

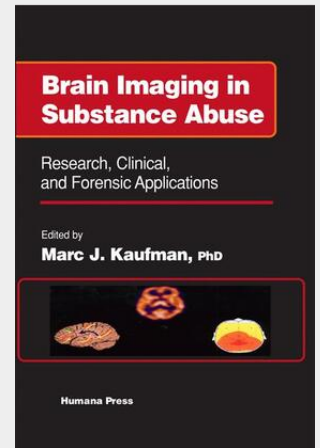
Kaufman

Brain Imaging in Substance Abuse

Research, Clinical, and Forensic Applications

The last two decades have seen prodigious growth in the application of brain imaging methods to questions of substance abuse and addiction. Despite considerable advances in our understanding of the central effects of drugs provided by preclinical data, relatively little direct evidence was known of how substances of abuse affect the brain and other eNS processes in humans. Brain imaging techniques have allowed access to the human brain and enabled the asking of questions never before imagined. The positron emission tomography (PET) data of Volkow and her colleagues in the late 1980s, showing the uptake and time course of cocaine's binding in the human brain, revealed for the first time the distinct sites of action of this drug. This work was extremely important because it showed clearly, through imaging a drug in the brain of a living human, that the time course of its action paralleled the behavioral state of "high." This study marked a turning point in our understanding of drug-brain-behavior interactions in humans. Many more investigations of drug effects on the structure and function of the human brain were soon to follow, leading to much better insights into brain systems. Brain imaging allowed for the direct assessment of structural and functional anatomy, biology, and chemistry in substance abusers.

Highly experienced clinical researchers from diverse fields describe in detail the use of electroencephalography, emission tomography, magnetic resonance imaging, and neuropsychology to study the neural effects of substance abuse. They extensively review research findings these powerful methods have yielded. The authors detail the effects of drugs, including alcohol, benzodiazepines, marijuana, opiates, cocaine, amphetamines, hallucinogens, and solvents on brain electrical activity, metabolism, hemodynamics, receptor and neurotransmitter levels, neurochemistry, and structure. The striking findings they report emerge from more than 1350 articles in some 320 journals, and are organized by method, abused substance, and drug use state. Comprehensive and readily accessible, Brain Imaging in Substance Abuse: Research, Clinical, and Forensic Applications offers psychiatrists, radiologists, neurologists, pharmacologists, physiologists, substance abuse specialists, and legal professionals a broad yet thoroughly integrated understanding of the methods and results obtained with clinical neuroimaging studies of substance abuse today.



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