

Neurobehavioral effects of environmental contaminants

Donna Mergler PhD

CINBIOSE

WHO-PAHO Collaborating Centre for the Prevention of Work and

Environment Related Illnesses

Institute for Environmental Sciences

University of Quebec at Montreal

Many environmental contaminants (lead, mercury, PCBs, pesticides) have the capacity to interfere with normal nervous system functioning. Neurobehavioral studies have allowed us to measure subtle changes in nervous system functions that are not necessarily perceptible at the level of individual health, but when examined collectively and related to exposure, can reveal important changes in children's development, intellectual functioning and behaviour. Pioneering research, which began in the 1970's showed how *in utero* lead (Pb) exposure affected children's IQ. Since that time, studies of Pb exposure in children have shown effects on cognitive, sensory and motor functions as well as behaviour., at very low levels of exposure. At higher levels of Pb exposure, clinical deficits, learning problems and hyperactive behaviour have been reported. Recent follow-up studies of adolescents with early Pb exposure have reported dose-effect relations with delinquent behaviour. There are currently important on-going longitudinal cohort studies examining *in utero* and childhood exposure to methylmercury and to PCBs, which show long-term effects of these environmental contaminants on children's development. Although fewer studies have been performed on pesticide exposure, there is some evidence of important neurodevelopmental effects. In this presentation, neurobehavioral methods used in the evaluation of nervous system dysfunction in children in relation to exposure to different neurotoxic agents will be described. The findings and differences within the major studies will be examined and the methodological and social consequences of neurofunctional deficits will be discussed.