

NOVEMBER 1999

Exercise in women (University of South Carolina, Columbia, SC): “The effect of endurance training on vascular volumes in females has received little research attention. Further, the effect of exercise training intensity on vascular volumes is unknown ... There were 26 healthy, sedentary adult females ... who were randomly assigned to control ... high intensity ... or low intensity ... cycle ergometer training groups ... Within the limits of this study, endurance training did not increase [plasma volume], [total blood volume], [red cell volume] and [calculated total hemoglobin] in previously sedentary females regardless of the intensity of training.”¹

What did you say at altitude? (Royal Norwegian Air Force Institute of Aviation Medicine, Oslo; University of Oslo, Oslo; Royal Norwegian Air Force Material Command, Kjeller, Norway): “Few studies have addressed physiological effects of altitude and noise combined, although these two factors are inherent parts of all aviation. Altitude effects on hearing function have mainly been studied using gas mixtures with reduced oxygen content. The results have been inconclusive ... The present study was designed to assess the effect of altitude on speech intelligibility in aircraft noise ... A substantial increase in speech intelligibility in noise due to altitude was evident in our study. The physical effect of barometric pressure on noise causing an increased signal-to-noise ratio was found to greatly outweigh any possible hypoxic detrimental effect.”²

NOVEMBER 1974

Radiation in space (U.S. Air Force Academy, CO; U.S. Air Force Space and Missile System Organization, Los Angeles, CA; Weapons Lab, Kirtland Air Force Base, NM): “The [Skylab II] command module was equipped with passive dosimeters ... The measurements ... include no influence of solar flare particles, since no major solar flare particle events were observed ... Solar particles in the Skylab orbit would be largely shielded by the earth’s magnetic field, except for short time exposures at the highest latitudes. This shielding should be sufficient to prevent any hazardous radiation levels from reaching the astronauts, even from very large particle events ... Manned missions operating at higher altitudes, even in equatorial orbits >300 nm, for extended periods would accumulate significant exposures which would limit crew time on orbit. Practicable shielding appears to reduce the exposure levels only by a few per cent due to the high energy of the due to the high energy of the trapped proton component of the space radiation environment.”³

Stress and heart rate (Royal Norwegian Air Force Institute of Aviation Medicine, Oslo; Norwegian College of Physical Education and Sport, Oslo; University of Bergen, Bergen, Norway): “During flight operations [of helicopter and transport aircraft pilots], the heart rate accelerated without a corresponding increase in oxygen consumption. This heart rate increase beyond that expected from the oxygen uptake, i.e. additional heart rate, is therefore used as an indicator of psychological activation. This activation did not depend only on the actual task, but also on the experience level of the pilot himself. The levels of heart rate (and blood pressure) recorded indicate that even routine missions may impose a hazard to pilots with unmanifested or latent heart failure. This obviously calls for frequent workload-ECG examinations of flying personnel.”⁴

NOVEMBER 1949

Physiology of space (U.S. Air Force School of Aviation Medicine, Randolph Field, TX): “One might perhaps say that space flight physiology belongs to the realm of imagination. However, we should always be aware of the fact that, in numerous instances, the imagination of yesterday is the reality of tomorrow. And even if a round trip to the moon should never be realized, a meticulous study of the problems arising in this field will reflexly aid in the investigations of the terrestrial [sic] conditions on our home planet. We might add better understanding, for instance, of our sensory motor system by visualizing its function in the absence of gravity. In any case the occupation with the subject of space medicine will give impetus to science.”⁵

Psychiatry in aviation (Colonel, U.S. Air Force): “[1,751 psychiatric] cases which appeared before the Central Medical Board of the First Central Medical Establishment of the Eighth Air Force for evaluation and disposition were reviewed and categorized into diagnostic groupings ...

“70 per cent of the entire series [had Anxiety Reaction and were] extensively studied in reference to age, rank, aircrew position, predisposition, degree of stress experienced, and duration of symptoms prior to evaluation by the Board ...

“A significant positive finding was the relationship between duration of symptoms prior to evaluation by the Medical Board and persistence of residual effects.

“The study indicates a need in combat units for more medical officers who are psychiatrically oriented, competent and alert to recognize early signs of anxiety and willing to assume the responsibility of recommending treatment and rehabilitation measures. Further, standardized policies on disposition, approved methods of handling Anxiety Reaction patients, and adequate facilities for treatment and rehabilitation need to be established.”⁶

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