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Brain Treatments and Creativity

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A COLLEAGUE WROTE AN article on brain disease and creativity which brought up an interesting point that I had never considered seriously, namely, the potential side effect of reducing creativity in patients who we put on brain-active drugs. The article focused on people who suffered from mental



illness (*Can J Psychiatry* 2011;56:132) but there's no reason the point doesn't carry over to any brain disorder. While many of us are familiar with the eccentricities of friends or relatives with major mental illnesses, few of these people are very creative, simply because few people are very creative. Mental illness may be associated with creativity, particularly mania, when not out of control, but, as Sylvia Plath noted, "When you are insane, you are busy being insane – all the time...When I was crazy, that's all I was." While I am not a psychiatrist, I have seen a large number of people with major psychiatric illnesses, and her personal observation rings true.

My patients form a highly select group. They all have movement disorders. This does not mean that the psychiatric patients with movement disorder side effects of their medications were poorly treated. Sometimes side effects are unavoidable. However, those patients I've seen haven't seemed particularly creative. Neuroleptics,

the antipsychotic drugs that cause movement disorders, tend to slow people down, both in their movements and in their thinking. In fact, in the "early" days of psychopharmacology, animal testing for anti-schizophrenic drugs focused on the drug's ability to slow the animals and make

them less inquisitive. Likewise the presumed benefit of frontal lobotomies was reduced agitation, often reduced movement in general, probably due largely to apathy. Dopamine receptor blockade, the cardinal neurotransmitter effect shared by all anti-psychotic drugs, probably produces apathy or at least some degree of indifference, in the patients I see. This is why they were used on political prisoners in the Soviet Union. In Parkinson's disease (PD), a dopamine depleting disorder, we think we see a reduction in "risk seeking behavior," that some have opined is related to the reduced dopamine. I doubt that apathy and creativity can coexist.

In her article, my friend cites medical conditions thought to be linked to creativity: hypomania and temporal lobe epilepsy. The link may be anecdotal (Dostoyevsky) or by clinical research (see articles by Norman Geschwind, MD), and those linked by popular opinion, particularly certain recreational drugs. (Think of Coleridge and his opium

haze-induced Xanadu, or Timothy Leary and his LSD "trips.") It seems unlikely to me, on the face of it, that drugs induce creativity, although I do admit it is plausible. More likely, drugs suppress anxiety, or increase activity by combating depression, leading to increased and more considered expression of already-present thoughts, but this is certainly not an evidence-based opinion, and the bottom line is the bottom line. If drug X helps someone to write a great poem, create a dance, or solve some problem, then who can argue?

The interesting question that arises in the article is whether certain medications might squelch creativity. There was a famous British comedian who was well known to be at his creative peak as he became hypomanic. But his hypomania preceded severe mania which would require hospitalization. What if the only way to control his need for hospitalization was to use medication that suppressed these bouts of creativity? Of course, the patient is the one who would determine whether to be treated or not, but a case like that is extraordinary. In most cases one can only wonder if there may be a link between a "mental illness," either frank illness or a premonitory state, and creativity. The author of the article opines that, based on theories about creativity and the modes of action of certain medications, some patients, "creative types" (my quotes, not hers) should be treated with certain drugs, less likely

to inhibit the creative impulse, than others approved for a similar indication. I am skeptical. I am not persuaded that we have such knowledge to guide us. If these drugs have predictable effects on creativity I would wonder if there may be different drugs for mathematicians, painters, writers or musicians. Some creative artists are creative in several realms, but so far as I know, Mozart and Einstein were known for single field creativity, implying that there is not a single “creativity circuit” in the brain.

One of the problems that we have in studying the brain is our tendency to oversimplify. This has become a problem because oversimplification sometimes does, in fact, produce heuristically helpful models that translate into actually useful outcomes. It’s not always wrong. The insulin deficit in diabetes, or the dopamine deficiency problem in Parkinson’s disease are good examples. But giving insulin through contemporaneous blood sugar samples only helps glucose control, not the other problems associated with diabetes. Increasing dopamine in the brain improves some movements in people with PD, but not all, and does nothing for any of the non-motor problems in that disorder. In addition, none of the ways we have of supplementing dopamine activity are

helpful for the many disorders of dopamine deficiency that are not idiopathic PD. Furthermore, as I learned from a prominent neuropharmacologist, there are few, if any, neurological disorders that don’t, at some point, involve dopamine. In the brain, as most people know, everything is connected to everything else. There are no isolated physiological circuits and there are no isolated neurotransmitter circuits. Any perturbation is counterbalanced by some response somewhere. Blocking dopamine, increasing serotonin, reducing nicotine activity create imbalances in one (or more) place, counterbalanced by changes in other neurotransmitters somewhere else. I fully believe that in one hundred years our current most sophisticated analyses of brain circuitry will seem closer to the four humors of the Greeks than 22nd century brain science. I am skeptical of theories that are not empiric when it comes to the brain because we know what we observe, but rarely why it occurs. We have too often been wrong, misled by our oversimplifications. Since there are usually several options for choosing psychiatric drugs, most of which work equally well, there is no harm in this theorizing, so long as we don’t take it too seriously. ❖

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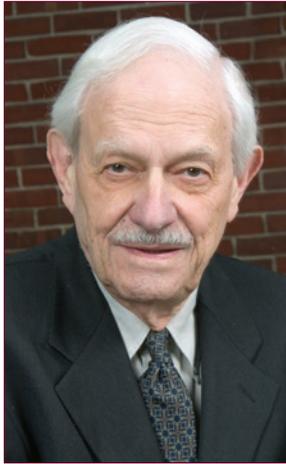
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January 1920: The Beginning of Nationwide Sobriety

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A SOBERING EVENT WAS enacted on January 16, 1920; for on this date the use, manufacture, sale and distribution of alcoholic beverages, except for those employed in religious ritual, were henceforth forbidden in the United States. And thus, for the first time in American history, the Constitution was employed to regulate certain allegedly aberrant human behaviors.



The 18th Amendment prohibiting alcoholic beverages was the culmination of a lengthy temperance drive that began almost a century before, led by a generation of determined women who had witnessed the corrupting effects of liquor upon the integrity of their family; and they took to the streets to protest. The newspapers characterized these courageous women as remorseless extremists determined to destroy the saloons which provided transient tranquility to working men. Rarely, though, did these same newspapers tell of the wife-beatings, the unpaid rents and the domestic discord contributed to by alcohol. The Amendment was ratified on January 16, 1919 but was not enacted into law until January of 1920. Only two states failed to ratify the Amendment (Connecticut and Rhode Island – but, of course, it was Rhode Island that also failed to ratify the first draft of the Constitution).

For the next thirteen years the 18th Amendment stumbled along, spawning an immense new industry of illegally shipped alcoholic beverages, a vast network of illicit saloons called speakeasies, a major force augmenting police

corruption and a new incentive for crime.

Prohibition has been caricatured as a wasted effort to vainly legislate human weakness. Yet, from a medical point of view, prohibition had its modest successes. Where prohibition was strictly enforced, the frequency of auto accidents was reduced. And more significantly, death due to the late sequels of chronic alcoholism – namely cir-

rrhosis of the liver – dropped significantly during the 1920s and rose again in 1933 and beyond when the purchase of

liquor resumed.

Prohibition was a mixed success, reflecting the human ambivalence toward alcohol. The Rubaiyat taught us: “Drink, for you know not whence you came nor why.” But Shakespeare’s Cassio responds: “O God! that men should put an enemy in their mouths to steal away their brains.” ❖

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Disclosures

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This cartoon by Friedrich Graetz appeared in a New York publication during the Prohibition era with the caption: The drug store of the future. The interior view shows people in a line to the side of a consultation-free, doctor's office booth; men are sitting at a drug store counter; a graphic insert is the outside of the building with the window sign saloon crossed out and drug store written underneath.



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Note: PHP Perspectives is a new column bringing you news and information from the Rhode Island Medical Society's Physician Health Program (RIPHP)

Marijuana Use in Athletics

DAVID B. STOLL, MD, FACP

This month's PHP Perspectives is in reference to RIMJ's November "Sports Medicine" issue. While professional athletes are susceptible to a whole host of sports-related pathology with various organ involvements, they are also susceptible to developing dependence on substances used to relieve pain and stress, recover from injuries or to enhance performance.¹ Dr. David Stoll, a member of RIMS Physician Health Committee since 2005, reflects on the controversial issue of prohibiting use of cannabis by athletes and its inclusion as a banned substance under the World Anti-Doping Agency (WADA); along with his perspective on the effect of using cannabis as a means of coping with the stress and anxiety of competitive sports.

Let me begin by stating that, unfortunately, any discussion of marijuana use becomes mired in social and political issues, which leads us away from discussing it in terms of evidence-based medicine. The use of marijuana by athletes is a somewhat contentious issue for these reasons. Considering the adverse effects of marijuana, there appears to be good evidence that addiction can range from 9% to 50%, depending on the age of first consumption and the frequency of consumption. Known side effects of marijuana use include impaired short-term memory, impaired motor coordination, or altered judgment. It has also been documented that marijuana consumed in high doses can result in paranoia and psychosis. As the dose increases, the user may experience hallucinations, an alteration of the perception of reality, and the marked reduction in concentration. Effects include tachycardia, increased appetite, vasodilatation, Broncho dilatation, increased sleep, and/or analgesia.

It is difficult to classify marijuana as a stimulant, tranquilizer, or hallucinogen.^{2,3,4} It is also difficult to quantitate the dose because marijuana is consumed in a variety of ways and produced under non-regulated conditions. Health risks, as stated above, are very well defined.

Why should marijuana be considered a banned substance under the World Anti-Doping Prohibited List? The World Anti-Doping Agency's (WADA) Prohibited List is the comprehensive document serving as the international standard for identifying substances and methods prohibited in sport. Mandated by, and serving as a key component of the WADA Code, the Prohibited List is one of the most important parts of harmonization globally across the anti-doping movement.⁵ Three criteria are used to consider if a drug, class of drug, or method should be included on the prohibited list. At least two of these criteria should be fulfilled. A drug should be included on the prohibited list if it poses a potential health risk. A substance shall be considered performance enhancing when the substance alone, or in combination with other substances, has the potential to enhance sport performance. Dose-induced euphoria, improved self-confidence, relaxation, steadiness, and the relief from the stress of competition are effects of marijuana use. It also improves sleep and recovery after an event and reduces anxiety and fear. It is believed to aid in the forgetting of negative events during a sport performance. It perhaps improves training and performance; thereby, yielding a competitive edge.^{2,3}

Marijuana may permit athletes to work through pain that is induced by

training, fatigue, or injuries. Therefore, in spite of its detrimental effects, marijuana can be viewed as performance enhancing for some athletes in some sports disciplines. Additionally, it is classified as an illegal substance in most of the world with a variety of penalties, ranging from no action to long-term incarceration. In principle, marijuana smoking, like the use of other illegal performance enhancing drugs, does contradict the spirit of fair competition. The effects of anabolic steroids are well known and there are few among us who would encourage their use by athletes. We also would not want athletes using opiates, benzodiazepines, or amphetamines to enhance their performance. This is not just from the standpoint of health risk, but also, from the standpoint of fair competition.

When so much needs to be learned about marijuana, it would make sense to keep it as a banned substance until medical research points to some possible positive effect. At the present time, there does not seem to be one. ❖

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