PRESIDENT'S COLUMN

Colonel John Stepp

Forc Protection: If you have had even the slightest contact with the operational Air Force during the past six months or so, you undoubtedly recognize that a mysterious beast called force protection is now the highest of the high interest items in the ops world. Further, that high level of interest runs from your local intel flight and SP squadron right up to the CSAF. So what, you ask, does this have to do with Team Aerospace? In my view, nearly everything. At minimum, it is a 24-carat solid gold opportunity for us to better market ourselves to the line. However, most people, sadly including most medics, think of force protection exclusively as the things the cop and intel communities do to minimize the threat posed by a terrorist attack involving bombs or bullets. But what about the threat posed by a food-borne or water-borne illness outbreak? What about the threat posed by BW agents?

At Headquarters, Air Force Space Command my Team Aerospace staff and I are working on a package that looks at our traditional preventive medicine activities from the force protection perspective. For example, we posit that communicable diseases represent a very real threat to Air Force mission capability. Against these threats we medics deploy

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a variety of countermeasures, to include communicable disease surveillance, vector surveillance, and immunization. Similarly, against the threat of food borne illness, we conduct food vulnerability analyses, food inspection programs, and facility sanitation inspections. Likewise with environmental and occupational surveillance, medical intelligence collection and dissemination, chemoprophylaxis, etc.

Now, is this real, or is it a slick but not very meaningful attempt to jump on the latest high viz bandwagon? If you have any doubts, I suggest you talk with some of our colleagues who were involved in illness outbreaks during ODS. Having done so, I firmly believe that the vast majority of what Team Aerospace does for a living constitutes not only legitimate but absolutely vital force protection activities. It behooves us to start thinking and talking about them in those terms.

Society Luncheon

This annual event will be on Monday, May 12, from 1200 to 1400. In addition to the presentation of several awards, including Flight Surgeon of the Year, the guest speaker will be the Surgeon General of the US Air Force, Lt Gen Charles H. Roadman II. He will be speaking on the future of Aerospace Medicine in the Air Force. This is a presentation you don’t want to miss! The cost is $20.00 and it can be paid at registration.

Society Social

We also traditionally have a social event for all of the Air Force flight surgeons and their spouses. This year it will be a pizza dinner and it will be held at the Grand Ballroom of the Swissotel, which is within walking distance of the Hyatt. It will be held May 14, 1900 - 2200. The cost will be $20.00 per person to cover the cost of renting the Grand Ballroom and of the pizza. The atmosphere for these social events is always relaxed and informal, so please come if you can!

Ballots for the 1997-1998 Society Officers and Board of Governors

You may have noticed something stuck in the middle of your newsletter. This is a ballot for the new officers and board of governors for the Society of USAF Flight Surgeons. Time is short so it is critical for you to act NOW if you plan to cast your vote. Circle one candidate for President, one for Secretary, and choose three of the listed for Board of Governors. Mail it in the enclosed envelope and please do not send it as Official mail. It is not. Place a stamp on it and immediately put it in the mail. Ballots will be accepted up to May 9th, and that is soon. If time is too short, just email your vote to rhodes@alaoc.brooks.af.mil or fax to DSN 240-2817 (Com: 210-536-2817).
The finishing touches are on the Preventive Health Assessment (PHA) and Col (s) Courtney Scott is briefing the program to the general officers, both line and medical. We anticipate completion of the briefings and implementation this summer. The plans for PHA have been changed significantly, primarily as a result of constructive review by the MAJCOM staffs and a survey of line squadron commanders. Each of us who have reviewed the details of the PHA are struck by the great change it brings to how we support the warfighters, flying and nonflying. Many of you have commented on the difficulties of bringing about such a significant change — possibly the most fundamental change in our program since the advent of the flight physical during World War I. I’d like to briefly review why we believe we must implement the PHA.

With the advent of TriCare and constricting resources we hear a great deal now about how we will provide the health care benefit to the beneficiaries. As flight surgeons, we recognize that the changing Air Force and its mission also require more from its medical operational support. Why? The force has been shrinking steadily while the ops tempo has remained steady since the Gulf War. Small package deployments are the rule for 90-120 days with a lean manpower mix that leaves no room for attrition of people. Increasingly, commanders need people capable of sustained optimal performance. We meet this requirement by enhancing the performance capability of the force and protecting the force from threats to their health and performance.

Are we doing this now? Low immunization completion rates in people deploying to Southwest Asia, fewer than 30% of nonflying officers with physical exams within five years, fewer than 50% of nonflying NCOs with physical exams within five years, and physical exams (flying and nonflying) that are not focused on occupational and health risks are just some of the indications we could do much better. The gulf war experience showed us that mobilization is a poor time to determine the health of a deploying force.

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The Williams-Steiger Occupational Safety and Health Act (OSH Act) of 1970, as amended, is the body of law which governs the conduct of most employers in the United States with respect to their provision of a safe and healthy work environment for the people who work for them. The U.S. Department of Labor (DOL) is given the responsibility for enforcing the provisions of the act. The DOL has promulgated regulations concordant with the will of Congress and these may be found in three titles of the Code of Federal Regulations (CFR). Specifically they may be found in Title 20 CFR chapters I, IV, V, VI and VII; Title 29 CFR subtitles A and B; and Title 41 CFR chapters 50, 60 and 61. This brief discussion will focus on the first part of Title 29 CFR subtitle B, Chapter XVII.

You need to be aware that the Federal Government has ceded the authority for regulation and enforcement of OSHA to the States if they submit qualifying plans to the DOL. Parts 1900 to 1902 specify the requirements for acceptance of state plans. If you are based in a State which has met the requirements of the Williams-Steiger Act, the State plan will be at least as restrictive as the Federal Regulations for the area of the law that it covers. States may ask permission to regulate all or any part of the OSH Act. States may have other regulations, which must be complied with, that are not part of the Federal Regulations.

Enforcement of the OSH Act is covered in Part 1903. If the regulatory agency (usually the DOL) becomes aware of an alleged violation of the OSH Act, the agency may gain entry to the work site and conduct a compliance inspection. If the inspected site is classified for reasons of national security, the inspector must be cleared to the level of the functions to be inspected (1903.3(b)). For the most part, compliance inspections seem to result from employee complaints. The act specifically protects employees who identify OSH Act violations from any retribution (1903.11(d)). If an OSH Act violation is found, a citation will be issued. Citations must be posted in the workplace and immediate efforts must be made to remediate the problem. Prompt remediation does not exempt the offending parties from civil or criminal prosecution. Failure to remediate may result in the accrual of additional penalties. In the case of imminent danger to worker’s health or life, immediate civil legal action may be undertaken to insure compliance or protect workers by closing or restricting the work site. The simple translation of Part 1903 is that violations of the OSH Act can be expensive and may result in criminal prosecution (i.e. jail). Federal employees are not immune from these provisions and the USAF may not indemnify offending personnel which means that the responsible individuals may be prosecuted as individuals.

In one case, a civil contractor was hired to work on a military installation and an Occupational Safety & Health Administration (OSHA) compliance inspector witnessed some knowledgeable Air Force personnel failing to correct a violation being committed by the contractor. You guessed it, both the contractor and the USAF employees were cited. Defending and supporting the laws of the United States is not just accomplished during armed combat.

Employers who believe that they have been cited incorrectly, penalized unfairly or required to comply in an unreasonably short (Continued on page 7)
As an elective course in the Residency in Aerospace Medicine both authors spent approximately a week on board US Navy aircraft carriers. Major Robinette was on the USS Constellation, CV-64, and Major Marchiando on the USS Nimitz, CVN-68. Both ships are home-ported on the West Coast. While defending the same country and constitution, having the same commander in chief, and being part of the US military, the Navy is very different from the Air Force. The people, the flying, the words, the medicine are all familiar, but not the same. You can hum the tune, but don’t know the words.

First of all the ship is a huge machine, except for when trying to land on it. It is extremely disorienting inside the ship. It is incredibly easy to get lost and difficult to navigate within. It is challenging to find ladders going the direction you want. It can be hard to find a head (bathroom). It is noisy on the ship (OSHA hazardous noise level noisy). Flight crew and visitor berthing is directly beneath the flight deck. The noise and vibration of an F-14 running up for a catapult launch, and the catapult going off, will wake the dead. Ear plugs are a must in some of the heads during the launching of aircraft as catapult steam lines run through them.

Sound rest is accomplished through fatigue. Aircrew duty days and crew rest were supposedly followed, but not in any fashion recognizable to the USAF. Reveille sounded over the ship’s loudspeaker system at 0600. Final aircraft launches are often 2300 and recoveries after 2400 hours. Aircrews usually hang out in the squadron ready room whenever they were not flying. So the aircrew are constantly at work, even when not scheduled to be at work. The medical staff’s working hours are even worse, especially for the medical technicians (corpsmen). The 20-200-man berthing areas they lived in were worse than being at work. They would be at work from 0700 or earlier to 2000-2200 hours every day. Occupational exams were routinely scheduled for 1900 hours. Upon return from a six-month deployment, the ship’s crew “stands-down” for a month. When the ships are in port, crewmembers not on duty are free to leave the ship. The crew is typically divided into four duty sections, with duty every fourth day. The crew is off, unless in the duty section. Perhaps the Air Force could learn something from the Navy in this regard.

The flight deck is amazing. There is so much going on, in so little space, all at the same time, all directed by hand signals. Airplanes taxi by each other so close, and so close to the edge of the deck that disaster seems inevitable. Launch of each aircraft is a precisely choreographed procedure of at least 15 steps, all outlined in Navy manuals. Yet it happens so smoothly and quickly, you hardly realize all that is occurring. It’s also all done without radios, to help prevent giving away the carrier’s position and activities. The standard aircraft complement is nine squadrons embarked: One or two F-14 Tomcat, two Navy F-18 Hornet, one Marine F-18, one E-2C Hawkeye, one or two S-3 Viking, one EA-6B and one SH-60. All the aircraft types are usually involved in each launch evolution. The F-14s are launched and provide fleet protection. The F-18s are used as strike aircraft. Almost everything

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hinges around the flying duration of the Hornet. The 1.2 to 1.4 hours they are up is the time between aircraft launch and recovery cycles. S-3 Vikings are used primarily as tankers, now that the submarine threat is greatly reduced. The S-3s orbit overhead the carrier and refuel any F-18s that return low on gas or top them off before they depart for their strikes. The E-2C is just like AWACS and provides radar coverage for the strikers and the fleet. The EA-6B is an electronic countermeasures (ECM) aircraft. The Air Force is turning over the EF-111’s ECM role to the EA-6B. Air Force crewmembers are starting to show up on carriers to fly with the Navy in this aircraft. The SH-60 Seahawk helicopters fly plane guard any time the aircraft carrier has planes in the air. They are always the first to launch and the last to recover. The other plane seen on the carrier is the C-2A Greyhound, (the Carrier Onboard Delivery or COD aircraft). It is the most anticipated aircraft because it delivers mail, some supplies, newspapers and people to and from the ship, usually twice a day. The COD usually is shore-based and follows the ship around the world.

Aircraft recovery is done with the Hornets coming aboard first. Aircraft start recovery by stacking in 1000 feet altitude orbits overhead the carrier. As each aircraft comes aboard the stack drops 1000 feet. Planes come aboard in at about 30 second intervals. After the Hornets, the F-14s come aboard. Then the EA-6, then the S-3s and finally the E-2. The E-2 is the only aircraft that can’t inflight refuel, but it has the longest legs by far. The recovery is done completely without using the radio until on short final. Then it’s just to say gear down and visual with the approach system. The landing ship officer (LSO) then talks down the plane and uses a lighting approach system to visually signal the pilot. Each LSO is a very experienced carrier pilot.

Each landing is graded by the LSO. Usually a huge gaggle of LSOs watch and grade each landing. After all the aircraft are down, they debrief each pilot. They walk into the ready rooms in their special LSO combination life preserver and jacket, and everything gets real serious. If that wasn’t enough pressure, every landing grade is posted on the ready-room wall, for the whole squadron to see. And it’s left there for the entire cruise. There is no hiding how you fly. Also every takeoff and landing is videotaped. This is broadcast throughout the ship on closed circuit television. No sound is broadcast, as you can hear planes slamming onto the deck or the catapult shots, throughout the ship. The reason for the broadcast is to ensure everyone is aware what is occurring on the flight deck. The flight deck is the most likely starting point for any disasters.

Mass casualty drills are run much like in the Air Force. Transporting patients through the ship can be a major ordeal. The elevators that bring the planes from the flight deck to the hanger deck are used to move patients similarly. Then weapons elevators, that usually move ordinance from weapons bays deep in the ship, are used to move patients to the medical department. Litter bearers are from non-medical manpower teams. A great deal of coordination is necessary to get the elevators, and then to move through “exercise undamaged” areas of the ship.

The medical complement onboard consists of two or three flight surgeons, one General Medical Officer (GMO), one surgeon, one anesthesiologist, one Physician’s Assistant and the Senior Medical Officer (SMO). The SMO usually is a RAM, and the Navy residency emphasizes preparation for this duty. There are approximately 40 corpsmen, one
nurse, and one medical administrator. The medical department includes everything needed to take care of the approximately 5000 people on board. The medical space is divided into an operating room, two trauma rooms, the smallest 60-bed ward ever seen, a three-bed ICU, four-bed isolation area, lab, pharmacy, and offices for two flight surgeons, the surgeon, the GMO, administration and the SMO. It’s extremely space critical and not very private. Patients wait in the passageways.

There is too much more to describe than space available. Both authors got their catapult shot and trap (arresting wire landing). As an absolute minimum, one must have some sort of water survival and or swim test to fly with the Navy. It is definitely a career highlight to visit a carrier at sea, and will make you appreciative of the Air Force.

**NAVY WORD GLOSSARY**

Each service has its own vernacular, and the Navy has no shortage of interesting, funny terms. Here are just a few:

- **Nuggets**: New guys on their first tour, like a shiny, un tarnished, metal nugget
- **Vulture’s Row**: Area on the carrier’s island where people are allowed to watch take-offs and landings
- **B.O.N.S.**: Boots On NonSkid—Time briefed to step to the jet.
- **Suspend**: Navy version of “Knock it Off”
- **Geedunk**: Food, especially junk food
- **Hot Runner**: A fast burner through the ranks
- **Topper**: A real good BS-er
- **Admiral**: A “been there, done that” kind of guy
- **Khakis**: Chief Petty Officers and Commissioned Officers, refers to the khaki uniforms they wear
- **J.O.**: Junior Officer-O-3 or less
- **Hinge**: O-4—like you have a hinge in your neck and can only nod yes to the skipper, because you’re at that point in your career
- **Snivel Log**: Meeting schedule or appointment book

**Cranials**: Helmets everyone wears on the flight deck

**Battle Rack**: Hiding in your bunk during an exercise

Not all visits by OSH Act personnel are enforcement activities. The OSH Act provides a consultative service through the National Institutes of Occupational Safety & Health (NIOSH) or a State equivalent agency. NIOSH is not part of the DOL but is under the operational control of the Department of Health & Human Services. These visits are in response to employer requests for review of their OSH Act programs and will not result in the assessment of penalties (1908.7). Consultative visits may not be conducted simultaneously with OSH Act compliance inspections. When consultants identify conditions presenting an imminent danger, they will work with employers to develop a plan to promptly rectify the identified problem(s).

This brief article is no substitute for studying the applicable regulations. If all of this sounded familiar to you, congratulations, be-
In flight medicine we have demonstrated that integration of occupational, preventive, and primary care medicine is highly effective. By teaming with family practice, we can extend this integrated approach to the nonfliers. By focusing our assessments on occupational and health risk, we can maximize the benefit of our prevention and screening efforts.

A few MTFs have already gathered some experience with PHA. Their lessons-learned have been most helpful in preparing PHA for full implementation. Their experience shows us that the first year will be a challenge as we review nonflier records for the first time and identify medical issues that have not been fully addressed. A cooperative effort with family practice will be key to making PHA work, which is why it is being implemented as an MTF program rather than an aerospace medicine program. Clearly, however, aerospace medicine will be the key players in PHA, as we should be, since prevention and operational support are at the core of our competencies.

In summary, we need the PHA to more completely exercise prevention in operational support and help ensure the force is equal to the performance challenges and threats of today and the future. Most flight surgeons I’ve talked to recognize the goal and purpose of the PHA, but not all have the same notions of how best to work the details. The next year will be a learning experience for all of us and we will undoubtedly learn ways to enhance the PHA.

Thanks, in advance, for your help.

OLESTRA — GROUND TESTING RECOMMENDED!
A POTENTIAL "EXPLOSIVE" HAZARD?

Col Shari Falkenheimer
Associate RAM Director

Olestra — what:in the world is that? If you don't watch Jay Leno, live in an olestra test city, or eat Fat Free Pringles and you don't know what olestra is, you're not without company. A summary of calls to an olestra adverse effects call-in line recently found that some callers had consulted their doctors about potential side effects of the non-digestible fat substitute, only to find they knew little or nothing about the new food additive. In fact, not much seems to be known about olestra in humans and it's hard to find information in MedLine on it, even when you're looking. The only readily accessible article on it I could find with a MedLine search was not a scientific article, but a three page opinion piece (1).

With all we need to know in flight medicine, why even bother to know about olestra? Well, it could be a fun flying safety meeting topic — cartoons, jokes and even poems on it are available from the Center for Science in the Public Interest (CSPI) website at: http://www.cspinet.org/olestra/index.html

... as are articles such as, "I Didn't Appreciate Being a Guinea Pig — What People Who've Eaten Max Chips Have to Say About Olestra." Knowing about it might also be in our own best interest in case a patient asks about it. It could also keep us from naively deciding to try it and getting unexpected results; most of us would prefer to avoid the D word (diarrhea), not to mention "anal leakage!" In fact, given the severity of the adverse effects experienced by a significant
portion of test populations, maybe this should be a flying safety meeting topic.

**OLESTRA QUIZ**

Check your OQ (olestra quotient) now by taking the Olestra Quiz below and then suggest to your flyers that if they must try it, to be sure to ground test themselves (preferably on the weekend, or, better yet, when they won't be flying for several days). The answers follow on page 10.

1. What is olestra made of?
   A. Mineral oil
   B. A sugar esterified with fatty acids
   C. Olefin
   D. Dietary fiber

2. All of the following are purported benefits of olestra EXCEPT:
   A. It can replace some of the fat in various prepared foods.
   B. Unlike other fat replacements, it can withstand the high temperatures needed to fry many foods, such as potato chips.
   C. Since it is neither digested nor absorbed, it adds no calories or fat to the diet and might help those trying to lose or maintain lost weight.
   D. It decreases the absorption of nutrients called carotenoids, which are believed to help prevent heart disease, cancer, and a form of blindness (macular degeneration).

3. So what's the big deal then? Just what are the adverse effects of olestra? (Select all that apply).
   A. Diarrhea, cramps, and/or vomiting.
   B. Decreased absorption of fat soluble vitamins.
   C. Anal leakage.
   D. Decreased blood levels of carotenoids.

4. Which of the following is NOT TRUE about human studies on olestra?
   A. Most of the human data available are from studies by the manufacturer.
   B. The only controlled study of the effects of olestra in adults was a short-term, low-dose study with inadequate statistical power.
   C. The longest controlled study on children was 7 days in duration.
   D. Most human studies of olestra have emphasized epidemiology rather than biologic mechanisms.

5. Aeromedical concerns related to olestra include all of the following EXCEPT:
   A. Incapacitating or distracting abdominal symptoms which might adversely affect flying safety and mission completion.
   B. Reversal of the constipating effect of MREs during deployments.
   C. Anal leakage, especially likely during high G maneuvers.
   D. Potentially increased long-term incidence of heart disease, cancer, and macular degeneration.

6. The best way to "put prevention into practice" with respect to olestra is to:
   A. Insure flyers are aware of the potential risks of olestra and avoid olestra intake or ground test when not flying in the next several days.
   B. Have the entire squadron try olestra-containing snacks during your next flight surgeon briefing before an across-the-pond deployment.
   C. Have the Health and Wellness Center give out "Anal Leakage — Just Say No!" T-shirts.
   D. Have the base leadership set the example by competing in an olestra-containing snack eating contest at the next base picnic.

**ANSWERS TO OLESTRA QUIZ**

1. B. Olestra is also known as sucrose (Continued from page 8)
   A. Mineral oil
   B. A sugar esterified with fatty acids
   C. Olefin
   D. Dietary fiber

2. All of the following are purported benefits of olestra EXCEPT:
   A. It can replace some of the fat in various prepared foods.
   B. Unlike other fat replacements, it can withstand the high temperatures needed to fry many foods, such as potato chips.
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**ANSWERS TO OLESTRA QUIZ**

1. B. Olestra is also known as sucrose (Continued on page 10)
polyester or by the brand name Olean. It is made of sucrose sugar esterified with fatty acids.

2. D. All are advertised as benefits of olestra, except D, which is a cause for concern.

3. A, B, C, D. A two- to eight-fold increase in gastrointestinal symptoms such as diarrhea, cramps, and/or vomiting was shown in the manufacturer's own studies. These symptoms may be severe. One man said he felt like he was "trying to pass a softball which wouldn't move" and a woman compared it to labor pains. Even if only a portion of users experience such severe symptoms, it could potentially be a safety issue in flight, making ground testing wise before flyers eat olestra and fly. Since olestra is not absorbed and is lipophilic, it carries fat soluble vitamins and carotenoids out of the body. It may cause anal leakage, both because it is an oily substance and because it increases the weight and water content of the stool.

4. D. Few human studies exist and most have been done by the manufacturer. The only controlled adult study on the GI symptoms and nutritional consequences of regular consumption of snacks containing olestra had only 194 subjects, lasted only eight weeks, was limited to those 15–44 years of age; and consisted of daily olestra intakes equivalent to that found in only about a one ounce package of potato chips per day; it did not have sufficient statistical power to detect even significant short term effects of olestra. The longest controlled study on children was 7 days and involved olestra intakes equivalent to only one ounce of potato chips per day.

5. B. All are aeromedical concerns, except B which might be somewhat beneficial!

6. A. Choices C and D might be amusing but cause fraud, waste and abuse accusations and increased emergency room visits, respectively. Choice B is not acceptable and would probably result in you being banned from the squadron in perpetuity.

References
2. "Correspondence - Olestra and the FDA," NEJ 335, 668-70, 1996

(Continued from page 7)
WHY A RAM?

Maj Bob Ruiz, US Army
RAM 98

In the previous article, we answered the question “Why a Flight Surgeon?” This column will discuss the next question dealing with those of us practicing Aerospace Medicine. The Residency in Aerospace Medicine (RAM) is a three year program involving a Masters in Public Health, a year of Preventive Medicine training in Aerospace Medicine and a final year in Occupational Medicine. Future options for the third year might also include training leading to boards in General Preventive Medicine and a Hyperbaric Medicine Fellowship.

To be a little more specific, RAMs are trained in the Preventive Medicine aspects of Operational Medicine, especially as they pertain to aircrews and aerospace personnel. Some clinical training is given on the Aeromedical Consult Service at Brooks AFB and during most of the Occupational Medicine year. Otherwise, the training is didactic and experiential. Training in such areas as survival and flight familiarization are just a few of the operational training experiences in the second year. Trips to NASA, the FAA and American Airlines help to give the resident a good overview of aviation in areas not usually experienced by military flight surgeons. The intensity and depth of the training is by far greater than the training received by the GMO flight surgeon. Indeed, the applicant to the residency usually has at least five years of experience as a basic flight surgeon. The Specialist in Aerospace Medicine (SAM) is the best trained to supervise general medical officer flight surgeons. In terms of the experience he/she brings to the Aerospace Medicine Squadron, the SAM may well be the best choice for command as well. Within limitations, the SAM will make an effective primary care case manager, acting as the primary care provider and intermediary to the other medical specialties. A focus on operational requirements and the unique environment of flight makes the SAM invaluable to the line commander and the aviators alike.

The RAM does not produce Family Practitioners, however. Expectations by other medical specialties that SAMs function in those areas, especially with regard to inpatient care, are not warranted. This becomes more of a concern when applying for medical privileges. There is a certain amount of pressure being exerted within the TRICARE arena to maximize the services provided by practitioners. Medical commanders should be cognizant of the strengths and limitations of this valuable member of their staff.

A SAM provides a wealth of experience and expertise to the line and medical commanders. He/she enhances the Occupational and Preventive Medicine capabilities of the hospital commander. Providing clinical oversight to junior flight surgeons and effective primary care case management are additional strengths. These have been and remain the critical thrust of the RAM program and in these austere days, become even greater strengths. ✗
As a member of the RAM 98 class I was participating in MOFFT (Medical Officer Flight Familiarization Training) at Randolph AFB, TX in April and experienced an episode of recognized spatial disorientation (Type II) in the T-38A. I believe the episode was a combination of the Somatogravic Illusion and Oculogyral/Somatogyral Illusions.

I was in the back seat of the T-38A with a very experienced instructor pilot in the front. The sortie was our second of the day and involved a formation departure from Randolph, maneuvers in the East MOA (Military Operating Area) and a formation landing back at Randolph. The weather included a very heavy, dark cloud deck from approximately 800 feet AGL (Above Ground Level) to approximately 4000 feet AGL.

We departed number two in the formation and flew directly to the MOA where we flew several 5+ Gz formation maneuvers, first in trail and then in lead. Having successfully completed our training goals, we were returning to base again in the number two position. We descended from 8000 feet to the cloud deck at 4000 and began a turn to the right for an ILS (Instrument Landing System) approach. At about this time I became very aware of my stomach. Having grabbed a quick lunch just before flight I thought I was about to lose it. I notified the pilot I was dropping my mask, and leaned forward to get an emesis bag. The pilot, aware that I was not well, began to level off. I remained leaning forward for approximately thirty seconds as I finished my task. Meanwhile, we had turned to final for a straight in approach. I sat upright, reconnected my mask and looked to the right at the lead aircraft. He appeared to be in a thirty degree left bank and at about thirty to forty degrees of nose low pitch. I felt a strong sensation to pull back and to the right on the stick. I quickly looked inside at my attitude indicator and DME (Distance Measuring Equipment) only to see that we were on final approach in straight and level flight about 7 miles from Randolph. I looked back out at lead and his orientation appeared the same as previously. A crosscheck to my primary and back-up instruments again revealed straight and level flight with properly functioning instruments. At about this time we temporarily broke out below the clouds and I could see, based upon the ground reference, that we were indeed straight and level. A quick glance at lead now showed him in straight and level flight with us in close formation off his left wing tip.

Spatial disorientation may prove fatal in flight, especially if it occurs while on final approach or in close proximity to the ground. There are three types of spatial disorientation in flight, easily remembered as URI: Type I (unrecognized), Type II (recognized) and Type III (incapacitating). This was an example of Type II (recognized) spatial disorientation. I recognized a conflict between what the flight instruments indicated and my perception of the aircraft’s attitude. Type II spatial disorientation does not mean the pilot must recognize he/she is disoriented, only that he/she recognizes he/she is having a problem.

I believe this episode was a combination of illusions: Somatogravic, Somatogyral and Oculogyral. The illusion of a thirty-degree nose-low dive appears to be due to the somatogravic illusion. Since I was leaning forward while the aircraft was in a 1000 feet per minute descent, I had placed my inner

(Continued on page 14)
The twin-tail, twin engine fighter concept is popular with aviators, not to mention highly successful in aerial combat.

Challenge yourself to see if you can identify all of these magnificent birds of prey by both series number and common name. Answers are on page 15.

Hint: None of them is the F-22 Raptor, our nation’s newest twin-tail, twin engine fighter.
ears in a plane with more forward pitch than that of the aircraft. Upon level-off my head remained down and I perceived we were still descending. When I lifted my head to level, it still felt as though we were in descent. This false perception was caused by the appearance of a somatogravic illusion. The otolith organs are responsible for this illusion. This illusion typically occurs on take-off in reduced visibility. During take-off the pilot pushes up the power, displacing his otoliths posteriorly. Upon rotation the otolith is further displaced posteriorly, and the pilot senses that he is pitching up at a vector greater than he actually is. In my situation, the opposite occurred. Since we were descending and decelerating, my otoliths were displaced anteriorly. Given that my head was forward, my otoliths were displaced even further anteriorly. Upon level off, my otoliths remained anterior of where they should have been based upon our flight path, due to the slightly increased G. After I lifted my head to level, they now moved posteriorly toward their neutral position. Hence, I felt as if we remained in a dive.

The somatogyral illusion is a false sense of bank about the roll axis or spin about the yaw axis, following a prolonged constant rate of bank or spin in the opposite direction. The best known and most common of these illusions is the graveyard spiral. What occurred in my situation was most similar to the graveyard spiral. We had been in a prolonged right bank to intercept the ILS while in the clouds. Upon entry into the bank, the endolymph of the semi-circular canals accelerates in the direction opposite to the bank and displaces the cupula in that direction. After some time in this bank angle, the cupula-endolymph of the semi-circular canals stabilizes to the resting position. With rollout the endolymph is displaced in the direction of the bank, and the pilot perceives a bank in the opposite direction. In my situation, we had leveled off after a bank to the right and I perceived we were in a thirty-degree left bank when in fact we were level. The visual perception of this illusion is the oculogyral illusion. The Somatogyral and Oculogyral Illusions often accompany one another, with the second only the visual manifestation of the first. My inner ears perceived that we were in a thirty-degree left bank and my vision did not refute this. However, the instruments did. Upon visualizing the ground, my visual system’s dominance overcame my inner ear’s misperceptions. I was able to recognize straight and level flight matching the instruments.

It is not difficult for me to understand how a pilot can become spatially disoriented in flight. I had all the proper requirements to develop spatial disorientation. We were in the clouds, in a bank, in descent, in formation flight, and decelerating. Bottom-line: cross-check and trust your instruments.

References:

PLEASE!!
Just take a short moment right now to send in your Society ballot. Time is too short too delay! Be an active member; it’s easy.
A QUESTION OF CREDENTIALING AND LIABILITY

You are the lone flight surgeon, flying on a routine MEDEVAC outside of your command jurisdiction. A medical emergency in-flight makes it necessary for you to provide care to a patient onboard. Prior to enplaning the patient, you were advised of his seemingly stable condition. You think to yourself, "How can it be that suddenly I am now running an inflight "CODE BLUE"?"

Unfortunately, the patient doesn't make it. Now what? If the patient being transported was a civilian emergency, what are the limits of your liability (assuming you've correctly done everything you could do)? What if something went wrong? What if you don't have the right equipment to take care of a patient this ill (or the training)?

I'm sure that some of you out there (no names please) have knowledge of events such as this. Under these conditions, as flight surgeons we are operating in a legal "gray area." I would be very interested to hear your thoughts, ideas and experiences in this area. Respondent may be anonymous, specific cases are not necessary This may be an area for further research. I'll let you know what I find out.

Bob Ruiz, Maj, USA

LETTERS TO THE EDITOR

I read your article in FlightLines with a lot of interest. Being in the Reserves, I can say that it would be difficult to find the time and funds to accomplish the training you suggest. At this time we are having great difficulty recruiting new Flight Surgeons. The docs who are getting off active duty are so disillusioned that few choose to join us.

They also are surprised that our weekend drills are not a lot of fun; we see 20-30 patients each on Saturday and do admin duties, waivers, shop visits, briefings, etc. on Sundays. In fact, we could not even do our currency items on weekends and we have to do them at some other time. Flying has to be done at another time also.

We have tried to recruit docs without previous military experience but when they discover that it takes a lot of time to be a Flight Surgeon they back out. Commissioned Officer Training, previously known as MIMSO, is now one month and the AMP is two months. In addition there are training items that need to be completed before you can fly operationally. If you add all that and the training you want then it would be impossible for the reservists to become operational FSs.

We would like to have all the training possible but time and probably slots and funds are not available to us.

Manuel H. Enriquez, Maj, USAFR, FS 315th Medical Squadron, Charleston

CONSTANTINE

INFLIGHT CRASH

The day started off well. I was flying a MEDEVAC mission and everything was going smoothly until we encountered turbulence. Suddenly, the left engine failed and we had to make an emergency landing. Fortunately, the patient and I were able to evacuate safely.

I am interested in hearing from other flight surgeons who have dealt with similar situations. How did you handle the aftermath? Did you need any special training or equipment?

Bob Ruiz, Maj, USA

FROM THE EDITORS...

IDENTIFY THE JET ANSWERS

1. F-14 Tomcat
2. F-18 Hornet
3. Su-27 Flanker
4. MiG-29 Fulcrum
5. Mig-25 Foxbat
6. F-15 Eagle
MEMBERSHIP APPLICATION, RENEWAL, AND/OR CHANGE OF ADDRESS FORM

Please complete the applicable items on this form, detach and mail with a check for $15/yr. Checks should be made payable to: The Society of USAF Flight Surgeons

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THE FOLLOWING INFORMATION IS REQUIRED OF NEW MEMBERS ONLY

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