

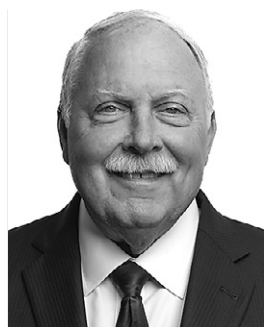
2022 Annual AsMA and UHMS Lectures

67th Louis H. Bauer Lecture

Michael A. Berry, M.D., M.S.

"Historical Issues in U.S. Aerospace Medicine: What did we know? When did we know it? Could we have predicted it?"

Michael A. Berry received his M.D. degree from the University of Texas Southwestern Medical School in Dallas in 1971. After a general surgery internship in the U.S. Air Force, he spent 4 yr as a fighter squadron flight surgeon in Spain and England. In 1976,



he entered his residency in Aerospace Medicine at Ohio State University in Columbus, OH, and received his Master's in Preventive Medicine in 1977. In 1978, he was certified by the American Board of Preventive Medicine in Aerospace Medicine. Following his residency, he became the Chief of the Flight Medicine Clinic at the NASA Johnson Space Center in Houston, TX, where he was responsible for the screening and selection of new astro-

nauts and participated in the certification and training of astronauts for spaceflight. In addition to participating in the extensive medical preparations for the first flight of the Space Shuttle, he served as a member of the Flight Control Team for the first two flights of the Shuttle Columbia. On leaving NASA in 1981, he entered the private practice of Aerospace Medicine with Preventive & Aerospace Medicine Consultants, in Houston, TX, where he was a consultant and FAA Aviation Medical Examiner for 25 years. During this time, he also served as an FAA Human Intervention Motivation Study (HIMS) trained AME monitoring many airline and corporate pilots during their recovery from substance use disorders. In 2006, Dr. Berry accepted a Senior Executive position with the Federal Aviation Administration in Washington, DC, as the Manager, Medical Specialties Division at FAA Headquarters where he was responsible for aerospace medicine policy and procedures. In March 2014, Dr. Berry was selected as the FAA Deputy Federal Air Surgeon. In January 2017, he was selected as the FAA Federal Air Surgeon with responsibility for all Office of Aerospace Medicine programs. Dr. Berry retired from the FAA on September 30, 2020 and returned to Texas. He is now working as an Aerospace Medicine Consultant and Medical Director for Harvey Watt, and Company, Atlanta, GA. Past President and Fellow of AsMA, he is a Fellow of the American College of Preventive Medicine. He is also past Vice-President of the Civil Aviation Medical Association, and Past President of the International Academy of Aviation and Space Medicine (2009-2011), and in 2015, he was selected as the 4th Emeritus Member of the Academy. He served as a Board Member and Trustee of the American Board of Preventive Medicine and as the Vice-Chair for Aerospace Medicine from 1990-1998. Dr. Berry is the recipient of numerous national awards, including the Kay and Bauer Founders Award from AsMA. He has several academic appointments, and has authored many scientific papers and book chapters.

About Louis H. Bauer:

Dr. Louis H. Bauer founded the Aero Medical Association of the United States, now the Aerospace Medical Association. He served as its first president from 1929-1931. Dr. Bauer earned his med-

ical degree at the Harvard School of Medicine in 1912. On August 25, 1913, Bauer joined the Medical Corps of the U.S. Army as a first lieutenant and graduated from the U.S. Army Medical School in 1914. After World War I he served as a medical officer on the Mexican border, in the Philippines, and then at Kelly Field, San Antonio, TX. He was named director of the Air Service Medical Research Laboratory in Minneola, NY, in 1919 and established the world's first school for flight surgeons. He was the commandant from 1919-1925. The school was officially designated the School of Aviation Medicine on November 8, 1922. In 1926, Dr. Bauer wrote "Aviation Medicine," the first textbook on the subject published in the U.S. The same year he was appointed medical director of the newly established Aeronautics Branch of the Department of Commerce and began developing medical standards for certifying civil airmen and designated physicians throughout the country as aviation medical examiners. It was this group he brought together to form what is not the Aerospace Medical Association. He also established the quarterly publication, the *Journal of Aviation Medicine*, which has evolved over the past 93 years into *Aerospace Medicine and Human Performance*.

56th Harry G. Armstrong Lecture

Melchor J. Antuñano, M.D., M.S.

"Medical & Human Factors Challenges of New Aerospace Transportation Systems"

Melchor J. Antuñano, M.D., M.S., is currently the Director of the U.S. Federal Aviation Administration (FAA) Civil Aerospace Medical Institute (CAMI) in Oklahoma City, OK. A native of



Mexico City, Dr. Antuñano is a graduate of the National Autonomous University of Mexico School of Medicine. He completed the Residency Program in Aerospace Medicine at Wright State University in Dayton, OH. He was awarded a post-doctoral research associateship by the U.S. National Research Council of the National Academy of Sciences at the USAF School of Aerospace Medicine in San Antonio, TX. A Fellow and Past

President of AsMA, Dr. Antuñano is also Past-President of the International Academy of Aviation and Space Medicine, the Space Medicine Association, and the Iberoamerican Association of Aerospace Medicine and a Fellow of the Aerospace Human Factors Association. He is Honorary Member of the Austrian, Brazilian, Colombian, Greek, Mexican, Peruvian, Slovenian and Turkish Societies of Aviation/Aerospace Medicine. He is a member of the International Academy of Astronautics. Dr. Antuñano is a faculty member at the University of Texas Medical Branch in Galveston and the National University of Colombia School of Medicine. He is a former faculty member at Wright State University School of Medicine. He is credited with 929 professional presentations and invited lectures at national and international conferences in aerospace medicine in 41 countries, and with 65 scientific publications covering a variety of aerospace medicine topics. Dr. Antuñano has received 85 awards and recognitions for his academic, administrative, and research achievements including: "DOT Secretary's Award for Meritorious Achievement: Silver

Medal” granted by the Secretary of the U.S. DOT; the “Jay Pardee AVS Champion of Safety Award” granted by the FAA Office of Aviation Safety for significant contributions to the promotion of global aviation safety; the “Louis H. Bauer Founders Award” granted by the Aerospace Medical Association for the most significant contribution in aerospace medicine; the “Won Chuel Kay Award” granted by the Aerospace Medical Association for outstanding contributions to international aerospace medicine; the “Eric Liljencrantz Award” granted by the Aerospace Medical Association for excellence as an educator in aerospace medicine.

About Harry G. Armstrong:

Maj. Gen. Harry G. Armstrong, USAF (Ret), was the 1951-52 President of both the Aerospace Medical Association and the Association of Military Surgeons. Armstrong was born in 1899, on a farm near De Met, SD. After a year at the University of Minnesota, he joined the Marines for a year. On discharge in 1919, he took up his studies again, earning his M.D. degree at the University of Louisville. After graduation in 1925, and a year's internship, he opened private practice in Minneapolis. A year or so later, while riding an elevator, another doctor asked if he'd like to take a course in aviation medicine. So, in 1929, Armstrong was commissioned a First Lieutenant in the Army's Medical Reserve Corps, and was sent to Brooks Field, TX, for study at the School of Aviation Medicine. It was here that he tested parachuting to analyze the physiological and psychological problems—he delayed opening his chute in order to avoid the problems of reduced oxygen and reduced temperature at altitude and advocated free-fall parachuting as a way to not only reduce the physiological problems of altitude but to avoid enemy fire. He attended more medical service schools before joining the 1st Pursuit Group at Selfridge Field, MI, and in 1936 Armstrong was assigned to Wright Field, OH, where for the next 6 years his research flourished. With Dr. J. W. Helm, he designed and built a human centrifuge to test pilot reaction. He unearthed an altitude chamber and used that in tests, too. He developed an aircraft first aid kit, tools for rescuing crash victims, aircraft carbon monoxide detectors, aircraft oxygen systems, soundproof flying helmets, color blindness test equipment, shoulder-type safety belts, and improved flying clothing and goggles, and cockpit lighting systems. He studied the effects on pilots of vibration, cold, reduced oxygen, barometric pressure, water loss, fatigue, toxic gasses, and explosive decompression. He discovered that the high altitude limit of flight with oxygen alone was 40,000 feet. He discovered that body fluids would boil at 63,000 feet. And he wrote a classic 496-page textbook, “Principles and Practices of Aviation Medicine.” In World War II, Armstrong directed the central effort which reduced flight casualties from: ditching at sea, “combat fatigue,” hypoxia. In 1949, as Commandant of the School of Aviation Medicine at Brooks, he created a separate Department of Space Medicine. From 1949-54 he was USAF Surgeon General, then for 3 years was Surgeon of the U.S. Air Forces in Europe. General Armstrong's decorations include the Distinguished Service Medal, Legion of Merit with oak leaf cluster; Order of the British Empire; and the French and Belgium Croix de Guerre with Palms. He is rated a flight surgeon. In 1939 he was presented the Collier Award, given annually for the greatest achievement in Aviation, and the John Jeffries Award in 1941, awarded yearly for the greatest achievement in aviation medicine during the preceding year; both of which were given for his contribution to the general over-all safety of aviation and the protection of pilots in flight. He was a fellow of the American Medical Association, Aerospace Medical

Association, Institute of Aeronautical Sciences, American College of Physicians, and the Royal Medical Society of London, England.

8th Reinartz Lecture:

“Overcoming Barriers on the Pressure Spectrum: From the Past to the Future”

A Joint UHMS and AsMA Panel

Moderator: Joseph P. Dervay

Panelists: Richard Moon

Mike Gernhardt

Jay Dean

Advances in aerospace and diving medicine have usually been driven by specific military or commercial exigences. Each physiological barrier has required a technological solution. Innovation in one field has provided solutions for the other. In this panel we hope to provide a somewhat chronological perspective on “overcoming barriers” at both ends of the pressure spectrum, and the ways in which innovators translated solutions from one field to the other:

- Physiological barriers encountered in WWII aviation drove advancements in decompression physiology and oxygen toxicity;
- Physiological barriers of deep sea commercial diving used data about oxygen toxicity and decompression to break depth records;
- Physiological barriers of high altitude parachute operations - required solutions informed by both diving and aviation;
- Knowledge from diving decompression drove solutions for astronaut EVA protocols, and commercial diving technology lead to innovations for working in microgravity.

About Eugen Reinartz:

Eugen Reinhartz was the 15th president of AsMA from 1944-1946. He served two terms due to WWII, when no elections were held in 1945. Born in Liverpool, OH. His father was German and his mother was Canadian. He graduated from the Medico-Chirurgical College of Philadelphia in 1916 and interned at Philadelphia General Hospital. He became a flight surgeon in 1920. He attained the rank of Brigadier General. He joined AsMA in 1930 (the year after it was founded!) and became a Fellow in 1942. He promoted “blind” or instrument flying between 1928 and 1940. He was Commandant of the School of Aviation Medicine from 1941-46. He received the John Jeffries Award in 1943. He was also an instructor in Psychiatry at the University of California from 1946-48. He received both the World War I ribbon and the World War II ribbon, as well as the Legion of Merit, the American Defense Medal, and several others. He authored many articles on aviation medicine and psychiatry.

Eric P. Kindwall Memorial Lecture

Guest Speaker: Lindell Weaver, M.D.

“Decision Making for Hyperbaric Oxygen for Brain Injury”

Lindell Weaver, M.D., received a B.S. in Engineering Science from Arizona State University followed by medical school at the University of Arizona. He served a rotating internship in the U.S. Navy, then went through the medical officer's course

in Undersea and Submarine medicine, and was an Undersea Medical Officer on the *USS Canopus* (AS-34) for 2 yr. After being discharged, he served in the Naval Reserves with SEAL



Team 1-3-5 for a few years. Dr. Weaver trained in Internal Medicine, with a fellowship in pulmonary and critical care at the University of Utah. He became the Medical Director of Hyperbaric Medicine and Co-Director of the Shock Trauma Respiratory ICU at the Level One trauma center, LDS Hospital, Salt Lake City, UT for 20 years. A Past President of the Undersea and Hyperbaric Medical Society, Dr. Weaver has authored and co-authored hundreds of papers, abstracts and book chapters. He was a co-investigator for the ARDSnet of the NIH and principle investigator of a randomized controlled trial of hyperbaric oxygen for acute carbon monoxide poisoning, published by the *New England Journal of Medicine*. For 10 years he had a senior leadership role in the DoD effort to conduct blinded randomized trials of hyperbaric oxygen for post-concussive syndrome due to war-related mild traumatic brain injury. Research activities include study of neural auto-antibodies following carbon monoxide poisoning and a randomized trial of hyperbaric oxygen for sequelae months to years after brain injury.

Dr. Weaver will discuss "Decision Making for HBO₂ in Brain Injury." He will review hyperbaric oxygen for diving-related disorders affecting the central nervous system, carbon monoxide poisoning, hypoxic brain injury and traumatic brain injury. Clinicians are typically aggressive at accepting and treating compressed gas divers and aviators with decompression illness who exhibit central nervous system injury, yet have much more variable interest and willingness to treat non-diving, or decompression-related disorders that affect the central nervous system. Fundamentally the injury that occurs with dysbarism may be similar to the cascade of injuries from non-dysbarism causes. Dr. Weaver plans to discuss these differing clinician behaviors.

About Eric P. Kindwall:

Eric P. Kindwall is known by so many as the "Father of Hyperbaric Medicine." Whether you knew him personally or simply by reputation, we have all benefited from his efforts, passion, wisdom, knowledge, energy, and vision. Dr. Kindwall has played a great role in growing and shaping the specialty of Undersea and Hyperbaric Medicine. He was likewise instrumental in molding the UHMS into what it is today. Dr. Kindwall began diving in 1950. He cultivated his interest in the field and during the Vietnam War served as the Assistant Director of the U.S. Navy School of Submarine Medicine. He also was the Senior Officer responsible for the Diving Medicine Program. In 1969, after leaving the Navy, Dr. Kindwall became Chief of the Department of Hyperbaric Medicine at St. Luke's Medical Center, Milwaukee, WI. Shortly after the Undersea Medical Society was created in the mid-1960s, Dr. Kindwall identified the need for standardized education in the field. He created the UMS Education and Standards Committee to help elevate course content and ensure instructor competence. This committee later became our Education Committee. When the AMA initiated its Continuing Medical Education program, Dr. Kindwall persuaded the organization to recognize the UMS as a grantor

of CME credits. In 1972, Dr. Kindwall felt that the Society's members would benefit from improved communication. He created our first newsletter and was named editor. Dr. Kindwall chose the name Pressure because clinical hyperbaric medicine was rapidly developing. Even though the UHMS had not yet incorporated "Hyperbaric" into the Society's name, he wanted a title for the newsletter that would encompass all who worked with increased atmospheric pressure. He stated: "The Society's goal then, as it is now, is to serve all who deal with the effects of increased barometric pressure." That same year, Dr. Kindwall recognized the need to have a relationship with Medicare to help provide insight on reputable clinical management. The UMS followed this lead, and a Medicare Panel was created. The recommendations were presented to the U.S. Public Health Service. The challenge was that no reliable hyperbaric medicine clinical guidelines were available that addressed appropriate applications of Hyperbaric Medicine. To remedy this deficit, the UMS Executive Committee created an Ad Hoc Committee on hyperbaric oxygen therapy. Dr. Kindwall was named Chair. The committee created the first Hyperbaric Oxygen Therapy Committee Report. Again, this text was published 10 years before the UHMS incorporated "Hyperbaric" into its name. The report was sent to HCFA and the Blues and became their source document for reimbursement. Dr. Kindwall updated the text two more times and thus was the Editor and Chair of the Committee and text for three of its 12 editions. Dr. Kindwall later worked to expand the available information on the specialty by creating one of the first complete texts on the field. He created Hyperbaric Medicine Practice in 1994 and later updated and revised his text two more times. The Society's first journal, Hyperbaric Oxygen Review, has also been influenced by Dr. Kindwall. His love for research and education was clear: He became the initial editor, creating a journal that at first consisted of review articles and one original contribution. Over the years, it has grown to one full of original research. Dr. Kindwall's presence is felt in so many of the UHMS' activities and initiatives.

Christian J. Lambertsen Memorial Lecture Guest Speaker: Robert Sanders, MD, DMT, FACEP, FUHM

"Undersea Medicine is Out of this World! - Hyperbaric Medical Support at NASA's Neutral Buoyancy Lab"

Robert Sanders, M.D. began his diving career in 1983, training through both NAUI and LA County. Passionate about the sport he attended the NAUI college and became a certified



SCUBA diving instructor in 1987. Dr. Sanders' medical "career" began in 1989 as an EMT & Ski Patrol member, and in 1993 he ventured into hyperbarics as a technician and supervisor at the USC Catalina Hyperbaric Chamber. He also served as a scientific diver and field safety officer in Antarctica for 4 seasons diving in 28° water below 12' of ice. Sanders received his MD degree from the Chicago Medical School. After residency in Emergency Medicine at the University of Pittsburgh, and additional training at the University of Hawaii's Hyperbaric Treatment Center, he became boarded in both Emergency

Medicine and Undersea & Hyperbaric Medicine. He is a nationally recognized speaker and has authored multiple book chapters and peer-reviewed journal articles. Currently, Sanders is a Crew Health and Safety Flight Surgeon at the University of Texas Medical Branch and KBR on contract to NASA's NBL as their Medical Director and lead physician for the exploration class spacesuit development project. He has been the Medical Director for American Hyperbaric Centers in Anchorage, AK, (overseeing clinical hyperbarics & commercial dive operations) and was the Undersea and Hyperbaric Medicine Fellowship director at the Hennepin County Medical Center. He has worked as an Attending Emergency Physician since 2008 and has served as a Flight Physician for STAT MedEvac. Dr. Sanders also serves as the tactical medicine physician for the Harris County Sheriff's Office Dive Team, after many years diving with Pittsburgh River Rescue and the LA County Sheriff conducting search and recovery of bodies and evidence. He is an avid technical and scientific diver; has conducted shark diving & tagging operations and worked as a set medic and water safety coordinator for the Motion Picture Industry. In 2017 Sanders was awarded NASA's prestigious "Early Career Public Achievement Medal", The UHMS Gulf Coast Chapter's most prestigious award, the Jefferson C. Davis MD Memorial Award presented for clinical excellence and research in clinical hyperbaric medicine, and the UHMS Commercial Diving Award.

This presentation will take you on a journey into a 6,200,000 gallon pool with a mock up of the international space station. We will focus on the training and support that is performed, the risks associated with this training as well as the benefits. This presentation will convince you that EVA, extravehicular activity, space walking, is indeed diving in space. We will also discuss some of the current hurdles that face NASA as we train for our next mission, a return to the lunar surface.

About Christian J. Lambertsen:

Dr. Christian J. Lambertsen received a B.S. from Rutgers University in 1938 and an M.D. from the University of Pennsylvania

in 1943. During his medical school period, he invented and first used forms of the initial U.S. self-contained closed-circuit oxygen rebreathing apparatus, for neutral buoyancy underwater swimming and diving. As a student, he aided the early Office of Strategic Services (O.S.S.) in establishing the first cadres of U.S. military operational combat swimmers. Dr. Lambertsen became a U.S. Army medical officer on graduation from medical school in early 1943, and immediately joined the O.S.S. Maritime Unit on active duty through its period of function in World War II. He joined the University of Pennsylvania Medical Faculty in 1946, and became Professor of Pharmacology in 1952. While a faculty member he combined diving research and further underwater rebreathing equipment developments for the Army and Navy. In 1967 he served as Founding President of the Undersea Medical Society (now Undersea and Hyperbaric Medical Society.) Dr. Lambertsen is recognized by the Naval Special Warfare community as "The Father of U.S. Combat Swimming." His hand has touched every aspect of military and commercial diving. Dr. Lambertsen's active contributions to diving began during WWII and became even more progressive in the post-war period through the evolutions of the U.S. Navy Deep Submergence and Naval Special Warfare developmental programs. He was a Fellow of the Aerospace Medical Association and received the Tuttle and Environmental Science Awards from AsMA.

The Bauer Lecture will be given on Monday, May 23, at 8:00 a.m. during Opening Ceremonies in the Tuscany C,D,E Ballroom. Educational Support is provided by Wyle.

The UHMS Eric P. Kindwall Memorial Lecture will be given on Monday, May 23, at 10:30 a.m.

The Reinartz Lecture will be given on Tuesday, May 24 at 8:30 a.m. Support is provided by the Eugen Reinartz Memorial Fund.

The UHMS Christian J. Lambertsen Memorial Lecture will be given Wednesday, May 25, at 8:30 a.m.

The Armstrong Lecture will be given on Thursday, May 26 at 8:15 a.m. Educational support is provided by Environmental Tectonics Corp.