

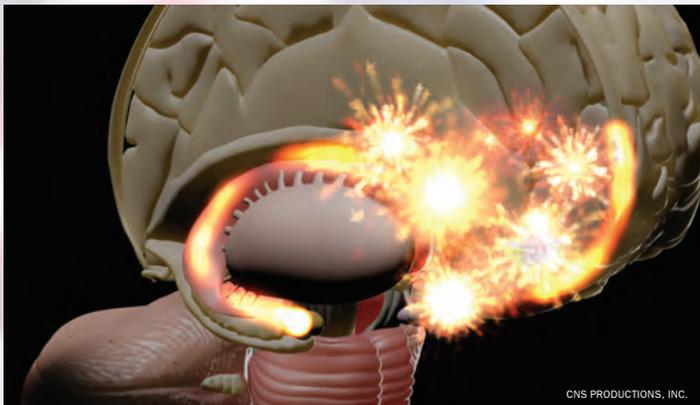
Beyond Opiates

Addiction: Conditioning the Brain for Reward

BY ANDY MENDENHALL, MD

It is estimated that there are 1.7 million heroin, and 3 to 4 million prescription opiate addicts in America.¹ Recent data inform us that in this current era of opiate abuse more people are dying from these drugs than are dying from highway accidents.² To better understand what we in the treatment and recovery field are facing it is useful to consider the science of pain and reward.

Endorphins are the natural opioids that give us a feeling of contented well-being in the world. Endorphins are released when we eat, exercise, or have sex. Our brains are used to release small amounts of endorphins and other neurotransmitters in response to these survival related activities. When people are exposed to 'exogenous,' or outside of the body opioids, the brain responds by releasing very large or unnatural levels of dopamine. This tidal wave of dopamine is rewarding and reinforcing for many individuals. In addition to creating a down-regulation of opioid and dopamine receptors, the brain imprints this profound experience of reward.



Evidence within the pain management field reveals the brain and nervous system start down-regulating opioid receptors immediately after exposure to opioids. This down-regulation leads to tolerance to opioid therapy for pain treatment. Tolerance leads to the need to take more medication to achieve the same level of pain relief, and leads to deeper levels of physical dependency on the opioid pain medication.

We know that opioids amplify pain in many patients, independent of whether they suffer from addiction. A type of nerve cell called a microglial cell activates in response to opioid medication and changes the way in which the brain receives pain information. Chronic exposure to opioids leads to microglial cell activation and pain amplification. It is proposed that the experience of pain amplification or "hyperalgesia" may lead patients into the spiral of opioid misuse and abuse in an attempt to achieve the prior states of analgesia associated with early use of these powerful medicines. Further evidence suggests microglial cell activation within the brain may lead to permanent destruction of reward neurons and/or signal pathways between neurons in response to unnaturally elevated levels of dopamine from exposure to high-doses of heroin or opioids.

I have observed clinically, that many patients suffering from chronic pain become deeply tolerant and physically dependent to opioids, and begin to misuse and abuse their medication as a direct result of these unanticipated side effects of the opiate medication. Many of these patients demonstrate abuse and or addictive behaviors, and are

at great risk of dying due to their attempt to achieve analgesia and/or avoidance of withdrawal that has become the main driver for the risky accelerated use of prescription opiate medications.

In the United States there are upwards of 14 million patients receiving daily prescription opioid therapy for pain.³ It is estimated that four out of ten patients regularly misuse or abuse their medication.⁴

For people who have been abusing opiates who are successful in completing a detoxification to an opioid-free state, it takes upwards of two years for the brain to restore itself from a synaptic and receptor basis. Some addicts may require periods of medication assistance with buprenorphine or methadone to reduce cravings and withdrawal symptoms to a point where behavior change from the compulsive use of opioids or other drugs is achieved. There is an abundance of medical evidence that supports the clinical utility of providing buprenorphine or methadone to patients. While this issue remains deeply controversial within the context of abstinence-based recovery, the evidence is clear that the use of medication assisted treatment saves lives, reduces relapse, and reduces drug use-associated medical and criminal justice costs.

Of equal importance, the development of deep attachment to the feeling created from opioids becomes the most potent driver of relapse behavior. This reality is complicated by the associated deep levels of physical dependency which yield through successful detoxification, protracted periods of post-acute withdrawal and prolonged substance-induced mood disorders. These conditions are primary drivers for relapse behavior.

Opioid relapse after a successful period of detoxification is exceptionally dangerous as the patient's tolerance to opioids is dramatically reduced. Use of a small fraction of the previous amount of opioid can lead to death due to unintentional overdose.

Why is relapse with opioids so common?

It is important to remember that the burden of addiction is an evolutionary process turned upside down. When the brain experiences large releases of dopamine, this creates a profound and deeply existential and reinforcing experience. With opioids in particular, it is difficult for an addicted person to not return to those experiences.

Some patients report that the slightest hint of emotional or physical distress leads to deep triggering to return to the warm comfort of the opioid high. The challenge for many opioid-addicted individuals is to truly embrace the concept of 'never-again.'

I present to my patients the concept of recovery from addiction as a pathway of 'brain ownership.' By this I mean, we educate to the nature of the chemical brain lesion and conditioning that has occurred through repetitive substance use behavior, and then provide immersion in 12-Step-based treatment and fellowship along with medication assisted recovery support. Medication will not do the work over the long-term. It is a useful tool, but is not and cannot be the ultimate solution. The support of recovery fellowship, relentless internal integrity and accountability, and a program of abstinence-based recovery represent the most powerful and free solution to the problem of addiction.

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When we consider the existential nature of our existence as biological creatures who experience our bodies, and our minds through the filter of our physical 'tissue,' a deep juxtaposition exists between the programming of biological reward states and the reinforcement of our experience of reality. A duality surrounding attachment to the illusion of control and the 'artificial' state of intoxication could not be more profound than in the brain of the opioid-addicted person. An essential component of 12-Step recovery embraces the spiritual nature of our existence. It is interesting to see patients working personal programs of recovery informed by the perspective that we are able to question our biological experience, see the truth and the deception of the mind relating to our attachments. It is also relevant to note that the experience of recovery fellowship provides itself a biological-tissue driven, reward relating to physical proximity, emotional intimacy and the experience of compassion and empathy.

A message of hope

I think that the most important message to any person addicted to opiates is for a person must admit their powerlessness over the drug. I have seen people try to rationalize their way into their recovery. Every time I have seen that happen people seem to find a new bottom. Ego and the concept of self-will are deeply reinforced by the emotions of shame and guilt surrounding being addicted. These concepts are ubiquitous in treatment and recovery, but with opioid addicts there is such deep salience for the drug the concept of abstinence is exceptionally difficult for many to embrace. The concept of 'never-again' is very difficult on both a conscious and subconscious level. I have always thought that it is critical for recovering people to ask themselves if they are ready to get the divorce from their drugs.

Recovery treatment must focus on something more than the provision of medication. It is essential to provide a safe context, a safety net for pain recovery which includes working the 12-Steps, which includes: accepting limitations, working with a sponsor and

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better coordination of research between agencies. The NRAP will serve as a strategic plan for reducing the morbidity and mortality of PTSD and TBI.

In his announcement of NRAP, the President told of the remarkable journey of an Army Ranger, Sergeant First Class Cory Remsburg, who was nearly killed by an improvised explosive device in Afghanistan. After months in a coma, dozens of surgeries, and years of rehab, Sergeant Remsburg is now planning for a 42-mile bike race. As the President said, "The war in Afghanistan may be ending, but for Cory and our disabled vets, the work has only just begun. Cory is 30 years old. His recovery — like so many of yours — will last a lifetime. But he won't give up, because you haven't given up. And when it comes to our work, to making sure that our nation is fulfilling its promises to the men and women who served and sacrificed, America cannot give up either."

NIMH was founded in 1948, charged by President Truman to address the problems of soldiers and veterans with "combat neurosis." Now, 65 years later, we have the same charge, to address the same illnesses from a very different war. Fortunately, we have better tools and a better understanding of the problem. But it is important to acknowledge that there is still much we do not know. We can provide better

defining what ever their limitations may be, making a phone call, and working with a group of experts such as physical therapists, physicians, and pain psychologists.

We strive to create a holistic approach to the mind, the body, the spirit of each of our patients. It is important to understand that the essence of 12-Step recovery is essentially a spiritual and/or existential transformational process. It is important to understand the biology of pain and what is going on in the body. An appreciation of the neurochemical dynamics of opioid drugs and pain informs us about how we can help heal the mind of those who are addicted. If we as health providers can create a stable platform using varying modalities enhanced with medications, I believe that we can help patients achieve the existential transformation that becomes the central core of successful treatment and recovery programs.



Andrew B. Mendenhall, MD, is Medical Director of Hazelden in Beaverton, OR. Dr. Mendenhall's primary practice is general addiction medicine. His subspecialty is caring for addicted or chemically dependent individuals with complex pain management challenges. His primary clinical interest is helping patients remain clean and sober through abstinence-based recovery, particularly Hazelden's Comprehensive Opioid Response with the Twelve Steps (COR-12) program. Dr. Mendenhall supervises complex medical detoxification, and provides multidisciplinary, integrative pain management consultation. Dr. Mendenhall is a graduate of Oregon Health and Sciences University and completed Family Medicine residency at OHSU in 2003. He completed a Fellowship in Clinical Leadership at OHSU in 2004. He is board certified by the American Board of Addiction Medicine and the American Board of Family Medicine. He is also a diplomate of the American Academy of Pain Management.

REFERENCES

- ¹Substance Abuse and Mental Health Services Administration. (2013). *Results from the 2012 National Survey on Drug Use and Health: Summary of National Findings*. NSDUH Series H-46, HHS Publication No. (SMA) 13-4795.
- ²Centers for Disease Control. (2011). Overdoses of prescription opioid pain relievers—United States 1999-2008. *Vital Signs*. 60(43);1487-1492.
- ³Edlund, M., et al. (2007). Do users of regularly prescribed opioids have higher rates of substance use problems than nonusers? *Pain Medicine*, 8(8); 647-56.
- ⁴Manchikanti, L., et al. (2006). Controlled substance abuse and illicit drug use in chronic pain patients: An evaluation of multiple variables. *Pain Physician*. 9(3); 215-25.

access to current diagnostics and current treatments, but for too many people this will not be enough. As the NRAP makes clear, we will need better science if we are to repay the debt owed to the more than two million men and women who have sacrificed for us all.



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REFERENCES

- ¹Brett T. Litz and William E. Schlenger, PTSD in Service Members and New Veterans of the Iraq and Afghanistan Wars, *PTSD Research Quarterly*, Volume 20/Number 1, ISSN 1050-1835, Winter 2009, www.ptsd.va.gov/professional/newsletters/research-quarterly/V20N1.pdf
- ²Christopher Munsey, Step up to help military families, *Monitor on Psychology*, May 2011, Vol 42, No. 5, page 57, American Psychological Association, www.apa.org/monitor/2011/05/military-families.aspx
- ³U.S. Military's Suicide Rate Surpassed Combat Deaths In 2012, www.npr.org/blogs/thetwo-way/2013/01/14/169364733/u-s-militarys-suicide-rate-surpassed-combat-deaths-in-2012, January 14, 2013.