

**SEPTEMBER 1991**

*Causes of in-flight incapacitation (USAF Hospital, Robins Air Force Base, GA, and USAF School of Aerospace Medicine, Brooks AFB, TX):* "In-flight incapacitation of a fully trained crewmember due to a serious underlying medical condition is a rather infrequent event. In order to delineate the extent and nature of the incapacitation problem we reviewed the data base at the Air Force Safety and Inspection Center for all incidents coded for incapacitation, preexisting disease, or other acute illnesses occurring during the 10 years between 1978 and 1987. During this period there were 23 in-flight incidents of incapacitation due to significant underlying medical conditions. In 11 of the incidents the incapacitation resulted in a loss of consciousness. Neurologic conditions were the most frequent cause [9 cases] followed by cardiovascular conditions [2 cases]. We calculated a rate of incapacitation as 0.19 per million aircrew flying hours."<sup>4</sup>

*Detecting inebriation through speech analysis (NTSB, Washington, DC):* "As part of its investigation of the EXXON VALDEZ tankship accident and oil spill, the National Transportation Safety Board (NTSB) examined the master's speech for alcohol-related effects. Recorded speech samples were obtained from marine radio communications tapes. The samples were tested for four effects associated with alcohol consumption in available scientific literature: slowed speech, speech errors, misarticulation of difficult sounds ('slurring'), and audible changes in speech quality. It was found that speech immediately before and after the accident displayed large changes of the sort associated with alcohol consumption. These changes were not readily explained by fatigue, psychological stress, drug effects, or medical problems. Speech analysis appears to be a useful technique to provide secondary evidence of alcohol impairment."<sup>1</sup>

**SEPTEMBER 1966**

*Hypoglycemia and aviation mishaps (Southwest Regional Flight Surgeon, FAA, Fort Worth, TX):* "A case history of an aircraft accident is presented. The apparent cause of the accident was incapacitation secondary to marked hypoglycemia (blood glucose level was 20 mg per cent and blood alcohol level was 98 mg per cent).

"Alcohol induced hypoglycemia (AIH) is mentioned frequently in the literature. Since 30 per cent of fatal aircraft accidents in the Federal Aviation Agency's Southwest Region have alcohol involved, an investigation was undertaken to evaluate the role of associated hypoglycemia in these accidents as a possible contributing factor. Due to the post mortem changes in blood glucose levels, the data is considered unreliable and no conclusions were reached regarding the frequency of AIH. A phenomenon of agonal hypoglycemia is suggested, and the role of AIH in diabetes is mentioned...

"Alcohol induced hypoglycemia (AIH) is a distinct clinical syndrome. One case history of an aircraft accident apparently involving AIH is presented. Although alcohol ingestion is associated with a high percentage of aircraft accidents, no substantial evidence is presented that AIH plays a significant role in these

accidents. The possibility of an agonal or stress hypoglycemic syndrome is mentioned."<sup>2</sup>

**SEPTEMBER 1941**

*Testing susceptibility to "black-out" (Harvard University, Soldiers Field, Boston, MA):* "A major interest in regard to the aviation training program is the problem of the 'blackout' or the veiling of vision during dive bombing maneuvers. One would expect that the large centrifugal forces experienced when coming out of the dive would be so great that the comparatively small differences among aviators in respect to their ability to withstand these forces could not be appreciated. Interestingly enough such is not the case. Not only are there considerable individual differences in regard to ability to withstand these centrifugal forces but there is also considerable variation in the same person depending on his state of physical fitness...

"The tilt-table test provides a good method of testing the functions of the peripheral vascular system... Of the 91 persons tested in our series, 9 collapsed or fainted, 13 showed a poor response, 58 a fairly good and 11 a good response... When the subject's response was correlated with the changes in blood pressure and pulse the most important items in the order of their significance were (1) fall in systolic blood pressure, (2) pulse pressure and (3) increase in heart rate... The wide variation in response is due to individual differences and to a number of factors which render a given individual physically unfit... The response to tilting or the erect position may be improved with training... It has been noted that there is a correlation between susceptibility to fainting and ease of 'blacking out' when pulling out of a dive. Consequently a method capable of testing this susceptibility should be of value... The results so far warrant further studies in exploring the possibilities of the test and in standardizing the procedure."<sup>3</sup>

**REFERENCES**

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This column is prepared each month by Walter Dalitsch III, M.D., M.P.H. Most of the articles mentioned here were printed over the years in the official journal of the Aerospace Medical Association. These and other articles are available for download from Mira LibrarySmart via <https://submissions.miraed.com/asmaarchive/Login.aspx>.

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DOI: 10.3357/AMHP.4723.2016