

Handbook of Abusable DRUGS

AMENDED EDITION

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The Background for Abuse

Social Pharmacologic Aspects of Substance Abuse

Basic Pharmacologic Considerations and Principles

Classification of Psychoactive Drugs

Narcotics

Pharmacology and Clinical Applications of Narcotic

Antagonists

Methadone and Other Narcotic Maintenance Drugs

Internal Opioids: A Look into the Future

CNS Depressants

Solvent and Aerosol Inhalants

Alcohol: The World's Most Devastating Drug

Central Nervous System Stimulants

Tranquilizing Agents

Antidepressants and Antimania Drugs

Tobacco and Smoking Behavior

Over-the-counter Drugs

Marijuana: Heaven or Hell

Psychedelics: Brave Old World

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"The Reward Deficiency Syndrome"

A Biogenic Model

Foreword by David E. Smith, M.D.

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Founder, Haight-Ashbury Medical Free Clinic

FOREWORD

Interest in the nervous system has been growing in recent years, not only because of increased public concern over the impact of psychoactive drugs on human health and improvement of the quality of life, but also because the nervous system has been shown to be especially vulnerable to chemical insult. More importantly, since the first edition of the *Handbook of Abusable Drugs*, science into the understanding of the brain and the biogenic aspects of reinforcement and the addictive process remarkably increased indeed. It is the era denoted by the neuroscientists as "The Decade of the Brain". This has led to the appearance and definition of a novel science, appropriately named "Addiction Medicine."

On this occasion of an amended edition to this important work, the American Medical Association, formally recognized the importance of his new discipline and with it came great expansion in terms of prevention, diagnosis, and treatment. Studies in the field of "addiction medicine" involves the action of drugs and/or other substances on the neurochemistry, neurophysiology, electrophysiology and genetic aspects of the nervous system. Moreover, it explores the resultant linking so-called "normality" to aberrant behavior. Certainly toxic disorders to the nervous system of human beings may occur following exposure to abused substances (e.g. ethanol, inhalants, narcotics, cocaine, marijuana, etc.) However, what is more remarkable, is the possibility that we as homosapiens are creatures of our primitive past and therefore may have a link to a genetic legacy, a centuries old romance with mind altering chemicals. It is quite normal to seek pleasure, but when it is replaced with a compulsive uncontrollable force leading to the breakdown of one's moral fabric, loss of spirituality and other negative consequences, treatment becomes inevitable.

Notwithstanding, this work reflects a total understanding of the disease model of addiction.

However, the concept originated by Kenneth Blum referred to as the "Reward Deficiency Syndrome", which for the first time in history provides a conceptual framework linking addictive behaviors together is truly a breakthrough which I believe will stand up against the test of time. Accordingly, Blum points out that addictive, impulsive, and compulsive disorders including alcoholism, attention deficit disorder, drug abuse, and food binging may have a common genetic basis.

This book authored by Kenneth Blum and Jay Holder is at the very forefront of the progress in the field. It is designed to sensitize the reader to a new way to understand behavior, how chemicals affect the mind, the mechanisms involved in genetically induced psychiatric disorders and the psychosocial and spiritual aspects of the addictive brain. This brilliant compendium should be of interest to anyone concerned with the advances in "addiction medicine" and it should be highly recommended also in view of the extensive international stature of the authors.

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PREFACE TO THE AMENDED EDITION

In 1984, when the *Handbook of Abusable Drugs* first appeared, our understanding of the phenomenon of drug abuse/dependence was little understood. Only a decade earlier did we see the beginnings of the neurobiological approach to explain brain function as we know it in this century. The remarkable findings of that time included the discovery of the opiate receptor, and the equally important findings related to the endogenous brain opioid peptides. With the advent of receptor binding techniques, push-pull cannulas, microdialysis, Doppler, immunology, molecular biology, and novel molecular genetic methods, our understanding of the brain physiology and pharmacology increased at an incredible rate; therefore propelling us into an unheralded growth in the field of neuroscience. As an example, in the early 1970's, the Society of Neuroscience had a very small beginning, while today the last annual meeting in Washington D.C. was attended by approximately 30,000 participants. With these enormous numbers; one subspecialty, the study of psychoactive drugs on the nervous system or addictionology has obtained support by a number of organizations; such as, the American Medical Association, the Psychiatric Association, the Society of Neuroscience, the World Chiropractic Alliance, and the Council on Chiropractic Practice. In fact, in 1987, through the effort of Dr. David Smith, the term *addiction medicine* received an official blessing from the AMA.

We are now into the 90's, the "decade of the brain". Certainly, even more rapid advances will come before the millennium. While the basic pharmacology, biochemistry, neurochemistry, toxicology, and pharmacogenetics of abusable drugs have not changed much since 1984, the psychobiology and molecular genetic aspects of Addiction Medicine have significantly increased with better understanding of the meaning of the addiction process in general. In the attempt to provide the reader with an update of the field we came together and created an amended version of this handbook. This new version embraces the view that addiction is indeed a true disease, biogenetic in origin, not just a "concept" as in "disease concept". This simple effort took a number of years waiting for rigorous scientific support and consensus from a vast number of publications.

These research efforts all over the world, based on the application of modern morphological techniques, have helped greatly to characterize *addiction medicine* as a separate specialty. Sadly, in the last few years, more and more of psychoactive drugs have been recognized as potential neurotoxins because of their ability to cause neuropsychological or neurohumoral alterations, behavioral abnormalities, or disruption of neurochemical activities (e.g. alterations of dopaminergic functions at the nucleus accumbens).

One very important outcome of this new addition to the basic understanding of addiction medicine is the concept termed "Reward Deficiency Syndrome (RDS)". In this term we embrace the fact that addiction, impulsive and compulsive disorders - including alcoholism, attention deficit disorder, drug abuse and food binging - may have a common genetic root. It is our contention that these concepts and teachings, backed by voluminous literature, will assist us to understand RDS in the coming millennium. We foresee the possibility for better treatment, new forms of prevention, and the removal of the social stigma attached not only to alcoholism, but also to related "reward-seeking" behaviors comprising the Reward Deficiency Syndrome.

*Kenneth Blum
Jay M. Holder*

SUBLUXATION BASED CHIROPRACTIC CARE IN RECOVERY

The possibility that alternative care would constitute chiropractic procedures to effect relapse and recidivism rates is currently under study by Holder and colleagues of the Exodus Treatment Center whereby subluxation based chiropractic procedures are being evaluated (unpublished). Basically, the investigation is a randomized clinical trial, blinded and with placebo control for the study of subluxation based chiropractic treatment for drug withdrawal and patient retention in a residential treatment setting. The purpose of the study is intended to document the efficacy of chiropractic care for the recovering person. The study which just finished includes 98 human subjects and consists of three groups:

1. standard residential treatment,
2. standard residential treatment plus chiropractic, and
3. standard residential treatment plus placebo chiropractic.

With the study just completed, the results are striking: chiropractic is producing a 100% retention rate within the 30 day residential model, with a statistically significant improvement in anxiety and depression scores based on a battery of seven psychological inventories when compared to placebo controls, as well as nursing station visits significantly reduced.

CHIROPRACTIC: A SUBLUXATION MODEL FOR ADDICTION AND COMPULSIVE DISORDERS

It is appropriate to discuss some research that appears to establish the vertebral subluxation complex as a primary issue in the multi-factorial expression of the addictions and compulsive disorders. Chiropractic has never considered the spine a separate issue from the rest of the nervous system. However, in the first 100 years of chiropractic a steady direction towards, and an increased focus on chiropractic and its role in musculo-skeletal disorders has both clouded and limited the scope of chiropractic practice. The very foundation of chiropractic has always been

neurological and therefore, it is appropriate and necessary for our purpose to re-focus on the neuro-physiology and neuro-immunology, as well as other neurological characteristics that demand attention.

Emotion and state of well-being, included but not limited to, self-esteem and attitude have not experienced much scientific investigation. Nor has the vertebral subluxation in its ability to interfere with the expression of both function and communication "information". The "Brain Reward Cascade" model first proposed by Blum's group (Blum and Kozlowski, 1990) has been both appropriate and effective in providing a better understanding as to one's ability in obtaining one's potential for such things, including satisfaction or state of well-being. The limbic system is the seat of where feelings are mediated. These feelings are expressed through the reward cascade of neurochemicals. A number of these neurochemicals including neuropeptides are the biochemical mediators of a state of well being. Herkenham and Pert (1979) developed a receptor-analyzing technique known as autoradiography. This technique can establish the neuro-anatomy of receptors in nerve tissue (brain and spinal cord). By the use of this technique, science has established that opiate receptors are the densest in the amygdala and hypothalamus, which are classically considered to be the core of the limbic system. Again, we must accept that the limbic system is the neurosubstrate of the emotions. Pert and Dienstrey (1988) have expanded and established the limbic system to include, not only the amygdala and hypothalamus, but the dorsal roots and dorsal horn of the spinal cord, "Our research suggests that the usual picture of the limbic system should be extended to include the spinal cord, for a third area enriched with neuropeptide receptors is the dorsal horn of the spinal cord." Lewis, Mishkin and Pert (1981) suggest that the reflex at this level is more than just nociceptive. The five senses, as well as, the immune system which is considered the sixth sense by a number of scientists, are communicating simultaneously.

Science has proven the nociceptive reflex of the spinal cord in pain management. Further, established is a direct connection of the nociceptive reflex at any level of the spine to the limbic system. However, it has been first suggested by Holder and Blum (1994 and 1995) that it is time to accept that "every level of the spine)s an intimate relationship with the limbic system's ability to process and establish a balanced brain reward cascade."

Recently through a literature search conducted in 1995, it was found by Holder and Blum that only vertebrates have an opiate receptor brain reward cascade mechanism and therefore, can express a state of well being inspite of opioid peptides found in invertebrates. It is essential to accept that in this instance the common denominator is the spine and spinal cord. Therefore, if the spine is allowed to express itself without interference (minus subluxations), the vertebrate can express state of well being at its greatest potential. Therefore, the ability of the limbic system to function and express itself without interference would require a subluxation free spine. In 1994, as stated earlier, The Holder Research Institute recently finished chiropractic's first human population research study (Holder et al., unpublished) implicating the vertebral subluxation complex as a primary intervention resource in the treatment of chemical dependency in a residential setting. Sigmund Freud spoke of the conscience and sub-conscience mind, as well as suggesting that one's emotional state contributed to disease (Pert and Dienstfrey, 1988). Pert and Dienstfrey (1988) state "The sub-conscience is in the spinal cord and even lower" and further suggested "that the sub-conscience extends to one's T-cells, to one's monocytes, and, in a kind of flowing wave, back to one's brain cells." The origin of Pert's inference was at the spinal level, specifically at the dorsal horn (Pert and Dienstfrey, 1988). While there is evidence for opiate-like material in non-vertebrates-invertebrates (Medline Review, 1995), only vertebrates have confirmed opiate receptors and since the opiate receptor mechanism is in intimate and direct contact

with the limbic system it is fair to say that only vertebrates have the ability to conjure a state of wellbeing. A common denominator is the spine and it is tempting to speculate on the importance of having a subluxation free spine to express one's greater potential in both mind and health (Holder, 1995). Burstein and Potrebic of the Department of Neuro-Biology, Harvard Medical School, provide evidence for direct projection of the spinal cord neurons to the amygdala and orbital cortex (1993). Their laminar distribution in the spinal cord and the involvement of the amygdala and 'orbital cortex in limbic functions suggest that these pathways play a role in neuronal circuits that enable somatosensory information, including pain, to effect autonomic, endocrine and behavioral functions." Geisler and Katter and Dado of the Department of Cell Biology and Neuro-anatomy, University of Minnesota have found the exact spinal pathways to the limbic system for nociceptive information, however, they describe the pathway to include the hypothalamus bilaterally (1994).

This certainly suggests other information besides singularly nociceptive information. Prior to their work, nociceptive information was thought to reach the hypothalamic neurons through indirect, multisynaptic pathways. Liu and Wang et al. (1994) of the Department of Anatomy, University of California have concluded research which suggests that the portal of entry to the spinal system and its direct connection to the central nervous system is the receptor transported in dorsal roots and sciatic nerve. Raffa et al. (1993) of the Robert Wood Johnson Pharmaceutical Research Institute, has evidence linking the immune and opioid systems. Kyles et al. (1993) Department of Veterinary Surgery at the University of Bristol, England, has found that when dopaminergic and opioid systems process nociceptive information, it is mediated spinally.

In closing, it is important to embrace the concept that chiropractic must be maintained on a broad base and not limited to musculo-skeletal applications. Further

evidence on the cutting edge of scientific investigation supports that there is a connection in a healthy spine in mediating, not just immune system function, but growth factor, chemotaxis of human tumor cells, body temperature, water saving and water seeking behavior, as well as, but not limited to the dilemma of why an organism can be so severely damaged by HIV Infection when only a small percentage of the organism is affected (Pert and Dienstfrey, 1988). The similarities between the addictive process and subluxation are striking. There are four causes of a subluxation: physical, chemical, mental, and genetic. How interesting to find that those components are identical to, and make up the multifactoral "BRDS biogenic mold" of the disease of addiction.