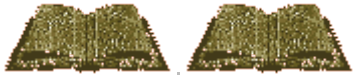
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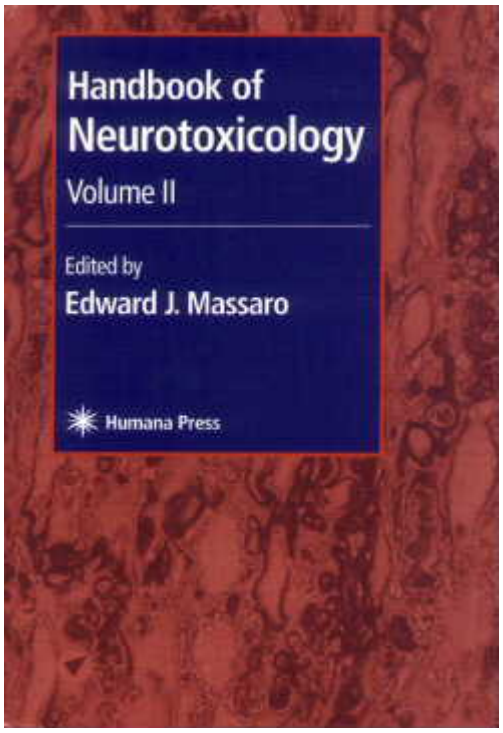
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HIGHLY ENTERTAINING, VERY READABLE AND QUITE INSTRUCTIVE

Handbook of Neurotoxicology, Vol II, 1st Edition, *edited by* Edward J. Massaro Hardcover, 7" x 10". Humana Press Inc., 999 Riverview Drive, Suite 208, Totowa, New Jersey 07512. Publication Date 21 March, 2002. xvi + 594 pages, ISBN 0-89603-796-7 (acid-free Paper). Price $125.00

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Publisher's Blurb

Neurotoxins - whether natural products that can provide valuable therapeutic agents and research reagents or human-generated pollutants - have recently attracted great scientific interest. In the Handbook of Neurotoxicology, Volumes I and II, many leading researchers and clinicians - all acknowledged experts - review in depth the status of research in key areas of current neurotoxicologic interest and examine the latest methodologies for in vivo assessment of a wide spectrum of agents exhibiting neurotoxicologic properties. This second volume of the Handbook focuses on the biologic effects of human-made toxins on the developing organism, and of drugs of abuse. Here are discussed the interpretation of neurotoxicity data, the art of risk assessment, and the manifestation of CNS insult during development. The drugs of abuse surveyed include cocaine, marijuana, the cannabinoids, and amphetamines. Also provided are state-of-the-art methods for the evaluation of neurotoxicant effects by both imaging and neurobehavioral assessment. Volume I concentrates on the biological effects of both human-made neurotoxins (pesticides, mercury, lead, zinc, and polytypic by-products of combustion and manufacture) and those of natural origin (microbial and animal toxins).

Up-to-date and timely, the *Handbook of Neurotoxicology, Volumes I and II*, not only affords today's biomedical and clinical investigators a full panoply of knowledge in all the critical areas of current neurotoxicologic interest, but also illuminates the latest methodologies for assessing the effects of a broad spectrum of significant neurotoxicological agents.

Neurotoxicology is a rapidly developing area of research in Toxicology as evidenced by a spate of research publications in medical literature in recent times. This is due to several reasons, one of the most important of which is rampant environmental contamination by numerous neurotoxins, especially pesticides, heavy metals, and noxious byproducts of industrial activity. Even today there is a huge controversy over the use of endosulfan spraying of cashew plantations in some parts of India, due to indications of serious health effects on human populations living in close vicinity. The Government of India refuses to acknowledge scientific evidence of the role of this organochlorine

pesticide in producing distressing health effects on the local populace, claiming that the existing evidence is not convincing enough. It is precisely for reasons such as these, that books documenting irrefutable proof of the deleterious effects of such neurotoxins assume vital importance. A classical example of one such book is the book under review. It is however disappointing that this reviewer could not get hold of Volume I of this Handbook of Neurotoxicology, since the neurotoxicity of pesticides have been dealt with in that volume. Nevertheless, Volume II which is being reviewed here is invaluable in itself, as it delves into the harmful neural effects of common drugs of abuse such as cannabis, cocaine, amphetamines, and several other emerging drugs.

Edward Massaro, a renowned expert in Neurotoxicology, leads a distinguished team of section editors and contributors, each of whom is an acknowledged expert in his or her respective field of specialization, in an exhaustive discussion of selected issues, beginning with developmental neurotoxicology and subsequently progressing to a neurotoxic assessment of drugs of abuse, discussion of the role of imaging techniques in assessing neurotoxic damage, and concluding with a section on neurobehavioural assessment methods. Each section is dealt with competently in chapter-wise manner by various experts.

Conents

& I. Developmental Neurotoxicology. Developmental Neurotoxicology: Testing and Interpretation. Manifestations of CNS Insult During Development. Developmental Neurotoxicity: What Have We learned from Guideline Studies? Risk Assessment of Developmental Neurotoxicants.
& II. Drugs of Abuse. Electrophysiologic Evidence of Neural Injury or Adaptation in Cocaine Dependence. Addictive Basis of Marijuana and Cannabinoids. Dopamine and Its Modulation of Drug-induced Neuronal Damage. NMDA Antagonist-induced Neurotoxicity and Psychosis: The Dissociative Stimulation Hypothesis. Emerging Drugs of Abuse: Use Patterns and Clinical Toxicity. Mechanisms of Methamphetamine induced Neurotoxicity. Neurotoxic Effects of Substituted Amphetamines in Rats and Mice: Challenges to the Current Dogma. Studies of Neural Degeneration indicate that Fasciculus Retroflexus Is a Weak Link in Brain for Many Drugs of Abuse. Microsensors Detect Neuroadaptation by Cocaine: Serotonin Released in Motor Basal Ganglia is Not Rhythmic with Movement.
& III. Imaging. Impact of Intoxication: Structural and Functional Modifications in the Brain Induced by Ethanol Exposure. Structural and Functional Neuroimaging of the Effects of Opioids. Structural and Functional Neuroimaging of the Effects of Cocaine in Human and Nonhuman Primates. Functional Neuroimaging of Cannabinoid Effects. Neuroimaging of MDMA-induced Neurotoxicity.
& IV. Neurobehavioral Assessment Methods. Tier 1 Neurological Assessment in Regulated Animal Safety Studies. Neurological Assessment: The Role of the Clinician in Clinical Neurotoxicology. Human Neuropsychological Testing and Evaluation. Index.

Developmental neurotoxicology focuses on the biological effects of human-generated toxins on the developing organism with details on testing and interpretation, as well as risk assessment. This is an extremely important area of research, since it is well known that the immature nervous system is highly susceptible to toxic insult, and exposure to neurotoxins often results in adverse effects at much lower doses than those required to produce the same effects in the adult nervous system. Developmental neurotoxicology as a separate scientific discipline had its genesis in the 1940s, and

is today a thriving field of active research. Important developmental neurotoxins which have received wide attention include ethanol (responsible for producing fetal alcohol syndrome), lead, methylmercury, opiates, and several other therapeutic and chemical agents.

The section on drugs of abuse discusses the mechanisms of neurotoxicity relating to some common drugs such as ethanol, cannabis, cocaine, and amphetamines. The addictive basis of some of these highly addictive drugs is also discussed at length. Of particular interest is the chapter on emerging drugs such as those referred to as "club drugs" which are used illicitly by young adults in the West (and increasingly in India) at all-night dance parties, the so-called "raves" or "trances." The most important examples include ketamine, an NMDA antagonist which has a role in therapeutics as an anaesthetic agent, and substituted amphetamines such as methylenedioxymethamphetamine (MDMA or "Ecstacy").

QUICK NOTES

& Comprehensive coverage of development effects of anthropogenic toxins an drugs of abuse
& Cutting-edge methods for assessing in vivo effects of neurotoxic agents
& Evaluation of biological effects by imaging and neurobehavioral assessment methods
& Extensive bibliographies

The section on imaging techniques such as computed tomography (CT) and magnetic resonance imaging (MRI) which are being increasingly employed to study the neural damage inflicted by neurotoxins is both fascinating and educative. Neuroimaging of the effects of various drugs has thrown new light on the pathological manifestations of abuse relating to ethanol, opiates, cocaine, amphetamines, and cannabis. The discussions are well supported by numerous illustrations in the form of actual scans, several of which have been grouped as a series of striking colour plates.

The final section dealing with neurobehavioural assessment methods should be of particular interest to clinicians. There is in fact an entire chapter devoted to the role of the clinician in clinical neurotoxicology. Methods of neurological and neuropsychological testing and evaluation have been discussed thread-bare.

Every chapter is supported by pertinent recent references, and profusely illustrated with graphs and figures. This beautifully produced book is an invaluable reference source which presents biomedical and clinical investigators with exhaustive, updated information on critical areas of neurotoxicological interest, and provides also latest methodologies for accurately assessing the effects of some very important neurotoxic substances and drugs.

This reviewer recommends the book very highly to all those investigators, clinicians, and research workers involved with the subject of toxicology in any manner or capacity, and is of the strong opinion that it should be a mandatory addition to every library stocking books on toxicology.



-V.V.Pillay

Dr. Pillay is one of the foremost exponents of toxicology in the Asian continent. He has authored two books on toxicology, besides a Comprehensive textbook on Forensic Medicine. His books on toxicology include the bestseller "Pocketbook of Pesticide Poisoning for physicians". He is currently the Chief of Poison Control Centre, at the Department of Forensic Medicine & Toxicology, Amrita Institute of

Medical Sciences, Cochin - 682 026. He is the Chief Reviewer of Best Toxicology Books.

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