FEBRUARY 1993

HIV and pilot performance (Henry M. Jackson Foundation, Rockville, MD; Georgetown University School of Medicine, Washington, DC; Walter Reed Army Institute of Research, Washington, DC): "There is controversy over whether cognitive impairment occurs in early human immunodeficiency virus (HIV) disease. When impairment is reported, findings are typically subclinical, affect only a minority, and their relationship to occupational functioning has not been established. Despite such findings, it has been recommended [by AsMA] that HIV-seropositive pilots be disqualified from flying… Based upon current data, we conclude that although subtle neurobehavioral dysfunction may occur in some asymptomatic HIV-seropositive individuals, there is no research which has demonstrated associated decrements in aviation-related skills."[4]

Shallow water DCS (Maritime Self-Defense Force, Undersea Medical Center, Yokosuka, Japan): "To find the minimum supersaturation pressure for detectable bubble formation and for contraction of decompression sickness (DCS), three shallow air saturation dives at the depth of 6 m, 7 m, and 8 m were performed… One bubble streak was shown in the 6-m dive group. A small number of bubbles were seen… in the 7-m dive. All subjects in the 8-m dive presented various amounts of bubbles. DCS was not observed in the 6-m and 7-m dives. On the other hand, in the 8-m dive, four subjects suffered from DCS and required recompression treatment. The minimum depth for detectable bubble formation was assessed at around 6 m and the direct ascent from saturation at 8 m seems to have a high risk of DCS."[2]

FEBRUARY 1968

Forms of hypoxia (Lovelace Foundation for Medical Education and Research, Albuquerque, NM): "The pathway of oxygen from the environment to its ultimate destination in the mitochondria of the cells can be visualized as a series of steps forming a cascade from the inspired air to alveolar gas, arterial blood, systemic capillaries, and finally the tissues and venous blood…

"One should bear in mind, however, that oxidative metabolism can be jeopardized by a large variety of other factors besides lack of oxygen. In considering these, it is useful to distinguish between HYPOXIDATION as the attenuation of aerobiosis associated with reduced energy requirements of the organism and HYPOXIDOSIS which denotes the insufficiency of aerobic metabolism to meet the undiminished or increased demands of the body due to deficiency or malfunction of certain agents indispensable for the metabolic process…

"Although the hazards of aerohypoxia, so prominent in the early days of aviation have been practically eliminated by the use of appropriate oxygen equipment, pressure cabins and suits, hypoxidosis is still encountered under certain conditions which disrupt the normal course of the oxygen cascade. Thus, arterial hypoxia may occur in the presence of normal alveolar Po_2 when high G forces disturb the ventilation/bloodflow relationship in the lungs creating an alveolararterial gradient. Under extreme conditions, regional pulmonary atelectasis may occur producing functional shunts with venous admixture which may persist for a considerable period of time after the G forces have subsided, particularly if the aviator has been breathing pure oxygen."[3]

FEBRUARY 1943

Muscular effort and oxygen availability [Editorial note: Dr. Delucchi was the first Argentinian flight surgeon to attend and present at the annual meeting.] (Chief of the Psychological and Physiological Laboratory, Headquarters of the Argentine Military Aviation): "As the vascular obstruction of both calves by tight boots accompanied with a muscular effort increases the total ventilation, the pilot will finish his plane's oxygen tank sooner than he would finish it without the obstruction. Then, he will be in peril and will feel discomfort in all cases of high altitudes or nocturnal flights in that condition…

"When the pilot finds an oblique wind in his route, he must maintain his direction and therefore must push the rudder constantly in the opposite way of the acting wind (the rudder of the same side of the acting wind).

"When a plane motor stops, the ship inclines down to the stopped motor side, then the torque of the running motor tries to turn the plane permanently toward the side of the stopped motor. Therefore, the pilot must constantly push the rudder to the opposite way of the stopped motor to maintain the correct direction (the rudder of the opposite side of the stopped motor)…

"If the muscular effort is moderate in these maneuvers and total ventilation increases in a short time in our experiments, we must suppose that total ventilation will increase more and probably fatigue and discomfort will appear when the same condition persists for longer periods."[1]

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