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**Program and Abstracts**



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## Assessment of neurobehavioral performance as a function of current and cumulative lead exposure

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**Introduction and Objective** Occupational exposure to lead can cause impairment of neurobehavioral performance as measured with sensitive test batteries. In workers exposed to low lead levels, the dysfunction of central nervous system (CNS) seems to be related more to cumulative, rather than current exposure levels.

**Material and Method** In a group of 65 workers exposed to lead in different smelting and dry alkaline batteries, current exposure was measured with blood lead levels and cumulative exposure was estimated by means of average life-time PbB, calculated by multiplying the number of exposure years by the average annual PbB. The group of exposed subjects was divided in subgroups according to the current and the previous exposure levels, and the results of neurobehavioral testing and symptom reporting was compared within the subgroups and with the control subjects. A group of 87 hospital workers was used as the control group. The cross-sectional design of the study included the evaluation of a number of variables such as age, educational level, alcohol and coffee consumption, night shifts and stress level, which are all able to influence CNS performance. The reporting of neurological symptoms was measured with questionnaires and CNS performance was assessed with 4 tasks selected from the SPES (Swedish Performance Evaluation System): Simple Reaction Time, Symbol Digit, Digit Span, Finger Tapping and 5 motor tasks from the Luria-Nebraska Neurobehavioral Battery. Near visual contrast sensitivity was also examined using the Vistech grating charts (VCTS 6000).

**Results** Average PbB levels (GM) in the total exposed group and in the control subjects were respectively 24.82 (range 6-61) and 7.25 (range 2-42) µg/dl. The lead exposed workers showed a highly significant decrease in near visual contrast sensitivity ( $p < 0.0001$ ) at all frequencies examined.

**Discussion and Conclusion** On a group basis, this effect resulted to be associated to previous, more than current exposure.