



# Federal Air Surgeon's Medical Bulletin

## Aviation Safety Through Aerospace Medicine

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

Vol. 52, No. 1

2014-1

### *Federal Air Surgeon's Medical Bulletin*

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

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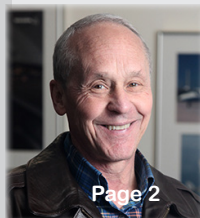
The *Federal Air Surgeon's Medical Bulletin* is published quarterly for aviation medical examiners and others interested in aviation safety and aviation medicine. The Bulletin is prepared by the FAA's Civil Aerospace Medical Institute, with policy guidance and support from the Office of Aerospace Medicine.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

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

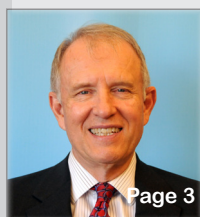
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First neuro review panel meets at CAMI, page 3

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

BY FRED TILTON, MD

**'GOOD HEALTH AND SAFE FLYING'**

Hello Everyone

This is my last editorial. In fact, as you read this, I will be retired.

First, I want to commend all of our aviation medical examiners (AMEs) for your dedication and service. Each year, you perform over 400,000 certification examinations for the Federal Aviation Administration (FAA) Office of Aerospace Medicine (OAM).

Some of you are AMEs because you are pilots yourselves; some of you were trained as flight surgeons by the military and wished to continue practicing aerospace medicine as a civilian, and some of you simply enjoy working with people who are reasonably healthy and love what they do.

Regardless of why you have chosen to be an AME, thank you so much for doing so. We could not possibly fulfill our safety mandate without your service, dedication, and aerospace expertise.

Next, I salute all of the OAM employees. Some of you have highly visible jobs such as those who work on medical certification, whereas others may be invisible to the public because your job responsibilities mainly deal with internal FAA operations. No matter what specific OAM position you fill, you are absolutely essential to the accomplishment of our mission, and OAM would fail without you.

Aviation medical examiners and the OAM staff make up the largest, the most complex, and in my opinion, the most effective aerospace medicine team in the world. Working together, you have helped to assure the safety of the national airspace and the people affected by it. Well done!

It has been an honor and a privilege to serve as the Federal Air Surgeon for the last eight years. I wish you all the best in the future.

FLY SAFE!

—Fred

*Until a permanent replacement is named, Deputy Federal Air Surgeon James R. Frazer, MD, becomes the acting Federal Air Surgeon. —Ed*



Dr. Fred Tilton

FAA Photo by Chris Rossi

Dr. Fred Tilton retires from the Office of Aerospace Medicine after 14 years, eight of them as Federal Air Surgeon. His aviation career began with the U.S. Air Force, for which he served 26 years and logged 4,000 hours as a command pilot flying trainers, transports, reconnaissance aircraft, and fighters.

He also spent 11 years in the medical corps. Prior to joining the FAA in 1999, he was the corporate medical director for The Boeing Company. Under his leadership, his department received the American College of Occupational Medicine's prestigious Corporate Health Achievement Award as one of the best industrial medicine programs in the nation.

Before Dr. Tilton became the FAA's Federal Air Surgeon or even went to medical school, he was a pilot in the U.S. Air Force. For three of his 26 years in the service, he flew high-altitude reconnaissance missions.

One of those missions required him to take off from a base near Fairbanks, Alaska, whenever scientists spotted a solar flare, and head for the North Pole, flying 60,000 feet above the earth. His job was to fly his plane through the radiation while onboard instruments recorded the number of protons (positively charged particles) that rained down from space.



The RB-57F aircraft Tilton flew (shown above) was an impressive 66 feet long and 122 feet wide.

"We were concerned about SSTs (supersonic transports)," Tilton said. "We wondered what kind of radiation passengers would get."

In the 1960s, there was much discussion of whether people were safe at high altitudes during periods of particularly intense solar activity. Supersonic transports, civil aircraft designed to carry passengers at speeds greater than that of sound, were first flown commercially by Concorde in 1976. Even today, NASA researchers question how protons might affect the cells of astronauts in deep space.

But 40-plus years ago, Tilton didn't worry about the effects his missions might have on him. If it involved airplanes, he was game.

"It's my first love," he said.

BIOGRAPHICAL INFORMATION PROVIDED BY FOCUS FAA

## CERTIFICATION SAYS...

*Topics for AMEs From the AMCD*

By COURTNEY D. SCOTT, JR, DO, MPH  
MANAGER, AMCD



## ECG PROCESS NOTES

*Changes Coming This Year*

THE CURRENT ELECTROCARDIOGRAM system that the Aerospace Medical Certification Division uses to receive and store ECG images is reaching its life cycle endpoint. In other words, the equipment is almost like the buggy whip—outmoded and expendable.

Many aviation medical examiners informed us that they are having difficulty procuring the requisite 56K modems to make analog transmissions. Many are also reporting difficulty in finding telecommunications providers that still provide analog transmission. Additionally, the contract with our current vendor expires this year, and there appears to be no intent to continue this contract.

### New Survey

The Civil Aerospace Medical Institute will send the new AME survey to you by the end of February, and you will see several questions in it inquiring about your current capabilities and what you would like for an ECG transmission system (see Dr. Wenzel's announcement, page 9). We will accommodate your needs as best we can.

### New System

To overcome these issues, we are developing a new system, which will be coming online soon, most likely this June. This system must be completely functional by the end of October 2014. We hope to keep the existing process online through this date, but after that, the only option for transmitting ECGs will be the new one.

Expect more details soon, either on the aviation medical examiner logon screen or in this newsletter.



**FIRST NEUROLOGICAL REVIEW PANEL.** Staff members (rear) and consultants review neurological applicants for certification. Foreground: (L-R) John Hastings, MD (Tulsa AME); Timothy Ingall, MD, PhD (Mayo Clinic); and Michael Berry, MD (FAA Headquarters).

## AVIATION MEDICAL EXAMINER INFORMATION LINKS

AME Guide

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

AME Training Information

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

AMCS Online Support

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

Regional Flight Surgeon Contacts

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

Pilot Safety Brochures

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

Multimedia Aviation Medical Examiner  
Refresher Course (MAMERC):

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

Medical Certification Information

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

MedXPress Login & Help

<https://medxpress.faa.gov>

MedXPress Video Page

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

FASMB Archives

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

CAMI Library Services

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

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

2012 Medical Certification Statistical Handbook  
[www.faa.gov/data\\_research/research/med\\_humanfacs/  
oamtechreports/2010s/media/201325.pdf](http://www.faa.gov/data_research/research/med_humanfacs/oamtechreports/2010s/media/201325.pdf)



## CARDIAC TRANSPLANT

Case Report, by N.V.T. Tran, MD, MPH

*Cardiac disease is the leading cause of mortality in the United States. Every minute, one American dies due to cardiac disease (1,2). Technological advances in cardiac transplants have saved many lives. As of December 2013, more than 56,000 cardiac transplants have been performed in the U.S. since 1988 (3). An airman with a cardiac disease obviously raises safety concerns. The Federal Aviation Administration strives to support airmen in their pursuit for flying, while keeping the airspace safe. This is sometimes a delicate balance, especially if the disease process is very complex. To fly after a cardiac transplant is such an example in which we have to carefully explore the boundaries between risk acceptance and safety.*

### History

A 69-YEAR-OLD AIRMAN WITH 900 flying hours applied for a third-class medical recertification in April 2010 after an orthotopic heart transplant in November 2006. His medical history consisted of non-Hodgkin's lymphoma (1996), which was treated with doxorubicin hydrochloride (Adriamycin) and stem cell transplant. Subsequently, he suffered from a drug-induced cardiomyopathy, which led to his cardiac transplantation. He was treated for depression after his surgery; the treatment was discontinued in 2010. Additionally, he underwent radiation therapy in 2008 for prostate cancer (adenocarcinoma) that was confined within the prostate capsule. No recurrence of the malignancies has been noted upon regular medical evaluations.

His surgery and recovery after the heart transplant was uneventful. Multiple biopsies of the allograft over the years showed no signs of rejection. The coronary angiography of his new heart in April 2010 showed no abnormalities. Additionally, a Holter monitor was performed in May 2010, and no malignant arrhythmias or pauses were present. His stress echocardiography on dobutamine over a period of 8:31 minutes recorded an ejection fraction of 55%, with 98% of the maximum predicted heart rate; maximum blood pressure 186/92; and no ST changes or arrhythmias were seen. His current medications: cyclosporine, sirolimus, aspirin, simvastatin, and olmesartan.

### Aeromedical Issues

Separately, each medical issue in this airman's history might be disqualifying. His malignancies showed no recurrence, and his psychiatric and psychological evaluation was normal. Let us focus on the more challenging medical condition, namely his cardiac transplant. As you can imagine, this raises many aeromedical concerns. Until the present day, only eight airmen with cardiac transplants have been issued a third-class medical certificate. The major concern is the sudden incapacitation due to coronary allograft vasculopathy, rejection of the allograft, malfunction of the pacemaker, infections due to the immunosuppressive state, adequate cardiovascular response to high stress, high performance demands, etc.

### DISEASE STATISTICS

Common diseases that may lead to cardiac transplantation include coronary heart diseases, cardiomyopathies, congenital/valvular heart diseases, and hypertensive heart diseases. In the United States, heart disease is the number-one leading cause of mortality. According to U.S. Department of Health and Human Services statistics, a total of 56,435 heart transplantations have been performed in the United States since January 1988. More than 4,000 heart transplants have been performed in the last two years (3). The one-year unadjusted patient survival data from 1998 to 2007 ranges from 84-85% (4). McGiffin and colleagues reported a 12-month mortality risk of 1% from any cause and a risk of sudden incapacitation of 0.3% (5).

### Federal Aviation Administration Policy

The Federal Aviation Administration (FAA) has only issued third-class medical certificates for airmen with cardiac transplants. The authority level lies with the Federal Air Surgeon (FAS). Applications are only considered after at least one year of uneventful post-surgical recovery. All mandatory studies must be performed within 30 days of application and reviewed by the FAA cardiac surgery consultant for initial authorizations. Criteria for favorable consideration are:

- » No angiographic evidence of coronary allograft vasculopathy
- » Normal left ventricular systolic function (either angiogram, echocardiography, or radionuclide ventriculogram)
- » No treated rejection in the 2 years before the anniversary evaluation
- » No hemodynamically compromising rejection at any time since cardiac transplantation
- » For initial authorization: no significant infection within the previous 6 months
- » For renewal of authorization or certificate: If an infection has occurred less than 6 months before an anniversary evaluation, therapy must be completed, and there must be no residual sequelae
- » No non-skin malignancy since transplantation
- » No lymphoma within 2 years of the anniversary evaluation
- » No pre- or posttransplant insulin-dependent diabetes

Applicants found to be qualified for a Special Issuance will receive a 12-month time-limited certification and are required to have annual follow-up evaluations. Due to the complexity and dynamic nature of a heart transplant, no Aeromedical Examiner Assisted Special Issuance is allowed.

The examiner (AME) must defer the airman and submit all documentations to the FAA for Special Issuance consideration. A list of required documents (performed within 30 days of the 8500-8 application or Authorization renewal) is outlined in

*Continued on page 5*

the FAA *Guide for Aviation Medical Examiners* (7) under the cardiac transplant disease protocol:

- » A 1 year recovery period shall elapse after the cardiac transplant before consideration
- » A current report from the treating transplant cardiologist regarding the status of the cardiac transplant, including all pre- and post-operative reports. A statement regarding functional capacity, modifiable cardiovascular risk factors, and prognosis for incapacitation
- » Current blood chemistries (fasting blood sugar, hemoglobin A1C concentration, and blood lipid profile to include total cholesterol, HDL, LDL, and triglycerides)
- » Any tests performed or deemed necessary by all treating physicians (e.g., myocardial biopsy)
- » Coronary angiogram
- » Graded exercise stress test and stress echocardiogram
- » A current 24-hour Holter monitor evaluation to include selective representative tracings
- » Complete documentation of all rejection history, whether treated or not; include hospital records and reports of any tests done
- » A complete history regarding any infectious process
- » All complete history regarding any malignancy
- » List of all present medications and dosages, including side effects

## LETTER TO THE EDITOR

### Good Information

Dear Editor,

I was actually fortunate to read this issue [Federal Air Surgeon's Medical Bulletin, Vol. 51, No. 4]....This FASMB has got to be one of the better ones I have read in the last several years. It had a great deal of very important medical and administrative information that the AME needs to know about.

Job well done to you, your staff and the authors for a great issue. Keep 'em coming.

Thomas B. Faulkner, MD, MHA  
Peachtree City, Ga.

Dear Dr. Faulkner,

**We appreciate your kind comments and will continue to provide timely, useful information to aviation medical examiners.**

Editor

## Outcome

Our airman met the stringent requirements listed above. He requested a third-class medical 4 years after his cardiac transplant. His cardiac examination showed no signs of rejection, and cardiac functioning was normal. A concern can be raised for his non-skin malignancy (prostate cancer) two years after his surgery, although no recurrence has been found on subsequent medical evaluations. With a favorable advice by the FAA cardiology consultant and normal medical results, the FAA has granted a Special Issuance with a 12-month time limitation.

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## About the Author

N.V.T. Tran, MD, MPH, was a U.S. Air Force School of Aerospace Medicine Resident in Aerospace Medicine, Class of 2012. He is an Exchange Officer from the Royal Netherlands Air Force. He wrote this article during a rotation at the FAA Civil Aerospace Medical Institute in Oklahoma City, OK.

# AEROMEDICAL CONSIDERATIONS OF CHOLANGIOCARCINOMA

CASE REPORT, BY BILLY D. PRUETT, MD, MPH

*Cholangiocarcinomas are rare malignancies arising from the epithelial cells of the intrahepatic and extrahepatic bile ducts. These cancers have an extremely poor prognosis, with an average five-year survival rate of 5 to 10 percent, with a median survival of less than 24 months following diagnosis. Surgery provides the only possibility for a cure. Both the devastating nature of the disease and the likely significant impact of the therapies are causes for aeromedical concern.*

## History

In March 2010, a 65-year-old male third-class pilot began experiencing abdominal pain and jaundice. A work-up subsequently revealed an apparent non-functioning gallbladder, and a cholecystectomy was scheduled. Unfortunately, the planned laparoscopic procedure was aborted due to a combination of the technical difficulty of the procedure, as well as the gallbladder's appearance. An open cholecystectomy was performed, and the resultant pathology demonstrated a poorly differentiated, infiltrating adenocarcinoma. The patient underwent endoscopic retrograde cholangiopancreatography with stent placement, and his jaundice subsequently resolved.

The airman was eventually diagnosed as having pT3N1MX stage IIB distal extrahepatic cholangiocarcinoma. He underwent three cycles of cisplatin plus gemcitabine, followed by bile duct excision, hepaticojunostomy, and portal lymph node dissection. Pathology from this procedure revealed a positive distal margin in the common bile duct. He was then treated with intensity modulated radiation therapy to the hepatic ileum and pancreatic head, but brachytherapy was not recommended. His treatment was concluded with capecitabine.

The airman underwent all phases of therapy without difficulty. His recovery was good, and he then began a period of intense post-therapy surveillance. His physician stated in a letter that the patient's incisions were completely healed, that he suffered no pain or obvious sequelae, and that he had returned to his pre-surgical performance status.

## Aeromedical Concerns

As with most cancer diagnosis, the primary aeromedical concern with cholangiocarcinoma revolves around the potential effects of the primary or recurrent tumor on the airman's ability to safely operate in the aviation environment. And as was pointed out in the sidebar, not only is the mortality rate from this diagnosis extremely high, but the clinical symptoms associated with both the cancer and its associated therapies are significant. Cholangiocarcinoma renders an airman ineligible for civilian medical certification under Title 14, Code of Federal Regulations 67.113(b), 67.213(b), and 67.313(b).

## Outcome

The airman in this case was denied a Special Issuance. His advanced age, the lymph node involvement, his IIB staging, and the presence of poorly differentiated adenocarcinoma and positive surgical margins are all poor prognostic indicators. Given that his surgery was not curative, his biliary tree stenting and subsequent neoadjuvant therapy would all have to be considered palliative. The case was referred to an FAA consultant. After reviewing the information, the consultant recommended that the airman's case not be reconsidered for at least one year.

## Etiology

Cholangiocarcinoma, the most common bile duct tumor, arises from the biliary epithelium in the intra- and extrahepatic biliary tree. The classification of extrahepatic can be further divided into hilar or distal bile duct cancers, and accounts for 80% to 90% of cholangiocarcinomas.<sup>1</sup> Distal bile duct tumors represent approximately 20% to 30% of all cholangiocarcinomas, while cholangiocarcinomas as a whole represent less than 2% of all malignancies.<sup>2</sup>

The most common clinical manifestations of intrahepatic cholangiocarcinoma are abdominal pain accompanied by systemic symptoms such as cachexia, malaise, and fatigue. Extrahepatic disease most often presents as painless jaundice secondary to malignant biliary obstruction. In 10% of patients, bacterial cholangitis is the initial presenting symptom.<sup>3</sup> Of those patients with distal extrahepatic disease, 75% to 90% will experience progressive jaundice, and less than one-third will have abdominal pain, weight loss, fever, or pruritus.

Diagnosing cholangiocarcinoma typically requires a multidisciplinary approach, which includes clinical evaluation combined with laboratory, endoscopic, and radiologic studies. Laboratory analysis often reveals evidence of obstructive cholestasis with serum alkaline phosphatase and bilirubin levels being elevated. Levels of several serum tumor markers (CA 19-9, carcinoembryonic antigen [CEA], and Ca-125) may also be elevated; however, none of these serum markers is specific, and can be elevated in other gastroenterologic or gynecologic malignancies and in the setting of biliary inflammation or infection. The most commonly used marker is CA 19-9.<sup>4</sup>

Cholangiography is an essential part of the work up, providing both anatomic information and tissue for diagnosis. Both endoscopic retrograde cholangiopancreatography and percutaneous transhepatic cholangiography (THC) provides information on intrabiliary tumor extension and allows cytologic sampling and therapeutic intervention. And while no such interventions are possible with magnetic resonance cholangiopancreatography, the technique has the benefit of being noninvasive and provides information on the extent of extrabiliary tumor, metastases, vascular encasement, and the relation of the primary tumor to surrounding structures.

*Continued on page 7*



Note that, in the setting of distal bile duct stricture and a clinical presentation consistent with cholangiocarcinoma, histologic confirmation is generally unnecessary when operative therapy is planned. Benign strictures of the lower bile duct are difficult to differentiate from the malignant variety without resection. Percutaneous needle biopsy often ranges from difficult to impossible, and endoscopic brushings of the bile duct have an unacceptably low sensitivity.<sup>5</sup>

Cholangiocarcinoma is a naturally aggressive cancer. The median survival following diagnosis is less than 24 months. Surgery is the only potentially curative treatment but is often precluded by the advanced stage of the disease at the time of diagnosis. Resection of intrahepatic tumors has a five-year survival rate, ranging from 22% to 42%. Survival positively correlates with early tumor stage, younger age, and better performance status.

When resection of extrahepatic cholangiocarcinomas produces clear surgical margins, five-year survival rates are 11% to 41% for hilar and 27% to 37% for distal. Unfortunately, the rates of such clear margins are less than 50%.<sup>3</sup> In a 2007 study, Murakami conducted a retrospective chart review of 43 patients with distal cholangiocarcinoma that underwent surgical resection. Of these, 35 underwent pancreatoduodenectomy, and eight had segmental bile duct resections. Overall survival rates were 72%, 53%, and 44% for 1, 3, and 5 years, respectively; with a median survival time of 26.0 months. Poor prognostic indicators were older age, pathological pancreatic invasion, lymph node metastasis, perineural invasion, positive surgical margin, and TNM stages II and III ( $P < 0.05$ ). Lymph node metastasis and positive surgical margin were found to be significant, independent predictors of poor prognosis.<sup>6</sup>

Gemcitabine remains the only FDA-approved chemotherapeutic drug. No randomized, controlled, phase III trials have shown a significant survival benefit derived from chemotherapy for patients with cholangiocarcinoma. Therefore, chemotherapy's only benefit is in either the palliative or neoadjuvant settings. Similarly, the use of radiation therapy remains controversial.<sup>1</sup>

As was previously noted, there is substantial morbidity associated with cholangiocarcinoma. Patients' quality of life is typically limited by cholestasis, abdominal pain, and cachexia. Subsequently, palliative care plays an essential role in the management of these patients. Palliative care options include chemo- and radiation therapies; restoration of biliary drainage through endoscopic, percutaneous, and surgical techniques; and more recently, photodynamic therapy (PDT).<sup>7</sup> The first two of these options have been shown to be relatively ineffective.

Conversely, early intervention with biliary stenting has been shown to not only improve palliation, but also to normalize bilirubin levels. And recently, PDT has demonstrated an ability to reduce cholestasis, improve quality of life, and possibly even provide a survival benefit. In PDT, the patient receives a photosensitizing agent (e.g., hematoporphyrin) prior to localized illumination of the tumor using a specific wavelength of light. Cytotoxicity then occurs as a result of reactive oxygen species-mediated cell death, tumor-vessel thrombosis, and tumor-specific immune reactions. The procedure is well tolerated with a low complication rate.<sup>3</sup>

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### About the Author

Col. Billy D. Pruett, MD, MPH, has been a U.S. Air Force Flight Surgeon since 1999. He was an internist in private practice before returning to active duty in 2008. He wrote this case report while attending the Advanced Aviation Medical Examiner Course at the Civil Aerospace Medical Institute as a member of the Alpha RAM XII Class of the USAF's School of Aerospace Medicine, the first class at Wright-Patterson Air Force Base. In 2013, after completing residencies and board certifications in both Aerospace and Occupational medicine, he was transferred to Joint Base Langley-Eustis, Va., where he currently serves as the 633nd AMDS commander, as well as the Chief of Aerospace Medicine for the Langley Hospital.

# COMPLEX REGIONAL PAIN SYNDROME, TYPE I

CASE REPORT, BY NATALIE L. RESTIVO, MD, MPH

*Complex regional pain syndrome, Type I, or sometimes reflex sympathetic dystrophy, is a neuropathic pain problem that typically develops after a painful event that may or may not be traumatic. Pain can be distracting, and functional impairment can interfere with safe aircraft operation and emergency egress. This case report describes an applicant diagnosed with the syndrome and how his aviation medical examiner worked the application to achieve an outcome.*

## History

A 20-YEAR-OLD MALE PRESENTED to his aviation medical examiner for a third-class student pilot certificate. He related that during his senior year in high school, he had sustained a neck injury while competitively wrestling. Subsequent workup for this injury was negative, and the applicant was treated symptomatically with complete resolution of his symptoms. However, he began to experience left toe pain and a persistent low-grade headache by the end of his senior year. The foot pain progressed over about a month to include both legs up to the hips.

After an exhaustive workup by various specialists and unsuccessful treatment with a variety of treatments, he was diagnosed with complex regional pain syndrome (CRPS), Type I of the right and left lower extremities. The applicant received three para-spinal lumbar sympathetic nerve blocks over a 2-month period the same year. He responded well to this treatment, and by the third nerve block, was pain-free with full use of his lower extremities.

In addition, he received psychotherapy and biofeedback for approximately 6 months and was diagnosed with adjustment disorder with mixed anxiety and depressed mood due to his distress related to his medical situation. His psychologist felt that the patient had made wonderful progress and had successfully resolved his issues. He has remained asymptomatic, pain-free with full mobility, and engaged in routine athletic activities without limitation for approximately one year.

## Aeromedical Issues

The primary aeromedical concerns associated with CRPS are related to incapacitation from the disease itself and the medications and modalities used to treat this condition. Pain associated with CRPS can be distracting, and functional impairment can interfere with safe aircraft operation and egress in the event of a mishap. While pain associated with CRPS is typically constant, symptoms can be waxing and waning in nature. For this reason, it is important to document a sufficient period of symptom control.

## COMPLEX REGIONAL PAIN SYNDROME TYPE I

Complex regional pain syndrome, Type I (CRPS), also known as reflex sympathetic dystrophy (RDS), is a neuropathic pain problem that typically develops after a painful event that is not always traumatic (1).

It is characterized by allodynia, hyperalgesia, or spontaneous pain that is typically not in the distribution of a single peripheral nerve (1). Edema, cutaneous blood flow abnormalities, and sudomotor abnormalities can be present in the affected area, and there is an absence of any other condition to account for these symptoms (1).

Symptoms usually present within 1 month of the precipitating event (2). Psychological stressors can exacerbate the pain associated with CRPS but has not been found to be causal in this disease process (2). Prevalence of severe, chronic CRPS is < 2%, but mild CRPS can occur after up to 40% of fractures and surgical trauma (2). An interdisciplinary approach to pain management emphasizing functional restoration may be most effective in treating this complex disease (3).

Occupational therapists and physiotherapists focus on desensitization and improving functionality while psychologists focus on the anxiety, depression, and avoidant behavior associated with chronic pain (3). Regional anesthetic techniques can be utilized for patients with moderate-to-severe pain that is non-responsive to other treatments, have severe sympathetic dysfunction, or who improve after a diagnostic sympathetic block (1). Most pharmacological treatments for CRPS are empirical, with few studies showing efficacy for this particular disease (4). Because of overlapping, physiological mechanisms of neuropathic pain, treatments that are effective in treating diabetic neuropathy and postherpetic neuropathy such as tricyclic antidepressants, serotonin-norepinephrine reuptake inhibitors, opiates, and certain anticonvulsants may be helpful in treating CRPS (4). The problem with these medications is that, with the exception of four of the SSRI medications, the medications are unacceptable for medical certification for any class.

## Role of the AME

The general medical standards for medical certification annotated in Title 14 of the Code of Federal Regulations Parts 67.113, 67.213, and 67.313 include no functional or structural disease, defect, or limitation that makes the applicant unable to safely perform the duties or exercise the privileges of being an airman. CRPS is a challenging entity to treat, and prognosis is typically better if treatment is begun within 3 months of the first symptoms. It is critically important that an applicant demonstrate that he is pain free, has full functionality, and is

*Continued on page 9*



taking no medications or undergoing any treatment that is incompatible with flying for a period of time long enough to determine that the disease process is under adequate control prior to consideration for medical certification. All pertinent medical records and treatment should be forwarded to the Federal Aviation Administration for review. While CPRS is not specifically disqualifying, aviation medical examiners should consider the airman's risk of incapacitation related to the disease itself and the medications and modalities used to treat this disease.

### Outcome

This applicant was eventually issued a third-class student pilot time-limited certificate for 12 months. At that time, he was to submit a certification status report.

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### About the Author

*Lt. Col. Natalie L. Restivo, MD, MPH, is the Commander, 82nd Medical Operations Squadron, Sheppard Air Force Base, Texas. She wrote this case report while on a clinical rotation at the Civil Aerospace Medical Institute.*

## NEW SURVEY FOR AMES ANNOUNCED

*Your Candid Feedback is Needed*

By BRENDA WENZEL, PhD

THE OFFICE OF Aerospace Medicine invites all domestic, military, federal, and international aviation medical examiners (AMEs) to evaluate the services, tools, and support that the Federal Aviation Administration (FAA) provides you to perform your duties as an FAA designee.

To continuously improve the AME Program, we need your candid feedback on:

- AME seminars and training,
- Medical certification standards and regulations,
- Issuance guidance,
- Internet-based Aerospace Medical Certification Subsystem,
- Electrocardiogram system, and
- Technical support.

Letters and emails with detailed information on how to participate in the evaluation are being sent out. If you do not receive this information by the end of February, please contact the Civil Aerospace Medical Institute at (405) 954-8579 between 9:00 a.m. and 4:00 p.m. CST, or send an email to:

[9-AMC-SurveySupport@faa.gov](mailto:9-AMC-SurveySupport@faa.gov)

We encourage all active aviation medical examiners to participate and have their voices heard!

*Dr. Wenzel is a research psychologist in the Aerospace Human Factors Research Division.*

## EXCITING NEWS FOR AMES

*You Asked for It and You Got It*

By BRIAN PINKSTON, MD, MPH

YOU MAY REMEMBER the AME Survey that we sent to you in 2012. Based on your feedback, the Office of Aerospace Medicine has been working hard to make your job easier and more efficient. Here's a list of some suggestions and our responses after working on the issues:

- **Suggestion:** Make navigation of the Guide for Aviation Medical Examiners easier
- **Response:** The new NAVAIDS navigation tool arranges it in a review of systems format:

[www.faa.gov/about/office\\_org/headquarters\\_offices/avs/offices/aam/ame/guide/](http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/)

- **Suggestion:** Make the navigation of the FAA website easier for AMEs
- **Response:** the Go AME page provides links to the most commonly used areas

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

- **Suggestion:** Improve the ECG transmission process for AMEs
- **Response:** the Aerospace Medical Certification Division is actively working on a project for this system (see Dr. Scott's article in this issue). PLEASE take the AME survey due out shortly to help answer some key questions for the project
- **Suggestion:** Provide more AME refresher seminars in my region
- **Response:** With current budgetary issues, it is extremely difficult to have more frequent traditional refresher seminars in each region. However, the Aerospace Medical Education Division, the FAA ATN Studio, and several Regional Flight Surgeons' offices are collaborating to provide a distance learning seminar pilot in March. Based on outcomes from this pilot, we may be able to provide this as a regular service in the future. More to follow.

- **Suggestion:** Provide more information about aeromedical disposition and medications
- **Response:** The *Guide for Aviation Medical Examiners* now provides expanded information about some medications of concern and a newly released list of "do not issue/do not fly" medications.

[www.faa.gov/about/office\\_org/headquarters\\_offices/avs/offices/aam/ame/guide/pharm/](http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/pharm/)

[www.faa.gov/about/office\\_org/headquarters\\_offices/avs/offices/aam/ame/guide/pharm/dni\\_dnf/](http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/pharm/dni_dnf/)

- **Suggestion:** Conduct an annual online review of recent changes to AME processes
- **Response:** there are two video updates for 2013 and we are planning for future annual updates. The two video updates are for the Conditions AMEs Can Issue (CACI) process/policy and the cardiology policy updates. They can be found on the Go AME site or at:

[www.faa.gov/tv/?mediald=733](http://www.faa.gov/tv/?mediald=733)

[www.faa.gov/tv/?mediald=734](http://www.faa.gov/tv/?mediald=734)

We continue to work on your suggestions and new ways to improve our program to serve your needs. Two new updates are the all-new Civil Aviation Physiology for Aviation Medical Examiners—CAPAME—(released on January 31; for more information, see Dr. **Buriak's** announcement on page 12), and the multimedia AME refresher course is under revision to reflect the CACI policy changes.

Please keep the suggestions coming. Finally, please take the survey, and watch for new education announcements in the near future.

Thanks for all you do!



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

## New Feature

### JOHN HASTINGS, MD: 33 YEARS OF ORATIONS

By JAN WRIGHT, M.A.



WE ARE INITIATING a new feature that highlights consultant speakers at our aviation medical examiner seminars. Dr. **John (Jack) Hastings** (left) is our featured speaker for this issue. Dr. Hastings is a neurologist from Tulsa, Oklahoma. One cannot go very

far in the world of aviation medicine without coming across Dr. Hastings in person, or at least seeing his name as a contributor, author, or presenter at an aerospace medicine event.

Dr. Hastings has served as president of both the Aerospace Medical Association and the Civil Aviation Medical Association, as well as chairman of the Experimental Aircraft Association's Aeromedical Advisory Council. He is also a member of the International Academy of Aviation and Space Medicine, past president of the American Bonanza Society, and currently is serving as president, American Society of Neurophysiologic Monitoring.

Dr. Hastings is a commercial pilot with multi-engine and instrument ratings earned during 43 years of flying experience and 6,200 hours of flight time. Like so many other physicians, becoming an aviation medical examiner (AME) gave him a natural opportunity to combine his love of flying and medicine. He began speaking at FAA training events more than 33 years ago, five years after becoming an AME.

As a speaker at AME training seminars, Dr. Hastings has an opportunity to share his knowledge and enthusiasm with other pilots and physicians. "The most important thing an AME needs to know," he said, "is how to assemble the necessary information that the FAA needs for an aeromedical decision." His lectures at seminars explain the process of how to write noteworthy comments, including what may be pertinent information while leaving out the superfluous.

The Aerospace Medical Education Division recently selected him to be the first speaker to test and implement a newly revised education template for seminar training presentations. His lecture was adapted with new learning objectives, new formatting, and new graphics to become the first of a standardized curriculum design for theme seminars.

Thank you, Dr. Hastings, for your leadership in the field of Aerospace Medicine!



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

## DR. SAENGER RECEIVES DOT AWARD

By COURTNEY D. SCOTT, JR, DO, MPH



Dr. Arleen Saenger (c) with Associate Administrator for Aviation Safety Peggy Gilligan and Administrator Michael Huerta.

DR. ARLEEN SAENGER received a meritorious achievement award from the U.S. Department of Transportation for her "extraordinary contributions to the safety mission of the Office of Aerospace Medicine over the last year." Dr. Saenger is the manager of the Federal Aviation Administration's Aeromedical Policy and Standards Branch in Washington, D.C.

Dr. Saenger is an instrumental part of the policy branch for the Federal Air Surgeon. She meticulously reviews new medications to ascertain if there are side effects that might adversely affect aeronautical safety. She maintains the FAS Medication information that compiles this information. She diligently publishes changes to the *Guide for Aviation Medical Examiners*.

This online guide is the publication that AMEs use in their daily work. Historically, the *Guide* was not user friendly, but Dr. Saenger worked to produce a "NavAids" tool that allows the *Guide* to be searched. This has substantially simplified life for the AMEs.

She also is the keeper of the internal reference document used for certification purposes to help ensure fairness and standardization in aerospace medicine case dispositions.

Prior to coming to the FAA, Dr. Saenger had a highly successful U.S. Air Force career. In addition to her work as an Air Force flight surgeon, she also served in the capacity as the top physician in the aeromedical evacuation system, and she served as Chief of Physical Standards for the Air Force.



*Dr. Scott is the Manager, Aerospace Medical Certification Division*



## CAPAME SIGNIFICANTLY UPDATED

*Now Available Online*

BY SUSAN BURIK, MPH, DHEd

THE AEROSPACE MEDICAL Education Division is taking a scalpel to the educational content and programming of CAPAME (Civil Aerospace Physiology for Aviation Medical Examiners) and has published a vastly improved version online. CAPAME is the distance-learning product that serves as a prerequisite for aspiring aviation medical examiners worldwide.

The operating room team, a curriculum committee of physicians and physiologists, spearheaded the revision effort. This committee reviewed existing content and videos and established a revised curriculum of core modules and specialty topics. The course developer recruited 22 authors, based on their expertise, to update the content using current literature, including applicable Civil Aerospace Medical Institute (CAMI) research.

Contributors included CAMI staff, Residents in Aerospace Medicine, consultants, and visiting physicians.

In addition to aerospace physiology fundamentals such as spatial disorientation, noise, and hypoxia, new modules include vision, lasers, acceleration forces, space physiology, and fitness. The working group also updated graphics and videos to support the revised content material.

A new feature, *Educational Grand Rounds*, incorporates a new video format into the instructional design, whereby primary teaching points from each topic are consolidated into simulated cases and presented with questions and answers.

The link to the newly revised course on the AME training website is:

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

*Dr. Buriak is the Program Manager for Curriculum Development & Quality Assurance  
Aerospace Medical Education Division*



### 2014 AME SEMINAR SCHEDULE

February 21-23	Atlanta, Georgia	NEU (3)*
March 24-28	Oklahoma City, Oklahoma	Basic (2)
May 12-15	San Diego, California	AsMA (1)
July 14-18	Oklahoma City, Oklahoma	Basic (2)
August 8-10	Bethesda, Maryland	OOE (3)
October 9-11	Reno, Nevada	CAMA (4)
October 27-31	Oklahoma City, Oklahoma	Basic (2)
November 21-23	San Antonio, Texas	CAR (1)

### NOTES

- (1) A 3½-day theme AME seminar held in conjunction with the Aerospace Medical Association (AsMA). This seminar is a Medical Certification theme, with aeromedical certification lectures presented by FAA medical review officers, in addition to other medical specialty topics. Registration must be made through AsMA at (703) 739-2240. A registration fee will be charged by AsMA to cover their overhead costs. Registrants have full access to the AsMA meeting. CME credit for the FAA seminar is free.
- (2) A 4½-day basic AME seminar focused on preparing physicians to be designated as aviation medical examiners. Call your Regional Flight Surgeon.
- (3) A 2½-day theme aviation medical examiner (AME) seminar consisting of aviation medical examiner-specific subjects plus subjects related to a designated theme. Registration must be made through the Oklahoma City AME Programs staff, (405) 954-4831. NEU= Neurology, OOE= Ophthalmology-Otolaryngology-Endocrinology, CAR= Cardiology.
- (4) This seminar is being sponsored by the Civil Aviation Medical Association (CAMA) and is sanctioned by the FAA as fulfilling the FAA recertification training requirement. Registration will be through the CAMA Website:

[www.civilavmed.com](http://www.civilavmed.com).

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

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