Civilian Pilot Exposure to Ultraviolet and Blue Light and Pilot Use of Sunglasses.

Chorley AC, Evans BJW, Benwell MJ.

Risk of certain ocular pathologies such as cataracts and maculopathy has been increased due to long term exposure to short-wavelength visible light and ultraviolet radiation has indicated by certain population and animal studies. The potential risk to flight crew is unknown.

The UK civil aviation authority (CAA) has issued guidance to pilots regarding sunglass selection but its not known if this guidance is appropriate given pilot’s unique working/occupational environment.

There is limited evidence of higher prevalence of cataract in airline pilot population based on a search and appraisal of the relevant literature.

There are no data of other known UV-related ocular pathology.

There is some evidence of higher prevalence of skin melanomas.

Studies measuring cockpit UV radiation levels are limited and leave unanswered questions regarding airline pilot exposure. Data from optical transmission of cockpit windshields demonstrates the UV blocking properties at sea level. No studies have addressed the occupational use of sunglasses in airline pilots. Although its likely that an aircraft windshield effectively blocks UV-B radiation, the intensity of UV-A and short wavelength blue light present within cockpit at altitude is unknown. Pilots may be exposed to solar radiation for periods of many hours during flight where UV radiation is known to be significantly greater.

Aircraft windshields should have a standard for optical transmission, particularly of short wavelength radiation. Clear, un-tinted prescription glasses will offer some degree of UV protection; however, sunglasses will offer superior protection. Any sunglasses used should conform national standard.

Keywords: airline pilot, sunglasses, ocular pathology, UV-A, UV-B, UV-C, blue light hazard, CAA.

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Linear mixed effects modelling of the relationship between heart rate variability and fatigue arising from sleep deprivation


It is a well known fact that fatigue decreases the cognitive performance of an individual however there is no universally accepted objective measure of fatigue. In this article, the objective quantification of fatigue due to sleep deprivation has been done using heart rate variability (HRV).

Study consisted of two experimental groups and 35 male subjects participated in the study (age=18.8-24yrs). Control group consisted of 16 subjects and the experimental group were 19 in number who were 48hrs sleep deprived. 3-h sampling intervals was used. Simultaneously fatigue level, cognitive performance and HRV were tracked. Linear mixed-effects (LME) models were used to evaluate linear relationships between fatigue level and HRV.

LME models of fatigue level and cognitive performance showed significant negative slopes. The ratio of low frequency to high frequency R-R interval in the supine position had the clearest significant relationship when modelled against fatigue level.

The results suggested that HRV tracks fatigue arising from sleep deprivation and it is a non invasive objective method to quantify fatigue.

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Events Calendar

60th International Congress of Aviation & Space Medicine
ICASM 2012, 16 – 20 September 2012
Melbourne Convention Centre, Melbourne, Australia,
Chairman Organising Committee
Dr Gordon Cable, +61738764988
Enquiries: kara@icebergevents.com.au
www.icasm2012.com

50th ANNUAL SAFE SYMPOSIUM
October 22-24, 2012
Grand Sierra Resort & Casino, Reno, NV

The 83rd Annual Scientific Meeting of the Aerospace Medical Association
May 13-17, 2012,
Atlanta Hilton in Atlanta, Georgia, USA
Contact: Gloria (703-739-2240 x 106)
Sheryl (703-739-2240 x 107).

52nd Annual Conference of Indian Society of Aerospace Medicine
31 Aug to 02 Sep 2012
Contact: Gp Capt JK Srivastava Organising Secretary Ph: 080-25224131 Extn.: 3306
IAM, IAF Bangalore

56th Annual Meeting of the Human Factors and Ergonomics Society
October 22-26, 2012
Westin Boston Waterfront, 425 Summer Street, Boston, MA 02210.
Director Lois Smith(310/394-1811)

UK SPACE ENVIRONMENTS & MICROGRAVITY CONFERENCE 2012
June 16 - 17 2012
Satrosphere Science Centre
Aberdeen, Scotland

The 45th Undersea & Hyperbaric Medical Society (UHMS)
June 21-23, 2012, Annual Scientific Meeting
JW Marriott Desert Ridge Resort & Spa
5350 E. Marriott Drive, Phoenix, Arizona 85054
Tel: 480-293-500

23rd Annual NASA Space Radiation Investigators’ Workshop
July 8–11, 2012,
Washington Duke Inn in Durham, North Carolina
Contact: Gail Pacetti, Workshop Coordinator
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