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## Ups and downs in the development of ergonomics standards in the US

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Musculoskeletal disorders account for the majority of disabling injuries in the workplace in the US. In 2001, a scientific panel assembled by the National Academy of Sciences and the Institute of Medicine concluded that there was adequate evidence to support public health measures, using ergonomic principles, to prevent these disorders. But a national ergonomics standard has failed to emerge in the US. The history of workplace ergonomics standards at the local and national level is a complex one. In the mid-1980s, in response to pressure from public unions, San Francisco, CA and Albany, NY promulgated ergonomic regulations for computer users. This initial success encouraged unions to push for ergonomic regulations covering all industrial sectors at the state and national level. At the national level, OSHA began rule making in 1995 and published a final ergonomics rule on November 13, 2000. Four months later, in one of the first acts of the Bush II administration, the standard was repealed under intense lobbying from industry groups. The standard was strongly opposed by industry who were concerned that the standard was far reaching without clear criteria for enforcement. During this time, several states also began the process, but, ultimately, in 1999, California became and has remained the only state with an ergonomics standard. In parallel to these activities federal and state activities, consensus based, non-enforceable ergonomics standards were developed by ANSI/HFES (American National Standards Institute/ Human Factors and Ergonomics Society) and by ACGIH (American Conference of Governmental Industrial Hygienists). The 13 year effort by ANSI/HFES was abandoned in 2001 following legal challenges from industry. After settling a legal challenge from industry in 2002, the ACGIH established Threshold Limit Values for hand activity level and lifting. If a federal ergonomics standard is developed again, it is likely to be heavily opposed by industry.

## Work-related neurobehavioral toxicity from a historical perspective.

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In the early seventies, unlike many areas of occupational health and occupational medicine which had already produced substantial information on methodologies to prevent and detect workplace disorders from chemical, physical and biological agents, the field of neurobehavioral toxicity was still largely underestimated and underserved; this was probably in connection with a cultural delay in developing methods, information and training. Along with changes in work technologies and working environment that reduced manual work while increasing mental and psychological effort, it was recognized that higher engagement of the nervous system activities deserved more information thus emphasizing the need for activating this sector. Further, it was gradually becoming possible to uncover even minor brain changes representing the psycho-organic syndrome due to exposure to neurotoxic substances. These conditions favored the rise of a new discipline. The first meeting on Behavioral Toxicology was held at NIOSH in Cincinnati in 1973 by Charles Xintaras, Barry Johnson and Ido de Groot and the need was felt to periodically review the state of the art of this new discipline and to make every effort to develop a common approach to neurotoxicity effects in the working environment. Based on these premises, the newly restructured ICOH Scientific Committee on Neurotoxicology and Psychophysiology with the crucial cooperation of the World Health Organization Headquarters in Geneva jointly sponsored a series of triennial symposia on neurobehavioral methods in occupational and environmental health to respond to this new demand. The first three symposia (Milan, 1982; Copenhagen, 1985; Washington DC, 1988) were aimed at exchanging state of the art information on development and application of neurobehavioral methods in occupational and environmental health by sharing these topics with colleagues in developing countries, in order to devise preventive and medical strategies compatible with the resources. Regarding this issue, the previous symposia were mainly concerned with emerging problems in Africa and Latin America by trying to develop simple and inexpensive protocols and tools. Instead, the symposia which followed (Tokyo, 1991; Cairo, 1994, Shanghai, 1997) focused more on the respective Regions and addressed, with more emphasis, the issue of the effects on the nervous system functions. In fact, during the latter three symposia, specific topics included neurotoxic effects of industrial chemicals, use of neurobehavioral test batteries (WHO Neurobehavioral Core test battery) with special reference to cross cultural applications, recent electrophysiological neuroimaging techniques, biochemical markers, questionnaire studies, epidemiological studies of neurotoxic disorders, work-related stress and psychosomatic illness, current advances of the effects on the nervous system due to occupational and environmental factors., Later on, environmental and occupational factors versus aging and neurodegenerative illness in the elderly, educational strategies for prevention of work-related or environmental neurobehavioral effects became prominent themes. All these initiatives contributed largely to disseminating information not only in industrialized countries where often a decrease of neurotoxic syndromes was observed, but also in underprivileged areas of the world, although these problems are far from being resolved and are still prevalent, especially in countries in transition.