NOVEMBER 1990

Risk of DCS at altitude following chamber training (USAF Medical Center, Wright-Patterson AFB, OH): "Approximately 38,000 students are trained annually in United States Air Force (USAF) altitude chambers. Students who depart the training site via aircraft on the same day as their altitude chamber exposure may place themselves at increased risk for decompression sickness (DCS). Air travel as a passenger in the immediate past-chamber flight period is unrestricted by current USAF regulations. A retrospective study was conducted to assess the potential risk involved in such post-chamber flight travel During the years 1982-87, there were 292 cases of DCS involving altitude chamber students which were subsequently treated with hyperbaric oxygen therapy. Only seven cases were found wherein the student was asymptomatic prior to air travel and subsequently developed DCS. Because the percentage of students who postpone travel is unknown, a precise relative risk could not be determined. Although the number of cases where sequential chamber and aircraft hypobaric exposures has initiated DCS is small, the potential for such occurrences remains a health concern."[3]

NOVEMBER 1965

Mitigating human factors in the Concord program (Chief Medical Officer, Ministry of Aviation, London): "Of the problems raised by the high cruising altitude, pressurization failure is the most significant. Allowing 1 minute reaction time, Concord can make an emergency descent to 40,000 ft. [from 65,000 ft.] in 3 1/2 minutes, and to 15,000 ft. in 9 minutes. Assuming that only simple types of oxygen equipment are suitable for general passenger use, this means that a failure giving 10,000 ft/minute rate of climb of cabin altitude represents the approximate limit for passenger survival…

"Observations of background cosmic radiation dosage at cruising altitude have shown an average of 1.5 millirem/hour at 65,000 ft. (R.B.E. 1.1) in Northern latitudes, in the solar minimum year. Using this figure and allowing for time spent at lower altitudes, pilots flying the legal maximum of 1000 hours/year would receive about 1300 millirem/year. In fact it seems unlikely that pilots will fly more than 600 hours/year in the Concord. The total-body dosage accumulated by a passenger in one transatlantic crossing would be about 4 millirem – 1/25th that of a routine chest x-ray…

"The high speed also means that great distances–and therefore several time zones–can be crossed in a duty day. Crew scheduling is therefore being studied to minimize the serious effects of disturbances of circadian rhythms. One method of achieving this is the positioning of crews for periods of weeks or months at strategic points along an airline route…

"The attention given to safety standards in this very expensive aircraft should result in a low accident rate. If a potentially survivable accident does occur, the strong structure, the use of heat resistant alloys, and the thermal insulation of the cabin should all improve the chances of survival. Studies are therefore in progress to improve the crashworthiness of passenger seating and tie-down…."[1]

NOVEMBER 1940

Amphetamine and human performance (Fatigue Laboratory, Harvard University, Boston, MA): "Benzedrine (amphetamine) is a drug whose stimulating action physiologically is similar to that of adrenalin… [S]tudies have shown a delay in decrement in prolonged mental work and a retardation of the report of subjective symptoms of fatigue, boredom and inattentiveness…

"We were interested in the possibility that benzedrine in a suitable quantity could delay the failure of mental function observed in acute anoxia, and consequently be of some value in aviation…

"Four experiments were run on eight men in order to determine the extent to which benzedrine modifies the failure of mental function in acute anoxia. With the subjects working near their capacity, the data for the code and the square root tests do not evidence any advantage in using the drug. [Timed mental tasks: "The code test was scored as the total time for the test divided by the number of correct letters transliterated (total possible correct–50). The square roots were figured from four-place whole numbers selected at random from a telephone directory, worked to three figures with the accuracy of the last place required to a tenth. The score was the total time divided by the number of correct figures in the answer."] When the arterial oxygen saturation is normal, benzedrine does not appear to affect the scores on either of the tests."[2]

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