APRIL 1995

Pilot visual skill comparison (Naval Aerospace Medical Research Laboratory, Pensacola, FL, USA): "Jet pilots (JP) (N = 44), helicopter pilots (HP) (N = 29), and college students (CS) (N = 41) were tested with a battery of vision tests designed to assess vision skills important for success as a naval aviator. Tests included measures of reaction time, high-contrast acuity, law-contrast acuity, spot detection, far-to-near gaze shift, near-to-far gaze shift, low-contrast acuity with glare, and dark focus… Only with the Far-to-Near test was there no difference among the three groups. On all other tests, JP outperformed CS. The difference between HP and CS was less consistent and less dramatic than the difference between JP and CS. Only with the glare test were CS significantly better than HP. The results were interpreted as reflecting the influence of various selection factors, operational requirements, differential attrition, and age…

"The tests were designed to assess visual skills that were thought to be critical for success as JP, most of them assess some aspect of vision that is heavily dependent upon the quality of foveal or central vision. The differences in test performance between HP and JP should not be construed as some kind of visual excellence of one aviation community over another. The visual skills required for success in the different aviation communities are different, driven by different operational requirements. Routine helicopter tasks such as nap-of-the-earth flying, search and rescue, and close-in support require visual skills different from those required for the detection of distant targets. The vision skills required to accomplish helicopter tasks, less easy to describe and evaluate, are not part of routine vision testing."[3]

APRIL 1970

Passenger oxygen for decompression (McDonnell Douglas Corporation, Long Beach, CA, USA): "A review of the need for passenger emergency oxygen for cabin decompressions is worthy of detailed analysis from a physiological point of view. Statistical analysis of the results of past decompressions in aircraft is not sufficient to make the decision to eliminate emergency oxygen. In performing such an analysis, many physical and physiological variables must be considered. The Time of Useful Consciousness (TUC) and the time it takes to become unconscious are guidelines that have been used in the past for flight crew members. These criteria are not applicable to the passengers' situation. The analysis delineates and discusses those factors involved in determining a Time of Safe Unconsciousness (TSU) permissible for passengers after cabin decompression. Simply stated, the degree of hazard is directly proportional to the time the passenger is unconscious from lack of oxygen…

"In the event of an aircraft cabin decompression, it is suggested that a quick-reference guide for pilots to determine the safety of passengers be established as the time the cabin is above 25,000 feet altitude. A relatively safe time may be considered as 1 minute and 40 seconds to 2 minutes. The passengers may become unconscious due to other influential factors such as decompression rate, maximum cabin altitude, rate of descent, and final cruise altitude. To be more accurate in determining the TSU, these factors must all be considered, assuming healthy passengers. Finally, a plea must be made for the collection of better data on decompression events which will occur in the future, so that the TSU can be more accurately determined."[1]

APRIL 1945

Carbs, protein, and fat for altitude tolerance (Columbia University, New York, NY, USA): "Repeated tests during eighteen months of well-controlled experimental study, including the use of twenty-five different research subjects and two independent groups of observers, have shown clearly that significant gains in altitude tolerance can be accomplished by ingesting pre-flight and inflight foods of relatively high carbohydrate content.

"Cortico-retinal function (peripheral vision) and psychomotor function (block placement) tests provided good quantitative measures of impairment caused by altitude exposures at 15,000 to 17,000 feet, through periods of one to four hours. The data from the quantitative tests were in essential agreement, too, with records of subjective and objective changes of a less quantitative nature provided by the subjects and observers…

"Compared to performance records after omitting a single meal or after eating a single meal high in protein, pre-flight or in-flight meals high in carbohydrate increased the altitude tolerance of all the subjects tested. The degree of gain in altitude tolerance varied in different individuals. There were no instances of reversal; that is, better performance on low carbohydrate diets. Fats were intermediate and without marked effect when fed in small quantities, but when fed in large quantities they more nearly resembled the proteins in their effect on altitude tolerance.

"The foods tested included both relatively purified items, such as sugar, to eliminate the effects of minor constituents, and typical every-day foodstuffs that comprise practical dietaries. The latter included an extensive list of items from regular Army rations and from common hospital foods. The particular type of available carbohydrate (sucrose, glucose, cooked starch, et cetera) or protein (milk, meat, eggs, cheese, et cetera) made little difference."[2]

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