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SPACE MEDICINE BRANCH REPORT

Space Medicine in Japan

This article is the fifth in a series on Space medicine, and was written by Chiharu Sekiguchi, M.D., of the National Space Development Agency of Japan.

Space medicine is a very important discipline for supporting manned spaceflight. The U.S. and the U.S.S.R. have conducted manned space programs since the 1960's, and space medicine developed very rapidly. Japan has been conducting unmanned spaceflights with rocket and satellite launchings, but has never had a manned launch system. However, they presently have a joint manned space program with the U.S. National Aeronautics and Space Administration (NASA): the first Japanese Space Lab mission (SL-J). Japan has been preparing for this mission for the last 10 years, and a Japanese payload specialist is scheduled to fly onboard the U.S. Space Shuttle in June 1991. Before the SL-J mission was planned, several investigators began studying basic space medicine using simulation methods such as water immersion and head down tilt, but there was no operational space medicine.

Only a few medical schools and institutes in Japan have been interested in studying space medicine. The Institute of Environmental Medicine at Nagoya University, which was formerly the Institute of Aviation Medicine, has been studying space medicine with special emphasis on endocrinological changes, vestibular function, and visual stability. The Nihon University School of Medicine, has been studying cardiovascular deconditioning using head down tilt and Lower Body Negative Pressure (LBNP). The Space Medicine Laboratory in Jikei Medical School has been studying acceleration and body fluid changes using various simulation methods, and several medical schools have been investigating muscle problems which occur under reduced gravity conditions. The Japanese Society of Space, Aviation, and Environmental Medicine is an academic society in which space medicine issues are actively considered.

After Japan decided to participate in the U.S. Shuttle program, it completed the medical selection of three payload specialists, including backups, and has subsequently given retention medical examinations to provide health care for the Japanese astronauts. This is considered to be the first stage of operational space medicine in Japan. The SL-J mission is a combined space laboratory flight including material and life sciences experiments for NASA and the National Space Development Agency of Japan (NASDA). NASDA is proposing 13 life science and 22 material science experiments, and several of the life science experiments are related to space medicine. Among these are experiments which will use a Japanese astronaut as a human subject to monitor the overall health of the astronaut during flight. The health monitoring experiment is an NASDA experiment which consists of EKG, blood pressure, respiration, and skin potential reflex monitoring using a physiological monitoring system and observation of cardiac hemodynamics by echocardiograph with or without LBNP stress. To obtain baseline data for this health monitoring experiment, a KC-135 parabolic flight experiment was conducted in January 1990. Other experiments investigated changes in circadian rhythms and body fluid shifts due to spaceflight.

NASDA has had a medical operations branch, responsible for maintaining the health of the Japanese astronauts, since 1985. The branch also conducts ground-based research activities related to medical operations. This research is conducted in collaboration with medical schools to develop new, special medical examinations for the selection and health care of astronauts.

Another major task of the medical operations branch is to participate in the Space Station Freedom Program with NASA. New astronauts will be selected for this program; the branch will provide their health care before, during, and after long-duration spaceflight. NASDA is presently investigating medical standards for selection and annual retention of astronauts for long-duration spaceflight, with special emphasis on psychological issues. There are two working groups which have been discussing these issues with the international partners (NASA, NASDA, European Space Agency (ESA), and Canada): the Space Station Freedom Medical Standards Working Group; which addressees the development of new medical standards for astronauts, and the International Psychiatric Selection Working Group; which addresses psychiatric and psychological selection methods.

As previously mentioned, space medicine in Japan is in its very early stages, however, it is anticipated that space medicine will make positive contributions to human life both on Earth and in space.

NASA tests drag chute for Shuttle

Testing at NASA's Ames-Dryden Flight Research Facility, Edwards, CA, has begun on the drag parachute system used to land the Space Shuttle orbiters. The tests are part of a continuing program made to upgrade the flight capabilities and safety of the Space Shuttle fleet.

Drag chutes are specially designed parachutes deployed from an aircraft or aerospace vehicle to supplement the normal system of brakes and help slow down the vehicle. Eight landing tests are planned at Ames-Dryden with chute deployment at speeds ranging from 160 to 230 mph. Endeavour, the orbiter being built by Rockwell International, Palmdale, CA, and scheduled for completion in 1991, will be the first Space Shuttle with a built-in drag chute deployment system.

Nominations Sought for 1991 Awards

The Awards Committee of the Aerospace Medical Association, which is responsible for selecting the annual winners of special awards, has set a Dec. 15 deadline for receiving nominations for awards to be presented at the 1991 annual meeting of the Association in Cincinnati, Ohio.

The committee chair emphasizes, however, that the names of prospective award winners should be submitted as far in advance of the deadline as possible. Lots of time is needed to ensure review of all the names and selection of the winners.

Nominations can be made by any member of the Association.

The nominations must be submitted on forms available from AsMA Headquarters, and printed in the Journal.

Nomination form and 14 copies should be sent to:

Chair, Awards Committee
Aerospace Medical Association
320 South Henry Street
Alexandria, VA 22314-3524

Policies:

1. The nominee must be a current member of the Association, except that the Sidney D. Leverett, Jr., Environmental Science Award is open to nonmembers. Deceased members may be nominated.
2. The Chair of the Awards Committee does not vote and is not eligible for an award during his/her tenure.
3. Winners may receive only one award in any year and may receive additional awards only at 7-year intervals, except for the Sidney D. Leverett, Jr., Environmental Science Award.
4. Employees of a company sponsoring an award are eligible to receive the award.
5. Awards involving a published paper will be made only to the senior author.
6. Unsuccessful nominees for an annual award will be retained in the active file through three award cycles.