MAY 1993

Importance of CRM (United States Air Force Academy, CO): "Data from 156 fighter aircraft mechanical breakdown mishaps are used to compare the decision-making of flight leads to that of wingmen. The results suggest decision-making performance of flight leads is significantly inferior to wingmen. Further, we demonstrate this effect of flight leadership only affects experienced pilots, not inexperienced pilots. Explanations for this counter-intuitive finding include stress, training practices, and communication limitations."[4]

PRK for pilots? (Naval Aerospace Medical Institute, Pensacola, FL): "The development of the excimer laser, which is capable of correcting myopia without leaving obvious scars as does radial keratotomy, makes it certain that this promising but very new modality is something the military aviation community will be facing in the immediate future… Should military aviation permit or even sponsor a group of PRK student pilots in order to observe them closely, and then perhaps use this new modality in place of contact lenses or even spectacles?"[3]

Human mistakes (Naval Safety Center, Norfolk, VA): "We reviewed mishap trends and causes for all naval aircraft over a 4-year period, 1986-90… Of 308 total Class A mishaps, 179 (58%) were attributed to aircrew error. There were 145 (47%) attributed to supervisory error, another form of human mistakes."[6]

MAY 1968

Hyperventilation a mystery? (St. Paul's Clinical Investigation Unit, Vancouver, BC, Canada): "Though a quarter of a century has passed since the first clear description of an episode of hyperventilation occurring in a pilot during flight, we remain uncertain of the true frequency of the condition, its causes, and contribution to the production of accidents. In 1957 Balke, et al. showed that hyperventilation and hypocapnia are common in pilots of jet aircraft, and their finding that the incidence increased with the speed and complexity of the aircraft supported the assumption that anxiety was the cause. However, since then it has been shown that whole body vibration, acceleration, and pressure of safety belts can also give rise to it."[5]

Physical defects and aircraft mishaps (Harvard School of Public Health, Boston, MA): "With an estimate of prevalence of physical defects, risk of accident can be determined…

"[A] relative risk of 2.24 for defects in general was found. A range of minimum relative risks from 1.78 to 4.65 was found for various types of physical defect.

"The relative risk of fatal accident was found to be 2.41 with increasing risks for multiple defects. The pilots with 3 or more defects showed a minimum relative risk of 3.70 which supports the need for careful evaluation of such pilots."[1]

MAY 1943

Or hyperventilation an answer to today's physiologic episodes? (Mayo Clinic, Rochester, MN): "In recent years clinicians have come to recognize emotional disturbances of respiration as a physiologic basis for the production of certain symptoms… The symptoms may be readily reproduced within a few minutes by voluntary forced breathing… [D]izziness, instability and faintness often will appear within thirty to sixty seconds. Within a minute or two a sensation of numbness and tingling in the extremities… often associated with similar sensations about the mouth or face. [B]lurring of vision, a loss of sense of balance and an inability to think clearly and calmly... [E]xcitement and apprehension, even alarm, is rapidly produced… [After] several more minutes, the muscles may become perceptibly tense… tetanic contracture of the muscles may develop, especially in the hands, with the fingers in the characteristic position called 'carpopedal spasm.' Severe disturbances of the vasomotor system may develop by this time, with pallor, perspiration, rapid increase in the pulse and cyanosis. Although the person is overbreathing, he may come to experience a false sense of air-hunger… A few, unusually susceptible, individuals may partially or totally lose consciousness or may exhibit symptoms closely resembling those of shock…

"[D]epletion of carbon dioxide at high altitudes has been recognized as being responsible for part of the symptoms attributed to anoxia [i.e., hypoxia]… Those types of oxygen inhalation apparatus which possess a reservoir rebreathing bag have the advantage of tending to prevent excessive loss of carbon dioxide…

"An additional hazard which occurs during uncompensated hyperventilation at high altitudes should be emphasized; namely, the excessive loss of carbon dioxide which interferes with the dissociation of oxygen from oxyhemoglobin… frequently referred to as the 'Bohr phenomenon.' As a result, tissue anoxia can occur, even though the oxygen content of arterial blood is normal. This type of anoxia is particularly subtle in onset, and is hazardous in that it may often pass unrecognized because the subject so affected is not cyanotic…

"These symptoms are produced by acapnia and may result from spontaneous, unrecognized, hyperventilation occurring under conditions of emotional strain, excitement and anxiety."[2]

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