FEBRUARY 1992

Soft contact lenses in flight (Aerospace Vision Laboratory, Ophthalmology Branch, Armstrong Laboratory, Brooks AFB, TX): "Seventy-two Tactical Air Command (TAC) aircrew members completed one full year of soft contact lens (SCL) wear. A daily-wear regimen, using extended-wear lenses, was used to minimize corneal stress. Baseline measurements of visual acuity with SCLs and with spectacles after SCL removal and ocular indicator gradings were compared to measurements at 5-d, 10-d, 1-month, 3-month, 6-month, and 12-month examinations. Visual acuity did not decrease during the test. No aircrew member developed corneal ulcers or other serious complications requiring elimination from the test. Two aircrew members lost a total of 9 'duties not to include flying' (DNIF) days: one flyer was grounded for 1 d with a corneal abrasion and another for 8 d with epithelial microcysts. The TAC SCL Test, as designed, was generally successful. The conservative approach to SCL wear during the test and the meticulous follow-up care by United States Air Force eye care professionals most likely contributed to the low ocular complication rate."[1]

FEBRUARY 1967

Heart rate in combat (NASA Flight Research Center, Edwards, CA, and Office of Advanced Research and Technology, NASA HQ, with the assistance of Captain Frank Austin, MC, USN): "The feasibility of medical monitoring in combat was demonstrated by instrumenting ten dive-bombing missions from a Navy attack aircraft carrier operating in the Gulf of Tonkin. Nine missions suitable for data analysis were obtained. The results were remarkable primarily for the low heart rates seen on these opposed missions. The overall heart rate for 18 hours of data was 87.6 beats per minute. The heart rates at launch and recovery were substantially higher than the bombing heart rates, in spite of the significant normal acceleration experienced during the bomb runs. The difference between launch or recovery, and bombing was statistically highly significant. Comparisons between the first and the second combat missions of the day for the same pilots on the same day showed heart rate to be substantially lower on the second mission. The difference was statistically significant. The pilots were of an unusually high experience level, and the data presented could not be considered representative for a pilot group of average combat experience, or average carrier operations experience."[4]

Civil aviation sensory overload (University of California, Santa Barbara, CA): "It was the purpose of this study to determine the effect of sensory input overload on the performance of non-professional civil pilots during simulated instrument flights in a LINK AN 2550-1 trainer. Parameters included track, altitude, and airspeed deviations measured under overload conditions induced by amended clearances and extraneous kinesthetic, visual, and auditory stimuli. Data from experimental flights for each subject was compared with his performance on control flights under similar flight plans.

"The analysis suggests that pilot performance may be facilitated by an auditory stimulus which does not require a response. A visual stimulus, whether or not a response was required, resulted in a performance decrement. The kinesthetic stimulus, a result of rough air activators, produced significant pilot errors when introduced alone and in combination with auditory or visual stimulus. Even with no additional sensory input, a single amended clearance delivered at a critical period of the flight was sufficient to cause gross errors in simulator control."[2]

FEBRUARY 1942

Is the EKG useful in flight physicals? (School of Aviation Medicine, Randolph Field, TX): "An electrocardiogram is recorded as a part of the annual physical examination of all pilots in the Army Air Forces who have reached the age of forty-five years. The reason for this practice is to detect heart disease, principally of the degenerative type, in aviators with no clinical manifestations of the disease.

"Comparable to the doctor in civilian life, the average flight surgeon has a superficial knowledge of what the electrocardiogram represents and how it is to be interpreted. The error of reading too much into curves showing minor abnormalities is often made…

"[A]n opinion on a man's physical ability to fly safely from an electrocardiogram cannot be made except in rare instances, and then only by specially trained personnel. Although the electrocardiogram is still the most valuable single laboratory aid we have in clinical cardiology, it has all the limitations and fallacies of any laboratory method, especially in the hands of the unskilled. There is no simple short cut to deciding whether any man has or does not have heart disease which may be dangerous to him and to others while flying. To arrive at an intelligent, accurate decision in any case requires first, a painstaking collection of historical, physical, and laboratory facts, and second, a precise, carefully weighed interpretation of these facts."[3]

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