

**Direct and Indirect Cognitive and Psychological  
Consequences of Workplace Neurotoxic Exposure**

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**B.A. (Hons). M.APP.PSYCH**

**This Thesis is presented for the degree of professional doctorate in  
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I declare that this thesis is my own account of my research and contains as its main content work which has not previously been submitted for a degree at any tertiary education institution

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## **ABSTRACT**

Cognitive assessments were conducted on aircraft crew who reported symptoms following exposure to jet oil engine emissions from BAe-146 aircraft. Results demonstrated impairments on tests of reaction time, processing speed and fine motor skills in most participants. Findings were significant but with such a small sample this may not be representative. However if extrapolated across the aviation industry, could indicate significant aviation safety problems. The possibility of consistent neuropsychological impairments with exposure to jet engine emissions indicates a need for more robust studies.

A second study investigated the psychological impact on spouses of aircraft maintenance engineers affected by the toxic chemicals used in the Deseal/Reseal program of F-III aircraft.

Ninety one spouses of affected RAAF workers were administered the Personality Assessment Inventory (PAI); Zarit Burden Interview (ZBI); and Spouse Questionnaire (SQ). Controls were twenty five aged matched spouses of RAAF personnel not involved in the program. Results demonstrated significant differences between experimental group and controls on PAI Somatic Complaints, Anxiety, Depression, and Stress scales. Spouse Questionnaire of coping skills, demonstrated that the experimental group had significant difficulties coping with spouses. ZBI administered to experimental group only, indicated that their burden of stress was moderate to severe.

Despite limited control group, results were considered significantly robust and statistically significant, which suggested it unlikely that results would have been different, given a larger sample.

In the final study cognitive assessments were conducted on forty two health care workers exposed to the chemical glutaraldehyde. Workers were divided into two experimental groups: EXP1, currently working with glutaraldehyde, with protective measures; EXP2, previously worked with glutaraldehyde with poor protection. Controls were eighteen age matched health care workers, not exposed to glutaraldehyde.

All groups were administered the Hospital Anxiety and Depression Scale (HADS) for emotional impact of chemical exposure. Results indicated significant impairments in information processing speed, reaction time and accuracy of responses in experimental groups compared with controls. Differences were more significant in the extensively exposed EXP2 group, who also had higher elevations on the depression scale of the HADS.

Results demonstrated significant neuropsychological and emotional effects in individuals extensively exposed to glutaraldehyde, using few protective measures, compared with less severely exposed workers or controls. Implications of test results and importance of adherence to health and safety regulations are discussed.

If extrapolated across the health care professions this could indicate occupational health and safety issues in hospitals and clinics, where chemicals are used.

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