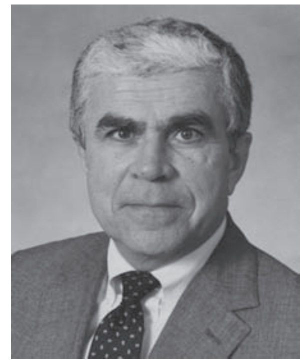
President's Page



John D. Hastings, M.D.

Along with others I have long felt the need for a comprehensive approach to the medical certification of aviators. Within AsMA we have physicians involved in many levels of aeromedical certification including establishment of standards, revision of standards in light of technological advances, exceptions to standards (waivers), harmonization of standards, and individual assessment of fitness by the individual aviation medical examiner (AME). To this end, we established an ad hoc AsMA Clinical Aviation Medicine Committee, which had its inaugural meeting in conjunction with our annual scientific meeting in New Orleans this past May. The committee is composed of six international members and one U.S. member. This is a committee that will guide the development of clinical aviation medicine initiatives.

I have just returned from two stimulating aviation medicine meetings held overseas. The first was Medicine and Mobility, held in Cologne, Germany. The second was the International Congress of Aviation and Space Medicine held in Vienna, Austria. Most of the papers presented discuss the question: "Why do we do what we do in aeromedical certification?" Other questions come to mind. What gave rise to established standards? Was there a scientific basis for certification standards? Why do standards differ from nation to nation? How should standards be revised, strengthened, or eliminated in light of advances in knowledge? What justification should there be for exceptions to the standards (waivers, special issuance)? What authority should be given to the individual aviation medical examiner? How should global harmonization of standards be advanced?

Many of today's standards, protocols, and exemption (waiver/special issuance) policies have their origin in arbitrary decision and expert opinion. Review and revision of standards does not take place in a coordinated, evidence-based manner. There is a lack of coordinated data collection and review of outcomes of aeromedical disposition to validate or question the wisdom of our decisions. Though there is little doubt that a wealth of data has been gathered, mining of data by clinical researchers has proved difficult.

The aerospace medicine community is small, and aviation medicine parishioners are involved in a range of activates including regulation, administration, occupational medicine, and numerous clinical specialties. Opportunities and resources for clinical research are limited or non-existent, hampering attempts to introduce an evidence-based approach to aviation medicine. We must often "borrow" the expertise, research, and evidence gathered by our clinical research colleagues in cardiology, neurology, psychiatry, and other specialties. Attempts to generalize the data to the aviator population may be problematic, since the groups may not be comparable. Within my specialty of neurology, there is need for study of minor traumatic brain injury, minor stroke with minimal risk factors, migraine in the aviator, and a number of other conditions.

Need for scientific data collection is not limited to flight and cabin crew, but must include passengers. There is a need for a cooperative and coordinated effort among the world's major air carriers to insure uniform data collection and reporting of in-flight medical incidents.

The purpose of the Clinical Aviation Medicine Committee is to foster clinical aviation medicine by encouraging and coordinating data gathering, scientific data review, and evidence based presentation of data to the aviation medicine community. The committee also seeks to promote an internationally coordinated, harmonized, evidence-based approach to medical certification standards, exemption/waiver/special issuance provisions, policy development, and standard revision.

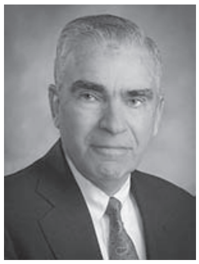
Tradition, case studies, and expert opinion have often provided the basis for aeromedical standards and policy. In the hierarchy of evidence based medicine, the lowest level of evidence is that provided by opinions of respected authorities based upon clinical experience, descriptive studies, or reports of expert committees. The need for scientific, evidence-based, approach to aeromedical certification is clearly evident. What steps are needed to mount such an effort? How can support be gained? What funding is available?

I have the fond hope that the Clinical Aviation Medicine Committee will be a major contributor to an evidence based approach to aviation medicine. However, in order to achieve success and support I feel there must be a global effort involving AsMA, the International Academy of Aviation and Space Medicine, and all aviation medicine societies and associations concerned with the safe certification of flight crew, cabin crew, and aircraft passengers

Perhaps the first step in finding a solution is clear definition of the problem. Our needs in aeromedical certification are global, and solutions must be global. I urge that we commit to working together on this most important and pressing need.

Medical News

Executive Director's Column



Rayman

Boston 2008

Our upcoming meeting in May 2008 will be in Boston, MA. This is definitely a first-tier city. Our site team recently visited the Sheraton Hotel where the meeting will be held; we were very impressed by the physical layout of the property as well as the friendliness and responsiveness of the hotel staff. The Sheraton, which is a five-star hotel, is located in downtown Boston and is connected to two very large shopping malls. And one block away is the famous Newberry Street, Boston's premiere upscale shopping area. If you are a baseball fan, Fenway Park, home of the Boston Red Sox, is within walking distance of the Sheraton. Our entire meeting, including the academic sessions as well as the social events and luncheons, will be under one roof in the Sheraton Hotel although Opening Ceremonies and the Exhibits and Posters will be located in the Hynes Center, which is connected to the Hotel.

Boston is probably the most historical city in the U.S. You can spend days there seeing the sites, particularly those associated with the American Revolution. Some are within walking distance of the Hotel, while others can be reached by a tourist trolley which makes the rounds hourly.

Because we are in such a great city, we would expect a large number of abstracts to be submitted and a large number of attendees. We can draw upon speakers from local institutions such as Harvard and MIT.

Because Boston is a tier-one city, things will be relatively expensive. I would implore you to stay at the Boston Sheraton (our headquarters hotel), as we have contracted a room block with that hotel. If we do not fill our room block commitment, we are subject to heavy penalties. So please, please stay at the Sheraton. Our contract does state that the sleeping room charges will be at the current Federal per-diem. So regardless what the per-diem is, that will be the charge for the sleeping rooms. Again, I urge you to stay at our contracted hotel.

The Science Program Committee will be meeting later this month to review all abstracts and prepare the academic program. I hope all of you can come to Boston next May for our 79th Annual Scientific Meeting.

AsMA Future Meetings

May 11-15, 2008
Sheraton Hotel
Boston, MA

May 3-7, 2009
Westin Bonaventure Hotel
Los Angeles, CA

May 9-13, 2010
Sheraton Hotel
Phoenix, AZ

Growth in Air Traffic Projected to Continue to 2025, According to ICAO

Total world airline scheduled passenger traffic in terms of passenger-kilometers is expected to grow at an average annual rate of 4.6 % up to the year 2025, half a percentage point lower than the growth rate achieved over the period 1985-2005, according to forecasts prepared by the International Civil Aviation Organization (ICAO). Total freight traffic growth over the same period is forecast to be stronger, at 6.6% per annum in terms of freight tonne-kilometers. International traffic is expected to continue to grow faster than total traffic, at 5.3% per annum for passenger-kilometers and 6.9% per annum for freight tonne-kilometers.

The total number of departures and distance flown on domestic and international services of scheduled airlines are expected to more than double over the 2005-2025 period.

The airlines of the Middle East and Asia/Pacific regions are expected to show the highest growth in both passenger and freight traffic. All international route groups are anticipated to grow at average rates ranging from 3.5% to 6.6% per annum over the forecast period. The fastest growing route groups are those to, from, and within the Asia/Pacific region.

Further details and background, including a comprehensive review of air transport trends and challenges, are available in the ICAO publication, Outlook for Air Transport to the Year 2025 (Circular 313). ICAO publications may be purchased through ICAO's Document Sales Unit at sales@icao.int.

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A specialized agency of the United Nations, ICAO was created in 1944 to promote the safe and orderly development of international civil aviation throughout the world. It sets standards and regulations necessary for aviation safety, security, efficiency and regularity, as well as for aviation environmental protection. The Organization serves as the forum for cooperation in all fields of civil aviation among its 190 Contracting States.

Meetings Calendar 2007

November 1-2, 2007, Holiday Inn Regents Park, London, UK. Second Annual Aviation Health Conference. Details: www.quaynote.com. For sponsorship or speaking opportunities, contact lorna@quaynote.com or phone 44-20-8531-6464.

November 13-14, 2007, Holiday Inn, Kensington Forum, London, UK. Crisis Management, Business Resilience and Business Continuity for the Aviation Industry Details: www.quaynote.com; Alison@quaynote.com; 44(0)20 7074 0241

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The Journal Has a New Look

You may have noticed that the printing of the "Front of the Book," *Aviation, Space, and Environmental Medicine*, has a new look. If you didn't notice--take a look! We hope that the new look will make the content easier to read. Please let us know what you think. Contact Pam Day : pday@asma.org; (703) 739-2240, x 101.

This Month in Aerospace Medicine History-- November 2007

By Walter Dalitsch III, M.D., M.P.H.

Seventy-five Years Ago

Medical problems unique to Naval aviation: "In a general way the problems of aviation medicine in the United States Navy are identical with those of all types of military aviation, using the term 'military' in its broad sense. However the specialized uses of naval aircraft in operations over the water from the floating mobile bases called aircraft carriers, certain high speed bombing manoeuvres, tropical flying, catapulting airplanes from warships and long distance water patrols are conditions of interest to the flight surgeon which are usually peculiar to the Navy.

"High speed diving, or dive-bombing, as it is also termed, puts a premium on the efficiency of the pilot's circulation. From altitudes of ten thousand feet and above the light bombing plane is put into a nearly vertical power dive down to one or two thousand feet, when the bomb is released from the undercarriage of the ship upon the target, and the plane pulled up suddenly from the descent at a speed of about 260 to 300 miles per hour. The quick change of direction upward from the dive is an insult to the human organism which only the physically fit can withstand, the penalty being a fainting reaction from the cerebral anemia produced by centrifugal action, probably. I say 'probably,' because I do not believe that there is general agreement that sufficient blood is whirled from the brain to the splanchnic reservoirs in the short time required for the change of direction, to account for the sense of blackness complained of by some pilots. Vasomotor relaxation may be the answer. Research work is necessary to determine the average limits of human endurance in this manoeuvre and to explain more clearly the phenomena resulting either from an excess of speed or a deficiency in the physical mechanism of the pilot. The problem here is again the conservation of the human material, for it seems apparent that in dive bombing operations there may be a greater danger of the pilot's collapse than of structural failure of the airplane…

"It is difficult for some pilots to keep up their systematic exercise when based aboard ship. These men are generally the ardent golfers ashore, who, when deprived of that sport, are at a loss to pick up some new form of physical recreation more suited to the temperament of a true aviator. I refer now to the competitive games like tennis, volley ball, handball and the like, which can be played on shipboard, and which make for quick judgment, alertness and rapid visual reactions, things that the combat pilot must possess or develop, if he is to live long. The flight surgeon's problem is to adjust the exercise on shipboard to the pilots' needs - realizing that the purpose of the games is physical fitness and mental relaxation, and not permitting the exercise to degenerate into a daily task, for this breeds the cumulative fatigue known as staleness…

"In conclusion, let me repeat briefly some of the opportunities for research work in aviation medicine in the Navy:

"1. Inquiry into the mechanism of the physical collapse of the flyer following sudden changes of directions in the recovery from high speed dive bombing, with tests to eliminate those who are peculiarly susceptible to such syncope.

"2. The design of an all-purpose airplane goggles, which will successfully eliminate injurious sunglare without changing the color of the terrain.

"3. Further work on carbon monoxide poisoning from the exhaust of airplane engines, with the development of a routine field test, possibly, to indicate the flyer who has an idiosyncrasy to this gas" (4).

Fifty Years Ago

Using aircraft mishap data to prevent future mishaps (Aviation Crash Injury Research of Cornell University, Skyharbor Airport, Phoenix, AZ): "As death and taxes are inevitable, so are accidents. Certainly, the automobile casualty record in the United States shows that accidents continue to occur, despite better driver-training programs, better highways, better tires, brakes, and stricter speed regulations. The more than 40,000 persons killed and one million injured on U. S. highways in 1956 prove this point. Why do accidents happen? Because man is essentially an unpredictable quantity, particularly under conditions of emotional stress.

"Civil aviation enjoys a phenomenal safety record in comparison with that of the automobile, it being approximately forty times safer to fly on a scheduled airliner than to travel a like distance by auto. But this wide variation would not exist if reasonable consideration had been given in earlier years to crash-safety design in automobiles. If all automobiles were equipped with safety belts - and people wore them, adequate door locks to keep the occupants from cracking their skulls on the pavement, and delethalized interiors, the difference in the 'safety ratio' between airline and automobile travel would be reduced by at least one-half…

"To obtain all the data necessary for a well planned attack against unnecessary, death and injury in survivable crashes, accident investigators, safety engineers, design engineers, flight surgeons and pathologists must aid each other in obtaining the information necessary for analyses. Then some means must be found to direct these data from each accident investigation to one group experienced in the analysis and reporting of such data. Only in this way can needed information from accidents, regardless of where they occur in the world, be made available for effective use by all safety groups and engineers in all countries. Aviation ideally recognizes no geographical boundaries; neither should the development of crash protection he hampered by geographical boundaries. Regardless of our nationality, we are all striving for the preservation of human life" (2).

Twenty-five Years Ago

Technology preventing controlled flight into terrain (Battelle Columbus Laboratories, Columbus, OH): "This paper examines the performance of two systems to prevent controlled-flight-into-terrain (CFIT) accidents, including their development and preimplementation issues and attitudes. The airborne version, the Ground Proximity Warning System (GPWS), was required for certain large turbine-powered airplanes. The ground-based system, the Minimum Safe Altitude Warning (MSAW) is a feature of the ARTS-3 system. Accident data from the National Transportation Safety Board (NTSB) and reports from the Aviation Safety Reporting System (ASRS) were used in assessing performance. It is concluded that these systems have dramatically reduced accidents. Although false and nuisance alarms continue, no evidence suggests that they have caused any accident. The tenacity of the alarms - especially the GPWS - as well as appropriate triggering criteria seem to be basic to their success…

"Many pilots and controllers are not aware of the net benefit of the GPWS/MSAW systems. One ASRS report reflects a view held by many: 'In my opinion and also the opinion of my fellow pilots, the GPWS is more likely to cause an accident than to prevent one.'

"The efficacy of the GPWS system, vs. the perceived value of warning devices held by some, probably traces to its two unique characteristics - it can't be ignored and it can't be disarmed with anonymity. How much room this leaves for adding other tenacious alarms remains to be seen" (3).

Human stress effects on aviation safety (reprinted with permission from Ag Pilot International, from May 1980): "Reports of 90 percent of pilots lost due to 'troubles in the flier himself' appeared in 1916. Approximately the same percentage applies to human factors causes of general aviation accidents today. Of the medical factors that you will hear the most about, physical incapacitation may cause around 1 percent of fatal accidents; drugs and alcohol, 8 to 10 percent; spatial disorientation, 14 to 17 percent; and hypoxia, one or two a year. Most accidents are caused by various failures in performance or errors in judgment, and inadequate training and experience must be considered. Many are due to combinations of factors. A spatial disorientation accident frequently involves weather, inadequate instrument training, poor judgment in getting into the situation, and, occasionally, alcohol. Usually, the basic underlying reasons for human factors accidents go undetected…

"Nice things are stressful, too. Marriage, reconciliation, outstanding achievement, graduation, buying a car, buying a home, and vacations are covered on the list. One eminent scientist who conducted daring research, frequently on himself, did not schedule tests on Fridays when the staff might be preoccupied with thoughts of weekend plans…

"Preflight yourself for physical and emotional fitness for each flight. If you are angry from an argument or a speeding ticket, or even if you are anticipating a pleasant experience, errors in planning and making a flight may result. Double check your actions. With a more stressful recent event, such as death of a spouse or a divorce, you should not fly until you have adapted somehow and shed the acute stress" (1).

REFERENCES

1. Dille JR. Doctor stuff: Mental stress causes accidents, too (reprinted with permission from Ag Pilot International for May, 1980). Aviat Space Environ Med, 1982; 53(11):1137.
2. Hasbrook HJ. Crash injury research: A means of greater safety in aircraft accidents. J Aviat Med, 1957; 18(6):541-52.
3. Loomis JP, Porter RF. The performance of warning systems in avoiding controlled-flight-into-terrain (CFIT) accidents. Aviat Space Environ Med, 1982; 53(11):1085-1090.
4. Yanquell CC. Naval problems in aviation medicine. J Aviat Med, 1932; 3(4):191-3.

Science & Technology Watch

Keeping You Informed Of The Latest Advances In Science And Technology

In this month's edition of the Watch, Dr. Chelette discusses new ways to glean information from visual images.

3D Interpretation of Imaging - Every Pixel a Database

Tamara L. Chelette, Ph.D., P.E.,
Sensors Directorate, Air Force Research Laboratory, Wright-Patterson AFB, OH

Digital photography has now become a familiar technology in most modern homes. Those households that don't subscribe yet should consider investing their time and splurge funds soon, because it is becoming increasingly difficult to find and afford film cameras and processing. For decades, photographers have had to understand the physics of light and the chemistry of film in order to produce quality images. Today is no different; digital photographers still need to understand the physics of light as it bounces off of objects and enters the optical imager. But in place of the wet chemistry of film development, even the amateur photographer needs to understand what his or her camera/computer is doing with the pixels. Many handheld cameras (still, video, and the increasingly more common hybrid) are really hand held computers that execute complex algorithms on each frame to provide improved quality such as contrast balance, red-eye removal, image stability, etc. Some higher-end cameras are fully programmable. Once the image is imported into a standard computer, there is a large variety of software manipulations available. Some of the most interesting are those which simulate additional interaction of light with matter that was not captured in the original photo. Examples include adding a lens flair for dramatic effect, adding or removing a flash reflection, adding or removing shadows, adding or removing motion blur, removing fog, or even removing particular color objects. All these operations are based on a mathematical representation of light interacting with matter and producing a visual effect on the human eye.

But alas, the best retail cameras for purchase merely produce two dimensional, flat pictures of the human-visible spectrum. All appearance of depth is based on interpretation cues of the light-matter interaction in a flat plane. In fact, human eyes are also planar imagers, using the same techniques (plus stereo-opsis) to deduce depth information in the image. The next generation camera will likely capture the third dimension. That is, for every pixel the camera would capture and record not only the red, green, and blue reflection at each X and Y coordinate, but would also obtain the Z distance from the camera – or at least the Z distance relative to some reference point in the focal plane of the image. The post-capture algorithms could then operate on a much higher fidelity 3D model of the interaction between light and the objects. Shaped shadows could truly be generated or removed. Objects in a defined plane could be rotated. But possibly most intriguing would be the ability to take actual measurements of an object in the image. The 'image' file would now include information representing 'real' objects, not just a planar image. None of this will seem strange or new to folks who have studied CAD/CAM or holograms, but most people will have to rethink how to conceptualize an 'image file'. In the future, each pixel will represent a real thing, not just a light reflection. In addition to a recording of the quantity of red, green, and blue light that a pixel element captured, additional qualities of the object pixel could be detected and processed. Examples include:

- The velocity of the matter at that pixel relative to background pixels;
- The velocity of the matter at that pixel relative to nearby pixels;
- The reflection of electromagnetic energy beyond the human visible range, in shorter wave infrared;
- The emission of electromagnetic energy beyond the human visible range, in long wave infrared, leading to a determination of the temperature at each object pixel;
- The polarization phase of the light reflected to that pixel;
- The path length of the light from the camera to each pixel and back.

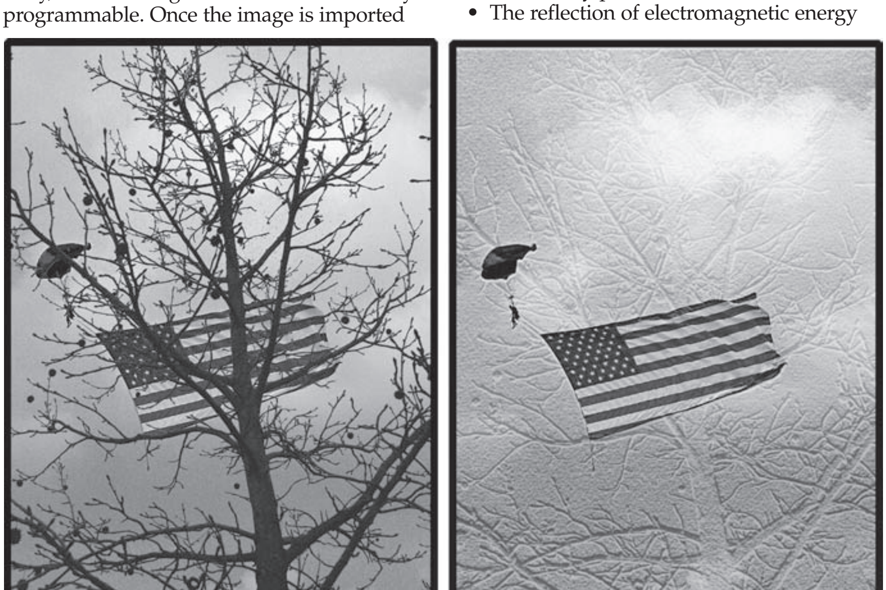

Fig. 1. Removal of near obscurant with reconstruction of focal plane image

New algorithms in the camera or computer could remove pixel content received from path lengths shorter than the focal plane of interest. That would allow the processor to remove any absorption or reflection of translucent objects in front of the object of interest – say leaves in front of a statue, or a veil covering a face in a security camera, or a cloud in front of an airplane (**Fig. 1**). Remember translucence is a function of wavelength, so imager sensitivity to spectrum beyond human visual would render some opaque objects translucent. Obscured objects in the selected plane could be restored with pixel interpolation techniques to construct the full image in the plane of interest.

In addition, new algorithms could ignore energy coming from beyond the focal plane of interest. Distracting city street traffic could be removed from an otherwise terrific picture of a fancy car, or background clutter that might disrupt an automatic target recognition algorithm could be removed.

Infrared discrimination of a warm human standing in front of a warm automobile at night in a planar image can be very difficult, but with the third dimension, an algorithm is much more likely to be successful at removing the more distant pixels. A warm object behind a cooler camouflage net might also be discernable.

Anyone who has had the opportunity to work in the fields of laser scanning, radar, medical imaging, or computer animation is already very familiar with these concepts. But the remaining challenge is in the broad application of 3D representations of objects in the everyday world of data processing. What salient features of each pixel should be recorded, in what formats and with what level of accuracy and resolution? What statistical algorithms work best with each of these formats? Will the next generation ATM security camera generate a 3D rendering of your skull and signature to match it to the last time you visited the ATM? Will video teleconferencing of the future include 3D animations of the boss's head talking in the center of the room, including the sunburn he got over the weekend? Will the future generation of phone/camera/PDA devices be able to not only measure and display the distance to the putting green, but automatically find the golfer's ball on the fairway and e-mail her stroke performance to her competitor on the next hole? All of these applications could be commonplace within the next decade, as long as the mainstream data processing world considers that 'Every pixel is a database'.

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The AsMA Science and Technology Committee provides the Watch as a forum to introduce and discuss a variety of topics involving all aspects of civil and military aerospace medicine. Please send your submissions and comments via email to: barry.shender@navy.mil. Watch columns are available at www.asma.org in the AsMA News link under Publications.

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Medical Operations at Kennedy Space Center

K. Jeffrey Myers, M.D.

In order to better understand the many functions and duties required of medical operations at the Kennedy Space Center (KSC), a brief description is helpful. The Kennedy Space Center is very much like a small city. It requires food, water, sanitation, police, fire & rescue, and medical services. The location is in a wildlife preserve, which includes 160,000 acres of estuary swampland and, of course, some of the finest specimens of alligators and snakes you would ever care to meet. A broad range of industrial processes are performed in complexes that sprawl across the large landscape. A visitor's center also accommodates several thousand tourists a day. In addition, we have the responsibility for the nominal Shuttle operational support including microbiological and potable water monitoring, pre-launch physical exam support, and postflight data collection.

KSC Medical Support

Medical services including emergency care, medical evacuation, evaluation/ treatment of occupational injuries and exposures, physical therapy, ergonomic evaluations, indoor air quality evaluations, mental health and employee assistance counseling are provided to the 16,000 employees. This not only includes injuries and exposures arising from the processing and launching of space vehicles, but also those resulting from the many different industrial and office working environments. Most of these employees require medical certifications to perform their jobs. This is accomplished through periodic physical examination at the Occupational Health Facility. First aid, emergency triage, and medevac capabilities are available to the tourists at the visitor's center, as well. People sometimes ask, "What kinds of medical events do you see?" I would have to say that in my 20 years of experience it pretty well runs the entire gamut of the things that you might encounter in the emergency room (except, of course, without the violent crime and drugs) but spiced up with rocket fuel (hydrazine) and oxidizer (nitrogen tetroxide) exposures. Due to the occupational setting, the extremes of age are also less common, although a day care center and the tourists will keep you on your toes with the occasional Pediatric and Geriatric consults.

Fig1. LAUNCH CONTROL CENTER--The EMS and the Console Biomedical Systems Engineer stationed at the biomed console in Firing Room 3 at KSC.

KSC Shuttle Launch and Landing Support

"Make a Plan and Practice it" is a good motto for any type of disaster preparation program. The KSC Emergency Medical Services Plan provides a dynamic guideline to follow during a contingency. Through regular rehearsal and simulation, improvements are constantly incorporated.

For a launch or landing, we bring in extra support: 4 trauma physicians from the University of Florida, 4 USAF Blackhawk helicopters with 4 DOD Flight Surgeons and 4-8 Para-rescue Specialists. At least 4 area hospitals (including 2-3 medevac helicopter services) are placed on alert. These augment a baseline of triage, command post, and clinic personnel including physicians, nurses, logistics (supplies) coordinators, communications specialists, laboratory personnel, and X-ray technicians. We also have 3-4 ambulances with 6-8 trained paramedics, 7-14 Fire/Rescue personnel and 1-2 NASA medevac UH-1 helicopters. Three Environmental Health Specialists are present to detect possible hazardous chemical contamination.

The overall command and control is by a physician (EMS) stationed in the Launch Control Center who is linked by radio, video (secure internet), and wireless communication to the Triage forces. An additional KSC physician coordinates with the outside hospitals. The Johnson Space Center Crew Surgeon is with the Triage forces in the field, while the Deputy Crew Surgeon is stationed with the EMS physician in the Launch Control Center (**Fig. 1**). Medical support is divided into Triage & medevac for Shuttle contingencies, and support for other operations and guests/tourists. The plan consists of the Triage forces staging near the Launch Area Clinic (launch) or near the Shuttle Landing Facility (landing). Helicopters (rescue/medevac) will stage at the Shuttle Landing Facility. The other medical teams are distributed to viewing sites and industrial areas (work on many projects continues throughout the Shuttle launch and landing so a wide variety of injuries/illnesses that are not directly related to the Shuttle event must be prepared to be treated).

Shuttle contingencies are categorized as Modes. Modes I-IV are pre-launch: Mode I involves the Shuttle Crew only and they are able to egress on their own; Mode II involves both the Shuttle Crew and the Closeout Crew (the team which helps the Shuttle Crew in the final launch preparations) and they are able to egress on own; Mode III concerns the Shuttle Crew only and rescue is required; Mode IV means Shuttle Crew and Closeout Crew both require rescue (**Fig. 2)** Modes V-VI apply only to landing: in Mode V the Shuttle Crew is able to egress on their own; in Mode VI the Shuttle Crew require rescue. Mode VII is a landing or impact outside of the nominal runway area, but within KSC. Mode VIII is a bailout (expected to be over water) or mishap outside of KSC. In Modes VII & VIII the Shuttle Crew may be taken directly by the USAF helicopters and rescue teams to area hospitals or to a triage site at KSC. In Modes I-VI the Crew will be rescued by KSC Fire/Rescue personnel and taken to a triage site in M113 armored personnel carriers (pre-launch) or by Bearcat (amphibious) or by other rescue vehicles (landing).

Once at the Triage site , the Shuttle Crew and any other personnel who are potentially injured or exposed are evaluated by an Advance Paramedic for the fundamental ABCs (Airway, Breathing, Circulation) while an Environmental Health Specialist checks for Hydrazine (rocket fuel), Nitrogen Tetroxide (rocket oxidizer), or other contaminants in the Decontamination Area. ABC fundamental interventions may be accomplished here if required. The patients are then transferred across the "clean line" to the Treatment area for further evaluation and stabilization by the Triage and Trauma Physicians. The Triage Physician will then consult with the EMS Physician to arrange for appropriate medical evacuation. Those crewmembers who are not injured will meet with the Crew Surgeon at the Triage site to assist with further coordination of any injured crewmembers.

This elaborate and complicated plan benefits from periodic rehearsal simulations. We currently accomplish this following the nominal landing support of each Shuttle mission. It is convenient since the various forces are already in place. It can be tough because while the rest of the Space Center is celebrating a successful mission, your work is only just beginning. Such is the life of a physician at KSC. You've got to love it!

Fig 2. A MODE IV SIMULATION-Mode IV involves paramedics, nurses, emergency physicians and a simulated Shuttle crewmember.

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AEROSPACE PHYSIOLOGY REPORT

Aerospace Physiology Board Certification Announcement 2008

CDR Thomas J. Wheaton, MSC, USN

The Council of the AsMA, acting upon recommendations of the Aerospace Physiology Certification Board, grants certification in aerospace physiology. Board certification in aerospace physiology was established by the Aerospace Medical Association (AsMA) to encourage the study, improve the practice and elevate the standards of excellence in aerospace physiology. Formal Board Certification provides an avenue for professional and peer recognition in aerospace medicine, and is a worthy goal for members to attain.

This year's certification examination will be offered at the 79th annual scientific meeting of the Aerospace Medical Association on Sunday, 11 May 2008, at the Sheraton Hotel in downtown Boston, MA.

Board certification is for professionals with an abiding interest and demonstrated productivity in the field of aerospace physiology. Applicants must possess, as a minimum, a baccalaureate degree either in physiology, or a closely related science. A history of significant contributions to aerospace physiology is also required. Applicants should have 5 years of active professional experience in an aeromedical field.

The 5-hour exam contains questions covering various areas relevant to aerospace physiology including, but not limited to, general human physiology, acceleration physiology, decompression physiology, impact, hypoxia, vibration and noise, operational aspects, space physiology, and spatial orientation.

Applications and letters of reference are due to the Admissions Committee no later than the close of business, **Friday, 07 March 2008.** Applicants should contact the Admissions Chair for an application form (available in English only). Applicants should also submit a suitable portrait photograph, a short professional biography of less than 300 words, two professional letters of recommendation submitted directly to the Board, and a one-time, non-refundable Application Fee of $25 (U.S). A non-refundable $75 Examination Fee is due prior to the exam. Make checks payable to the Aerospace Physiology Certification Board. Applicants are encouraged to submit documents to the Admissions Chair in a digital format; MS-Word compatible for text documents, and high-resolution JPEG for graphics/photos.

Applications for Aerospace Physiology Board Certification are available from the Admissions Committee Chairman:
CDR Thomas J. Wheaton, MSC USN, MS,CaSP
13529 Osprey Lane, P.O. Box 202
Dowell, MD 20629
E-mail: thomas.wheaton@navy.mil (professional); tjwheaton@comcast.net (personal)
Deadline for Application: 07 March 2008.

AsPS Member Benefits

The outstanding network potential and the chance to gain knowledge from the field's top minds.

The opportunity to take part in forums for the integration and utilization of experts in many diverse professional fields. Our members have shared their expertise in multinational and multi-service working groups for altitude effects, acceleration, spatial disorientation, passenger and patient transport, and human factors.

The opportunity to recognize scientific acheivement in the field of aerospace physiology. There are three Society awards presented each year.

The chance to contribute to the success and quality of the annual AsMA conference. The Society's Education and Training Day has been one of the most widely attended sessions during the annual conference.

Membership is only $10. For more information, please contact Joe Essex at joseph.essex@navy.mil, or write to:

LCDR Joe Essex, MSC, USN
BLDG 2272 Suite 345
47123 Buse Rd
Patuxent River, MD 20670

Send information for publication on this page
to: **Chris Borchardt**
102 Sevendales Dr.
Goldsboro, NC 27534
christopher.borchardt@gmail.com

ASSOCIATE FELLOWS GROUP NEWS

AsMA Associate Fellows Group Newsletter www.asmaafg.org

The Associate Fellows Group officers have been actively engaged via teleconference prioritizing efforts and dedicating energy toward the projects highlighted below.

Programs--Genie Bopp is spearheading an effort to sponsor an AFG panel at the AsMA annual meeting. The goal is to develop a respected recurring forum that recognizes expertise from within the AFG.

Membership--Bruce Edwards assisted the Home Office with selecting New Associate Fellows. They are listed here. Also, he has challenged us to enhance the annual meeting AFG reception by growing it into a distinctive opportunity for introductions, mingling, and mentorship. We're truly looking forward to seeing everyone at what will be a worthwhile gathering.

Informatics--Rob Carroll is working to polish our web presence. Pushing useful reminders and updates to the membership via e-mail is one of several objectives. Making the AFG website into a useful interactive asset for the membership is a priority.

Communication--Chris Borchardt is solidifying the process that will keep the AFG membership informed from within these journal pages so keep looking for us here.

Update of Fellows Selection-- Peggy Matarese is energetically collaborating with those involved in the Fellow selection process that is undergoing significant revisions. George Anderson's brief summary of the major details is available at www.asmaafg.org

New Associate Fellows

The following AsMA members achieved Associate Fellowship status and were approved by the Executive Committee during their meeting in August 2007:
Lance L. Annicelli
Gary E. Beven, MD
Bascom K. Bradshaw, DO, MPH, MAS
John A. Caldwell, PhD
Robert A. Cocks, MD, FRCS
Michaela A. Demboski
Ramon Dominguez-Mompell, MD
Rene J. Germa, MD, FRCS
Richard J. Hamilton, MD, FRCS
George M. Hudson, MD
Matt E. Lewis, MB, CHB
Vania E.R. Melhado, MD, PhD
Yasuhiko Miura, MD, PhD
Alan D. Moore, Jr., PhD
Eric W. Olins, MD, MPH
Eduard M. Ricaurte, MD
Scott K. Rineer, MD, FRCS
Shelly D. Robertson, MB, BS
Janet L. Sanner, RN
Peter Wechgelaer, MD, MPH

Congratulations to the newest AFG members!

Fellows Election Process Update
Available at www.asmaafg.org

Update your Biography Data at
www.afgbio.org

This publication is available in microform from ProQuest www.proquest.com

Send information for publication on this page to:
Jennie Bendrick
8825 Redwood Blvd
California City, CA 93505
760-373-810; butljenn@aol.com

Boston, the History of Thanksgiving ……

When the pilgrims first landed in Plymouth, Massachusetts, in December 1620, it was the day after Christmas. Those who know Massachusetts winters realize that this was just about the worst time to land, with frozen land, no food, and bitter snows coming shortly. The ship had carried 102 passengers, and about half of the Pilgrims died during this first winter. Still, that even some of them survived was thanks to the native Wampanoag Indians, who met up with them as soon as they landed.

The Wampanoags lived in small villages along the coastline of both Massachusetts and Rhode Island. They fished, farmed, and were generally peaceful and friendly. They lived in wigwams, and wore deerskin outfits.

The Indian who helped the Pilgrims the most was "Squanto," who had visited England before and knew how to speak English and work with these visitors. His ability to communicate with the Pilgrims and show them how to survive in this harsh winter was key to their survival.

"The First Thanksgiving"

The Pilgrims invited their two key Indian helpers, Squanto and Samoset, plus Chief Massasoit to share in their first Thanksgiving since they had been so instrumental in the pilgrims' successes that summer. The Indians brought their families, numbering over 90 people. The Pilgrims were overwhelmed, and didn't have enough food, so the Indians brought along their own supplies for the feast. The Wampanoags brought turkey, deer, berries, squash, cornbread, and beans - things that they'd farmed and that they'd shown the Pilgrims how to care for.

The Wampanoag Indians normally sit on the ground, on furs. For this special occasion, they sat at the tables with the Pilgrims. The Indian women and men both ate together. Pilgrim women didn't have this equal status though - they had to stand behind their menfolk, dutifully waiting until the men were done and full before they were allowed to eat.

Many states began having their own Thanksgiving celebrations in the fall, to give thanks for bountiful harvests. Abraham Lincoln made it official, and set aside the third Thursday in November as the National holiday in 1863.

The First Thanksgiving

Get Ready for Boston: May 11 - 15, 2008

Susan Bassick and team are busy setting up meeting places, tours, and restaurants to make the upcoming meeting in Boston another BIG success and wonderful experience for the Wing members. It's not too early for us to begin preparing for this; as it's not only a good time to see new places and experience new things, but to renew old friendships and make new friends.

Final plans are not in place but, as you can see, there will be a lot of great places to chose from.

Bean Town Trolley

Sandwich Glass Museum

Fenway Park

1369 Coffee House

Join the Wing!

The Wing of the Aerospace Medical Association was formed in 1952 "to support the specialty of aviation, aerospace, and environmental medicine by facilitating cooperation among its practitioners and by increasing public understanding and appreciation of its importance." A second purpose of the Wing is "to promote sociability among its members and their families." Each year at the scientific meeting, AsMA spouses meet new friends from every corner of the world, sharing in the many cultural experiences and educational opportunities of the host city. Dues are $20 per year. For further information, contact:

Judy Waring
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Seattle, WA 98136
(206) 933-0884
judywaring@comcast.net

Send information for publication on this page
to: **News of Members**
Aerospace Medical Association
320 S. Henry Street
Alexandria, VA 22314-3579
pday@asma.org

NEWS OF MEMBERS

Dr. Silvio Finkelstein of Argentina Recipient of 2007 Edward Warner Award

The 38th Edward Warner Award, the highest honor in the world of civil aviation, has been conferred by the Council of the International Civil Aviation Organization (ICAO) on Dr. Silvio Finkelstein, in recognition of his leadership in the field of aviation medicine and his important contribution to safety in international civil aviation.

"It is a great honour for me which goes beyond my person. It honours my country of Argentina and the numerous practitioners of aviation medicine around the world," said Dr. Finkelstein upon accepting the prestigious decoration.

The Award was presented by Roberto Kobeh González, President of the Council of ICAO, during a special ceremony at the Organization's Headquarters. Mr. Kobeh González praised Dr. Finkelstein for his vision and determination which have been instrumental in significantly raising the profile of health and aviation.

"His deep commitment to his work and assiduous efforts have led to major achievements in aviation medicine," said Kobeh González. "Dr. Finkelstein's untiring energy in emphasizing the strong link between health and safety in aviation operations has benefited civil aviation throughout the world."

WARNER AWARD---Silvio Finkelstein (left) receives ICAO's 38th Edward Warner from president, Roberto Kobeh Gonzalez (right).

After joining ICAO in 1971 as an Aviation Medicine Officer, Dr. Finkelstein soon went on to become Chief of the Organization's Aviation Medicine Section between 1975 and his retirement in 1994. During that time, he undertook a special study on the potential adverse safety effects of tobacco smoking. A decade of pioneering work and research on the subject led to the adoption by the ICAO Assembly, in 1992, of Resolution A29-15, restricting smoking on international passenger flights.

Throughout his distinguished career, Dr. Finkelstein has made aviation medicine education the cornerstone of his activities. The ICAO Manual of Civil Aviation Medicine was developed under his leadership and published in 1973. He also spearheaded the development of a standard for aviation medical examiners, emphasizing the importance of training, and is responsible for the worldwide introduction and expansion of regional aviation medicine training seminars.

Since his retirement from ICAO, Dr. Finkelstein has remained active with the International Academy of Aviation and Space Medicine (IAASM) and the Aerospace Medical Association (AsMA). He has also been working as a consultant to government authorities and providing his services to the ICAO Technical Co-operation Bureau for multinational projects on matters such as Severe Acute Respiratory Syndrome (SARS) and Avian Flu.

Recently, Dr. Finkelstein has devoted his time to studies on crew and passenger health and the development of systems to reduce the risk of spreading communicable disease by air transport. As Chief Observer for IAASM at the 35th Session of the ICAO Assembly in 2004, he participated in deliberations resulting in the adoption of Resolution A35-12, which for the first time recognized that the protection of the health of passengers and crews is an integral element of safe air travel.

Among the many honors and awards he has received are the Merito Santos Dumont granted by the Government of Brazil and the prestigious Eric Liljencrantz Award from AsMA for his role as an educator in aviation medicine.

The Edward Warner Award is bestowed, in the form of a gold medal, on an individual or institution, in recognition of outstanding contributions to the safe and orderly development of civil air transport. Edward Warner (United States) was the first President of the Council of ICAO.

ICAO Press Release PIO2007/07.

Nominations for 2008 Awards

December 15 is the deadline for receiving nominations for awards to be presented at the 2008 Annual Scientific Meeting in Boston, MA. Nominations can be made by any member of AsMA. The award nomination form is available on the AsMA website. You may either submit the nomination directly from the website or you may download the nomination form into your computer for e-mailing as a Word document attachment. Nomination forms sent via e-mail should be addressed to the Awards Committee Chair, Dwight Holland at Dwightholl@aol.com; and Ms Gisselle Vargas at AsMA Headquarters (gvargas@asma.org). If e-mail is not available, you can send a hard copy of the form via normal mail to: Dwight Holland
4874 Glenbrooke Dr.
Roanoke, VA 24081
Phone: (540)761-1576
AsMA FAX: (703)739-9652.

Any auxiliary biographical material in electronic or hard copy attachments **must be limited to 3 typed pages** and will be retained in Association files.

Nominations received by Dec. 15 will be considered for awards to be presented at the next annual meeting. Unsuccessful nominations will be retained in the active file through three award cycles.

To view a list of past recipients go to the AsMA website: www.asma.org/pdf/awrdwin.pdf

POSITION AVAILABLE

Exciting opportunity for medical director in occupational medicine practice in Washington State! The position is primarily administrative requiring strong leadership and political savvy skills. Previous government contracting experience with DOE, DOD a plus. MRO certification, experience in beryllium, toxicology, legacy health issues preferred. Current valid license to practice medicine in Washington state or ability to obtain. Three years minimum medical directorship experience required. Requires MD or DO degree with certification in either Occupational and Environmental Medicine (OEM), Aerospace Medicine (AM), or Public Health and Preventive Medicine (PM) by the appropriate Medical or Osteopathic Medical certifying board. Excellent compensation package.

Please contact Jason Zaccaria, Clinic Director, 1979 Snyder St., Ste 150, Richland, WA 99354

Email CV to Jason_Zaccaria@rl.gov
Fax (509) 376-2020, Phone (509) 376-4082

New Members

Beyda, David, M.D., Phoenix, AZ
Dhanaliwala, Ali Haider, BSE, Charlottesville, VA
George, James J., LCDR, MC, USN, Beaufort, SC
McNiff, Katherine B., LT, MC, USN, Sneads Ferry, NC
Millar, Ian L., M.B., B.S., Glen Iris, Australia
Nusbaum, Derek M., B.A., Kalamazoo, MI
Oldham, Karen L., LTC, MC, ANG, Lebanon, TN
Punwaney, Raj, M.D., New York City, NY

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