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# Abstracts for a conference on trace elements in diet, nutrition, and health: essentiality and toxicity

**A Joint Conference Constituting the:**

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IXth Conference of the Nordic Trace Element Society (NTES)
VIth Conference of the Hellenic Trace Element Society (HTES)
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## Category 1: Trace element intakes, dietary patterns, bioavailability, and tissue distributions

1.P01

### The effect of enrichment with sunflower seed, sesame seed and alpha tocopherol acetate to linoleic acid quantity in cookies

Sumalika Piammongkol Patcharin Pakdeechanuan; Prince of Songkla University (Pattani, Thailand)

findings from modern basic scientific approaches can greatly improve risk assessments for toxic trace elements and help to delineate populations at special risk within the general population.

14.B.3

**Neurological and renal effects of low dose exposure to elemental mercury exposure from amalgam in children**

Lars Barregard
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Dental amalgam constitutes the most common source of exposure to elemental mercury in the general population, and the possible health risks have been debated for a long time. Many studies have been performed in adults exposed to low levels of elemental mercury, but until recently, a few data were available on this topic in children, who might be more vulnerable. In 2006, two large randomized controlled trials were published, comparing neuropsychological (full scale IQ, memory, attention, visuomotor tests) and renal outcomes (e.g., albumin excretion) between children treated with dental amalgam or composites over a 5-year trial period. The studies included more than 1,000 children from northeast USA or Portugal. These studies failed to demonstrate any statistically significant differences in adverse effects between treatment groups. The increase in urinary mercury in the amalgam-treated groups compared to controls treated with composites was, however, limited, on average about 0.5–1 μg/g creatinine. The results of these two trials will be reviewed, together with subsequent studies using this rich data set. The strengths and limitations of the two trials will be discussed as well as children's exposure to inorganic mercury in general and the results of some recent observational studies of possible adverse effects.

14.B.4

**Manganese exposure as a determinant of parkinsonian damage**

Roberto Lucchini, Elisa Albini, Laura Benedetti, Stefano Borghesi, Annalisa Caruso, Eleonora Nan, Giovanni Parrinello, and Lorenzo Alessio
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Manganese is an essential element for humans and animals and plays an important role in bone mineralization, protein and energy metabolism, metabolic regulation, cellular protection from damaging free radical species, and the formation of glycosaminoglycans. Homeostatic mechanisms regulate the absorption and excretion rates to keep manganese concentration within a strict range. Nevertheless, short-term exposure to high doses or prolonged exposure to low doses can determine a manganese overload in the central nervous system, given the slow elimination rate from this organ. In cases of overload, manganese accumulates in the globus pallidus of the basal ganglia, where it can cause cellular damage on the GABAergic and dopaminergic pathways. As a consequence, motor function and coordination of fine movements are affected, and mood regulation as well with marked aggressivity. Human exposure to air concentration higher then 1 mg/m$^3$ can determine the clinical picture of manganism, an atypical Parkinsonism that shows clinical differences from the typical features of Parkinson's Disease. After prolonged exposure at much lower levels, manganese may also act as an environmental trigger and favor the onset of typical Parkinsonian disturbances. This can be determined by a damage of the dopaminergic neurons of the substantia nigra-pars compacta, which is located very closely to the globus pallidus and shares various interconnections within the basal ganglia. This hypothesis is presented based on experimental animal studies and human epidemiological studies on exposed workers and the general population resident in the proximities of polluting sources.

14.B.5

**Kidney and bone effects of low-dose cadmium exposure in Sweden**

Agneta Åkesson
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Cadmium is a toxic environmental pollutant that all are exposed to via foods considered healthy, such as whole grains, vegetables, and potatoes. High-cadmium exposure is well-known to cause kidney and bone damage, but these associations at low-level cadmium exposure need further attention, and the critical exposure level in the general population needs to be defined. We investigated health effects of cadmium exposure