be a pilot instead of entering the family business. The young man soon realized his mistake and told his parents, who rushed him to the hospital. All follow-up neurological exams and LFT levels were normal. The patient entered psychiatric counseling and was declared fit to fly by his therapist. Initially, he was started on Prozac, 20 mg QD for five months, but when he discovered that the medication could affect his medical certification, his psychiatrist stopped the medication. Since discontinuation, the applicant has not suffered from suicidal ideation or signs of depression. His psychiatrist gave him a diagnosis of adjustment disorder, not otherwise specified, and suggested he continue counseling for family conflict issues, which reportedly has been successful. Since this incident, he has graduated from a community college and held down a full-time job while taking flight training courses. He has never had trouble with the law, drank only socially, and did not take any illegal drugs. His parents decided

to fully support his decision to be an airline pilot.

He denied problems with sleep or diminished interest in his hobbies since the incident. While he felt bad about putting his parents through this ordeal, he had overcome most of his guilt. He reported a good energy level and concentrates well at both school and work. His appetite was robust, and he weighed 220 pounds. He denied psychomotor deficiency and regularly played basketball. He has not had suicidal or homicidal thoughts since his "poor decision" as a young man four years earlier. He plans to pursue his FAA medical certificate and continue his pilot training.

### Aeromedical Concerns

The airman needed his case reviewed by the FAA for a suicide attempt. FAA Form 8500-8, question P, specifically asks the applicant about prior suicide attempts. Furthermore, question M asks about current or previous depression. Regarding his suicide attempt, the *AME Guide* notes that a history of suicidal attempts or suicidal gestures requires further evaluation. The ultimate decision of whether an applicant with such a history is eligible for medical certification rests with the FAA. The Examiner should take a supplemental history as indicated, assist in the gathering of medical records related to the incident(s), and, if the applicant agrees, assist in obtaining psychiatric and/or psychological examinations.<sup>2</sup> One major concern for the FAA is the specter of suicide by aircraft. Suicide by aircraft is not a new concept. A

### ETIOLOGY of SUICIDE

Suicide results from unendurable emotional pain and the belief that only continuation or cessation of pain are options and thus cessation of pain is preferable. Elements of despair, distress, and loss of control are common.<sup>5</sup> Comparing suicide attempters and completers, attempters report less precipitating pain, and the desired outcome is more a cry for help rather than death.<sup>6</sup> However, the National Institute of Mental Health states emphatically that "Most suicide attempts are expressions of extreme distress, not harmless bids for attention. A person who appears suicidal should not be left alone and needs immediate mental-health treatment." Attempters most often use medication overdose, while completers use a weapon, carbon monoxide, or hanging.

Demographic analyses of non-military populations indicate that women are three times more likely to attempt suicide than men, but men are three times more likely to complete suicide. The overall rate for suicide within the general U.S. population is 10.9 per 100,000 people. An estimated eight to 25 attempted suicides occur for every suicide death.<sup>7</sup>

Patterson studied USAF aviator attempters and completers and noted a failed or failing intimate relationship was the prominent trigger for suicide or suicide attempt, followed by administrative/legal problems, psychiatric disorder, death of a spouse, and job conflicts. Substance abuse, most often alcohol, was involved in 54% of the attempts and 79% of the completions. Most attempts were impulsive (77%), whereas most completions were well-planned (93%).<sup>8</sup> Self-destructive motivation should be considered in individuals flying in a reckless or dangerous manner, as this may be a manifestation of subintentional or overt suicidal behavior.

Continued →

1967 article by Gibbons et al., in the journal *Clinical Aviation and Aerospace Medicine*, presented six aircraft mishaps they believed had actually been suicides by aircraft. Study in this area was an offshoot of previous studies of other lethal "accidents" such as automobile accidents.<sup>3</sup> Between 1993 and 2002, there were 3,648 fatal aviation accidents. The National Transportation Safety Board determined that 16 were aircraft-assisted suicides. All pilots involved were male with a median age of 40 years, and seven of the 14 pilots of whom specimens were available were positive for disqualifying substances.

Specifically, four pilots tested positive for alcohol while one had evidence of marijuana, one for cocaine, two for benzodiazepines, and one for venlafaxine. Ten of the 16 airmen had thought of suicide, talked of suicide, attempted suicide before, and/or left a note. Specifically, seven of 16 had expressed recent thoughts of suicide, five left a note, and two had made previous attempts. Additionally, 46% had experienced domestic problems, 46% had criminal issues, and 31% suffered from depression.<sup>4</sup>

The second concern is the applicant's questionable diagnosis of Adjustment Disorder and his use of Prozac. The *AME Guide* notes that the use of a psychotropic drug is disqualifying for aeromedical certification purposes. This includes all sedatives, tranquilizers, antipsychotic drugs, antidepressant drugs (including selective serotonin reuptake inhibitors, SSRIs), analeptics, anxiolytics, and hallucinogens. In such cases, the Examiner should defer issuance and forward the medical records to the AMCD. However, the *AME Guide* also states that if the depression was minor AND stable; resolved, not associated with disturbance of thought, there were no recurrent episodes, and there is an absence of psychotropic medication or they were used for less than six months and discontinued for at least three months, it is acceptable to issue.

In this particular case, the airman was on a SSRI for only five months and appears to have resolved the issues which caused his distress. While at this

time the FAA still does not allow the use of SSRI medications, this issue is under constant consideration and may change in the future.

#### Outcome

Based on the guidance found in 14 CFR 67.401, the AMCD may grant special issuances to airmen who do not meet flying class medical requirements. The decision to grant such an issuance is based on the individual considerations of each case. Medical certification of an airman diagnosed with suicide attempt and depression depends upon the successful resolution of symptoms and maintenance of symptom remission. In this case, the airman demonstrated good insight (per his psychiatrist) and appears to have resolved the issues that led to his suicide attempt.

He also actively participated in his treatment and demonstrated excellent motivation throughout the treatment process. He no longer needed his SSRI and was off the medication for greater than three months. Given that his mental and physical symptoms resolved successfully, the AMCD concluded it was unlikely that his symptoms would relapse during flight or while on the ground, and it was safe and appropriate to issue a Class-I medical certificate. Therefore, the AMCD exercised the guidance found in 14 CFR 67.401 and granted the airman a Class-I, 12-month Special Issuance for his previous suicide attempt.

Regarding his use of an SSRI four years ago for five months, there is no need for a Special Issuance due to the issues discussed above. Additionally, the AME warned the airman that he must report any recurrence of his depression or suicidal ideation. Given the distant occurrence of his suicide attempt and an apparent full recovery, it is unlikely that the FAA will require further follow up of the SSRI issue.

Ultimately, what will determine the disposition of this airman is not his distant suicide attempt or prior SSRI use. Instead, his disposition should be determined by how he has handled the factors that led to his suicide attempt and subsequent SSRI use. In this particular case, he has responded well, and should be given a Special Issuance for a Class-I medical certificate.<sup>9</sup>

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## Aviation Medical Examiner Seminar Schedule 2010

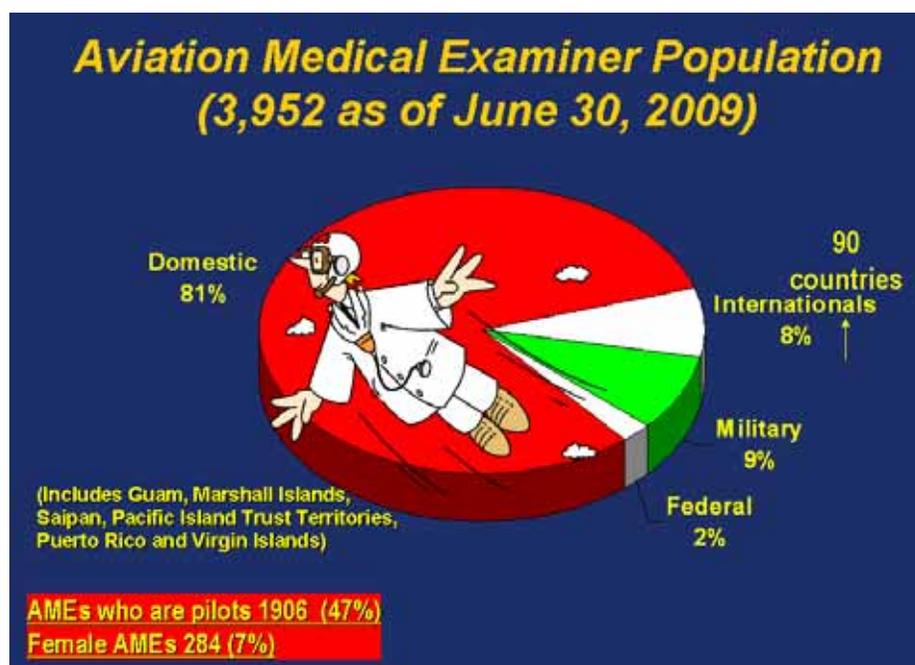
March 1 – 5	Oklahoma City, Oklahoma	Basic (1)
April 9 – 11	Salt Lake City, Utah	N/NP/P (2)
May 10 – 13	Phoenix, Arizona	AsMA (3)
July 12 – 16	Oklahoma City, Oklahoma	Basic (1)
August 6 – 8	Washington, D.C.	OOE (2)
August 26 – 29	Wiesbaden, Germany	(4)
October 7 – 9	Pensacola, Florida	CAMA (5)
November 1 – 5	Oklahoma City, Oklahoma	Basic (1)

### CODES

AP/HF Aviation Physiology/Human Factors Theme  
 CAR Cardiology Theme  
 N/NP/P Neurology/Neuro-Psychology/Psychiatry Theme  
 OOE Ophthalmology-Otolaryngology-Endocrinology Theme

- (1) 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 12 hours of aviation medical examiner-specific subjects plus 8 hours of subjects related to a designated theme. Registration must be made through the Oklahoma City AME Programs staff, (405) 954-4830, or -4258.
- (3) A 3½-day theme AME seminar held in conjunction with the Aerospace Medical Association (AsMA). Registration must be made through AsMA at (703) 739-2240. A registration fee will be charged by AsMA to cover their overhead costs. Registrants have full access to the AsMA meeting. CME credit for the FAA seminar is free.
- (4) This seminar is sponsored by the German Academy of Aviation and Travel Medicine and is sanctioned by the FAA as fulfilling the FAA recertification training requirement. For more information, see the Academy Web site: [www.flugmed.org](http://www.flugmed.org).
- (5) This seminar is being sponsored by the Civil Aviation Medical Association (CAMA) and is sanctioned by the FAA as fulfilling the FAA recertification training requirement. Registration will be through the CAMA Web site: [www.civilavmed.com](http://www.civilavmed.com).

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



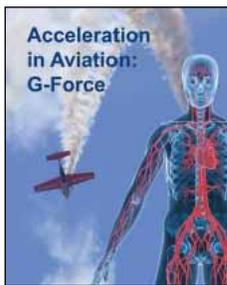
## New Pilot Safety Brochures in Works

By Mike Wayda

The Office of Aerospace Medicine is preparing two new pilot safety brochures for distribution to aviation medical examiners. The first, *Acceleration in Aviation: G-Force*, is available for immediate ordering and shipment through the usual channels.<sup>1</sup>

*Acceleration in Aviation* describes the importance of being prepared and knowing how to cope with G-forces that affect the safety of flight. Any aircraft, civilian or military, can expose the pilot, crew, and passengers to forces in excess of 1 G. During steep turns and unusual attitude recovery, civil aviation pilots can experience high G forces that may take them by surprise, unless they are prepared. Thus, all aviators need to understand what makes them more resistant to the effects of G acceleration. Conversely, aviators need to understand those conditions that will make their body more susceptible to the effects of G forces.

In short, G tolerance for individual aviators may fluctuate from day to day, and this can lead to disastrous consequences in flight. This is one of the reasons that military pilots do a “G warm-up” maneuver prior to flying high-performance aircraft—it allows them to assess their own body and how well they will be able to tolerate the high-G environment.



The second brochure, *Obstructive Sleep Apnea*, was prompted by a commercial aircraft incident in which both pilots fell asleep and overshot their intended destination. While no one was injured, the National Transportation Safety Board investigated and found that the captain’s undiagnosed obstructive sleep apnea was a contributing factor.

The consequences for pilots and crewmembers with this condition are significant. People with mild-to-moderate sleep apnea can show performance degradation equivalent to 0.06 to 0.08% blood alcohol levels, which is the measure of *legal intoxication* in most states. While most pilots will not fly while intoxicated, sleep deprivation may cause equivalent effects.

The brochure lists the usual symptoms of obstructive sleep apnea and several treatment options. The lesson to be learned is that flying with undiagnosed obstructive sleep apnea is an unnecessary risk, possibly even a major safety issue.

*Obstructive Sleep Apnea* is nearing completion and should be ready to order by the middle of March 2010.

**Brochure List.** A list (see sidebar) of all Federal Aviation Administration pilot safety brochures is on the FAA Web site: [www.faa.gov/pilots/safety/pilotsafetybrochures](http://www.faa.gov/pilots/safety/pilotsafetybrochures).

### Spanish-Language Brochures

Three FAA pilot safety brochures are now available in Spanish at the FAA Web site:

- Alcohol and Flying
- Circadian Rhythm Disruption and Flying
- Fit for Flight



### <sup>1</sup>How to Order Brochures

Pilot safety brochures are free of charge. To order a quantity for your pilots, contact the Aerospace Medical Education Division’s shipping clerk:  
E-mail: [Gary.Sprouse@faa.gov](mailto:Gary.Sprouse@faa.gov)  
Phone: (405) 954-4831

## List of Pilot Safety Brochures

- Acceleration in Aviation: G Force
- Alcohol and Flying: A Deadly Combination
- Aviation Safety Courses Available Through the FAA
- Altitude Decompression Sickness
- Carbon Monoxide: A Deadly Menace
- Circadian Rhythm Disruption and Flying
- Civil Aerospace Medical Institute, The
- Deep Vein Thrombosis and Travel
- Fatigue in Aviation
- Fit for Flight
- Hearing and Noise in Aviation
- Hypoxia: The Higher You Fly...The Less Air in the Sky
- Information for Pilots Considering Laser Eye Surgery
- Medications and Flying
- Oxygen Equipment Use in General Aviation Operations
- Pilot Medical Certification: Information for the Aviation Community
- Pilot Vision
- Seat Belts and Shoulder Harnesses: Smart Protection in Small Airplanes
- Smoke!
- Spatial Disorientation: Visual Illusions
- Spatial Disorientation: Why You Shouldn’t Fly By the Seat of Your Pants
- Sunglasses for Pilots: Beyond the Image
- When There Are Questions About Your Pilot Medical Application

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