

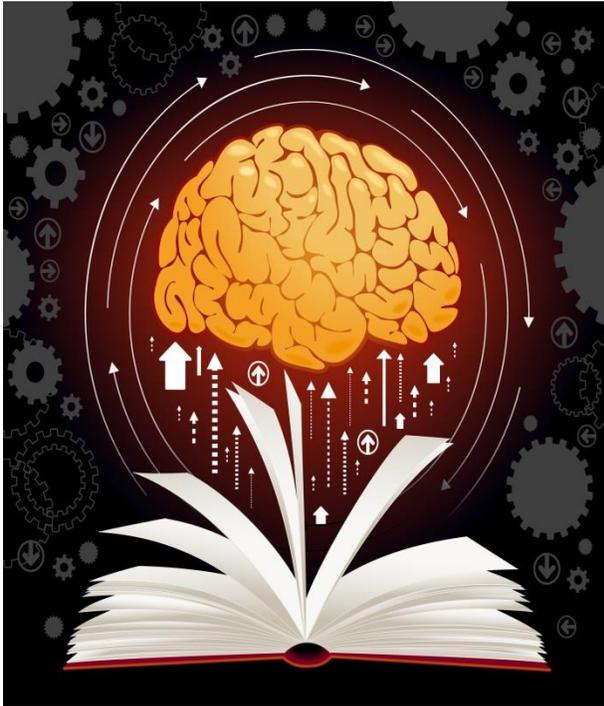


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IN THIS MONTH'S ISSUE:

1. **Neurology Didactic Curricula for Psychiatry Residents: A Review of the Literature and a Survey of Program Directors**
2. **Evidence Based and Emerging Psychological Practices in the Treatment of Psychotic Disorders**
3. **N-Acetylcysteine (NAC) and its role in Psychiatry**
4. **Grand Round Activity: Psychiatric Medical Organizations' Statements on Marijuana Policy**



Topics in this month-

Neurology Didactic Curricula for Psychiatry Residents: A Review of the Literature and a Survey of Program Directors

Guest Post by: Claudia Reardon M.D.

Psychiatrist, Assistant Professor, and Associate Residency Training Director

Department of Psychiatry, University of Wisconsin School of Medicine and Public Health

Evidence Based and Emerging Psychological Practices in the Treatment of Psychotic Disorders

By: Jennifer Boye, Ph.D. Psychologist, K3 Unit

Delaware Psychiatric Center

N-Acetylcysteine (NAC) and its role in Psychiatry

By: Sohail Mohamed M.D. PGY-II

Grand Round Activity: Psychiatric Medical Organizations' Statements on Marijuana Policy

Sanju George M.D. PGY-II and Abdelrahman Abdelaziz M.D. PGY-I

Neurology Didactic Curricula for Psychiatry Residents: A Review of the Literature and a Survey of Program Directors

Claudia L. Reardon, M.D.

Art Walaszek, M.D.

Objective: *Minimal literature exists on neurology didactic instruction offered to psychiatry residents, and there is no model neurology didactic curriculum offered for psychiatry residency programs. The authors sought to describe the current state of neurology didactic training in psychiatry residencies.*

Methods: *The authors electronically surveyed 172 directors of U.S. psychiatric residency training programs to examine the types and extent of neurology didactic instruction offered to their residents.*

Results: *Fifty-seven program directors (33%) responded. The majority of these psychiatry residency programs offer neurology didactic instruction to their residents, as provided by both neurology and psychiatry faculty, in a number of different settings and covering many topics. However, room for improvement likely remains.*

Conclusions: *The authors hope this report will guide psychiatry residencies in optimizing their neurology didactic curricula. Further research should explore tools for assessing resident knowledge in neurology and measure the effectiveness of neurology curricula in increasing knowledge and improving clinical outcomes.*

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Received July 3, 2010; revised September 5, 2010; accepted November 5, 2010. From the Dept. of Psychiatry, University of Wisconsin School of Medicine & Public Health, Madison, WI. Send correspondence to Dr. Reardon; clreardon@wisc.edu (e-mail).

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Neuroscience, neuropsychiatry, and neurology are increasingly recognized as important for the future of psychiatry. Neuroscience encompasses neuroanatomy, neurodevelopment, neuroimaging, cellular and molecular pathology, genetics, animal models, and basic pharmacology (1). Neuropsychiatry is that branch of medicine dealing with mental disorders attributable to neurologic disorders (2). The Accreditation Council for Graduate Medical Education (ACGME) requires that psychiatry residents complete 2 months of neurology training, defined as diagnosis and treatment of patients with neurological disorders. The American Board of Psychiatry and Neurology (ABPN) was formed in 1934 when the two constituent specialties were not highly differentiated. That ABPN continues to certify both specialties in spite of the divergence of the fields suggests an overlap in the clinical skills required to practice in either one. Unfortunately, no widely available model curriculum exists for clinical or didactic experience in these areas.

Our literature review revealed one article on the extent of neuroscience training within psychiatry residency programs. Roffman et al. (1) reported that the amount of neuroscience in psychiatry residency curricula has increased since the early 2000s, and their survey of psychiatry training directors demonstrated that further increases were expected. Directors reported that neuroscience constituted, on average, 12% of their residency curricula, but felt that it should comprise 20%.

We also found one article describing neuropsychiatry training within psychiatry residency programs. Duffy and Camlin (2) conducted a survey of psychiatry training directors and concluded that many psychiatry programs fail to provide adequate training in the evaluation and treatment of patients with neuropsychiatric disorders. Neuropsychiatry training objectives for psychiatry residents

have been authored by the American Neuropsychiatric Association Education Committee (3). However, it is unclear how many psychiatry residency directors are aware of this document, which has not been widely distributed.

Some articles have also been published detailing suggestions for enhanced collaboration between psychiatry and neurology educators. Duffy and Camlin (2) suggest shared curricula for residents in the clinical neurosciences (psychiatry, neurology, and neurosurgery) that address core skills such as neuroimaging, neuropsychology, and the clinical examination. Matthews et al. (4) describe “neurobehavior rounds” that include a behavioral neurologist, neuro-radiologist, neuropsychologists, and consultation–liaison psychiatrists. Chemali (5) suggests that, as part of psychiatry residents’ longitudinal experience, their training could include a neuropsychiatry continuity clinic beginning in the PGY2 year and continuing throughout residency.

We found no studies assessing the type and extent of instruction in clinical neurology per se that occurs within psychiatry residency programs. We know that resident confidence in treating neurologic disorders declines during residency (6), and that although 78% of psychiatry training directors favor neurology rotations that occur in outpatient or consultation settings, most programs are not able to offer that type of training (7). Also, we know that psychiatry training directors have preferences for neurology content areas to which they would like their residents exposed during their neurology rotations (7). However, we found no studies that focus specifically on what programs actually offer during neurology rotations or on neurology didactic exposure.

Thus, the aim of this study was to address the literature

gap in neurology didactic curricula for psychiatry residents. We surveyed psychiatry residency training directors to assess didactic instruction offered in this clinical area. Our goal was to gather specific data that could prove useful to psychiatry residency programs attempting to enhance their own neurology didactic curricula.

Method

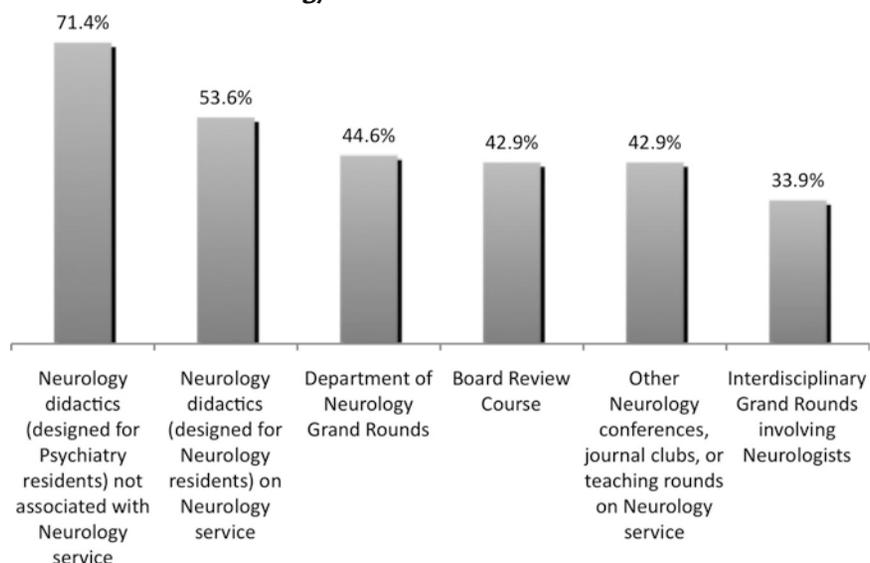
We anonymously surveyed the 172 directors of U.S. psychiatric residency training programs in the 2008–2009 American Association of Directors of Psychiatric Residency Training Membership Directory. Directors were sent an e-mail invitation in 2009 to complete a web-based survey on neurology didactic curricula for psychiatry residents. We sent an electronic reminder to complete the survey 1 month later.

The survey consisted of 10 multiple-choice and free-response style questions. The Institutional Review Board (IRB) of the University of Wisconsin granted an exemption from full IRB review.

Results

Fifty-seven of 172 program directors (33%) ultimately completed the survey. The results revealed that, in addition to a neurology clinical experience, psychiatry residents formally received didactic instruction in neurology in many ways (Figure 1). The majority of psychiatry residents attend neurology didactics specifically designed for psychiatry residents (71%) and neurology didactics de-

FIGURE 1. Methods of Instruction in Neurology



signed for neurology residents (54%). When psychiatry residents attend didactics designed for neurology residents while on a neurology service, most (41%) do so for an average of 1–2 hours per week.

The greatest number of neurology didactic hours are offered during the PGY1 and PGY4 years; 57% of respondents said that their programs offer more than 10 hours during the PGY1 year. In the PGY4 year, 32% of programs offer more than 10 hours, with another 25% offering 5–10 hours.

Many neurology topics are covered in those neurology didactics specifically designed for psychiatry residents. Those topics taught as part of neurology didactics by more than 75% of program respondents are the following: stroke/vascular disorders, epilepsy, dementia, movement disorders, and headache. Neurology didactics designed for psychiatry residents are frequently taught by neurology faculty (72% of programs) and psychiatry faculty (39%), with most programs using a combination of the two. Dually-appointed faculty and psychiatry and neurology residents less commonly teach these topics. The majority of respondents (85%) require or recommend the same textbook: *Clinical Neurology for Psychiatrists* by Kaufman (8).

Many programs use other educational resources or technologies, especially neuroradiology rounds or consultation (51% of programs), neuroanatomy lab (e.g., “brain-cutting,” 34%), and other electronic formats (e.g., CD-ROM [14%]) to teach their residents neurology; 97% of psychiatry programs utilize neurology scores on the Psychiatry Resident In-Training Examination (PRITE) to assess their residents’ neurology knowledge. Over half also use ABPN performance (56%) and performance evaluations by faculty (51%).

Fifty-five percent of program directors believe that their programs offer adequate neurology didactics for their psychiatry residents. Over half of respondents offered answers to what they would change about their neurology didactics. Many desire more integration of psychiatry and neurology didactic instruction and more involvement of neurologists as a routine manner. Several also would like more case-based instruction.

Discussion

Psychiatry residents receive neurology didactic education from their own psychiatry faculty, as well as from neurology faculty. An impressive array of topics is covered, and many programs use educational methods other

than didactics, notably, neuroradiology rounds and brain-cutting. The list of commonly-covered topics could serve as a useful starting-point for programs wanting to cover all salient neurology topics in their didactic curricula. At the very least, programs should teach the topics on this list that overlap with those on Selwa et al.’s list (7) of neurology topics felt by psychiatry training directors to be most important to cover during neurology rotations. Those topics that are both commonly taught and perceived as important would thus include the following: dementia (especially differential diagnosis and biological substrates), movement disorders (including diagnosis and treatment and especially, drug-related disorders), sleep disorders (especially apnea, insomnia, and sleep deprivation), and stroke (especially, late complications).

Opportunities exist for improvement in neurology didactic curricula. Although many programs take advantage of already-available neurology didactic educational experiences, approximately one-half do not. Many training directors desire more involvement with neurology faculty. One possibility for collaborative learning is to involve neurology trainees, especially neurology chief-residents and fellows, in delivery of didactic instruction. In turn, psychiatry trainees could offer teaching to their neurology counterparts. Such an interchange could afford important teaching opportunities for trainees and a sense of collegiality and interdisciplinary teamwork with colleagues at similar training levels.

Most psychiatry residency programs offer their neurology rotations during the PGY1 year. Many then offer neurology instruction in PGY4 Board-review courses. However, it might make sense to offer a longitudinal neurology didactic curriculum. In fact, Albuher et al. (6) call into question the tendency of psychiatry residency programs to offer the bulk of their neurology experiences early in residency. They point out that training in neurology should provide sufficient didactic and clinical experience to develop expertise in the diagnosis of neurological conditions encountered in psychiatric practice and that must be considered in the differential diagnosis of psychiatric conditions. We note that PGY1s are just starting to learn, in-depth, about psychiatric disorders, and, later in training, they might have a broader understanding of nuanced presentations of psychiatric illness, and thus a broader context for consideration of neurologic differential diagnoses.

Most psychiatry residency programs use the PRITE to assess neurology knowledge. This is potentially problematic, since the correlation of PRITE scores to the final

ABPN examination is better in psychiatry than it is in neurology (9). Further study should examine better tools to assess neurology competency.

Our study has potential limitations: Responder bias is a possibility; those with interest in neurology education for psychiatry residents may be more likely to participate. The relatively low response rate (33%) may also limit the generalizability of our findings and recommendations. We have no way of knowing whether those directors who responded represent a unique subset in any way, as our survey was not designed to assess characteristics such as the locations, size, or affiliation of respondents' programs.

In conclusion, the majority of psychiatry residency programs offer neurology didactic instruction to their residents, as provided by both neurology and psychiatry faculty, in various settings and covering many topics. Although finding this is reassuring, there is room for improvement. Directions for future research include effectiveness of increased collaboration between neurology and psychiatry departments in offering didactic instruction and enhanced integration of neurology and psychiatry didactic curricula.

Several areas for possible collaboration and integration between psychiatry and neurology exist. For example, combining the training that neurology residents receive in dementia and psychiatry residents receive in geriatric psychiatry into a single didactic experience might benefit both specialties. Likewise, research on methods to optimally assess neurology competence in ways that correlate with PRITE and ABPN outcomes is needed. Finally, we should determine the impact of strong neurology training on ultimate PRITE and ABPN scores and other markers of clinical success. For now, our hope is that this article will

help psychiatry residency programs optimize their own neurology didactic curricula.

Manuscripts authored by an editor of Academic Psychiatry or a member of its editorial or advisory board undergo the same editorial review process, including blinded peer-review, applied to all manuscripts. Also, the editor is recused from any editorial decision-making.

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Evidence Based and Emerging Psychological Practices in the Treatment of Psychotic Disorders
Jennifer Boye, Ph.D.

In recent years, a number of evidenced based practices have been employed in the treatment of psychiatric disorders with a psychotic presentation. Although medication management has often been the front line treatment for psychotic illnesses, efforts towards a recovery-oriented approach to the treatment of mental illness include a shift toward efficacious therapeutic interventions.

An intervention ideally suited for clients experiencing their first hospitalization or mental health treatment is Illness Management and Recovery (IMR). IMR materials, including training resources and client and practitioner handouts, are free online on the SAMSHA website. The intervention targets individuals with Schizophrenia, Depression, or Bipolar Disorder and is intended to be completed in group therapy but can be administered individually. The core components are psychoeducation, behavioral tailoring (helping clients manage daily medication regimes by teaching them strategies that make taking medication part of their daily routine), relapse prevention (identifying triggers of past relapses and early warning signs of an impending relapse), and coping skills training. Based on three randomized controlled trials (RCTs), IMR is associated with fewer hospitalizations days, fewer ER visits, improved knowledge about mental illness, decreased symptoms, and increased illness management.

Family psychoeducation also has a long history of support for patients with Schizophrenia. This model is based on principle that most relatives of individuals with Schizophrenia have little knowledge about the illness and have limited contact with providers. This is particularly striking given that individuals with Schizophrenia often live with family members, which can result in a heavy burden for family. Family psychoeducation focuses on the whole family, including the client. The intervention addresses psychoeducation on the diagnosis as well as treatment and improved stress reduction strategies, communication, and problem solving. This tends to be a long term treatment (often anywhere from 9 to 24 months) with the goal of developing a collaborative relationship between the family and treatment providers to help the client toward recovery. There have been over 50 RCTs which indicate that longer-term family programs show moderate to small effect sizes on reducing relapses & hospitalizations and small effects on improved psychosocial functioning.

Cognitive Behavioral Therapy for Psychosis (CBTp) targets individuals with psychotic illness or Schizophrenia while also addressing the numerous comorbidities these individuals may present with including substance use, depression, and medical problems. This treatment can be implemented in individual therapy or in a group and utilizes different approaches to treat positive and negative symptoms of the illness. To address positive symptoms, CBTp seeks to normalize hallucinations while enhancing coping skills, and addresses delusions through peripheral questioning/reality testing. The negative symptoms of Schizophrenia are addressed through traditional CBT modalities including behavioral activation and social skills training. CBTp for first episode Schizophrenia includes a strong emphasis on medication adherence by focusing on

automatic thoughts regarding medication, developing behavioral routines that support medication adherence, and identifying behavioral methods to address side effects. Research on CBTp finds stronger support for decreases in positive symptoms, with mixed results for negative symptoms. Unsurprisingly, this treatment is less effective for patients with comorbid disorders, low insight, extreme negative symptoms, and delusional beliefs.

An intervention that has strong support for Schizophrenia but may have utility for a number of diagnoses is Social Skills Training for Schizophrenia (SST). SST suggests that social skills deficits predate a client's mental illness and persist over time, and that one's social skills are related to their coping skills and ability to garner social support. Increased social skills are thought to reduce the effect of stress on relapses and help a client toward goal achievement. SST is intended to be implemented in group form but can be modified for individualized work. This is a manualized treatment where sessions are highly regimented but different social skills can be taught based on the clients' goals (e.g., making a request, listening to others, expressing unpleasant feelings). SST is based on social learning theory, so group leaders first model the social skill and then provide multiple opportunities for the client to practice the skill via role plays with reinforcement provided to shape the skill. Over 23 RCTs have been conducted and a meta-analysis found that SST has a large impact on skills acquisition and content mastery and a moderate impact on daily living skills, assertiveness, and social functioning

Two emerging practices worth highlighting are Acceptance and Commitment Therapy (ACT) for psychosis and Cognitive Training. ACT for psychosis provides an alternative to the reality-testing that occurs with CBTp. Instead, clients are taught to gain acceptance of private experiences (delusional thoughts, hallucinations), while still focusing on valued actions. For example, a client is encouraged to notice their hallucinations without becoming distressed by them, or to identify how becoming wrapped up in delusional content impedes one's ability to live a valued life (e.g., be independent, live with loved ones). Cognitive Training aims at improving neuropsychological functioning, as the cognitive deficits associated with a psychotic illness are thought to play a central role in problems with socialization and accomplishing activities of daily living, and cognitive deficits are also associated with negative symptoms. Most notably, impaired neuropsychological functioning is thought to be a "rate limiting factor" in the success of other psychosocial interventions (e.g., if a client cannot effectively maintain attention or store information in long term memory, than other psychological interventions will not be successful). Cognitive Training targets memory, learning, attention, and executive functioning through three types of interventions: restorative- correcting underlying cognitive deficits, compensatory- teaching patients to "work around" deficits, and environmental- manipulation of environment to decrease cognitive demands. There are a number of RCTs in support of both ACT for Psychosis and Cognitive Training; however, these interventions are not widely disseminated to providers or easily implemented at this time. For example, there is no manualized treatment protocol available for ACT for psychosis, and many Cognitive Training interventions utilize computer software that is not available or is costly.

Taken together, there are a number of psychological interventions that can be implemented by psychologists as well as other providers that can be a complement to psychiatric interventions (i.e., medication management). Many of these interventions are best implemented in a group format, making them an effective treatment option in the setting of a psychiatric hospitalization. These interventions can support a client in understanding their mental illness and increase their ability to effectively adhere to medication and treatment. Psychological interventions can also support an individual in their recovery by increasing social supports and personal skills.

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N-Acetylcysteine (NAC) and its role in Psychiatry

Sohail Mohammad MD, MPH

N-Acetylcysteine (NAC), precursor to the antioxidant, Glutathione, is being investigated by researchers for its potential benefits via modulating glutamatergic, neurotropic, and inflammatory pathways and thus its use in disorders including addiction, compulsive and grooming disorders, schizophrenia, and bipolar disorder.

Historically, NAC has been used in treatment of acetaminophen/paracetamol overdose, as a mucolytic, in the treatment of HIV, and reported efficacy in chronic obstructive pulmonary disease, and contrast induced nephropathy. It has shown some efficacy in patients with Alzheimer disease.

NAC replenishes primary endogenous antioxidant, glutathione, which neutralizes reactive oxygen and nitrogen species, thus maintaining the oxidative balance in the cell. Glial cells contain relatively higher levels of glutathione than neuronal cells and support neuronal glutathione production. Astrocytes release glutathione into the extracellular space which breaks down through a series of enzymatic reactions into three amino acids: glutamate, glycine, and cysteine which are then available for neuronal glutathione synthesis. Neuronal glutathione production is primarily mediated by astrocytic glutathione release, and astrocytic glutathione production is rate-limited by cysteine and the enzyme glutamate-cysteine ligase.

NAC administration provides cysteine for glutathione production and scavenges oxidants directly. It has been shown to successfully penetrate the blood-brain barrier in animal models and raise glutathione levels. It has also been shown to have anti-inflammatory properties that are linked to oxidative pathways.

Oral Glutathione and L-cysteine undergo rapid first pass metabolism and their penetration through the blood-brain barrier is poor. Oral NAC results in increased plasma cysteine levels and has been shown in animal models to successfully penetrate the blood-brain barrier and raise brain glutathione levels.

The research on the use of NAC in the treatment of psychiatric illness is expanding. It has been shown to restore glutamatergic pathways in addiction thereby reducing cravings and reward behaviors. NAC has been shown to significantly reduce gambling behavior. It has been found to decrease symptoms of trichotillomania and helpful in other grooming disorders like nail biting and skin pricking.

In schizophrenia, dysfunction in glutamate metabolism and decreased glutamate levels in the prefrontal cortex have been reported. NAC may be beneficial in the treatment of schizophrenia by targeting both oxidative stress and glutamatergic dysfunction. Improvements were seen in the negative symptoms measured on the Positive and Negative Symptoms scale, in global function, and improvements in abnormal movements particularly akathisia was reported. In addition, patients treated with NAC have demonstrated improvements in insight, self-care, social interaction, motivation, volition, psychomotor stability and stabilization of mood. In some studies, NAC appeared to modulate auditory sensory processing, measured using mismatch negativity, a marker of glutamatergic function and an endophenotype of psychosis.

In a double blind, randomized, placebo controlled trial of NAC in 75 participants with bipolar disorder, rating scores on the Montgomery-Asberg Depression Rating Scale (MADRS) and Bipolar Depression Rating Scale showed large decreases in depressive symptoms and improvements were seen on global improvement, severity and function scales.

In summary, research on NAC and its modulation of the inflammatory pathways is evolving. Studies have shown NAC add-on therapy to be safe and effective augmentative strategy for alleviating negative symptoms of schizophrenia. It is also being considered for prevention of psychiatric disorders, particularly, the Attenuated Psychosis Syndrome.

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Grand Round Activity: Psychiatric Medical Organizations' Statements on Marijuana Policy

By: Sanju George M.D. PGY-II and Abdelrahman Abdelaziz M.D. PGY-I

The discussion of marijuana in regards to use, its safety and individual possession have been a hotly debated topic lately due to recent changes in policy at the federal and state level.

When we take a look at the progression of policies at the federal level, the Marijuana Tax Act was enacted in 1937. However, during the Nixon administration, the controlled Substances Act of 1970 was passed, and developed the scheduling system we currently have. Marijuana was designated as a Schedule 1 drug. According to the DEA's definition, substances in this schedule have no currently accepted medical use in the United States, a lack of accepted safety for use under medical supervision, and a high potential for abuse.

President Carter (76-80) advocated for decriminalizing possession of small amounts of marijuana, going as far as to say that *"Penalties against possession of a drug should not be more damaging to an individual than the use of the drug itself."*

Reagan was first elected in 1980 and he declared a "War on Drugs". At the beginning of his second administration, the Anti-Drug Abuse Acts of 1986, 1988 were passed. These acts dictated that everyone who uses drug should face a criminal justice contact (not just "kingpins" and traffickers). These policies resulting in a record high increases in stops, searches, arrests, and incarceration for drug charges. The Anti-Drug Abuse Acts also established mandatory minimum sentencing and resulted in funding to local police agencies to establish SWAT teams and secure military-type After enactment of the Anti-Drug Abuse Acts, the US prison population doubled from 1990-2000 with a 75% increase due to drug offenses. There were profound racial disparities in criminal justice contacts, including searches, arrests, and prosecutions. Blacks were 3.7 times more likely than Whites to be arrested for marijuana possession, despite similar rates of use. Part of this is likely due to high police surveillance in low-income, urban neighborhoods.

Importantly, harsh criminal sanctions for drug offenses became "institutionalized," and strengthened under future presidents, including Bush (41), Clinton, and Bush (43). Clinton's crime bill and welfare reform included harsh sanctions for drug offenses.

Things have changed substantially in the past 10-15 years. As of 2015, 34 states have Medical Marijuana Laws that provide protection from criminal penalties for persons who use for medical purposes. Four States (Alaska, Colorado, Oregon, Washington) and DC have legalized marijuana use with no civil or criminal sanctions for recreational use, or possession for adults aged ≥ 21 years with the exception, for small amounts. Nineteen states have passed decriminalization laws, meaning that penalties for use or possession do not include jail/prison time for first offenses

Commensurate with these policy changes, public opinion surveys show that the majority of Americans favor legalizing marijuana for recreational use. Many factors have influenced changes in opinions toward marijuana, and one factor is the cost of a harsh criminal justice approach. The average annual cost of

incarceration in a juvenile corrections facility in the US approaches \$90,000. Many of these adolescents are socioeconomically disadvantaged adolescents whose development, education, and integration into society become permanently disrupted by the criminalization of marijuana.

To better understand the position of professional medical and psychiatric agencies, Dr. Johnson reviewed position statements of the following groups: American Academy of Addiction Psychiatry, American Academy of Child and Adolescent Psychiatry, American Academy of Pediatrics, American College of Physicians, American Medical Association, American Psychiatric Association, and American Society of Addiction Medicine. Five of the groups had statements on legalization, three had statements on decriminalization, and 4 had statements on medicalization. All organizations with statements on legalization oppose legalization. Most professional organizations supported research on effective uses of medical marijuana, through established regulatory channels (i.e., not by popular vote). Although few organizations had specific statements on decriminalization, they do support evidence-based treatment for drug offenders in lieu of criminal sanctions. Thus, as psychiatrists, our charge is to advocate that systems of care and the criminal justice system ensure that people with unhealthy substance use and substance use disorder get the medical and psychiatric care that they need.