

AUGUST 1993

Alcohol and flying (Decision Systems, Stanford, CA; Stanford University School of Medicine, Stanford, CA; and Veterans Administration Medical Center, Palo Alto, CA): “We tested 14 young (mean age 25.8 years) and 14 older (mean age 37.9 years) pilots in a Frasca 141 simulator during alcohol and placebo conditions. In the alcohol condition, pilots drank alcohol and were tested after reaching 0.10% BAL, and then 2, 4, 8, 24, and 48 h after they had stopped drinking. They were tested at the same times in the placebo condition. Alcohol impaired overall performance. Alcohol impairment also depended on the order in which subjects participated in the alcohol and placebo sessions, with larger decrements for the alcohol-placebo order than for the opposite order. To examine the influence of alcohol independent of session order effects, we compared performance in the first alcohol session with performance in the first placebo session. This analysis showed that alcohol significantly reduced mean performance in the alcohol condition at 0.10% BAL and at 2 h. In addition, alcohol increased variability in performance in the alcohol session from 0.10% BAL to 8 h, suggesting that some subjects were more susceptible to alcohol than others. Older pilots tended to perform same radio communication tasks less accurately than younger pilots.”³

AUGUST 1968

Skeletal atrophy in space (U.S. Public Health Service Hospital, San Francisco, CA): “Studies of astronauts have revealed abnormal losses of calcium and reduced bone density as a result of weightlessness incurred during space flight... It is concluded that significant skeletal atrophy may occur during prolonged exposure to a hypogravic environment. The etiology appears to consist of failure of the skeleton to maintain its mass under conditions of reduced mechanical strain. The resultant disorder seems to vary dynamically with time with regard to rates of bone formation and resorption in experimental models simulating reduced gravity. During hypogravic periods the rate of skeletal loss is estimated to be 1-2 percent per month...”

“Some program of in-flight exercise, possibly combined with hormonal, phosphate and/or fluoride supplementation may ultimately prove to be effective in lessening skeletal disease in space, expanding man’s frontier beyond earth.”²

Alcohol and flying (Armed Forces Institute of Pathology, Washington, DC): “Ethanol was found in 102 (4.8 percent) of the 2,123 toxicologic analyses done at the AFIP on tissue submitted from U. S. military aircraft-accident fatalities. In 94 of these cases putrefaction or contamination was associated with the formation of ethanol.

“Eight of the 102 cases (0.38 per cent of the ethanol determinations) are considered significant because of the presence of ethanol without putrefaction or contamination and, therefore, related to ingestion. In only two instances could the significant ethanol be implicated as ‘probable’ cause of the aircraft accident, and one of these involved a nonrated individual who had taken the aircraft without authorization...”¹

AUGUST 1943

Human Systems Integration (U.S. Army Air Corps): “The degree of mechanical efficiency of a plane is regarded to be the primary limiting factor determining the altitude to which it can fly. Even more important are the limitations imposed by man himself as he reaches the extremes of endurance... But even man’s physiology may be mechanically improved by the use of equipment which in turn has its limits of efficiency. Since this equipment involves certain aspects of engineering, and since man is an integral part of this equipment as he uses it, it might be well to consider somewhat the physical aspects of man as he becomes a cog in a piece of matériel.

“How much size fluctuation does he show? What are the sizes of regions of his body? What is the geography of his face? If he wears an oxygen mask, his face must be considered as much a piece of equipment as is the mask itself.”⁴

Altitude impact on patients (Mayo Clinic, Rochester, MN, and Aero Medical Research Laboratory, Wright Field, Dayton, OH): “The transportation of patients by plane is assuming greater importance daily... First, there is an increased use of aviation ambulances in war to evacuate the wounded... Second, the evacuation by air of the civilian population in war areas has been found to entail the moving of large numbers of the sick by plane... Third, with the great increase of civilian air transportation more and more people who are ill are being transported by plane...”

“The material studied consisted of information on 200 patients [with various illnesses or recent or pending surgical operations] coming into or leaving Rochester by plane. All of these patients were examined at the Mayo Clinic and a diagnosis was made in each case...”

“The effect of air transportation on 200 patients is studied. Sixty-nine per cent had mild discomfort from flying. Patients who have severe cardiac disease or pulmonary disease or who have undergone recent abdominal operation should fly only when absolutely necessary.”⁵

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DOI: <https://doi.org/10.3357/AMHP.5155.2018>