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PS-004. Biocidals and neurotoxic effects

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Neurotoxicity is harmful effect of physical, chemical or biological agents to central or peripheral nervous system. Degenerative disorders of the nervous system may start or increase with various agents, including biocidal products with neurotoxic effects. Although well known acute neurotoxic effects of certain biocides, in the long-term chronic exposure studies has shown they may block psychomotor and cognitive activity. Many component in biocidals that we use to protect our agriculture against unwanted pests, they target the nervous system of insects. Due to biochemical similarities, it is thought to be toxic to the nervous system in human. The most important point is that developing brains are thought to be more open to this effect and it may lead to irreversible damage. This makes biocidal neurotoxicity an important public health problem. Organophosphates, carbamates, pyrethroids, dithiocarbamates, bipyridine and chlorophenoxy herbicides are some of biocides that have the neurotoxic effects. The effects occur by oxidative stress, blocking the electron transport chain by creating metal chelates, blocking signaling cascade, by the affects on sodium channels or through some unknown mechanisms because brain is dependent on aerobic respiration. In addition to direct affects to our nervous system, some evidence about biocidals has been raised lately that they may be neurotoxic indirectly by effects such as disrupting thyroid function. Conclusion: Use of biocidals must be examined in both acute and chronic effects which is a wide area. Biocides with similar mechanisms that proven to be neurotoxic, should be used carefully and must re-evaluated until shown to be harmless. Biocidal users and practitioners should obey the instructions and in spite of clinical and experimental evidence, monitoring and investigating neurological effects carefully for long-term and chronic exposures, it must be among our top public health priorities.

Keywords: Biocidal, Exposure, Neurotoxicity