THE UNIVERSITY OF TEXAS
HOUSTON
HEALTH SCIENCE CENTER

School of Public Health
Department of Behavioral Services

Kenneth Blum, Ph.D.
Research Professor

Breakthrough Brain Research Links Chiropractic Treatment to Addictive Behaviors

Kenneth Blum, Ph.D., D.A.C.A.C.D.; John G. Cull, Ph.D., FAABM
and Jay Holder, D.C., D.A.C.A.C.D.

A "brain reward cascade" of neurotransmitters, when operating properly, results in feelings of well-being. If an imbalance impedes the normal flow of the "cascade", the feelings of well-being are supplanted by anxiety, anger, ... or by craving substances which alleviate the negative emotions. Disruption of the "brain reward cascade" results in Reward Deficiency Syndrome (**"RDS"**).

"RDS" can be manifested in mild forms (such as the chain smoker) or more severe forms as in the chemical addict. A genetic based biochemical inability to derive reward from everyday activity links these extremes in behaviors. Alcohol addiction, obesity (as a result of carbohydrate bingeing), nicotine addiction, attention-deficit/hyperactivity disorder, cocaine addiction, Tourette's disorder, and post-traumatic stress disorder are centrally mediated **"RDS"** behaviors. Anomalies of the Dopamine D_2 Receptor genes, Dopamine Transporter genes, and Dopamine Beta Hydroxylase genes predispose individuals to **"RDS"**.

Lack of dopamine receptors results in the inability to cope with stress and causes craving. A number of substances (*i.e.*, alcohol, cocaine, marijuana, nicotine, carbohydrates) that release neuronal dopamine may be taken in the attempt to gain temporary relief of stress and craving. These substances can be used singly, in combination, or to some extent interchangeably (have you noted how often recovering alcoholics crave nicotine and/or sugar?).

In support of a comprehensive treatment regimen for **"RDS"** behaviors, we must review research establishing the vertebral subluxation complex as a primary issue in the multi-factorial expression of addictions and compulsive disorders. The foundation of chiropractic is neurological; therefore, for our purpose we re-focus on neurophysiology and neuroimmunology.

The state of well-being has not received adequate scientific investigation in chiropractic; nor has vertebral subluxation received due study relative to its ability to interfere with the expression of both function and communication "information". The "Brain Reward Cascade" model is effective in providing a better understanding of one's ability to maintain a state of well-being.

Feelings are mediated in the limbic system and 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. Using autoradiography science has established opiate receptors are densest in the amygdala and hypothalamus (classically considered the core of the limbic system). Pert and Dienstrey (1988) expanded the limbic system (the neurosubstrate of emotions) to include the amygdala, hypothalamus, dorsal roots and dorsal horn of the spinal cord. In this regard a direct connection of the nocioceptive reflex at any level of the spine to the limbic system has been established.

Moreover, we suggest it is time to accept that "every level of the spine has an intimate relationship with the limbic system's ability to process and establish a balanced brain reward cascade" (Holder and Blum, 1995). A literature review (Holder and Blum, 1995) revealed only vertebrates have an opiate receptor brain reward cascade mechanism; therefore, inspite of opioid peptides found in invertebrates, only vertebrates express a well-being state. In this instance the common denominator is the spine and spinal cord. If the spine is allowed to express itself without interference (minus subluxations), the vertebrate can express a state of well-being at its greatest potential. Consequently, the ability of the limbic system to function and express itself without interference requires a subluxation free spine. In 1994 The Holder Research Institute finished a study implicating the vertebral subluxation complex as a primary intervention resource in the treatment of chemical dependency in a residential setting.

Pert and Dienstfrey (1988) state "The sub-conscious is in the spinal cord and even lower" and "the sub-conscious extends to one's T-cells [and] one's monocytes, and, ... back to one's brain cells." The origin of Pert's inference was at the dorsal horn of the spinal cord.

Burstein and Potrebic (1993), Harvard Medical School, provide evidence for direct projection of spinal cord neurons to the amygdala and orbital cortex. Their laminar distribution in the spinal cord and the involvement of the amygdala and orbital cortex in limbic functions suggest these pathways play a role in neuronal circuits that enable somatosensory information, including pain, to effect autonomic, endocrine, and behavioral functions. Giesler, *et al.* (1994), University of Minnesota, found the spinal pathways to the limbic system for nocioceptive information; they describe the pathway to include the hypothalamus bilaterally. Prior to Giesler, *et al.* nocioceptive information was thought to reach the hypothalamic neurons through indirect, multisynaptic pathways.

Raffa *et al.* (1993), Robert Wood Johnson Pharmaceutical Research Institute, report evidence linking the immune and opioid systems. Kyles *et al.* (1993), University of Bristol, found that when dopaminergic and opioid systems process nocioceptive information it is mediated spinally.

Chiropractic must be maintained on a broad base, not limited to musculo-skeletal applications. Further evidence supports the connection of 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, *etc.* (Pert and Dienstfrey, 1988).

Similarities between the addictive process and subluxation are striking. When one considers these similarities and the connection between the subluxation complex and genetic deficits in the dopaminergic system, it becomes important for the modern chiropractor to consider a total regimen of natural healing including the maximum reduction of the subluxation complex, genetic testing, and the administration of appropriate neutraceuticals.

Kenneth Blum John G. Cull Jay Holder