

# President's Page

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My thoughts are focused this month on our international members, and their participation in Aerospace Medicine. What prompted this? I have just left the 57th International Congress of Aviation and Space Medicine (ICASM), held this year in Zagreb, Croatia. I have remained in Europe for a few days, so I'm writing this from there.

The ICASM is the annual meeting of the International Academy of Aviation and Space Medicine ([www.iaasm.org](http://www.iaasm.org)). They put on an outstanding meeting, always in a great location, with both an excellent science program and an excellent social agenda. The opportunities for networking and for knowledge exchange are exceptional.

It was a great pleasure to attend such a well-organized meeting as this year's ICASM. Dr. Igor Jelčić and his committee did a superb job, as did Dr. Yehezkal Caine and the rest of the IAASM officers.

AsMA was well represented there, with many members in attendance. I counted 8 Past Presidents, along with 3 current Executive Committee members. This is the kind of opportunity to foster cooperation in which AsMA should continue to participate. The benefits on both sides would be synergistic.

And we've got a team doing exactly that. Our Vice President for International Activities, Dr. Jarnail Singh of Singapore, and the chair of our International Activities Committee, Dr. Gabor Hardicsay of Hungary, are leading the effort to further enhance the role of international cooperation in aerospace medicine. I applaud their ongoing efforts, and encourage all of us to help them.

The international component of AsMA (meaning non-U.S.-based members, but aren't we all international from someone's perspective?) is extremely important. It represents about 25% of our membership. Our internationals represent 76 countries, and are from similar backgrounds as U.S.-based members: civilian, military, practitioners, regulators, researchers, physicians, physiologists, psychologists, students, etc.

We are a richer organization because of our diversity, as regards both professional interests and background, and national origin.

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Another international organization with which we are allied is the European Society of Aerospace Medicine (ESAM, [www.esam.aero](http://www.esam.aero)). ESAM is an affiliate member of AsMA, and we are likewise an affiliate member of them.

This pan-European group is composed primarily of national aerospace medicine associations (not individuals, who belong via their national associations), and currently has 26 regular members. It acts as an indepen-



**Robert W. Weien, M.D., M.P.H.**

dent forum for promoting safety and health in the aerospace environment, and coordinating efforts in aerospace medicine.

Their next formal meeting will be in Athens, Greece, 10-13 November 2010. They made very sure their dates did not conflict with our Council and Scientific Program Committee meetings, being held later in that month. I would encourage all AsMA members to attend who are able to do so.

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At ICASM Dr. Michael Bagshaw (an AsMA Past President) presented the Andre Allard Lecture. His topic was communications, and he was an eloquent and persuasive advocate for improving the communication between our specialty and the general public and media. He cited examples where communications could be improved.

His remarks sync nicely with ideas several of us have been batting around about enhancing an AsMA sense of community via the enhanced communications assets of the internet. It might be a while before the president or executive director have a blog, or are sending tweets, but what about an Aeromed Wiki? Any interest out there in a user written and maintained compilation of information?

There may be an Aerospace Medicine Forum coming, where one could interact with other interested parties (this forum is in testing as I write this), and to which those with questions could pose them to the world-wide community of Aerospace Medicine specialists. It will be a lot like Dr. Dougal Watson's aeromed list, but in a newer and more user-friendly format: in fact Dougal is the prime mover behind this development. Stay tuned.

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To close along the theme of communications, please feel free to contact me with suggestions, ideas, or concerns at [president@asma.org](mailto:president@asma.org).

# Association News

## Space-Related Radiation Research Could Help Reduce Fractures in Cancer Survivors

Brad Thomas  
NSBRI, Houston, TX

HOUSTON - (Sept. 15, 2009) - A research project looking for ways to reduce bone loss in astronauts may yield methods of improving the bone health of cancer patients undergoing radiation treatment.

It is well documented that living in the microgravity environment of space causes bone loss in astronauts, but until recently, little was known about the effects of space radiation on bones. Dr. Ted Bateman leads a project funded by the National Space Biomedical Research Institute <<http://www.nsbri.org/>> (NSBRI) to understand radiation-induced bone loss and to determine which treatments can be used to reduce that loss and lower the risk of fractures.

"Our studies indicate significant bone loss at the radiation levels astronauts will experience during long missions to the Moon or Mars," said Bateman, a member of NSBRI's Musculoskeletal Alterations Team <<http://www.nsbri.org/Research/MusculoSkeletal.html>>.

Bateman, an associate professor of bioengineering at Clemson University, and colleagues at Clemson and Loma Linda University have discovered in experiments with mice that bone loss begins within days of radiation exposure through activation of bone-reducing cells called osteoclasts. Under normal conditions, these cells work with bone-building cells, called osteoblasts, to maintain bone health.

"Our research challenges some conventional thought by saying radiation turns on the bone-eating osteoclasts," Bateman said. "If that is indeed the case, existing treatments, such as bisphosphonates, may be able to prevent this early loss of bone."

Bisphosphonates are used to prevent loss of bone mass in patients who have osteoporosis or other bone disorders.

Even though the research is being performed to protect the health of NASA astronauts, cancer patients, especially those who receive radiation therapy in the pelvic region, could benefit from the research.

"We know that older women receiving radiotherapy to treat pelvic tumors are particularly vulnerable to fracture, with hip fracture rates increasing 65-200% in these cancer patients," said Bateman. "Hip fractures are very serious; nearly one in four patients who fracture a hip will not survive a year. A large number of surviving patients will require long-term care. More than 80% of the patients will not be able to walk unaided or will not be back to pre-fracture activity levels after a year."

Once a person loses bone, their long-term fracture risk depends on their ability to recover lost bone mass. For older cancer patients, early introduction of bisphosphonates and other forms of treatment could help greatly since the

process of regaining bone mass can be more difficult due to lower activity levels.

Clemson's Dr. Jeff Willey is a collaborator with Bateman and the lead investigator of an NSBRI-funded project looking at the cellular mechanisms involved in radiation-induced bone loss. He said the bone loss in the space-flight-related experiments has occurred quickly and cell physiology has changed.

"If we expose mice to a relatively low dose of radiation, the cells that break down bone are turned on several days after exposure," he said. "After radiation exposure, osteoclasts appear to have a different shape. They get flatter, and there are certainly more of them."

The mice used in the research have received the amount of radiation exposure that is expected to occur during a lengthy mission to the Moon or Mars. The amount is much less than what cancer patients receive during treatment. For example, patients receiving radiation treatment in the pelvic region can receive doses up to 80 gray over a 6- to 8-week period, with the hip receiving up to 25 gray. Astronauts are likely to receive about 0.5 to 1 gray during a long-duration lunar or martian mission.

Astronauts are at risk of radiation exposure from two sources. The first is proton radiation from the sun. The second, and less understood type, is galactic cosmic radiation from sources outside the galaxy. Galactic cosmic rays and protons would be the source of radiation damage for astronauts during a mission to Mars.

Marcelo Vazquez, NSBRI's senior scientist for space radiation research, said Bateman's project and other NSBRI radiation projects <<http://www.nsbri.org/EarthBenefits/NSBRIRadiationProjects.html>> will influence spacecraft design and mission planning. "The research will help to define the radiation risks for astronauts during long-term missions," Vazquez said. "This will lead to strategies for shielding and medical countermeasures to protect against exposure."

Bateman's NSBRI work is leading to other studies. "We have been able to initiate a couple of clinical trials with cancer patients to determine if what we are seeing in mice corresponds with bone loss in humans. Preliminary results in these trials show rapid declines in bone mass and strength," Bateman said.

### Future AsMA Meeting Sites

May 9-13, 2010

Phoenix Sheraton Downtown  
Phoenix, AZ

May 8-12, 2011

Egan Convention Center  
Anchorage, AK

May 13-17, 2012

Atlanta Hilton  
Atlanta, GA

Learn more about other NSBRI radiation-related projects at <http://www.nsbri.org/EarthBenefits/NSBRIRadiationProjects.html>

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*NSBRI, funded by NASA, is a consortium of institutions studying the health risks related to long-duration spaceflight. The Institute's science, technology and education projects take place at more than 60 institutions across the United States. Release available at: <http://www.nsbri.org/NewsPublicOut/Release.ep1?r=125>*

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## DONATE TO THE AsMA FOUNDATION

The Foundation supports the field of Aerospace Medicine and the Association through financial support of educational and scientific programs, providing scholarships to members in training, supporting grants for research programs, and other activities. Please visit their website at [www.asma.org/asma\\_foundation/foundation-index.php](http://www.asma.org/asma_foundation/foundation-index.php).

Send checks to:

AsMA Foundation  
700 Gemini St., Suite 110  
Houston, TX 77058-2735  
Donations are tax deductible.

**Council Meetings are open to all members. The next Council Meeting is 9:00 a.m., Wednesday, November 18, 2009, at the Holiday Inn Eisenhower Ave., Alexandria, VA.**

## Aerospace Medicine at Mayo Clinic, Scottsdale, Arizona



The Aerospace Medicine program at Mayo Clinic began in the 1930s with a core team of physiologists, technicians, engineers and flight surgeons who introduced technologies that would later reshape aerospace life support systems and Medicine. The program has evolved into a modern resource for pilots, aircraft manufactures, airlines, corporate flight departments as well as operators in extreme environments. The Mayo Clinic Aerospace Medicine program is available in three locations in the U.S., including Scottsdale, AZ.

The Aerospace Medicine Program at Mayo Clinic in Arizona participates in activities applicable to recreational and professional pilots, government and civilian Aerospace operators, orbital and suborbital spaceflight participants, professional air transport personnel and individuals traveling in high altitude and extreme environments.

The Aerospace Medicine Program staff at Mayo Clinic in Arizona combines board certified specialists in the fields of Aerospace Medicine, Internal Medicine, Preventive Medicine and Occupational Medicine. An extensive list of experienced Aerospace Medicine consultants in a variety of key subspecialties at Mayo Clinic facilitate the evaluation of complex medical problems in an expedited fashion.

Aerospace Medicine at Mayo Clinic in Arizona has the following areas of emphasis:

### Clinical Space Medicine:

The inherent physiologic stresses of spaceflight, and the limited capability for medical care onboard, as well as the likely presence of preexisting medical conditions of significance (e.g. coronary artery disease and other chronic illnesses) require a standardized system for medical assessments of prospective passengers who want to engage in civilian spaceflight experiences. Specially trained physicians have professional expertise and experience as well as an expedited service model through the existing Executive Health program, to provide pre-flight medical assessments.

### Research:

The Aerospace Medicine and Vestibular Research Laboratory (AMVRL) operates in Scottsdale, AZ with the mission of investigating and developing strategies to enhance human performance and safety in the aerospace environment. Research work focuses on three areas:

- Spatial orientation/ disorientation & motion sickness (vestibular function);
- Acceleration related threats (blackout, disorientation); and

Altitude related threats (hypoxia, hyperventilation, altitude-related disorders).

AMVRL has developed special technical and biomedical data recording expertise in the above areas of emphasis for the purposes of research and training and closely collaborates with the Aerospace Medicine & Vestibular Research Laboratory (AMVRL) at Infocitex in Boston.

A novel computer controlled motion platform for the investigation of vestibular cues and cardiovascular parameter changes in the motion environment is part of the laboratory

The laboratory is funded by federal agencies to investigate aspects of flight simulation enhancement, acceleration training & protection, mitigation of motion sickness and altitude protection strategies.

### Education:

Select national and international trainees from within and from outside of Mayo Clinic are mentored and involved in research and clinical activities in Aerospace Medicine and biomedical engineering aspects.

*Jan Stepanek, MD, MPH  
Medical Director Aerospace Medicine Program  
Mayo Clinic, Scottsdale, AZ*



# AEROSPACE PHYSIOLOGY REPORT

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## 2009 Board Certified Aerospace Physiologists

T. J. Wheaton CDR MSC USN

Five candidates passed the 2009 examination for Board Certification in Aerospace Physiology (CASP). The exam was administered on 03 May 2009 at the Los Angeles Annual Scientific Meeting. The individuals certified in Aerospace Physiology for 2009 are:

### Karyn J. Ayers

Lt. Col. Karyn J. Ayers is a USAF flight surgeon and family practice physician currently assigned to the Flight Medicine Clinic, 72d Medical Operations Squadron, Tinker AFB, OK. Dr. Ayers received her Bachelor of Science in physics and mathematics from Texas Tech in 1986, and a Master of Science in electrical engineering from the University of Utah in 1987. In 1999 she attended the Uniformed Service University of the Health Sciences (USUHS), completing a Doctor of Medicine (M.D.) in 1999, and Masters in Public Health Administration (M.P.H.) from the Kirksville School of Osteopathic Medicine. Lt. Col. Ayers holds an FAA Private Pilot license with an Instrument Rating. She is a member of AsMA, a Certified Death Investigator Level IV, a member of the American College of Forensic Examiners, and a Fellow of the American College of Family Physicians. Lt. Col. Ayers is married with four children.



### Amber D. Biles

LCDR Amber D. Biles is a Naval aerospace physiologist currently assigned as Aeromedical Safety Officer (AMSO) to 2nd Marine Aircraft Wing, MCAS Cherry Point NC. She graduated with a Bachelor of Science in biology from Georgia Southern University in 1995, completing her Masters of Science in exercise physiology and cardiac rehabilitation in 1996.



LCDR Biles was commissioned into the Medical Service Corps in 1998, and completed Aerospace Physiology resident training in 2000. She has served at the Aviation Survival Training Center, MCAS Miramar, and Marine Aircraft Group 14, and is a graduate of the Naval Postgraduate School Aviation Safety Officer and Expeditionary Warfare School. LCDR Biles is a member of AsMA, the Aerospace Physiology Society, and the Society of U.S. Naval Aerospace Physiologists.

### Sean M. Lando

LCDR Sean M. Lando is a Naval aerospace physiologist currently under instruction as a graduate student at the University of Colorado-Boulder, and previously served as the Department Head for the Aviation Survival Training



Center, Pensacola, FL. LCDR Lando enlisted as a USAF medical flight technician. He went on to earn a Bachelor of Science in exercise science from Canisius College, Buffalo, NY in 1993; and a Master of Science in kinesiology from the University of Northern Colorado in 1996. He also holds a Master of Business Administration from UCLA. He was directly commissioned into the Medical Service Corps and completed Aerospace Physiology resident training in 1998. Military assignments include the Aviation Survival Training Center, Jacksonville, FL, Strike Fighter Wing, U.S. Pacific Fleet, NAS Lemoore as Aeromedical Safety Officer (AMSO), Marine Aircraft Group 39, Camp Pendleton, CA, and the Naval Survival Training Institute (NSTI), Pensacola. LCDR Lando was recognized as the 2003 Naval Aerospace Physiologist of the Year and received the 2004 Wiley Post Award of the Aerospace Physiology Society. He is a member of AsMA, the Aerospace Physiology Society, the Society of U.S. Naval Aerospace Physiologists, and the American College of Healthcare Executives. LCDR Lando is married with two children.

### Nathan B. Maertens

Capt. Nathan B. Maertens is a USAF aerospace physiologist currently assigned to the 52d Fighter Wing, Spangdahlem AG, Germany, and recently graduated from the University of Illinois-Urbana with a Masters in human factors. Capt. Maertens is a 2000 graduate of the U.S. Air Force Academy with a Bachelor of Science in biochemistry. He holds



a Master of Science in aerospace safety systems from Embry-Riddle Aeronautical University. His duty assignments include Peterson AFB, Elmendorf AFB as Head of the Human Performance Training team, and Chief of the 3rd Medical Group's Homeland Security Decontamination Team. He was recognized with the 2006 PACAF Chief of Safety Medical Achievement Award. He is a member of AsMA and the Aerospace Physiology Society.

### Melissa L. Ziarnick

Ms. Melissa L. Ziarnick is a Ph.D. candidate and graduate research assistant at New Mexico State University, Las Cruces, NM. She graduated from the U.S. Air Force Academy in



2003 with a Bachelor of Science in biology, and earned a Master of Aeronautical Science in human factors and aviation safety from Embry-Riddle in 2006. She holds an FAA Private Pilot Certificate. Ms. Ziarnick served as a U.S. Air Force Aerospace Physiologist for 5 yr between 2003-2008, stationed at Peterson AFB, CO, and Sheppard AFB, TX. She was honored as the 2004 and 2005 Aerospace Physiologist of the Year for Space Command. Ms. Ziarnick is a member of AsMA, the Aerospace Physiology Society, the Aerospace Human Factors Society, and the Human Factors and Ergonomics Society.

#### Certification in Aerospace Physiology

Applications for Aerospace Physiology Board Certification are available from the Admissions Committee Chairman:  
CDR Rich Folga, USN  
2302 35th Ct.  
Anacortes, WA 98221  
Email: folgas@bellsouth.net  
**Deadline for Application: 10 March 2010.**

#### 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 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 achievement 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:

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# NEWS OF MEMBERS

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

## New Members

Lee R. Allen, LT, MC, USN, Meridian, MS  
 Scott Avery, CAPT, MC, ANG, Jefferson City, MO  
 Randy W. Connolly, LT, MC, USN, Pensacola, FL  
 Steven J. Eickelberg, M.D., Paradise Valley, AZ  
 Richard Grainger, Capt, CF, Ottawa, Canada  
 Richard Harvey, Maj., USAF, MC, San Antonio, TX  
 Eleanor P. Luna, M.D., Abbu Dhabi, United Arab Emirates

Kent D. McDonald, Lt.Col., USAF, MC, Universal City, TX  
 Christopher C. Nagle, M.D., M.P.H., Oxford, MI  
 David V. Phan, MBBS, FRACGP, ACC, Beaumaris, Australia  
 Joseph S. Savage, Maj., USAF, MC, Knoxville, TN  
 Benjamin Shepherd, Maj., USAF, MC, Brooks City Base, TX

## RESEARCH PROPOSALS SOUGHT

The National Aeronautics and Space Administration (NASA) has released Research Announcement (NRA) NNJ09ZSA002N, titled, "Research and Technology Development to Support Crew Health and Performance in Space Exploration Missions." The solicitation document is available via the NASA Research Opportunities homepage at <http://nspires.nasaprs.com/>; link through the menu listing "Solicitations", then to "Open Solicitations."

This NRA jointly solicits ground-based, bed rest definition and flight definition proposals for both NASA and the National Space Biomedical Research Institute (NSBRI) in support of the Human Research Program. Proposals are being solicited by NASA in the areas of: Sensorimotor; Muscle and Bone; Cardiovascular and Muscular Endurance; Intervertebral Disc Damage; and Advanced Food Technology. Proposals are being solicited by the NSBRI in the areas of: Cardiovascular Alterations; and Smart Medical Systems and Technology.

Proposals responding to either the NASA emphases or NSBRI emphases must be submitted separately, and will receive separate evaluations, and if selected, separate awards. Step-1 proposals are due on September 3, 2009, and invited Step-2 proposals are due on December 3, 2009. Participation is open to all categories of organizations, including educational institutions, industry, nonprofit organizations, NASA centers, and other Government agencies.

Proposals solicited through this NRA will use a two-step process. Only PIs submitting Step-1 proposals determined to be relevant to the solicited research of this NRA will be invited to submit full Step-2 proposals. Proposals must be submitted electronically via the NASA NSPIRES (NASA Solicitation and Proposal Integrated Review and Evaluation System) proposal data system (<http://nspires.nasaprs.com>).

## CLASSIFIED AD

### July 2010 Mayo Clinic Aerospace Medicine Fellowship Position

Two-year Aerospace Medicine Fellowship (includes a Masters in Public Health) position open to physicians who have completed an ABMS approved clinical residency. For those with an MPH, we invite applications for a one-year fellowship. For applications visit: <http://www.mayo.edu/msgme/> or contact the program director, Lawrence Steinkraus, MD, MPH, for details at 507-284-9966.

Deadline for submission of applications: December 31, 2009.

## MEETINGS CALENDAR

**November 7, 2009; UK Space Biomedicine Conference 2009; Downing College, University of Cambridge, UK.** For more info, please visit <http://uksba.org/conference.php>.

**November 13-15, 2009; 49th Annual Conference of the Indian Society of Aerospace Medicine (ISAM); New Delhi, India.** For more information please visit <http://isam-india.org/> or contact the Organizing Secretary, 49th ISAM, at [isamdelhi@gmail.com](mailto:isamdelhi@gmail.com).

**February 23-26, 2010; Space, Propulsion and Energy Sciences International Forum (SPESIF) 2010; Johns Hopkins University, Applied Physics Laboratory, Laurel, MD.**

## Award Nominations for 2010

The Awards Committee of the Aerospace Medical Association, which is responsible for selecting the annual winners of special awards, has set a **December 15** deadline for receiving nominations for awards to be presented at the 2010 Annual Scientific Meeting in Phoenix, AZ. The names of prospective award winners should be submitted as far in advance of the deadline as possible. Lots of time is needed to review all of the names and select the winners. To view a list of past recipients and award descriptions go to the AsMA website: <http://www.asma.org/pdf/awrdwin.pdf>

Nominations can be made by any member of AsMA.

### Rules:

1. The nominee must be a current member of the Association, with the sole exception that the Sidney D. Leverett, Jr., Environmental Science Awards is open to nonmembers.
2. Employees of a company sponsoring an award are eligible to receive the award.
  - 2a. Self nomination is not allowed.
  - 2b. Deceased members may be nominated.
3. Nominations for the Tuttle and Environmental Science Awards must cite a specific paper printed in *Aviation, Space and Environmental Medicine*. The award will be given to the first author only.
4. An individual can only receive one award in any one year.
5. 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](mailto:Dwightholl@aol.com); and to Ms Gisselle Vargas at AsMA Headquarters ([gvargas@asma.org](mailto: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.

6. 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.

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