Climate Change and Its Impacts on Mental Health

The reality of climate change is undeniable, catastrophic, and immediate. Its impact is already being felt throughout the world. Climate change is propelled along an inexorable course, creating ever-worsening environmental conditions destined to be with us long into the future. The degree of peril we and most other forms of life on this planet face is particularly linked to two unsustainable and unsupportable human derived factors: air pollution from the extraction and consumption of fossil fuels and large-scale animal agriculture.

How long have we known and how long do we have? Scientists and policy experts have known about the risks of excessive carbon in the atmosphere for decades, yet our leaders have failed to do anything significant to adequately address this unmitigated global slow-moving disaster.

Climate and health connections
Climate change poses one of the greatest threats to public health in modern times. Assuming we don’t get annihilated by a meteor or extinguished by a nuclear winter from nuclear war, we will contend with... (CONTINUED ON PAGE 8)

Mania Linked to Beef Jerky: Hot Dogs and Bacon May Be Next

New Study Finds That Nitrate-Cured Meats May Play a Causative Role in Mania

Nitrate-cured meats may increase the risk of mania, according to a study published in *Molecular Psychiatry.* That includes meat sticks, beef jerky, and turkey jerky, but not prosciutto, which is dry-cured without nitrates.

The finding was striking, with a large odds ratio of 3.5. It surprised the research team, who set out to investigate the relationship between diet and psychiatric illness at the Sheppard Pratt Health System. Their cohort of 1101 subjects included patients with bipolar mania, bipolar depression, unipolar depression, schizophrenia, schizoaffective disorder, and normal controls. Midway through the 10-year study, they noticed a sharp spike of dry cured meats among the patients hospitalized for mania. Other psychiatric illnesses did not show this association, and the finding held up after controlling for age, gender, race, current... (CONTINUED ON PAGE 8)
Climate Change
Continued from Cover

the multiple and complex effects of climate disruption long beyond the time we successfully achieve the targeted reductions in global temperature. The effects of increasing global temperatures, rising sea level, excessive CO2 levels, droughts, and other extreme weather events, reflected most recently by the spate of historic hurricanes, cyclones, and wildfires, combine to threaten the health, well-being, and economic stability of individuals, communities, and nations worldwide. If we are concerned about well-being and burnout in the health sector, we should be even more concerned about the risks to earth’s well-being and planetary burnout.

The health effects of climate change are vast and distressingly serious. They encompass the creation, exacerbation, and complication of conditions involving almost all organ systems of humans and most other biological fauna and flora. The mental health consequences are also vast, pervasive, and likely to last longer than most other impacts on health. They require attention, understanding, education, and commitment from all of psychiatry (and other health and mental health professionals) to effectively identify, treat, and prevent.

The Climate Psychiatry Alliance (CPA) and other concerned mental health professional organizations have been growing in number and influence. The CPA has identified a broad agenda for addressing issues involving climate change and mental health. These concerns fall into five categories, reflected by the acronym, CA2RE: Clinical, Administrative, Advocacy, Research, and Education, detailed in the following sections.

Clinical areas to more fully understand and treat
We need to understand the direct psycho-somatic effects of climate change (CONTINUED ON PAGE 11)

Mania
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cigarette smoking, body mass index, socioeconomic status, and multiple statistical comparisons.

To further test that association with a controlled design, they added a series of animal studies in collaboration with the Nutrition Department at Purdue University. Compared with a standard diet, beef jerky increased manic behavior in rats, as measured by increased locomotor and novelty-seeking behavior. Additional experiments suggested that nitrates were part of the problem. Adding nitrates to the standard diet also increased manic behavior, although to a lesser degree than the beef jerky. When fed dried beef that was free of nitrates, the rats showed no increase in mania.

Mechanisms
How can dietary nitrates trigger mania? Nitric oxide is one possibility. This gas rises with nitrate consumption, derived from nitrate-cured meats.3 Nitric oxide is one possibility. How can dietary nitrates trigger manic behavior? Additional experiments showed no increase in mania. Post-mortem analysis and is increased in patients with bipolar disorder. Post-mortem analysis of the rat brains found alterations in brain regions that interact with nitric oxide: serotonin receptor signaling, nuclear factor (NF)-κB signaling, bacterial pattern recognition, and sphingosine-1-phosphate signaling. With the exception of sphingosine, each of those pathways has been linked to mania in human studies.

Another hypothesis is that the nitrate-rich foods alter the gut flora in ways that elevate the risk of mania. That may sound far-fetched, but it’s supported by basic science—the mind-gut connection—as well as by a recent controlled study (from the same Sheppard Pratt group) that found significant preventative benefits with probiotics after a manic episode.2 Indeed, the nitrate-fed rats had higher counts of two bacterial species associated with behavioral and cognitive changes in animals: Lachnospiraceae and Erysipelotrichales.

Another side of nitrites
It’s unlikely that nitrites are the sole cause of this association. In the typical diet, 80% of nitrates come from vegetables like spinach, beets, and celery, foods that confer both physical and mental benefits. Only 5% to 10% is derived from nitrate-cured meats.2 Nitrites act differently in cured meats, where they combine with amines to form nitrosamines. Nitrosamines are linked to mania in human studies.

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Climate Change

Continued from page 8

Psychiatric impacts of air and water pollution, increased temperature, flooding, opportunistic and pandemic infections, nutritional deficiencies, stress, and other factors on persons with current psychiatric conditions. Recent studies indicate a significant increase in suicides related directly to temperature increases as well as long-term negative impacts on cognitive functioning from exposure to air pollution. Higher rates of individual and group violence have also been associated with increases in temperature.

Persons taking various classes of medications, including most classes of psychiatric drugs, are at greater risk of dehydration, hyperthermia, and heat stroke at higher temperatures and require guidance and support to avoid illness or death. Childhood development is particularly threatened by the many toxic factors to which children are and will continue to be exposed. It has been suggested that those who fail to act effectively and promptly will be perceived as having perpetrated wholesale and generational child abuse.

Anxiety and trauma symptoms/syndromes arise from rapid and extreme changes in one’s environment. These include conditions variously described as psychotraumatic syndromes, solastalgia, eco-anxiety, and ecological grief. Many clinicians are reporting that their patients are worried about the future with particular emphasis on the geophysical and political environments. We are seeing a myriad of social, cultural, health, and economic consequences of mass migration stimulated, in part, by global environmental disruption.

Administrative actions

As psychiatrists and providers of care to persons with mental illness, we can advocate for and/or initiate the following:

1. Develop effective disaster preparedness plans and systems in all health care facilities, including residential and hospital settings in which persons with mental illnesses are housed.

2. Create greater psychiatric disaster response capacity in all communities and incorporate that capacity within the existing emergency response and public health disaster planning systems.

3. Develop and promote health system practices, guidelines, and incentives to reduce excessive carbon consumption and other environmentally harmful impacts, many of which are already being adopted and are having a major effect. This applies to individual practices (eg, My Green Doctor, larger clinics, hospitals and health systems (eg, Health Care Without Harm at https://noharm.org), as well as the many industries that make up the health system supply chain (eg, Green Health Exchange at www.greenhealthexchange.com).

4. Reduce or eliminate unnecessary professional travel when telecommunication methods allow various meetings or conferences to be conducted with participants in dispersed locations. This includes telehealth consultation and treatment as well as administrative, planning, or educational meetings.

5. Participate in developing public health preparedness for the ongoing risks and consequences of climate change at the community level, including assisting communities to remain committed to mitigating, preventing, and reversing future climate impacts while simultaneously maintaining individual and community health, well-being, and cohesion—a process known as transformational resilience.

Participate in the improvement and expansion of risk communication practices to incorporate understanding of the mental and emotional aspects required to effectively inform and motivate the public to act in timely and appropriate ways to various disaster scenarios.

Advocacy action

To mitigate the effects of climate changes, psychiatrists can work with political and policy leaders to disable and transcend the denial of science and to recognize the immediacy and urgency of climate disruption. They can participate in efforts to defund and divest in the fossil fuel industry. They can provide effective input into a wide range of policy initiatives to reduce and eliminate the primary causes of climate change, especially those that are relevant to maintaining and improving the public’s health. And they can promote the development and utilization of climate and health impact statements for any or all major governmental or private sector projects that require environmental impact analyses statements.

Research goals

To support and guide these efforts, research needs to be geared to fully understand the effects of climate change on mental health as well as how to address these impacts at the clinical and policy levels, including methods of improving resilience of individuals and communities. This includes efforts to better understand the the healing benefits of nature.

Education needs

As psychiatrists we have a duty to educate others about the impacts of climate change. Broad and evidence-based sets of curricula are essential for all health professional at the undergraduate, postgraduate, and continuing education levels. The public also needs to understand the connections between climate change and health. Data show that climate and health related arguments are the most potent and directly felt by all components of society and the most likely to motivate more positive action to reduce global temperatures and atmospheric carbon levels.

Conclusion

Discussing these overwhelming and fearsome issues is far healthier than pretending that they do not exist or that it is too soon or too late to worry about them. Our children and future generations depend on us to act meaningfully and urgently to manage global warming and climate disruptions, the ultimate social determinants of health.

In the coming months, my colleagues and I will provide a series of reports on climate and mental health. These reports will contain more specific details on many of these topics, explanations that health care professionals can use with their patients and communities, and specific clinical guidelines for relevant conditions. We welcome your feedback, questions, and comments.

(Continued on page 29)

Mania

Continued from page 8

thought to be responsible for other health risks that are associated with nitrate-cured meats, such as cancer, asthma, and chronic obstructive pulmonary disease. 4

The bottom line

Although the human data in this study is associational, the animal data adds controlled confirmation and a plausibly biological mechanism. What’s missing is replication, an important step with novel findings. Pending that, there is little harm in recommending that bipolar patients limit their consumption of processed meats, particularly beef sticks and jerky. Last year, two controlled studies found that a Mediterranean-style diet low in processed foods improved unipolar depression, and basic science suggests that following this type of diet is beneficial in bipolar disorder as well. 2, 5

What about hot dogs, bacon, sausage, pepperoni, and nitrate-cured fish? This study casts doubt on the safety of these nitrate-cured meats, although it did not examine them specifically. It did look at salami, which is often nitrate-cured, and found no risk there or with prosciutto, which is not made with nitrates. One word of caution for those wishing to avoid nitrates. The classification of nitrates as a probable carcinogen has led to some deceptive labeling such as “uncured” and “nitrate-free.” Look carefully for evidence of vegetable powder on those labels, such as celery or beets. Brining meats with these nitrate-rich vegeta-

bles causes the same risky chemicals to form as curing with nitrate salts, and often in greater amounts. 2

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Dr. Aiken does not accept honoraria from pharmaceutical companies but receives honoraria from WW Norton for Bipolar, Not So Much, which he coauthored with Jim Phelps, MD.

References


Telehealth and the Law

Dr Fanburg is chair of the Health Law Practice and the managing member at Brach Eichler LLC, a law firm based in Roseland, NJ. Dr Walzman is an associate in Brach Eichler’s Health Law Practice.

T

echnological advances continue to expand the health care delivery marketplace, granting access to care where previously there have been gaps. Telehealth allows clinicians to share their expertise with patients and providers in remote locations and places where care is otherwise unavailable. Of course, in order to be completely successful, clinicians need to consider issues regarding reimbursements.

In health care, financial viability for services is generally driven by reimbursements from government payers such as Medicare and Medicaid, private insurers such as Blue Cross and Aetna as well as self-pay patients. When it comes to telemedicine services, the primary factor affecting reimbursements is legal policy.

Under the Medicare program, which covers approximately 15% of Americans, telehealth services are typically reimbursable only if they are provided for beneficiaries who live in certain rural or underserved areas. In addition, the beneficiary who is receiving the telehealth services must be physically located at a certain originating site, such as practitioners’ offices, hospitals, rural health clinics, and nursing homes. Medicare publishes a list of procedures, which are designated by billing codes, for which Medicare will pay if all the required conditions are met. So, it is no surprise that telemedicine coverage is similar in-person services.

As with other types of health care, telemedicine coverage and profitability is driven primarily by payers, including Medicare, Medicaid, and private insurance companies. Even within the same jurisdiction, the laws and rules relating to each of these types of health care payers can be vastly different. This can create great difficulties for providers, especially providers delivering telehealth services from different states. In most jurisdictions, insurance companies have great discretion in determining how much to pay telehealth services, or even whether to pay at all. It is up to each provider to become aware of reimbursement rules for services they will provide for patients in another state before those services are covered.

Reimbursement for telehealth services provided for non-Medicare patients depends on where the patient is located while receiving the services. Most states have legal policy governing telehealth services. There is a lack of uniformity in state telehealth guidance, including site-of-service requirements and the types of technology that may be used. Perhaps even more importantly, there is variation regarding whether private insurers are obligated to reimburse for telehealth services.

Most states require private insurers to cover telehealth services. However, state laws vary on the amount that private payers must reimburse. Some states require private insurers to reimburse for telehealth services on par with in-person services. Other states, like New York, require private payers to cover telehealth services but either do not require or are silent with respect to parity for reimbursement. Yet other states have some form of reimbursement requirement for telehealth services that does not quite equate to on-par reimbursement. For example, New Jersey requires private insurers to reimburse for services provided through telehealth, but it only requires that the rates for telehealth reimbursement may not exceed the rates of reimbursement if the service was provided in person. Other states have no requirement for private payers to cover any telehealth services.

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Deductibles and coinsurance. In addition, Medicare fee schedule reimbursement for telehealth services are not necessarily on par with those for similar in-person services.

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PART 2

A New Treatment for Bipolar Depression

Dr. Phelps

Dr. Phelps is Medical Director at PsychEducation.org and Bipolar Disorder Section Editor for Psychiatric Times.

As with many medical disorders, determining thyroid dysfunction is a matter of degree; the standard range cutoffs are used as guidelines. In a review in the American Journal of Psychiatry, Cohen and colleagues assert that a level greater than 2.5 mIU/L of thyroid stimulating hormone (TSH) is not normal. As discussed in the article, the range of TSH in the general population is not a bell-shaped curve; rather, it is skewed, as shown schematically in the Figure. More than 90% of the people with no thyroid problems have a TSH reading of less than 2.5. The middle of the laboratory “normal” range is not the middle of the range! A reading of 2.5 is more like the end of normal than the middle. What does this mean for our clinical practice?

When prescribing, target median for age When prescribing thyroid hormone for mood, target a TSH at least around the median for age, as shown in the Table. To remember on the fly: target around 1.5 to age 50, around 1.6 to age 60, around 1.7 to age 70, and around 1.8 to age 80.

Why median for age? It is a nice euphemism for “go low!” Many practitioners will pull up short, pushing TSH into the laboratory normal range and leaving patients’ TSH at 2.5 to 3.0. But in major depression, TSH levels between 2.5 and 4.0 have been associated with more severe symptoms, and some data suggest poorer response to treatment. For instance, in a study of bipolar depression, the researchers found “outcomes were relatively poor unless patients had TSH values below the median.”

According to the review in the American Journal of Psychiatry, one should use doses adequate to get below 2.0 as an initial goal. In follow-up, if target symptoms remain that might respond to thyroid hormone, “a full trial of supplementation may require a target TSH near 1,” explained Cohen and colleagues (emphasizes mine).

**Initial dosing is not 25 mcg of levothyroxine**

If your goal is to land the patient’s TSH between 1.0 and median for age, how much levothyroxine should you use? Per Cohen and colleagues, “initial doses or increases in dosages can be low, 50 mcg/day for T4.” But watching my colleagues’ prescribing, including that of primary care providers, it seems that clinicians believe 50 mcg is not “low,” it is more like medium-aggressive.

For comparison, we might say that really aggressive is 100 mcg/day to start and increasing by that amount weekly: that is the protocol based on body mass index after thyroidectomy. These instructions are “half a pill for a patient who weighs 80 kg, these weight-based doses range from 88 mcg to 168 mcg daily. That gives you some idea of the final dose if you were to take over from the patient’s thyroid gland with your replacement dose.

But your starting dose is not likely to be determined by an algorithm or even your patient’s BMI. It will be determined by your own anxiety about doing harm by overshooting. After all, if you are too low, you will eventually get there using serial TSH measurements.

So, the question about initial dose comes down to the same question with which I left you in Part 1 of this series: What is the risk of driving TSH below the lower limit of the lab normal range? That is where we will pick up in Part 3. For now, remember: target “median for age” and don’t stop until you get there.

**TABLE. Target TSH for median age**

<table>
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<th>Age</th>
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<th>20-25</th>
<th>25-30</th>
<th>30-35</th>
<th>35-40</th>
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<th>45-50</th>
<th>50-55</th>
<th>55-60</th>
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<th>65-70</th>
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<td>1.72</td>
<td>1.79</td>
<td>1.80</td>
<td>1.85</td>
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</tbody>
</table>

**FIGURE. TSH distribution in the general population**

To read more about thyroid hormone as a treatment for bipolar depression, read Part 1 in the August issue of Psychiatric Times or go to http://www.psychiatrictimes.com/bipolar-disorder/new-treatment-bipolar-depression-part-1

Part 3 of this series will appear in an upcoming issue.

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1. Cohen BM, Sommer BR, Vuckovic A. Antidepres-
ADHD: A 24-Hour Disorder

Dr. Weiss is the Director of Child and Adolescent Psychiatry and Ms. McBride is Clinical Research Associate, Psychiatric Research Institute, University of Arkansas for Medical Sciences in Little Rock, AR.

Sleep difficulties and sleep disorders are the most common comorbidities reported in individuals with ADHD, affecting approximately 73% of children and adolescents with the condition and up to 80% of adults with ADHD.1 The high prevalence of sleep disorders in ADHD patients is a consistent finding, despite differences between studies with regard to population demographics and sleep assessment methodology (eg, subjective or objective measurement; see Table). There have been numerous reports detailing the multidirectional impact of sleep and ADHD on each other, noting that both sleep and ADHD related impairments may originate from common neurobiological pathways.

Bilateral comorbidity

Assessment of sleep disorders in patients with ADHD requires the clinician to disentangle the relationship between sleep and ADHD in individual patients. For example, a patient with ADHD may have a circadian rhythm sleep disorder that is being driven by difficulty going to bed or as an adverse effect of stimulants. Conversely, problems with attention and disinhibition can be a consequence of poor sleep, such as attention problems secondary to sleep disorders or the impact on attention, executive function. The “paradoxical” improvement in ADHD symptoms with stimulants also makes sense when considered within a theoretical framework that understands the overactivity of ADHD as the consequence of difficulty in regulation of nocturnal, daytime, and circadian rhythm regulation of alertness.

Over the past decade, the complex relationship between ADHD and sleep has become a focus of interest with a marked increase in number of publications. The research has led to a better appreciation of the subjective complaints of patients with ADHD that they “can’t turn their thoughts off.” Four main theories have been suggested as a conceptual model of the relationship between sleep and ADHD.4

First, it may be that sleep problems are a fundamental characteristic of ADHD, as suggested in DSM-III, which considered restless sleep one of the symptoms of ADHD. Second, sleep problems may mimic or cause symptoms that are characteristic of ADHD. Sleep difficulties have an impact on attention, executive functioning, and inhibition consistent with the symptoms of those with ADHD. Thirdly, ADHD and sleep problems may have a reciprocal relationship in that one disorder exacerbates the other in a vicious circle. Both ADHD and sleep problems are also often comorbid for internalizing disorders such as anxiety or depression where sleep difficulty is also part of the presentation. Lastly, it is possible that sleep and ADHD may share common etiological neurobiological pathways.

Significance for Practicing Psychiatrists

A multidirectional relationship is commonly present between ADHD and sleep issues. Practicing psychiatrists are on the front line to identify and assure optimal management of both conditions.

- Obtaining optimal functional outcomes requires 24-hour management of both ADHD and sleep.
- Screening for sleep difficulties prior to and during ADHD treatment is essential.
- Sleep hygiene training, changes to ADHD medications, or the use of melatonin or other hypnotic medications may be needed to manage sleep.

This theory is relevant to many of the most common sleep disorders associated with ADHD, such as initial insomnia, circadian rhythm sleep disorder, restless legs syndrome, and periodic limb movement disorder. Sleep disordered breathing also makes sense as a risk factor for ADHD, in that hypoxia of any etiology will affect attention, self-control, and executive function. The “paradoxical” improvement in ADHD symptoms with stimulants also makes sense when considered within a theoretical framework that understands the overactivity of ADHD as the consequence of difficulty in regulation of nocturnal, daytime, and circadian rhythm regulation of alertness.

Obtaining optimal functional outcomes requires 24-hour management of both ADHD and sleep issues. Pharmacological treatment of ADHD includes stimulant medications, as well as use of methylphenidate, atomoxetine and clonidine. Alternatives to stimulants are benzphetamine, lisdexamfetamine, and guanfacine. Nonpharmacological treatment of ADHD includes sleep hygiene education, exercise, and regular sleep times. Both stimulant medication and nonpharmacological treatment can help with sleep problems. In addition, stimulant medication may have an impact on sleep and may, in some cases, improve sleep.

Screening for sleep problems. For adults, the two very useful scales are the Pitts-
**FIGURE 1. Sample somnolog**

Name: ____________________________

Instructions: Shade in the periods when you were asleep; mark your bedtime and any nap times with downward arrows; leave blank if awake but still in bed; mark the time you get up in the morning and after any naps with upward arrow.

Example: To bed at 10 PM, slept until 4 AM, woke up but stayed in bed, out of bed at 6 AM

<table>
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The reality of clinical practice is that interventions should make a referral to a sleep clinic for children, Better Nights/Better Days® may provide access to expert intervention. For adults, apps such as CBTi COACH (Cognitive Behavior Therapy for Insomnia) or SHUTi (Sleep Health Using the Internet) provide access to sleep education as well as a way to systematically measure response. Evidence that melatonin is effective for initial insomnia in neurodevelopmental disorders has led to widespread and often long-term use by the public, especially where it is available over the counter. Exogenous melatonin use in the management of initial insomnia in ADHD has increased precipitously (10-fold in 10 years) where pharmacoepidemiologic studies are available such as the UK and Norway. Melatonin administered in small doses (.3 - .6 mg) has been used as a chronobiotic along with bright light to phase advance or phase delay sleep in patients with circadian rhythm sleep disorders. However, it is much more common to use melatonin as a hypnotic to assist with initial insomnia in doses between 1 and 10 mg administered a half hour before bedtime. This has been shown to be effective in decreasing sleep onset latency in multiple clinical trials and has become a common OTC method of dealing with insomnia in children with ADHD, even when it is induced by stimulants. Children on melatonin for insomnia who complain of the onset of nightmares or exacerbation of nightmares should have a trial of melatonin discontinuation before initiation of a specific medication for nightmares such as prazosin. Despite these cautions, clinicians should be aware of the relative safety of melatonin compared with benzodiazepines/Z drugs or antipsychotics.

**Psychiatric management of sleep problems**

Psychiatric management of sleep problems in patients with ADHD requires evaluation of how medication treatment of ADHD is affecting sleep. This may involve reducing the total dose of stimulant, changing the dose regimen or formulation, adding a third dose of stimulants in the evening. Adding an alpha-2 agonist, such as prazosin. Despite these cautions, clinicians should be aware of the relative safety of melatonin compared with benzodiazepines/Z drugs or antipsychotics.
ADHD, Bipolar Disorder, or Borderline Personality Disorder
Getting to the Right Diagnosis

Dr Weiss has received consulting and honorariums from Purdue Pharma, Rhodes Pharmaceuticals, Shire, and NLS Pharma; she has also received travel reimbursement from Rhodes, Shire, NLS Pharma, The Israel Society for ADHD, and the World Federation of ADHD. Ms McBride has no conflicts of interest concerning the subject matter of this article.

References

SIGNIFICANCE FOR PRACTICING PSYCHIATRISTS
This article briefly summarizes the differential diagnosis between ADHD, bipolar disorder, and borderline personality disorders, highlighting similarities and differences in onset, course, clinical picture, and treatment.

ADHD, bipolar disorder, and borderline personality disorders are highly prevalent psychiatric disorders in juveniles and young adults.

Comorbidity between these disorders is frequent and impacts symptoms and functional recovery as well as treatment response.

For an accurate differential diagnosis, the clinician should rely on age of onset, psychiatric family history, treatment response, caregiver reports, and objective signs such as locomotor activity and sleep pattern.

ADHD Onset and course. ADHD onset is generally before age 12 years, with a prevalence of 1.7% to 16%. ADHD follows a chronic and unremitting course, persisting into adulthood in half of the cases. The hyperactive-impulsive type is associated with trajectories of improvement while the inattentive type is often associated with negative outcomes. ADHD hyperactive type is more prevalent in males, while ADHD inattentive type is more common in girls. The persistence and severity during development are associated with adult antisocial and criminal behaviors.

Clinical picture. Hyperactivity in ADHD is characterized by restlessness, fidgeting, talkativeness due to lack of inhibition (but may be sometimes redirected), engaging in risky behaviors (without being aware of the consequences); hyperactivity is present all day and can worsen when prolonged attention or on-task behavior is expected, especially in structured activities.

In children with ADHD, difficulties with attention, resistance to completing homework and poor concentration often interfere with academic achievement. School and social relationships can be impaired by inappropriate behaviors that are accidental, related to inattention, impulsivity, and poor motor coordination. Mood fluctuations are common in children and adolescents with ADHD, with self-esteem worsening over time, but generally do not have dysphoric mood as predominant symptom; mood shifts are usually related to demands of learning and irritability is often worsened by withdrawal from stimulants.

ADHD patients are generally good sleepers, tend to rise quickly, and are alert in minutes; circadian rhythms are normal. ADHD and there isn’t a decreased need for sleep. Parents can report bedtime resistance but without sleep problems such as middle and late insomnia or nightmares. Psychotic symptoms and hyper-sexual behavior are not part of the ADHD clinical presentation.

Bipolar disorder Onset and course. Bipolar disorder has a lifetime prevalence of 2.1% in adults and 1.8% in children; at least two-thirds of the patients with bipolar disorder report onset before several of the symptoms from ADHD. This overlap with mood disorders and personality disorders (Table).

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ADHD is defined by early onset (before age 12) of persistent (six months or longer) symptoms of inattention and/or hyperactivity and impulsivity that are not consistent with development, causing impairment of normal functioning in at least two settings (home, school). It is the most common psychiatric disorder in children, mostly in school-age boys. Generally, the diagnosis of ADHD is based on the presentation of impairing levels of attention, hyperactivity, and impulsivity. However, ADHD can present with different symptoms such as irritability, emotional dysregulation, mood lability, low frustration tolerance, low self-esteem, and sleep problems, making the diagnosis difficult because of overlap with mood disorders and personality disorders (Table).

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A

SIGNIFICANCE FOR PRACTICING PSYCHIATRISTS
This article briefly summarizes the differential diagnosis between ADHD, bipolar disorder, and borderline personality disorders, highlighting similarities and differences in onset, course, clinical picture, and treatment.

ADHD, bipolar disorder, and borderline personality disorders are highly prevalent psychiatric disorders in juveniles and young adults.

Comorbidity between these disorders is frequent and impacts symptoms and functional recovery as well as treatment response.

For an accurate differential diagnosis, the clinician should rely on age of onset, psychiatric family history, treatment response, caregiver reports, and objective signs such as locomotor activity and sleep pattern.

ADHD Onset and course. ADHD onset is generally before age 12 years, with a prevalence of 1.7% to 16%. ADHD follows a chronic and unremitting course, persisting into adulthood in half of the cases. The hyperactive-impulsive type is associated with trajectories of improvement while the inattentive type is often associated with negative outcomes. ADHD hyperactive type is more prevalent in males, while ADHD inattentive type is more common in girls. The persistence and severity during development are associated with adult antisocial and criminal behaviors.

Clinical picture. Hyperactivity in ADHD is characterized by restlessness, fidgeting, talkativeness due to lack of inhibition (but may be sometimes redirected), engaging in risky behaviors (without being aware of the consequences); hyperactivity is present all day and can worsen when prolonged attention or on-task behavior is expected, especially in structured activities.

In children with ADHD, difficulties with attention, resistance to completing homework and poor concentration often interfere with academic achievement. School and social relationships can be impaired by inappropriate behaviors that are accidental, related to inattention, impulsivity, and poor motor coordination. Mood fluctuations are common in children and adolescents with ADHD, with self-esteem worsening over time, but generally do not have dysphoric mood as predominant symptom; mood shifts are usually related to demands of learning and irritability is often worsened by withdrawal from stimulants.

ADHD patients are generally good sleepers, tend to rise quickly, and are alert in minutes; circadian rhythms are normal. ADHD and there isn’t a decreased need for sleep. Parents can report bedtime resistance but without sleep problems such as middle and late insomnia or nightmares. Psychotic symptoms and hyper-sexual behavior are not part of the ADHD clinical presentation.

Bipolar disorder Onset and course. Bipolar disorder has a lifetime prevalence of 2.1% in adults and 1.8% in children; at least two-thirds of the patients with bipolar disorder report onset before several of the symptoms from ADHD. This overlap with mood disorders and personality disorders (Table).
Younger onset is associated with positive family history of mood disorders, comorbidity with anxiety and substance abuse disorders, rapid cycling course, treatment resistance, more hospitalizations, and suicidal behavior.

The episodic course is only one of many courses of illness. Some patients may experience chronic, unrelenting symptoms, while other patients may experience weeks or months with attenuated symptoms, or symptom-free intervals. In fact, the requirement of periodicity (recurring episodes of mania and depression) to diagnose BD has often resulted in the misdiagnosis of those with a chronic, non-episodic course of illness.

**Clinical picture.** The classic manic episode is characterized by the discrete appearance of euphoric/elated mood, talkativeness, decreased need for sleep, impulsivity, hyperactivity, and greater productivity, with rapid transitions to new and more stimulating projects. However, bipolar disorder in youth can also present with dysphoric (or mixed) mania characterized by marked irritability, negative/morbid thoughts, increased impulsivity, risk-taking and aggressive behaviors, and psychomotor agitation as well as a chronic course and ultra-rapid cycling episodes.

Circadian rhythms are altered, resulting in greater fluctuations of energy and activity. Evening hours are preferred with improved mood and energy in the later part of the day, early/middle/late insomnia, and sleep resistance.

Psychosis, including delusions, hallucinations, catatonic features, and bizarre behavior occurs frequently. Suicidality, including morbid ideation, suicidal ideation, and suicide attempts are common in children and adolescents with bipolar disorder as are various forms of aggression (eg, verbal aggression, anger dyscontrol, violent behavior leading to destruction of property or physical aggression).

An increased and precocious interest in sexual content as well as increased sexual behaviors have been described in children and adolescents with bipolar disorder. In such cases of inappropriately precocious sexualized behavior, it is extremely important to rule out any kind of inappropriate exposure to adult material, or sexual abuse.

**Borderline personality disorder**

**Onset and course.** According to DSM-5 criteria, a diagnosis of borderline personality disorder should not be made before the age of 18 years; however, diagnosis can be made earlier when symptoms are clear and persistent. The peak frequency of symptoms appears to be at 14 years of age.

Symptom remission (a reduction in the number of symptoms below the diagnostic threshold) is common, especially when diagnosis is made during adolescence. However, in spite of the high remission rate, the presence of borderline personality disorder in adolescence is far from harmless.
Stimulants are the cornerstone of treatment for ADHD and are helpful in reducing the impact of cognitive deficits on academic performance and social interaction, improving classroom behavior, and increasing time on task. Large-population studies have documented reduced criminal behavior in ADHD adults and decreased car accidents in males with ADHD.9

Despite the widespread use of stimulants in pediatric and adult populations, the effects of acute exposure during development and chronic exposure in youths and adults are poorly understood. More research is required to assess safety, especially because of the extent of abuse, although several studies suggest relative safety.5,10 Therapeutic approaches are often quite different depending on the primary diagnosis; for instance, mood stabilizing agents and atypical antipsychotics may be beneficial for children with early onset bipolar disorder but are unlikely to enhance attention in children with ADHD and are associated with serious adverse effects.11,12

On the other hand, stimulants have been shown to be ineffective in the treatment of bipolar disorder. They can cause disruption of sleep and circadian rhythms, and negatively affect persons with bipolar disorder.13 Although some findings indicate that stimulants added to mood stabilizers did not result in manic exacerbation.14 In case of comorbidity between ADHD and bipolar disorder, treatment should be directed first to the most severe condition (almost always bipolar disorder). Treatment of ADHD should be considered when ADHD symptoms persist following mood stabilization and have a moderate to severe impact on functioning and quality of life.

Treatment may be needed in stages, for example mood stabilizers for bipolar disorder, followed by stimulants/atomoxetine for ADHD. If a clear diagnosis of ADHD is made, and bipolar disorder is only suspected, then ADHD should be treated first while monitoring potential worsening of bipolar symptoms—stimulants or atomoxetine might exacerbate subthreshold mania. If bipolar symptoms emerge during treatment of ADHD, stop the ADHD treatment until bipolar symptoms have been stabilized and then review the diagnosis of ADHD before considering further treatment.

Psychotherapy is the primary treatment for borderline personality disorder. No fully evidence-based pharmacotherapy exits for core borderline symptoms, although some medications (eg SSRIs, atypical antipsychotics) may be effective for individual symptom domains, such as impulsivity (shared by ADHD and BPD).

Treatment of ADHD should always be considered when treating comorbid personality disorders. If the core syndrome of ADHD improves then patients with comorbid personality disorders are likely to be less distressed, function better in their daily lives, and have more control over their behavior. Moreover, they are more likely to engage and benefit from psychological treatment programs.

### Conclusions

Because ADHD, bipolar disorder, and borderline personality disorder share overlapping symptoms, these disorders can be difficult to differentiate and accurately diagnose. Therefore, it is important to take into account other information such as family history, developmental stages and delays, age and type of onset, course of illness, previous and current treatments, type of comorbidity. ADHD comorbid with bipolar disorder or borderline personality disorder further complicates identification of these conditions and possibly causes patient functioning to be worse than in the presence of only one of these disorders. It is important to accurately diagnose and treat each disorder, comorbid or not, to achieve higher levels of patient functioning.

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**TABLE. Clinical presentation of ADHD, BD and BPD**

<table>
<thead>
<tr>
<th>Clinical presentation</th>
<th>ADHD</th>
<th>BD mania</th>
<th>BPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inattention</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Forgetfulness</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Does not complete tasks</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Hyperactivity</td>
<td>All day, worse when prolonged attention or on-task behavior is expected</td>
<td>Fluctuation in activity levels day/night</td>
<td>No</td>
</tr>
<tr>
<td>Racing/crowded thoughts</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Pressured speech</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Impulsivity</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Decreased need for sleep</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Sleep difficulties</td>
<td>No</td>
<td>Difficult to get to sleep, awakening in the night</td>
<td>Yes</td>
</tr>
<tr>
<td>Early insomnia</td>
<td>Bedtime resistance</td>
<td>Decreased need for sleep</td>
<td>No</td>
</tr>
<tr>
<td>Disrupted sleep/late insomnia</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Euphoria/elation</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Irritability</td>
<td>Not frequent; often worsened by withdrawal of stimulant</td>
<td>Very frequent, especially on morning arousal</td>
<td>Yes</td>
</tr>
<tr>
<td>Mood shifts</td>
<td>Not frequent; usually related to demands of learning</td>
<td>Very frequent rapid mood shifts</td>
<td>Yes</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>Usually worsens over time</td>
<td>Generally inflated</td>
<td>Fluctuates from high to low</td>
</tr>
<tr>
<td>Psychotic symptoms</td>
<td>No</td>
<td>Yes</td>
<td>Transient, stress-related</td>
</tr>
<tr>
<td>Hypersexuality</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Verbal aggression</td>
<td>Due to frustration</td>
<td>Deliberate</td>
<td>Yes</td>
</tr>
<tr>
<td>Physical aggression</td>
<td>Rare</td>
<td>Deliberate</td>
<td>Yes</td>
</tr>
<tr>
<td>Destruction of property</td>
<td>Due to inattention</td>
<td>Deliberate</td>
<td>Yes</td>
</tr>
<tr>
<td>Suicidal ideation/attempts</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

BD, bipolar disorder; BPD, borderline personality disorder.

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special form of inattention as part of dissociative states when they feel emotionally stressed, particularly in response to feelings of rejection, failure, and loneliness. Inattentive symptoms in ADHD are particularly prominent in situations that lack external stimulation (eg, during boring, routine, or familiar tasks).

Patients with borderline personality disorder have a tendency to resort to self-injurious behavior in order to alleviate tension; ADHD patients are more likely to regulate emotional symptoms through extreme sports, novelty seeking, sexual activity, and aggression.

**Treatment**

Stimulants are the cornerstone of pharmacotherapy of ADHD and are helpful in reducing the impact of cognitive deficits on academic performance and social interaction, improving classroom behavior, and increasing time on task. Large-population studies have documented reduced criminal behavior in ADHD adults and decreased car accidents in males with ADHD.9

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(Continued on page 30)
ADHD Neuroimaging: What’s New?

Philip Shaw, BM BCh, PhD

Neuroimaging provides a window into the developing brain, allowing us to examine safely and noninvasively brain anatomy, function, biochemistry, and connectivity. When applied to neurodevelopmental disorders, such as ADHD, imaging in vivo could provide objective tools to inform diagnosis, prognosis, and stimulate discovery of novel therapeutics. In this article, three recent important trends in ADHD neuroimaging are highlighted: (1) the rise of big data in ADHD imaging; (2) how neuroimaging has expanded its focus to include adults; and (3) efforts to translate neuroimaging into clinical tools. This review is selective and provides a narrative rather than quantitative synthesis of recent literature.

Big data and genetic imaging

As clinicians know, the diagnosis of ADHD encompasses a wide range of clinical presentations, from the distracted day-dreamy child to the exceptionally impulsive hyperkinetic teen. This clinical heterogeneity is a major challenge for imaging studies, particularly those with small sample sizes—different clinical presentations are unlikely to have identical underlying neural substrates. This source of heterogeneity is compounded by the fact that different study centers often use different scanners, imaging protocols, and analytic approaches.

One strategy for dealing with some of this heterogeneity is to combine the data from multiple studies, thus providing a quantitative summary that will highlight the more robust ADHD-associated differences (Figure 1). One meta-analysis incorporated cross-sectional data from 1713 individuals with ADHD and 1529 unaffected controls and found smaller subcortical structures in patients with ADHD compared with controls, more pronounced in childhood than adulthood.

A similar collaborative effort used longitudinal imaging data from four cohorts to chart diagnostic differences in the growth of the cerebellum, a pivotal structure in movement, cognition, and emotion. Findings indicate that across these cohorts, the ADHD group showed slower growth of cerebellar white matter in early childhood, but faster growth in late childhood. Other meta-analyses have considered the
white matter tracts connecting different brain regions and report focal alterations to the corpus callosum and other association tracts.

Several key points emerge when considering these large, meta-analytic studies. The neural differences between youths with ADHD and youths without, while highly significant are associated with small to medium effect sizes. This means that although the distributions of a given brain feature in the ADHD and comparison groups are shifted apart, the distributions still overlap substantially.

These effect sizes are ubiquitous in psychiatric imaging and limit the application of neuroimaging to the individual. Nonetheless, such meta-analytic findings can give powerful insights into neurobiology, particularly when contrasts are drawn across diagnoses. For example, comparative meta-analyses find that while ADHD is associated with decreased volume and hypoactivation during inhibitory processing in the putamen and insula, obsessive compulsive disorder shows the reverse. Such dissociations, emerging through the meta-analyses on thousands of subjects, are particularly powerful pointers to key neural circuits in different disorders. Meta-analyses have their challenges. Statistical approaches can attenuate but do not completely remove the heterogeneity arising from differences in data acquisition between study centers. However, the field is advancing with a greater focus on harmonizing protocols and hardware across centers, developing methods to compensate for artifacts (such as those arising from in-scanner motion), and ensuring quality control procedures are uniform and objective.

Large samples, only attainable through collaboration, are critical for unraveling the etiology of ADHD, which is highly heritable (around 70% of the phenotype is under genetic control). A recent landmark was attained with the discovery of common genetic variants that conferred risk for the diagnosis at a genome wide level of significance. Each genetic variant confers tiny amounts of risk and thus large cohorts are needed to define which facets of the brain and cognition lie in the causal chain between genetic risk and ADHD symptoms.

The brain might itself provide phenotypes for future gene discovery, specifically neural features that are both heritable (and thus under genetic control) and strongly associated with ADHD. This goal can be attained by studying multigenerational, extended families with many members affected by ADHD. Using this approach, connectivity patterns within the cognitive network and its white matter tracts (specifically, the superior longitudinal fasciculus) emerge as both highly heritable and associated with symptoms.

**ADHD imaging throughout the lifespan**

There is increased recognition that ADHD is not just a disorder of childhood: approximately 20% will continue to have the full syndrome into adulthood, approximately 50% continue to have impairing symptoms, and the remainder have symptom remission. Understanding the neural mechanisms that underpin this variability in the adult outcomes of childhood ADHD can inform novel treatment approaches and might provide biomarkers to help predict outcome.

Why do symptoms remit in some children by adulthood, whereas in others, symptoms persist? One possibility is that symptom remission in adulthood is due to the correction of childhood neural anomalies, whereas clinical persistence is tied to the persistence of neural anomalies. Alternatively, remission might arise from neural reorganization as novel systems are recruited to help the individual compensate for core deficits of ADHD. These two models make different predictions about the “remitted” brain.

In the first model, neural features in those with symptom remission will resemble those seen among individuals never affected by ADHD. If, however, neural reorganization and compensation drives remission, then the “remitted” brain will differ from...
the never affected, albeit in potential-
beneficial ways. Finally, it is also
possible that some anomalies that re-
fect the childhood presence of ADHD could persist, regardless of
clinical recovery. By this reckoning,
both those who have symptom remis-
sion and those with symptom per-
sistence will show very similar atyp-
ic neural features, despite different
clinical presentations.

This question has been tackled by
several cohort studies that have as-
sessed children clinically as they
grew into adulthood (Figure 2). Most
neuroimaging was obtained only at
the adult endpoint as many tech-
niques were not widely used when
the participants were children. These
studies found that adults with persist-
ing ADHD symptoms showed neural
anomalies, often resembling those
reported in other childhood studies.

What about the neural features
seen among those who have symp-
tom remission? Several of the studies
found that adults with symptom re-
mission did not differ significantly
from the never affected comparison
group in neural features, compatible
with the concept of remission as con-
vergence towards typical dimen-
sions. Such similarity ranged from
prefrontal cortical activity during a
key cognitive facet of ADHD (defi-
cient response inhibition), the anato-
my of attention-related cortical
regions, and the microstructure of
some white matter tracts joining dif-
ferent cortical regions.15-17 Other
studies, however, found that those
with remitted or persistent ADHD
showed very similar neural anom-
lies, such as in the anatomy of poste-
rior brain regions, subcortical activi-
y during response preparation, and
cognitive control.15-17

A major limitation in these studies
is that imaging data were acquired in
adulthood. Thus, the similarity be-
tween the remitted and never affected
groups could arise if, in the group
with remission, there were more typ-
ic neural features in childhood that
had been carried forward into adult-
hood. A critical next stage is to col-
lect prospectively both clinical and
imaging data from childhood into
adulthood and use these data to de-
fine the bonds between neural and
clinical trajectories.

Towards clinical applications
Novel analytic approaches applied to
multimodal data might help bring
imaging into the clinic of the future.
Neuroimaging studies have been
central in demonstrating how psy-
costimulants may work, and in the
future might be used to provide neu-
rofeedback to shift brain activation
into more neurotypical ranges. But
what about now, are clinical applica-
tions currently feasible?

CASE VIGNETTE

Peter is 7 years old, his mother brought
him to a childhood assessment clinic
because of his problems with attention.
His mother describes Peter as unable to
sustain attention on any task for more
than a few seconds. Since age 3, he has
been easily distracted by noises and ob-
jects around him and constantly jumps
from one activity to another. He misplac-
es his toys and can’t follow the simplest
routine. He has problems at school, and
his teachers are concerned that he is
failing to learn the basics of reading and
arithmetic despite appearing very intel-
lectually capable.

Peter is highly impulsive, constantly
interrupting his peers and teachers, and
unable to wait his turn. As a result, he
has become isolated from his peers
who both puzzles and upsets him. He
is constantly on the go, exceptionally
fidgety and more often out of his class-
room chair than on it. Peter is more
prone to temper outbursts than his
peers, but is generally happy, free from
pervasive anxiety, and is healthy with
an unredeemable physical examination.
Peter’s mother recalls that her brother
had similar challenges which led him to
eventually drop out of school, and she is
very worried that Peter might follow the
same trajectory.

After obtaining this history from Pe-
ter’s mother and a teacher, and inter-
viewing Peter, the psychiatrist is confi-
dent of the diagnosis: ADHD, with a
combined presentation (symptoms of
inattention, hyperactivity, and impulsiv-
ity). Peter’s mother asks if Peter can
have a brain scan or a blood test to con-
firm this diagnosis. She has also read
about precision medicine and asks
about brain imaging and genetic testing
to help decide on the optimal treatment
for her son.

Currently, neuroimaging remains
a research tool and the diagnosis of
ADHD remains a clinical skill. There
are many steps before neuroimaging
becomes clinically useful: the scans
need to be reliable (repeatable across
different scanners), valid (ideally re-
reflecting a process central to ADHD
or one of its underlying, often trans-
diagnostic dimensions), and feasible
(affordable and acceptable).

Many groups are, however, trying
to make imaging more clinically use-
ful. Several researchers are applying
newer methods to analyze imaging
data such as pattern recognition/ma-
cine learning in order to predict a
diagnosis. In pattern recognition
analyses, neural features are provid-
et to an algorithm (such as a support
vector machine) that “learns” a rule
to predict diagnosis; the rule is then
tested on independent cohorts.

The hope is that we can translate
the modest, but significant neural dif-
fferences between groups—those
with and without ADHD—to the in-
dividual level. To date, there has been
modest success in these approaches,
which have used mainly neuroana-
tomical data, attaining diagnostic accu-
racies of 60% to 80%.18 Further advances
may rely on the in-
tegration of multimodal imaging
with genomic and cognitive data.

Parents sometimes ask if decisions
about treatment can be informed by
objective markers, such as those ob-
tained in neuroimaging (as seen in the
Case Vignette). Currently, treatment
choices for ADHD remain based on
an impressive body of clinical trials
rather than neuroimaging, or indeed
any biological markers at all.20 How-
however, neuroimaging stud-
ies have elucidated the mode of action
of treatments, particularly psycho-
stimulants, which are the most widely
used medications. Findings suggest
that psychostimulant-induced im-
provement of core symptoms is un-
derpinned by a shift in the activation
of key brain networks toward a more
typical range.19,20

There is also either no clear asso-
ciation between anatomy and psy-
costimulant treatment or that the
medication is associated with dimen-
sions unseen in unaffected controls.21
It is important to note that most studies
have been observational and thus
other factors, such as access to care,
demographic features, or comorbid-
ities, may be driving associations be-
 tween psychostimulants and brain
structure/function. Randomized tri-
als allow us to come closer to causal
inference and one interesting trial
found that methylphenidate—a psy-
costimulant—increased cerebral
blood flow in the thalamus in chil-
dren, but not in adults with ADHD.22

There is a long history in ADHD of
providing individuals feedback on
their neural activity, usually via a vi-
ual representation, so that they can
shift brain activity into more typical
patterns. EEG has mostly been used
to try to correct ADHD associated
patterns (that is, excessive slow [the-
ta] wave and suboptimal fast [beta]
wave activity) and to augment slow
cortical potentials that might improve
the allocation of cognitive resources.

Meta-analyses suggest such EEG
neurofeedback has trend level effica-
cy, with estimates varying widely be-
tween clinician, parent, and teacher
ratings.23 A new wave of studies use
fMRI to provide feedback on spatial-
ly well-defined brain activation, and
such spatial precision is generally
absent on EEG. For example, a re-
cent RCT provided children with
ADHD visual feedback on the activa-
tion of their right inferior frontal gy-
rus during a task requiring sustained
attention.24 Over time, children
learned to boost neural activation
and showed symptomatic improvement.

Conclusion

We are moving into the era of large,
collaborative studies that will provide
more robust measures of the anoma-
lies of brain structure and function
seen in ADHD. Such collaborations
face challenges, such as integrating
data acquired using different scanners
and sequences, but nonetheless prom-
ise to provide the sample sizes that
will be needed for future gene discov-
ery and understanding.

Dr Shaw reports no conflicts of interest concerning
the subject matter of this article.

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**Life with Dignity: A Tribute to Hilary Lister**

**Ronald W. Pies, MD**

“Death with dignity” is such a catchphrase right now in the media. But for those of us who suffer in our dark thoughts every day, we are living ‘life with dignity.’ Each day we live and make it through is a success. —Anonymous

No, this is not yet another philosophical discourse arguing against physician-assisted suicide. Along with my colleagues Drs Mark Komrad, Annette (Anne) Han-son, and Cynthia Geppert, I have covered that territory elsewhere. This article is about life with dignity—even amidst its raw and ravaging agonies. Mainly, this piece is about an Englishwoman, Hilary Lister, who recently died at the age of 46, after a long voyage of pain, endurance, and courage.

As related by Daniel Slotnik in *The New York Times*

Ms. Lister was relegated to her couch for years by a degenerative disease that rendered her immobile from the neck down and left her in near-constant pain. At one point the agony and tedium became too much to bear, and she resolved to end her life. ’I had been a very active person as a child,’ she told The Sunday Telegraph of London in 2008. ’I did sport. I played the clarinet. I went to Oxford University and studied biochemistry, and yet at that point of London in 2008. ’I did sport. I played the clarinet. I went to Oxford University and studied biochemistry, and yet at that point I not only couldn’t do anything, but I was also in terrible pain . . . I just couldn’t see the point in continuing, really.’ Then a friend persuaded Ms. Lister to come sailing, and she found a reason to live.

Over the years, Ms Lister became an adept sailor who could navigate sailboats using mechanisms similar to those that control electric wheelchairs, “. . . sipping on and puffing into straws connected to electronic mechanisms that controlled the vessels.” Most remarkably, in 2005, Ms Lister became the first quadriplegic person to sail alone across the English Channel and later to circumnavigate Britain entirely on her own. Throughout her many years of sailing, she endured almost unimaginable physical challenges:

*Her body struggled with thermoregulation . . . She was unable to go to the bathroom on a boat, which meant she could spend hours without relief. And she still experienced pain, which she said ranged from the sensation of sandpaper rasping her joints to that of knives piercing her.*

There were times when she was unable to breathe and required resuscitation by her support crew! And yet Ms Lister did what the English so famously and traditionally do: she carried on. Moreover, she described how sailing renewed her sense of pleasure on a boat, which meant she

Dr Chan’s account vividly illuminates the concept of “life with dignity”—the conviction that patients and physicians together may bear even the most harrowing circumstances at the end of life.

As physicians, we may not have chosen the course Dr Chan did; nor would all patients choose to continue battling their terminal illness after all realistic hope of cure or remission is gone. And, to be clear: any mentally competent person can refuse treatments that are unlikely to be of benefit (or are simply not desired) during one’s final days. Perhaps that is the wiser course for most—but not all—patients. And yet I believe Dr Chan exemplifies the best of Hippocratic medicine: listening carefully to the dying patient; offering one’s best medical advice; and then providing diligent care throughout the final days of the patient’s life. Most important, Dr Chan’s account vividly illuminates the concept of “life with dignity”—the conviction that patients and physicians together may bear even the most harrowing circumstances at the end of life.

As the poet Dylan Thomas famously expressed it:

Do not go gentle into that good night,
Old age should burn and rave at close of day;
Rage, rage against the dying of the light.

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**Additional Reading**


Three New Studies in Major Depression

Findings from three new studies in major depression indicate that

1. Vagus nerve stimulation improves the quality of life of patients with treatment-resistant depression;
2. Higher blood levels of omega-3 fatty acids have been linked to improved depression symptoms in patients with both depression and heart failure;
3. Treating depression in teens may benefit parents’ mental health.

Vagus nerve stimulation improves quality of life in patients with depression

Adding vagus nerve stimulation (VNS) to antidepressant therapy significantly improved the quality of life of patients with treatment-resistant depression. Self-reported quality of life assessments were used in a multicenter, longitudinal registry to compare the antidepressant efficacy of VNS plus antidepressant treatment...
(328 patients) with antidepressant treatment alone (271 patients). The patients had either unipolar or bipolar depression and experienced treatment failure in at least 4 antidepressant trials.

On about 10 of the 14 measures, patients in the VNS group had a clinically meaningful quality of life improvement of 34% to 40%, which was below the classically defined antidepressant response of 50%. Patients in this group also had significant gains in quality-of-life measures, such as mood, ability to work, social relationships, family relationships, and leisure activities compared with those who received only treatment as usual.

Clinical implications. “When evaluating patients with treatment-resistant depression, we need to focus more on their overall well-being. A lot of patients are on as many as three, four, or five antidepressant medications, and they are just barely getting by. But when you add a vagus nerve stimulator, it really can make a big difference in people’s everyday lives,” said principal investigator Charles R. Conway, MD, professor of psychiatry at Washington University.

Omega-3 supplementation eases depression in heart failure
Supplementation with omega-3 fatty acids can improve cognitive depres-
sive symptoms and social functioning in patients with comorbid heart failure and depression. A randomized, double-blind, placebo-controlled pilot clinical trial included 108 patients with chronic heart failure and MDD.

The patients received a combination of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) fish oil, an almost pure EPA, or a matched placebo daily for 12 weeks. Higher omega-3 blood levels were related to lower cognitive depression scores on the Beck Depression Inventory. The social functioning subscore of the SF-36 was significantly improved on the EPA/DHA supplement and tended to improve with the high EPA supplement.

Clinical implications. “Generally, we think of the function of omega-3s as preventative rather than as treatment. If used as treatment, the dose must be fairly high (4 grams is a typical drug dose) and blood levels must be measured. Linking higher blood levels of omega-3s to improved depression symptoms in people with both depression and heart failure hopefully leads to better treatment for their conditions,” said co-author William Harris, MD, of the Sanford School of Medicine in Sioux Falls, South Dakota.

Symptoms of depression linked in teens and parents
A long-term study included 325 teens who had a diagnosis of depression and 325 of their parents or caregivers. The teens were randomly assigned to receive cognitive behavioral therapy, an antidepressant, or a combination of both. The first treatment period ran for nearly one year, with an additional year of follow-up visits. One-quarter of the parents...
who participated also reported moderate to severe levels of depression before the treatment period.

The results showed that depressive symptoms improved in parents during treatment for adolescent depression in their children. In addition, improvement in adolescent depressive symptoms was associated with improvement in parental depressive symptoms. This supports the link between parent and youth mood and suggests that treatment for youth depression may benefit parents.

**Clinical implications.** “Depression is a massive public health concern that will take a variety of approaches to better manage. We believe our study is among the first to evaluate how the emotional health of a child can impact that of the parent,” said co-author Mark A. Reinecke, PhD, Professor of Psychiatry and Behavioral Sciences at the Northwestern University Feinberg School of Medicine. Lead author Kelsey R. Howard, MS, of Northwestern University, added: “The concept of emotions being ‘contagious’ and spreading from person to person is well-known by psychologists. This work opens up a range of possibilities for future research on the family wide effects of treatment for adolescent depression.”

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3. Howard KR. Parental depressive symptoms over the course of treatment for adolescent depression. Presented at the American Psychological Association Annual Convention. San Francisco; August 9-12, 2018.
New Developments in EEG Brain Scans Could Help Spot Mental Disorders “Early”

Daniel Pullin

Patients suffering from mental and neurological disorders, including autism, ADHD, and dementia, could benefit from new developments in brain scanning technology, according to a new study published in *The Neurodiagnostic Journal.* Recent advances in electroencephalography (EEG) technology, which may one day be used to measure brain function throughout a patient’s lifespan, could encourage earlier diagnoses of common mental and neurological disorders.

Easy-to-use, lower-cost EEG sensors are now widely available, thanks in part to research led by the computer games and consumer wearables industries. This new generation of portable EEG devices makes functional brain measurement possible...
The early detection of brain changes would open the door to new treatments aimed at slowing or prevention disorders.

The early detection of brain changes would open the door to new treatments aimed at slowing or prevention disorders.

Mental illness is responsible for an estimated 32.4% of years lived with disability and is as great a health burden as heart disease and cancer, when measured in terms of decreased quality of life. Early detection of brain changes would open the door to new treatments aimed at slowing or preventing disorders from advancing as soon as they start to develop, before significant irreversible changes have occurred in the brain.

Lead author of the study, Professor William Bosl, said:
EEG is the brain measurement tool of the future. Its relatively low cost and ease of use means that brain check-ups are now a real possibility in routine primary care. The challenge at this point is to develop the advanced computer algorithms that are needed to extract the brain information associated with various disorders.

Our initial research has shown that this is possible for autism spectrum disorder as early as 3 months of age. Neuroscience research suggests that EEG analysis may reveal information about a wide range of neurological and mental disorders, thus opening up a new approach based on early detection and prevention.

Professor Bosl and colleagues are currently working to introduce a master’s degree program in neurodiagnostic informatics at the University of San Francisco.

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Postpartum depression (PPD) in mothers has long been recognized and receives considerable attention, but the same is not true for fathers—until recently. Accumulating research and study on the influence of fathers on the early development of their children is shining a needed light on the challenges men encounter as they become parents and face the many similar situations that new mothers face. One challenge is postpartum depression and the cascading difficulties that this can have on new parents as well as their children.

Data show that between 2% and 25% of fathers experience postpartum depression, a prevalence that increases up to 50% if the mother also is depressed.1 The effect of parental PPD on children is profound and includes the potential for child abuse/neglect, adverse effects on the infant’s early brain development, family dysfunction, as well as increased medical care costs and inappropriate medical care.2

The American Academy of Pediatrics (AAP) recently published a clinical report on the evolving understanding of the important role fathers play in early childhood development. The report highlights the influence of paternal mental health on the wellbeing of children and urges a more active role in supporting new fathers as they transition into parenthood.1

“Dads are an important member of the team when we think about supporting families today, and one we often fail to include in pediatrics,” says Craig F. Garfield, MD, professor of Pediatrics, Northwestern University Feinberg School of Medicine, Chicago, Illinois, a coauthor of the report published in 2016. “This is unfortunate because father involvement and father well-being can benefit children and mothers. . . . If we want to optimize child outcomes, we need to think about the father but the whole family as well. Screening fathers for PPD

Recently published data from Cheng and colleagues adds to the growing body of evidence on the prevalence of PPD in fathers and the importance of paternal postpartum depression found during pediatric well-child care visits. Between August 1, 2016, and December 31, 2017, 9572 parents responded to a prescreening form that included assessment of postpartum depression. Of the parent responses from 9572 clinical visits, 2946 (30.8%) were attended by fathers and 806 (8.4%) responded to the prescreening questionnaire. Among the fathers who responded to the questionnaire, 4.4% screened positive for depression. This was comparable to the 5.0% of mothers who screened positive.

“Our study found that depression in new fathers is almost as common as it is in mothers,” says lead author of the study Erika R. Cheng, PhD, assistant professor of Pediatrics, Indiana University School of Medicine, Department of Pediatrics, Division of Children’s Health Services Research, Indianapolis. “The fact that so many new dads are experiencing this is significant because depression can have serious consequences if left untreated.” Cheng says, adding that depressed fathers are less engaged with their children, and this can lead to cognitive and behavioral problems in the child.

Among previous studies that also highlight the prevalence of PPD in fathers, data from the National Longitudinal Study of Adolescents to Adult Health (Add Health) provides additional information on specific variables of PPD in men. Using data from a nationally representative sample of 10,623 adolescent boys in the US who were followed for nearly 20 years into young adulthood, the study found that the prevalence of PPD rates in this cohort differed based on where the father lived (in the same home as the child or not).

Garfield, who was the lead author of the study, says the study showed that fathers who lived with their child had lower depressive scores before the child’s birth but that the depressive symptoms increased on average by 68% over the first 5 years of the child’s life. Conversely, fathers who did not live with their child had higher depressive symptoms prior to the child’s birth and lower depressive symptoms during the child’s early years. An important issue highlighted by this study is that fathers can and do play a diverse role in their children’s lives, whether they live with them or apart, and they are not necessarily the biological father but may be an adoptive father, stepfather, grandfather, or foster father.1 Given this diversity, “father” is broadly defined as “the male or males identified as most involved in caregiving and committed to the well-being of the child, regardless of living situation, marital status, or biological relation.”

Don’t forget the father

Clinicians are urged to talk with both parents, regardless of marital status, about the transition to parenthood. Checking how both parents are dealing with the new roles and responsibilities of parenthood and seeing if there is a way that can help both parents is key. (Table 1 provides suggestions on how to include the father in his partner’s clinical visit. Table 2 is a list of tools that can be used to screen fathers for perinatal depression.)

<table>
<thead>
<tr>
<th>TABLE 1. Suggestions to make fathers feel welcome during a mother’s visit†</th>
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<tbody>
<tr>
<td>• Welcome fathers and express appreciation for their attendance</td>
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<tr>
<td>• Recognize that mothers and fathers may not always agree on how best to raise a child</td>
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<tr>
<td>• Emphasize how children look to their fathers as role models of behavior and are likely to imitate behaviors they see</td>
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<tr>
<td>• Screen fathers for perinatal depression (see Table 2)</td>
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<tr>
<td>• Stress the unique role many fathers play in encouraging age-appropriate physical play and modeling such activity</td>
</tr>
<tr>
<td>• Explore the family composition of cultural beliefs about such things as fathering and men’s roles in families</td>
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<tr>
<td>• Encourage fathers to assume some roles early in the care of the child</td>
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<tr>
<td>• Inform the family about the normal elation, fatigue, and challenges of being a father</td>
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<tr>
<td>• Discuss how the couple is adapting to parenthood</td>
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</table>

<table>
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<tr>
<th>TABLE 2. Screening tools for perinatal depression in fathers</th>
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<tr>
<td>• Edinburgh Postnatal Depression Scale (EPDS), or a version that uses the partners report (EPDS-P)</td>
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<tr>
<td>• Gotland Male Depression Scale (GMDS)</td>
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<td>• Center for Epidemiological Studies Depression Scale (CES-D)</td>
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<td>• Patient Health Questionnaire-9 (PHQ-9)</td>
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References
Prescribing Substances of Abuse in Psychiatric Care

>> Samuel R. Weber, MD

Dr Weber is Psychiatry Department Chair, Intermountain Healthcare Logan Regional Hospital, Logan, UT.

Not long ago I attended a conference at which a speaker expressed some reservations regarding the use of hallucinogens—such as ketamine, MDMA, psilocybin, and LSD—as treatment options for patients with mental illness. The speaker’s reservations stemmed from an apparent discomfort with the idea of prescribing substances that before now had been known primarily as substances of abuse. Without any hint of irony, the speaker went on to comment that he viewed benzodiazepines as one of the most effective treatments for patients struggling with anxious depression.

The irony is that benzodiazepines, like hallucinogens, are substances that can be abused. In fact, the morbidly of benzodiazepine use appears to be significantly higher than that of hallucinogens. For example, in 2011 an estimated 152,179 patients had a benzodiazepine-related emergency department visit in the US, compared with 22,498 visits related to MDMA. Of those presenting for benzodiazepine-related visits, 42,314 (27.8%) required hospital admission. By contrast, only 2144 (9.5%) of those with MDMA-related visits required hospital admission.1

Despite the aforementioned discomfort with writing prescriptions that can lead to addiction, the use of potentially abusable substances has long been a staple of mental health care. The purpose of this article is to review some of that history, placing current discussions within a broader historical context, and to briefly examine ethical questions that such treatment raises.

COCAINE
Sigmund Freud was an enthusiastic proponent of cocaine as a mental stimulant and as a treatment for morphine addiction. In 1884, Freud noted that the euphoria brought about by cocaine “in no way differs from the normal euphoria of the healthy person” and that “no craving for the further use of cocaine appears after the first, or even after repeated taking of the drug.”2 Not long after Freud penned those words, the medical community became more aware of the addictive nature of cocaine. Freud later admitted that his advocacy for cocaine use “had brought serious reproaches down on me.”3 Cocaine was out of favor and is currently not utilized in the treatment of psychiatric disorders. Cocaine is a schedule II drug in the US, but it can still be prescribed as a topical numbing agent.

OPIOIDS
Before the advent of antidepressant medications in the 1950s, opioids had been used in the treatment of depression and anxiety. Once tricyclic antidepressants and monoamine oxidase inhibitors provided a more specific, nonaddictive pharmacologic option to treat depression, the use of opioids fell to the wayside.4

In the 1990s, tramadol, an opioid with a high degree of serotonergic activity, was studied as a treatment option for OCD.5 More recently, the lack of sufficient results from psychotropics focused on monoamine transmitter modulation has resulted in a renewed interest in opioids and opioid system modulation for the treatment of depression and suicidal- ity.6 Time will tell whether this enthusiasm for opioids is tempered by the current opioid crisis.

BARBITURATES
Barbiturates are CNS depressants with a lengthy history of being prescribed as anxiolytics and hypnotics, but the physical dependence generated by barbiturates was not widely recognized until the 1950s.7 These drugs were implicated in the deaths of celebrities such as Marilyn Monroe and Jimi Hendrix in the following decades.

The 1960s saw the development and commercialization of benzodiazepines, which eventually replaced barbiturates as anxiolytic-hypnotics in common psychiatric practice. Although no longer generally considered a preferred treatment for anxiety disorders, barbiturates are still prescribed by psychiatrists, for example in the treatment of severe alcohol withdrawal.

HALLUCINOGENS
LSD was made commercially available as a psychotropic prescription in 1947 under the trade name Delysid. Recreational use of LSD as part of the 1960s counterculture resulted in the decline and prohibition of medicinal LSD use.

Before being designated as a schedule I drug in 1985, MDMA had been used as an adjunctive treatment in psychotherapy.8 Despite the restrictions placed on these drugs, hallucinogens have recently seen some- thing of a renaissance in medical research, with ketamine notably being investigated because of its rapid effects in reducing suicidality.

LSD, psilocybin, and MDMA have been and continue to be investigated for potential benefits in psychiatric care.9 A breakthrough therapy designation by the FDA was granted to MDMA for treatment of PTSD in 2017.10 Although all of the mentioned hallucinogens are still under investigation, ketamine appears to have the most robust evidence supporting short-term efficacy in treatment-refractory depression. Recent findings suggest that ketamine’s antidepressant properties may be dependent on activation of opioid receptors, adding a layer of complexity and concern regarding its use.11 The use of other hallucinogens, albeit potentially promising, is stymied by their schedule I status and the need for additional research to increase clinical confidence in their use.

BENZODIAZEPINES
Benzodiazepines have generally replaced the use of barbiturates in treating anxiety disorders due to their improved safety with similar efficacy. Benzodiazepines are also addictive, however, and morbidity and mortality from benzodiazepine use appears to be on the rise. Overdose deaths involving benzodiazepines increased from 1135 in 1999 to 8791 in 2015.12 More than 30% of overdoses involving opioids also involve benzodiazepines, which has led the FDA to place black box warnings on these prescriptions about the hazards of combining benzodiazepines with opioids.13

Although safety concerns exist, benzodiazepines have established efficacy not only for the treatment of anxiety disorders, but also for agitation/aggression, catatonia, and alcohol withdrawal.

PSYCHOSTIMULANTS
Methylphenidate was synthesized in 1944. It was utilized in the 1950s in the treatment of depression, “smile behavior,” and narcolepsy.14 Later, the medication began to be used in the treatment of minimal brain dysfunction, the nosological precursor to ADHD.

Methylphenidate and other psychostimulants such as mixed amphetamine salts share properties with the street drug methamphetamine. The use of psychostimulants can also result in abuse and dependence. Methy- phenidate, amphetamine salts, and lisdexamfetamine are all schedule II drugs in the US.

Psychostimulants have well-established efficacy in the treatment of ADHD. More limited evidence supports their adjunctive use in the treatment of geriatric depression.

CANNABIS
Ongoing debates in the US regarding the therapeutic value of cannabis have included proposals for its use in psychiatric disorders. Although there is some interest in the potential role of cannabis in dementia-related behavioral disturbances and PTSD (with some states authorizing such use), current studies have not demonstrated robust results supporting efficacy for...
these purposes. Significant concerns also exist regarding the psychiatric adverse effects of cannabis, particularly the risk of developing psychotic illness such as schizophrenia when cannabis is used in adolescence.18

Aside from whole-plant cannabis, other cannabinoid-derived products have been investigated for use in neuropsychiatric conditions. A few small studies have examined nabilone, a synthetic endocannabinoid receptor agonist, with some initial findings suggesting benefits for sleep and nightmares in PTSD, although long-term tolerability remains unclear.16 An oral solution of cannabidiol recently received FDA approval to treat seizures associated with Lennox-Gastaut syndrome and Dravet syndrome.17 Although cannabidiol is a substance of interest for potential use in other psychiatric disorders including anxiety and addiction, additional data are needed to demonstrate its efficacy.18

Conclusion
Prescribing substances of abuse to treat psychiatric conditions has a lengthy history and continues to the present day. As noted, there are differences in the established utility and efficacy for each of these substances. Several of the mentioned substances are schedule I drugs. Others that are not include some being used off label. With this information in mind, the question is whether practitioners’ concerns about the use of a potential therapeutic agent relate more to a history of stigma against that drug than to other concerns? As well, are such concerns justifiable in light of the risks of addiction and abuse?

Such reflection may lead to an uncomfortable gray area in distinguishing therapeutic benefits from recreational highs. Drugs are addictive in part because they make the user feel “good” while under the influence of the substance. If a person is suffering from depression, isn’t the goal of treatment to make him or her feel “good” again? If so, what is the difference between the therapeutic resolution of depressive symptoms and the euphorogenic “high” of addiction? Perhaps the best measuring stick is that of a patient’s social and occupational functioning. As DSM-5 repeatedly points out, symptoms become disorders when they lead to impairments in functioning. If the substance enables functioning in the spheres where a patient was previously disabled, the benefits of the drug may outweigh the risks. If, however, the use of a drug becomes an end unto itself, the drug is not likely serving a beneficial purpose in the patient’s life.

Psychiatry will likely continue to occupy the “gray area” of prescribing substances with therapeutic intent that could also be misused. An understanding of the drugs prescribed, their potential risks and benefits, and the patients taking these drugs is more likely to promote safe prescribing practices and pharmacologic paradigms will ever do.

Dr Weber reports no conflicts of interest concerning the subject matter of this article.

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FROM OUR PARTNER PUBLICATION NEUROLOGY TIMES

Driving and Epilepsy
Issues to Discuss With Your Patients

Ana M. Sanchez, MD, and Allan Krumholz, MD

Dr Sanchez is Assistant Professor, Dr Krumholz is Professor Emeritus, Department of Neurology, University of Maryland School of Medicine, Baltimore, MD.

Worldwide there are more than 65 million individuals with epilepsy.1 In the US because driving an automobile is such an important aspect of our culture, driving restriction is an enormous problem for many of these individuals and their families. Indeed, surveys find individuals with epilepsy report driving as a major concern.2 Physicians and other medical providers play an important role educating and counseling people with seizures and their families regarding driving. Here, we provide some background and guidance regarding this issue.

Individuals with seizures are restricted from driving because of concerns that a seizure while driving might result in loss of control of the vehicle and a crash, potentially injuring the driver or others, and damaging property. Tragically, such crashes cause fatalities.3 Therefore every state in the US restricts some individuals with epilepsy from driving. Driving restrictions vary by state and are ultimately determined by the Department of Motor Vehicles (DMV).4 Physicians and other medical providers are involved to varying degrees throughout this process of driving regulation and restriction. They serve as advisers to patients, with a duty to inform patients regarding rules and regulations as well as consultants to state regulatory authorities.

To properly counsel patients, it is important that physicians and other medical providers are familiar with the rules governing driving for patients with seizure disorders. Our recommended approach to counseling patients with seizures and epilepsy regarding driving is illustrated in some of the following examples and discussion.

TABLE 1. States that require mandatory physician reporting of seizure5,11
Case example
A 23-year-old woman presents to your office with new-onset seizures. She generally feels well, has no other relevant history, and her examination is normal. Brain MRI with and without contrast and EEG are performed and are normal.

Q: As the medical provider, how would you counsel this patient regarding driving after her first unprovoked seizure (a seizure not related to an acute precipitating cause)?
A: She should be informed that a seizure while driving could be dangerous and result in a motor vehicle crash. Since she has had a seizure, she is at risk for further seizures. Regulations exist in an effort to prevent injury, death, or property damage that might result if a seizure were to occur while driving. She should be informed to stop driving and that patients are required by law to report their seizures to the DMV in their state. In some states, physicians and other medical providers are also required to report (Table 1) that a patient has had a seizure. The DMV will determine when she may resume driving.

A seizure-free interval is typically necessary for the DMV to approve a person to drive after a first seizure, this too varies by state. The typically required seizure-free interval may be as short as three months to as long as one year. There may be positive or negative modifiers that shorten or lengthen the seizure-free interval (Table 2). Antiseizure medication (ASM) is not always prescribed after a first seizure; this is a variable that may be considered on a case by case basis.

After reporting her seizures to the DMV, the patient and the medical provider are required to complete paperwork regarding the condition. A medical advisory board or similar type of state review will consider the case and make recommendations. Then a final decision regarding any driving restrictions will be made by the DMV. Decisions may be appealed by the patient.

Q: What if the seizure was provoked by some specific factor, such as triggered by a medication the patient was prescribed?
A: The driving restriction may be shorter if it is determined that a seizure was provoked and the provoking factor has been eliminated and is unlikely to recur.

The patient remains seizure free for several months, and the DMV determines that she is able to drive. Several months later, the patient has a second seizure and is prescribed levetiracetam, an ASM.

Q: Now how do you counsel the patient?
A: She is instructed that she should immediately stop driving and report the recent seizure to the DMV. Driving restrictions then resume while further medication adjustments are considered. She should be encouraged to try to utilize public transportation or be referred to the Epilepsy Foundation and other resources for transportation for patients with disabilities.

The patient has several more seizures and her dosage of antiseizure medication is increased. After the most recent dosage increase, she has had no further seizures. Her last seizure was 6 months ago. Paperwork is resubmitted to the DMV and the patient is told by the DMV that she can drive with close follow up in several months. She remains seizure free for five years, then she asks a question.

Q: The patient wonders now that she has been seizure free on medication for five years, might she come off antiseizure medication?
A: It is not unreasonable to consider taking her off ASM. There are no specific accepted state standards for restricting drivers with epilepsy when antiseizure medications are reduced or stopped. However, we would advise counseling patients that this is a period of somewhat greater risk for seizure recurrence, which may be about 30% in the first year after ASM is discontinued, and advising them to carefully consider that whether to discontinue ASM and their driving plans.

Q: What are some other legal issues for physicians or medical providers for drivers with epilepsy to consider?
A: In some cases, a physician should consider reporting a patient to the DMV even in a state without mandatory reporting. This would be the case if the patient was judged to be of considerable risk, for example, a patient who has frequent uncontrolled seizures, did not self-report, and has been involved in crashes because of the seizures.

Physicians and other medical providers should familiarize themselves with their states’ legal standards. The Epilepsy Foundation has a State Driving Laws Database (https://www.epilepsy.com/driving-laws). They should also document all discussions about driving and state laws in the patient’s medical record.

Discussion
Individuals with epilepsy are permitted to drive in every state in the US when their seizures are controlled. However, individuals with uncontrolled seizures are restricted from getting a license. In general, the main standard for determining adequate seizure control for licensure to drive is the duration of time that an individual has been seizure free. In the US this varies from three months to about one year. Details regarding the standards for licensure throughout the US are available on the Epilepsy Foundation website. The main reason that the seizure-free interval is used is because it is a reasonably reliable predictor of the risk of subsequent seizures.

There is evidence that the longer an individual remains seizure free the less likelihood there is for a seizure recurrence. A 3-month seizure-free interval has been proposed by a US Consensus Statement, and recent evidence supports that it is a reasonable standard. Both favorable and unfavorable factors are also proposed to influence the decision as to when someone with epilepsy may be licensed to drive (Table 2). These are based mainly on expert opinion, and one of the proposed favorable factors, reliable auras, has recently been questioned.

Noncompliance with legal standards is a major factor limiting the effectiveness of state regulations for drivers with epilepsy. Approximately half of all drivers with epilepsy or seizures who drive do not report their condition to state authorities. Such noncompliance limits the value of excessively long seizure-free intervals as they may promote greater noncompliance.

A major change is on the horizon for individuals in our society with epilepsy and other transportation disabilities. Pending their successful development, cost, and imple-

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**Table 2. Favorable modifying factors that might lead to a shorter seizure-free requirement and unfavorable modifiers that might lead to a relatively longer seizure-free requirement for driving**

<table>
<thead>
<tr>
<th>Favorable modifying factors</th>
<th>Unfavorable modifying factors</th>
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<tr>
<td>Seizures during medically directed changes in medication</td>
<td>Noncompliance with medication or medical visits, or lack of credibility</td>
</tr>
<tr>
<td>Focal seizures without alteration of awareness that do not interfere with consciousness or motor function</td>
<td>Recent history of active alcohol or drug abuse</td>
</tr>
<tr>
<td>Seizures that begin with consistent and prolonged auras</td>
<td>Structural brain disease</td>
</tr>
<tr>
<td>Seizures related to acute toxic or metabolic states or illnesses that are not likely to recur</td>
<td>Uncorrectable functional or metabolic disorder of the brain</td>
</tr>
<tr>
<td>Frequent seizure recurrences after prior seizure-free intervals</td>
<td>Prior crashes caused by seizures</td>
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<td>Prior bad driving record</td>
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mentation, so called “smart” or autonomous driving cars are likely to be in our futures and will revolutionize and benefit transportation and opportunities for people with epilepsy. Until that future when autonomous driving vehicles are widely available, reliable public transportation remains an important practical alternative that should be promoted for people with uncontrolled seizures and transportation disabilities.

References
Climate Change

and concerns, you can send an email to pollackd@ohsu.edu.

Dr Pollack is Professor Emeritus for Public Policy, Oregon Health and Science University, Portland, OR. He reports no conflicts of interest concerning the subject matter of this article.

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The Right Diagnosis

Continued from page 20

Dr. Marangoni reports no conflicts of interest concerning the subject matter of this article.

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ADHD Neuroimaging


Big Data for Depression

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One of the biggest challenges in treating depression is the ability to select the most appropriate and effective treatment for a particular individual from among the many available options. This is a significant public health issue, as the first treatment selected is effective only about 30% of the time. Although there are excellent clinical guidelines to address the management of a major depressive episode, the evidence is based on average rates of response in group data and not on individual characteristics or objective biological measures.

While the use of biomarkers in psychiatry holds great potential, large multimodal studies with standardized methods of data collection, longitudinal assessments, and collaboration among groups are necessary for discovery and subsequent validation of findings. Researchers have adopted this approach in an effort to stratify populations of depressed individuals based on their response to various treatments including pharmacotherapy, cognitive behavioral therapy (CBT), and neurostimulation.

Furthermore, standardized data collection using common measures within and across studies is required to help tease apart the heterogeneity of depression and thus identify treatment response subtypes. These measures can range from cognitive tests to blood-based protein assays as well as functional and structural MRI brain scans. Once these rich multidimensional datasets are integrated, the hope is that big data analytics will uncover clinically meaningful biological differences that can be translated into biomarkers.

The Canadian Biomarker Integration Network in Depression (CAN-BIND) is one of several multisite initiatives generating rich integrated datasets designed to identify biomarkers to inform treatment selection.

CAN-BIND’s standardized multimodality platform approach to data collection began with a 16-week open label standardized antidepressant treatment study called CAN-BIND-1. This internationally recognized research and education program has since expanded to include more than 10 clinical studies spanning 8 clinical research sites across Canada.

CAN-BIND researchers and study participants are working together to generate a large harmonized dataset that will span diverse interventions and specific populations, including adolescents at risk for developing mental health disorders and those who have attempted suicide. Collection of high quality data across CAN-BIND sites and studies is enabled by the Ontario Brain Institute’s (OBI) large-scale web-based neuroinformatics platform known as the Brain-Centre for Ontario Data Exploration (Brain-CODE). CAN-BIND is one of 5 OBI-sponsored Integrated Discovery Programs mandated to take a truly transldisciplinary research approach to advancing brain health. To maximize discovery from multimodal data collection, harmonized data points and established quality control processes are necessary to ensure sustained collection of high quality data and data integration. To facilitate this, CAN-BIND established platforms led by experts in each of the domains of interest: clinical outcomes, neuroimaging scans, electroencephalography (EEG) recordings, molecular assays involving standardized biospecimen collection, and mobile health (m-health) technologies.

Within this piece, we briefly describe standardization challenges, solutions provided by Brain-CODE, and potential effects within and across platforms. The hope is that these rich multidisciplinary datasets will contribute to the development and validation of tools and technology to help with self-management, real-time monitoring, and early detection and prevention of depression and relapses.

Electronic clinical data capture. While depression severity scales, such as the Montgomery-Asberg Depression Rating Scale (MADRS) and Hamilton Depression Rating Scale (HAM-D), are commonly used by research clinicians to assess patients, more nuanced behavioral and self-report tools to assess such variables as sleep and alertness, cognitive deficits, and anhedonia provide additional clinical information that could inform treatment selection. As such, 10 clinician-administered and 19 self-report questionnaires, all of which are based on theoretical and clinical utility, are part of the standardized battery of clinical information that could inform treatment selection.

Integrated Discovery

CAN-BIND is one of 5 OBI-sponsored Integrated Discovery Programs mandated to take a truly transldisciplinary research approach to advancing brain health. To maximize discovery from multimodal data collection, harmonized data points and established quality control processes are necessary to ensure sustained collection of high quality data and data integration. To facilitate this, CAN-BIND established platforms led by experts in each of the domains of interest: clinical outcomes, neuroimaging scans, electroencephalography (EEG) recordings, molecular assays involving standardized biospecimen collection, and mobile health (m-health) technologies.

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Multisite neuroimaging standardized data collection. In comparison to collecting clinical outcomes, collecting and standardizing brain scans is more costly and more technically difficult, especially when accounting for different MRI machines across sites. While this poses significant challenges for data integration, the additional biological information gained holds great promise for new discoveries and is representative of real-world clinical practice settings. CAN-BIND has taken on this challenge and implemented multiple quality control steps, including regular phantom scans that serve as a common reference to facilitate downstream analysis from different machines. In addition, semi-automated quality control procedures delivered through Brain-CODE’s imaging informatics software platform called Stroke Patient Research Recovery Database (SPReD), which is a part of the Extensible Neuroimaging Analysis Toolkit (XNAT), provides additional regular checks to ensure collection of high-quality brain imaging data across CAN-BIND sites and studies.

CAN-BIND is collecting structural and functional brain scans, both resting state and during various tasks, in an attempt to identify different depression subgroups based on brain connectivity and structure. These neuroimaging findings will contribute to a better understanding of the structural and/or functional changes associated with depression and treatment response, which in turn may inform treatment selection and facilitate a more targeted delivery. Hopefully, this also will lead to the development of more cost-effective and time-efficient proxy tests to shorten the path to recovery.

Potential in portable EEG devices. Brain activity measured by EEG may serve as a proxy biomarker for neuroimaging. With recent technological advances, portable EEG devices make it possible for assessments to be completed quickly and in community settings. Further research and development is needed to define measurements and create algorithms to predict and/or monitor treatment response. As a first step, CAN-BIND has developed standardized methodology to collect and analyze EEG data from dedicated research machines across sites and studies. This has yielded encouraging results as pilot EEG data from the CAN-BIND-1 study at baseline and 2 weeks post-antidepressant treatment have shown significant utility toward predicting treatment response. To investigate the possibility of enhancing sensitivity and specificity of predicting treatment outcome, follow-up analyses involving integration with MRI clinical, and molecular data are being conducted.

Molecular and mobile health technology data. Brain-CODE, through LabKey, has the capacity to handle the real-time monitoring capabilities. For secure transfer and storage of molecular data ranging from genomic and genetic data. LabKey serves as a file repository and allows for secure transfer and storage of CAN-BIND’s m-health data collected from wearables and mobile applications.

Computational psychiatry era. While individual platforms within CAN-BIND will contribute to expanding our knowledge of depression, the real strength and goal of the network is to carry out integrative data analyses across data collection platforms. To help prepare data for complex large-scale analytics, harmonized data are aggregated and interactive visual dashboards are created to query metadata and generate data packages on Brain-CODE.

Ontario Brain Institute’s Integrated Discovery Program

Brain-CODE

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FIGURE 2. Toward the improved understanding and treatment of comorbid depression

The Ontario Brain Institute

The Ontario Brain Institute is a provincially funded, not-for-profit research center seeking to maximize the neuroscience and establish Ontario as a world leader in brain research, commercialization, and care. OBI, in partnership with the Indoc Consortium, has built the Brain-CODE platform and provides data management support to its five Integrated Discovery Programs in cerebral palsy, depression, epilepsy, neurodegeneration, and neurodevelopment. For more information, please visit www.braininstitute.ca.

CAN-BIND

CAN-BIND is a national research and education program dedicated to transforming the way depression is characterized, understood, and treated. Our goal is to develop a precision treatment approach for depression. To achieve this, we have developed a large multidisciplinary team that includes clinician researchers, computer scientists, people with lived experience, mental health advocates, industry partners, government bodies, and many other experts. For more information, please visit www.canbind.ca.
In addition to integration across CAN-BIND studies, there are opportunities to collaborate and federate data with other international depression initiatives, such as the Establishing Moderators and Biosignatures of Antidepressants Response for Clinical Care for Depression (EMBARC) initiative. This should expedite discovery and validation of findings. Hopefully, this collaborative team effort will lead to readily accessible biological-based tests that can accurately and efficiently guide treatment selection for depression.

CAN-BIND, through Brain-CODE, will also have the opportunity to form linkages with other databases to further discovery. For example, Brain-CODE has developed a customized subject registry tool that collects an encrypted version of study participants’ Ontario Health Insurance Plan number; this enables linkage with the Institute for Clinical Evaluative Sciences health administrative database. In turn, this will allow CAN-BIND to link research and health care utilization data to conduct health economic analyses, including evaluation of the effects of new biomarkers and interventions and, ultimately, generate evidence to influence policy.

Comorbid depression
CAN-BIND, through its unique partnership with OBI and Brain-CODE, is also poised to advance our understanding of depression in other neurological disorders. For instance, in addition to CAN-BIND, OBI has supported the development of research programs in epilepsy, cerebral palsy, neurodevelopmental disorders (eg, autism), and neurodegenerative diseases (eg, Alzheimer disease, Parkinson disease).

To facilitate collaboration among the five existing OBI research programs, several common data elements (CDEs) were established using a Delphi consensus process with participation from all research programs. These CDEs reflect existing international standards established by such organizations as the National Institute of Neurological Disorders and Stroke and Clinical Data Interchange Standards Consortium. They include standardized instruments to collect demographic, depression, sleep, anxiety, quality of life, and other clinical questionnaire-based data. This paves the road for analysis of comorbid symptoms and common pathways related to depression and mental health (Figure 2).

To maximize outcomes, Brain-CODE is designed with data sharing, collaborative promotion, and open science in mind. Much thought and careful planning has gone into ensuring appropriate Brain-CODE governance, privacy, and security measures are in place to allow data from Brain-CODE to be shared, not only within and across OBI’s research programs, but also eventually with third parties to support data mining, discovery, and innovation.

Big data holds great potential for multidisciplinary innovations toward precision treatment and improving brain health. From CAN-BIND, this includes the use of portable brain activity monitoring devices, mobile applications, and blood based molecular assays as biomarker readouts, likely in combination with novel analytic algorithms, to improve management and treatment of depression.

(Continued on page 41)

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**Book Review**

**Memory’s Last Breath: Field Notes on My Dementia**

By Gerda Saunders

Reviewed by Burns Woodward, MD

Dr. Woodward is a psychiatrist in private practice in Waban, MA.

*Memory’s Last Breath* is the highly original account of a courageous and generous woman’s progressive cognitive impairment, and an exploration of its meaning in relationships and life. It will be good reading for psychiatrists and neurologists, other health professionals, patients, family members, and readers who enjoy fine writing.

Gerda Saunders, an emerita professor of gender studies, was diagnosed with vascular dementia at age 60. Her MRI showed multiple frontal lobe lesions. She describes her blunders—mismatched clothing, exiting stores without paying, damaging her car in a parking lot, rescue calls to her husband— with good-natured empathy. The story is carried by memories of her childhood in apartheid South Africa, university education in science, courtship and marriage, the family’s emigration to Salt Lake City, and her careers as mother, professor, and grandmother. With this she interweaves medical, psychological, and legal information about dementia. Most compelling are her fearless explorations of dementia in intimate relationships, and of suicide and assisted death for people with end-stage dementia.

The discrepancy between “the indignities accumulating in my daily activities” and her preserved writing skills led Saunders to wonder if she was “faking” dementia. Studying cognitive science, she learned of patients with more severe functional impairments who retained high-level skills they learned long ago. Her conclusion: “persons having spent a lifetime mastering particular knowledge structures and intellectual skills may retain access to this expertise even after becoming utterly dependent in daily activities . . . But in truth, writing is getting slower and harder.”

Slower and harder, but compelling. Her account of cortical functions is more cogent than most neuroscience writing:

*The parietal lobe is the site where visual auditory, and haptic, or touch-based, information combine to make sense of the world. The left parietal lobe is the area where letters come together to form words and where words are put together in thoughts. The right lobe enables understanding of the spatial nature of the world, including the ability to recognize faces and shapes, be aware of body states and deficiencies, and know directions.*

Two central chapters explore the implications of dementia for intimate relationships. She draws on her own marriage: John Bayley’s memoir of the dementia that killed his wife, the writer Iris Murdoch; a neighbor couple who had to be separated when the husband’s aggression became unmanageable; and a legislator who was tried and acquitted for sexual abuse of his wife, the claim being that she was too impaired to consent.

Dementia is an arduous subject, but Saunders’s understated style and creative juxtapositions hold and engage the reader. A feminist analysis of her relationship to fashion quickly morphs into struggles to remember what outfits go together, remedied by a photo album of successful combinations, followed by a trip to Nordstrom to resolve a funky mood but getting trapped in a locked stairwell. This ends, “I’m afraid my projects of writing down and/or photographing my outfits have, for the moment, come to an end. It takes me so long to write and just take care of myself that I have not been able to keep up my mnemonic system.”

No American state allows assisted suicide for people with dementia (or any other mental disorder). In a final chapter which rivals those on relationships for its unflinching courage, Saunders explores end-of-life issues around dementia. She does not want a painful and burdensome existence when her mind is gone, but more important is protecting her family from legal risk for hastening her death. She settles on voluntary stopping eating and drinking as a possible method. Here are a few of the “flags” she has provided to her relatives and health care agent about whether her quality of life is “dwindling below the level of acceptability”:

- Do I appear and act happy for more hours per day than I appear and act unhappy?
- Do I enjoy being in my garden (or that of the care center) watching the plants, birds, and insects?
- Can I physically get there without needing a team of people?
- Am I physically approachable without getting myself into a state of fear or anger; that is, is it still a pleasure for me to cuddle with a friend or child or grandchild?

Saunders includes more childhood memories than needed to understand her dementia—one senses an impulse to “get it all down.” But reviewing a life while one is still able can be psychologically important for the individual and family. I would have been grateful for an index, but this is no reference tome. It is a book to be read and experienced.
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The youth of today are digital natives; they have not experienced a world without the internet. They use social network sites and apps as a primary way of communicating with others in their social network as well as a means of obtaining information. Estimates from 2015 found that 67% of US teens ages 13 to 18 years old own a smartphone and engage with screen media for more than 6.5 hours each day.1 It is, therefore, only natural that the internet is one of the first places to which they turn when they experience stress or mental health related symptoms, whether they are trying to make sense of their experiences, aiming to understand possible diagnoses, gathering information about potential trajectories, evaluating treatment alternatives, or seeking peer advice. The presumed anonymity allows these youth to conduct their search and communication without feeling stigmatized by their real-world community.

Over the last several years there has been a sea of conflicting evidence regarding how youth use the internet and mobile technologies to learn about, access, and engage with mental health support. Last month a San Francisco-based social innovation group called HopeLab released a report on digital health, social media, and mental well-being among teens and young adults in the US.2 This online and telephone survey of 1,300 individuals between the ages of 18 and 22 offers an interesting single time point assessment of how younger generations are using technology in relationship to mental health (Figure). While the causal relationship between social media use and depression remains a controversial topic, this study did not find a correlation between use and self-reported depressive symptoms. However, the authors found that those with more self-reported depressive symptoms reported heightened response to social media (ie, it made them feel more positive and more negative at times) as compared to peers without any self-reported symptoms.

Another recent study published in the Journal of Pediatrics3 systematically reviewed how adolescents search for online health information and the extent to which they appraise the credibility of information they receive. The study found that adolescents are often not systematic in their search for online health information, and if indeed they search online at all. The youth face numerous barriers in their searches, particularly in constructing appropriate search strings and then navigating vast quantities of often irrelevant or inconsistent online health information. In addition, respondents noted that they felt overwhelmed by the responsibility of prioritizing the retrieved results.

Similarly, while many adolescents are aware that websites and the information therein vary in quality, the study found the way adolescents appraised websites was highly variable across individuals. The authors also found the methods were not always maximally effective. As a result, the researchers stressed the importance of developing resources to enhance search and appraisal skills. They also emphasized the need to collaborate with adolescents to ensure they are leveraging appropriate resources.

To complicate matters, there is an increasing volume of malicious and clearly harmful content aimed at youth with mental health vulnerabilities. In early August, for example, news spread of a suicide challenges on WhatsApp.4 Similarly, in 2017, a Russian online game called the Blue Whale Challenge encouraged users to commit suicide as part of the final challenge.5 This phenomenon of dangerous social media is not new to mental health; there is a long history of pro-eating disorder online communities that continue to thrive today.6 While these phenomena are relatively rare, they reflect the importance of online like-minded social communities and networks, something that is especially important for adolescents. Yet it remains difficult to understand how these dangerous challenges or communities proliferate, who they influence, and how they can be prevented.

Parents often find themselves overwhelmed by the abundance of oftentimes contradicting and non-empirical data and recommendations available online and therefore turn to clinicians for advice. Luckily, various online resources and portals are available relating to adolescent mental health issues, some even created by young people but curated by academic institutions (Table). One such example is Healthtalk, which provides a section for issues relating to young people, created by young people. The website stems from a unique partnership between a charity (DIPEx) that manages the website and the Health Experiences Research Group at the University of Oxford’s Nuffield Department of Primary Healthcare Sciences, which produces and shares the research that appears on the site. Beacon offers a portal to online applications (eg, websites, mobile applications and internet support groups) for mental disorders reviewed and rated by health experts maintained by the Centre for Mental Health Research at the Australian National University. Globally, the Society for Adolescent Health and Medicine offers online mental health resources aimed specifically at adolescents and young adults, including online resources, support groups, peer networks,

TABLE. Reputable online resources for adolescents

| HEALTH TALK | www.healthtalk.org |
| BEACON 2.0 | https://beacon.anu.edu.au |
| MINDFULNESS FOR TEENS | http://mindfullnesforteens.com |
| MOOD 247 | https://www.mood247.com/ |
| STRENGTH OF US | http://strengthofus.org/ |

*Interestingly, among those who scored higher on a depression screening test, 90% reported going online for mental health information.

Source: HopeLab"
helplines, treatment locators, and advocacy opportunities.

In this digital world, it is important for mental health clinicians serving adolescents to remain up-to-date on the dynamic evolution of online mental health resources. Clinicians also should be able to offer support around/involving technology. As it becomes impossible to deny that online communities are quickly becoming the gateway for youth to learn about mental health, it becomes clear that it is time for the mental health community to follow. A generation of youth has taken the lead and created new access, information, support, and risks in the creation of online communities centered on mental health. Partnering with these youths to steer this new frontier towards benefit and away from risk is the new challenge, as well as opportunity, for the field.

The authors report no conflicts of interest concerning the subject matter of this article.

References

Calling in the Script

Errors in technique are forgivable; failures in humanity are not.

—Ralph Greenson

Covering for a colleague I begin to startle after the tenth call—med refill requests, side effect questions, and suicidal thoughts I assess between my own patients rustling People in the waiting room. I’m strong all day, but when night comes on I tire, need food, time to reflect and catch my breath. At eleven, it’s the phone again. She’s anxious, can’t sleep, lost her script, can I phone it in? I question her hard, too hard, convinced I’m being scammed. Against my will, my voice becomes sandpaper, and I sand until she cries. Satisfied, I phone in the script. Fifty thousand calls in a career? Fifty thousand chances to get one wrong.
Psychocardiology, Part 2
Fixing the Broken Heart

The epidemiological aspects of the high comorbidity between cardiovascular disease (CVD) and major depressive disorder (MDD) were reviewed in Part 1 of this CME article in the September issue. The focus was on mental stress as a likely common instigator underlying both CVD and MDD. The role of the autonomic nervous system not only in regulating heart function but also in modulating the body’s inflammatory response to physical and mental insults threatening the integrity and the homeostatic balance of body and mind was discussed.

In Part 2, the role of the endothelium in undergoing pathological changes that lead to atheromatosis and atherosclerosis with ensuing sequelae are discussed. Endothelial dysfunction can be assessed using blood tests and application tonometry, the latter being a non-invasive procedure that can be carried out in ambulatory settings. Finally, the concept of psychocardiology as an emerging integrated approach to diagnose and manage heart disease patients and psychiatric patients vulnerable to heart and/or cerebrovascular disease is examined. The suggested formation of multidisciplinary teams will go a long way toward improved outcomes and a reduction in morbidity and mortality.

Endothelial dysfunction and arterial stiffness

MDD, by virtue of its proinflammatory status, leads to endothelial dysfunction that ultimately can lead to arterial stiffness. Studies have related arterial stiffness to absolute 10- to 12-year risk of stroke, coronary heart disease, and death. In addition to markers of inflammation, markers of endothelial function can be assessed in peripheral blood. Circulating biomarkers of endothelial function, include e-selectin, p-selectin, soluble intercellular adhesion molecule-1 (s-ICAM1), endothelin-1, asymmetric dimethylarginine (ADMA), von Willebrand Factor (vWF), and vascular cell adhesion molecule-1 (VCAM-1). These markers have been measured in the blood of subjects with CVD as well as in psychiatric populations with mood and anxiety disorders.

Do and colleagues’ assessed hopelessness, depression, and select endothelial markers. They found high levels of hopelessness to be significantly associated with e-ICAM1, whereas high levels of hopelessness were significantly associated with s-ICAM1.

In a large population-based cohort study (N=852), depressive symptoms were assessed with the Patient Health Questionnaire-9 and (major and minor) depressive disorder with the Mini-International Neuropsychiatric Interview. Plasma biomarkers of inflammation (hsCRP, SAA, sICAM-1, IL-6, IL-8, TNF-α) and endothelial dysfunction (sVCAM-1, sICAM-1, sE-selectin, vWF) were measured with immunoassays and combined into two standardized sum scores. Biomarkers of inflammation (hsCRP, TNF-α, SAA, sICAM-1) and endothelial dysfunction (sICAM-1, sE-selectin) were univariately associated with depressive symptoms and depressive disorder. The researchers concluded that both inflammation and endothelial dysfunction are associated with depressive disorder, independent of lifestyle factors.
In a recent study, Celano and colleagues' assessed psychological con-
structs in a cohort of post-acute coronary syndrome patients and measured
markers of inflammation, endothelial function, and myocardial strain. They
determined that depressive symptoms were associated with elevated inflam-
mation, endothelial dysfunction, and myocardial strain. By contrast, positive
psychological constructs, such as optimism and gratitude, were linked to bet-
ter endothelial function.

The index of arterial stiffness with the greatest pathophysiological and
clinical background is pulse wave velocity. The shape of the arterial pressure
waveform provides a measure of systemic arterial stiffness and can be as-
essed noninvasively by using the technique of pulse wave analysis. As deter-
mined by pulse wave analysis, arterial stiffness has been shown to be an in-
dependent marker of cardiovascular risk.4 The approach has been suc-
cessfully utilized to assess arterial stiffness in depression, aging, and
coronary artery disease (CAD).5,6 Unpublished data clearly indicate that
arterial stiffness increases as a function of age in physically and mentally
healthy men and women. However, in the presence of MDD, arterial stiffness
is significantly increased with the highest values observed in postmenopaus-
al women with MDD whether untreated or under treatment with an antide-
pressant medication.

Ischemic heart disease and depression

The association between depression—and likely other psychiatric disorders—
and CVD is bidirectional, with both entities sharing common pathophysio-
logy. A 2013 study of 45 young individuals at increased risk for depression
provided evidence of an altered cardiovascular risk profile in young adulthood
even without overt depressive symptoms. Such vulnerability may precede or
follow the onset of depression and may share common risk factors.7

Following myocardial infarction (MI) the presence of depression has a
cumulative effect on mortality. The Montreal Heart Study followed 222 post-
MI hospitalized patients and found that the cumulative mortality rate for de-
pressed patients post-MI was significantly higher than the rate for non-de-
pressed patients, with the greatest effect occurring in the first 6 months.8
Premature ventricular contractions and elevated Beck Depression Inventory
(BDI) scores were significantly related to mortality at 18 months.

The Montreal group also examined longer-term survival and measured
BDI scores of 892 post-MI patients at admission and again at 1 year.9 They
found a significant dose-response relationship between BDI scores and car-
diac mortality, and these results remained significant even after controlling
for multiple measures of cardiac disease severity. Patients with the highest
initial BDI scores had the worst prognosis; an improvement in depressive
symptoms lessened cardiac mortality only for patients with mild depression.
The researchers concluded that the link between depression and cardiac mor-
tality may be a relatively permanent marker for long-term survival.

Heart failure

Heart failure is a serious syndrome that, depending on severity, interferes with
normal functioning, significantly impairs the capacity of an individual to lead
a normal life, and may ultimately lead to death. Close to one million new
cases of heart failure will occur in the US in 2018 and, as reported at the An-
nual Cardiovascular Conference in Snowmass, Colorado, most of them could
have been prevented.

Before discussing preventive measures, what is our understanding of the
pathophysiology of this syndrome? Several models have been proposed but
inflammation remains at center stage. To quote from an earlier publication by
Seta and colleagues,10 “heart failure progresses, at least in part, as a result of
the toxic effects exerted by endogenous cytokine cascades on the heart and
the peripheral circulation.” Animal and clinical data support the presence of
an inflammatory cascade that is involved at least in the progression of heart
failure.11

The main risk factors for the development of heart failure are ischemic
heart disease and hypertension followed by diabetes, dyslipidemia, metaboli-
c syndrome, obesity, alcoholism, and smoking. Atherosclerotic cardiovascu-
lar disease must be diagnosed early in the process to prevent serious sequelae.
Diagnostic biomarkers including assessment of arterial stiffness may eventu-
ally be introduced into psychiatric practice since stress-related illness can
lead to endothelial dysfunction as a preamble to atheromatosis and athero-
sclerosis.

Effective management of hypertension and dyslipidemia, including edu-
cation of the patient, dietary counseling, and diabetes control, especially with
administration of inhibitors of the sodium-glucose transporter, are huge steps
toward the prevention of heart failure. The Framingham Heart Study conclud-
ed that obese individuals had double the risk of new-onset heart failure, com-
pared with those who were of normal weight.12 Obesity must be addressed in
primary care, general medicine, cardiology, and psychiatric practices.

Psychological interventions can be effective, especially if combined with
nutritional counseling and regular follow-ups. Smoking must be addressed in
most all practices independent of specialty or subspecialty area. Pharmacol-
ogical and psychological interventions, preferably in combination, can be
quite effective in enabling permanent smoking cessation. The administration
of psychotropic compounds that are known to cause weight gain and meta-
holic syndrome must be avoided especially since newer agents are available
that do not have such an adverse effect on the organism.

Lifestyle modification with expert counseling as part of general and/or
psychiatric practice can go a long way toward preventing ischemic heart dis-
ease and associated consequences. Key lifestyle factors include maintaining
a normal body weight, regular exercise, smoking cessation, drinking in mod-
eration, and a healthy diet made up primarily of vegetables and fruit.

Chest pain

Chest pain is a common presenting complaint in a cardiology clinic and can
have numerous etiologies beyond heart disease. It is a common and potential-
ly complex patient complaint, amounting to more than 6 million cases in the
US annually. After extensive and costly evaluations, many patients receive a
diagnosis of non-cardiac chest pain (NCCP). Approximately 30% of all cor-
nary angiograms prove to be negative for significant coronary artery disease
CAD, thus patients receive a diagnosis of NCCP.

Unexplained chest pain is often comorbid with anxiety, depression, and
somatiform disorders. In a recent study, the comorbidity of psychiatric con-
ditions and NCCP was examined prospectively in a cohort of 231 NCCP
patients free of a current or lifetime cardiac diagnosis.13 The findings indicate
that 44% of the NCCP patients suffered from a current Axis I psychiatric di-
agnosis; anxiety disorders (41%) and mood disorders (13%) were the most
prevalent. Patients with NCCP may also have exaggerated or abnormal car-
diac pain perceptions, visceral hyperalgesia, and/or abnormal cardiac sensi-
tivity to a variety of stimuli.

Treatment of NCCP includes psychotherapy and psychotropic medica-
tions, such as antidepressant and anxiolytic drugs. (For additional infor-
mation, the interested reader is referred to a recently published review article
on this topic.14)
The psychocardiology concept

The relationship between certain psychiatric disorders and CVD/cerebrovascular disease (CBVD) is complex. To address these issues, multidisciplinary teams of specialists in cardiology, psychiatry, and psychology as well as established researchers with diverse expertise in basic laboratory, clinical, and cardiodiagnostic methods are needed. Such integrated teams with the requisite expertise have recently begun to work collaboratively, but more needs to be done. Only through cohesive interactions of such multidisciplinary teams can we succeed in unraveling the complex relationships between mental stress, inflammation, immune responses, and psychiatric disorders and CVD/CBVD.

A number of collaborative care treatment programs have been formed that focus on the management of depression and anxiety disorders in patients with CVD as well as other conditions such as diabetes and cancer. The National Institutes of Health funded the Bypassing the Blues (BtB) study, the first trial to examine the impact of a collaborative care strategy for treating depression in patients with cardiac disease.12-17

Another relevant multicenter clinical trial is the Comparison of Depression Interventions after Acute Coronary Syndrome (CODIACS) randomized controlled trial. Results from this ambitious study demonstrated that for patients with post-acute coronary syndrome depression, active treatment had a significant beneficial effect on depressive symptoms. The researchers concluded that this kind of depression care is feasible, effective, and is likely to be cost-neutral, therefore it should be tested in a large phase 3 pragmatic trial.18,19

Last but certainly not least, TEAMcare is a highly successful model of practice-based interventions that address concomitant depression and chronic medical conditions in the primary care setting. These and others are notable examples of successful programs based on the psychocardiology concept.20,21

The psychocardiology concept would promote recognition of the high comorbidity between psychiatric disorders and CVD/CBVD and lead to more effective treatment approaches. A close interaction between the two specialties will lead to improved diagnostic and prognostic assessments, and significantly reduce patient suffering and health care costs.22

Such a concept could lead to the formation of teams of clinicians and researchers who would provide patient assessment and management and pursue multidisciplinary research. Designing and implementing training modules that focus on psychocardiology in psychiatric and internal medicine residency programs would be an excellent start. A formal subspecialty with fellowship training and board certification might follow after the successful implementation of pilot programs (Table 1).

Adoption and implementation of the psychocardiology concept will be a process over many years. The short- and long-term goals that private and hospital-based cardiology and psychiatry practices might consider are outlined in Table 2. The recommendations in Table 3 lend themselves to implementation as part of “Good Clinical Practice” regardless of whether a formal psychocardiology team has been assembled.

Conclusions

CVD and psychiatric disease (notably mood and anxiety disorders) comorbidity is highly prevalent and poses major and urgent challenges. Stress plays a critical role in the generation and progression of both disease entities. To address the complex factors that underlie the comorbidity, the concept of psychocardiology is proposed, which will lead to multidisciplinary teams who could be sponsored jointly by cardiology and psychiatry services/department.

Many of the short-term recommendations can be implemented right away, while longer-term goals will have to wait for additional research and validation. To that end, federal and private funding for the establishment of pilot programs would be a highly desirable first step to prove the validity of the psychocardiology concept and the utility of the proposed tests and procedures for introduction into practice.

References

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Table 3. Designing a comprehensive treatment plan

Upon completion of all assessments the psychocardiology team convenes to assess the findings and to develop a comprehensive treatment plan; such a plan for patients with a cardiovascular problem may include the following (in addition to conventional care for the underlying cardiovascular problem):

- Psychotropic agent(s) as appropriate for the condition; consider drug interactions
- An appropriate psychotherapeutic modality
- Smoking cessation, if indicated, with motivational training as appropriate
- Nutritional assessment and guidance including vitamins B, D, E
- Stress management skills for stress reduction
- Relaxation techniques to restore autonomic nervous system homeostatic balance (eg, yoga, mindfulness training)
- Sleep hygiene and sleep normalization

22. Lin EH, Von Korff M, Ciechanowski P, et al. Treatment adjustment and medication adherence for com-

Post-tests, credit request forms, and activity evaluations must be completed online at www.cmeoutfitters.com/PT (requires free account activation), and participants can print their certificate or statement of credit immediately (80% pass rate required). This Web site supports all browsers except Internet Explorer for Mac. For complete technical requirements and privacy policy, visit www.neurosciencecme.com/technical.asp.

PLEASE NOTE THAT THE POST-TEST IS AVAILABLE ONLINE ONLY ON THE 20TH OF THE MONTH OF ACTIVITY ISSUE AND FOR 18 MONTHS AFTER.

Big Data

Continued from page 34

Acknowledgment—This article is based on a presentation by Brendan Behan’s and Joanna Yu’s presentation at the 2017 Annual National Network of Depression Center (NINDC) Conference.

NINDC’s goal is to foster collaborative research to advance scientific discovery and drive forward improved care for patients with depression and mood disorders. NINDC is an American-based initiative and is a content partner of Psychiatric Times.

References

STATEMENT OF OWNERSHIP, MANAGEMENT, AND CIRCULATION
(Requester Publications Only) (Required by 39 USC 3685)

1. Publication Title: Psychiatric Times
2. Publication Number: 0893-2905
3. Filing Date: 9/30/18
4. Issue Frequency: Monthly
5. Number of Issues Published Annually: 12
6. Annual Subscription Price (if any): $59.00
7. Complete Mailing Address of Known Office of Publication:
   131 West First Street, Duluth, St. Louis County, Minnesota 55802-2065
   Contact Person: Kelly Kemper
   Telephone: 629-252-2039
8. Complete Mailing Address of Headquarters or General Business Office of Publisher:
   2 Penn Plaza, 15th Floor, New York, NY 10121
9. Full Names and Complete Mailing Addresses of Group Publisher:
   Arno Beilin, 485 F Route 1 South, Suite 210, Iselin, NJ 08830
   Executive Editor: Natalie Timotheos, 535 Connecticut Ave. Suite 300, Norwalk, CT 06854
   Digital Managing Editor: Laurie Martin, 535 Connecticut Ave., Suite 300, Norwalk, CT 06854
10. This publication is owned by: UBM Medica, 535 Connecticut Avenue, Suite 300, Norwalk, CT 06854. An indirect, wholly owned subsidiary of UBM, 240 Blackfriars Road, London, SE1 904, United Kingdom.
11. Known Bondholders, Mortgages, and Other Security Holders Owning or Holding 1 Percent or More of Total Amounts of Bonds, Mortgages, or Other Securities.
12. Does Not Apply
13. Publication Title: Psychiatric Times
14. Issue Date for Circulation Data Below: August 2018
15. Extent and Nature of Circulation

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17. Publication of Statement of Ownership for a Requester Publication is required and will be printed in the October issue of this publication.

Name and Title of Editor, Publisher, Manager, or Owner: Christine Shappell, Audience Development Research Director

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Date: 9/30/2018

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Los Angeles County Department of Mental Health is a nationally recognized leader providing a wide range of services to one of the largest populations in the country. We invite you to join our team as we help the most vulnerable in our community find a path to independence and personal recovery.

- Starting annual salary immediately post residency completion is $233,784 with potential bonuses of $52,000 annually.
- Reimbursement for eligible relocation expense up to $15,000.
- Student loan repayment incentive of $50,000/yr (up to 5 yrs), or recruitment incentive bonus of $25,000/yr (up to 2 yrs).

www.psychiatristjobs.la

Jacobi Medical Center (JMC) is a modern, state-of-the-art, Level 1 Trauma Center located in an attractive and safe residential Bronx neighborhood just 20 minutes north of Manhattan. It is a North Bronx Healthcare Network hospital affiliated with North Central Bronx Hospital and a teaching site and academic affiliate of the Albert Einstein College of Medicine. It offers a full continuum of Acute Care Inpatient and Outpatient services in diverse Medical and Surgical Specialties, including Psychiatry. The Department of Psychiatry has 80 Adult Acute Inpatient beds, a Comprehensive Psychiatric Emergency Program (CPEP), a Consultation-Liaison Service, an Adult Ambulatory Practice, and a Community-Based Assertive Community Treatment Program. The department employs evidenced-based best practices in providing the highest quality care to its patients, in a patient-centered approach that is respectful of their individuality, culture, and community.

North Central Bronx Hospital (NCB) is a modern, state-of-the-art community hospital located in an attractive and safe residential Bronx neighborhood just 20 minutes north of Manhattan. It is a North Bronx Healthcare Network hospital affiliated with Jacobi Medical Center and a teaching site and academic affiliate of the Albert Einstein College of Medicine. It offers a full continuum of acute care inpatient and outpatient services in diverse Medical and Surgical specialties, including Psychiatry. The NCBH Department of Psychiatry has 70 Adult and Geriatric Acute Inpatient Beds, a Partial Hospital Program, Psychiatric Emergency Consultation-Liaison Service, an Adult Ambulatory Practice, and a community-based Assertive Community Treatment Program. The department employs evidenced-based best practices in providing the highest quality care to its patients, in a patient-centered approach that is respectful of their individuality, culture, and community.

Jacobi Medical Center & North Central Bronx Hospital are currently accepting applications and referrals for the following opportunities:

- Inpatient Attendings (JMC and NCB)
- PI Coordinator (Jacobi)
- Attending Psychiatrist ER/CPEP (JMC)
- Inpatient Unit Chief (JMC)
- Director of Psychiatry Emergency Services (NCB)
- Attending Psychiatrist ER (NCB)
- Collaborative Care (Psychiatrist within Adult Primary Care Services)
- Moonlighting opportunities also available (JMC and NCB)

An academic appointment at Albert Einstein College of Medicine is offered. We offer a generous income package along with outstanding benefits, opportunities for advancement, retirement plan, malpractice, and much more!

For immediate confidential consideration, please contact:
Carmen Velez – Office of Physician Recruitment: Velezl@pagny.org 546-494-7559

www.pagny.org

Physician Affiliate Group of New York (PAGNY) is comprised of over 3,600 physicians and healthcare professionals who provide services to NYC Health + Hospital, the largest public healthcare system in the United States. Our practitioners are highly skilled professionals with outstanding credentials who deliver the highest level of quality healthcare to patients throughout New York City.

EOE M/F/D/V

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Board Certified
$261,612 - $314,352
Board Eligible
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Find Your Career Balance in California

California Correctional Health Care Services (CCHCS) is seeking proactive, knowledgeable psychiatrists with an interest in correctional or forensic psychiatry to join our Psychiatric Inpatient Program (PIP).

Within the PIP, you will:

- Perform psychiatric evaluations for assigned in-patients in the Acute Psychiatric Program and/or Intermediate Treatment Program units
- Write orders for admission, transfer, discharge, medications, seclusion, and suicide precautions
- Provide individual and group psychotherapy

We currently have opportunities at the following facilities:

- California Health Care Facility – Stockton
- California Medical Facility – Vacaville
- Salinas Valley State Prison – Soledad

CCHCS offers competitive salaries with all of the security that comes with State employment, including:

- 40-hour workweek with flexible schedules – affords you true work-life balance
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- $10,000 Thank You Bonus to professionals newly hired with the State of California

Take the first step in joining one of these outstanding teams and contact LaTreese Phillips at (916) 691-4818 or CentralizedHiringUnit@cdcr.ca.gov. You may also apply online at www.chhcs.ca.gov.

EOE
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For clinical staff and leadership positions

The State of New Jersey is seeking motivated BE/BC Psychiatrists for full-time inpatient work in our Joint Commission-Accredited state psychiatric hospitals and forensic center. Psychiatrists with management experience are also needed to serve as Medical Director or Associate Medical Directors in some facilities.

- Facilities are in close proximity to metropolitan centers of New York City and Philadelphia/Philadelphia area
- Psychiatrists work with a multidisciplinary team
- Primary care physicians provide for patients’ physical health care
- University affiliations
- Opportunities to work with forensic fellows and psychiatry residents
- On-site CME activities and paid CME leave time
- 35 hour work week
- Competitive salaries
- Opportunities for voluntary on call available
- Tuition reimbursement for full-time employment is available
- 12 paid holidays
- Generous medical and dental benefits and retirement packages for full-time positions

Candidates must possess N.J. medical license.

Interested candidates should send cover letter and detailed resume to:
Robert Eilers, MD
Medical Director
Robert.Eilers@njhealth.org
609-438-4147

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When you join Northwest Permanente, P.C., you’ll have the chance to practice in an environment that offers ample opportunity to pursue – and achieve – your personal and professional dreams. You’ll benefit from a comprehensive network of support services and a talented team of colleagues who share your passion for medicine and patient care. We invite you to consider these opportunities with our physician-managed, multi-specialty group of over 1,500 physicians and clinicians who care for over 600,000 members throughout Oregon and Southwest Washington.

BC/BE PSYCHIATRISTS • Pacific Northwest

Northwest Permanente, P.C. is currently seeking BC/BE Adult Psychiatrists to staff our facilities throughout the Portland Metro area and Salem, Oregon as well as in Longview-Kelso and Vancouver, Washington. The positions are outpatient with some virtual care, consultations occurring in our ERs and require compatibility with physicians in the primary care setting. Candidates should have experience in medication consultation, crisis intervention, evidence-based psychiatric treatments and psychiatric consultations. We also have openings for inpatient Psychiatrists at our Brookside Center in Portland, Oregon.

We offer excellent benefits:
- $25,000 sign-on bonus*
- $125,000 loan assistance program for medical education*
- Professional liability coverage
- Generous pension program
- Sabbatical leave, education leave and more
- Competitive salary and benefit package

* Inquire for details

To apply, please visit our Web site at: http://nwp.kpphysiciancareers.com.
For more information, call Laura at (503) 813-3862 or email Laura.A.Russell@kp.org.

EEO/AA employer M/F/D/V.

-seeking Psychiatrists!

Central New York Psychiatric Center (CNYPC) recognizes that our employees are our greatest resource. We are seeking motivated psychiatrists to help promote hope, resilience, and recovery within a culture of safety that employs a team approach. CNYPC is a dynamic organization that provides comprehensive forensic mental health services through a continuum of care at its inpatient setting, located in Central New York, and in the Correctional System throughout New York State. CNYPC is fully accredited by The Joint Commission.

Benefits:
- Recent inpatient salary increase: $247,087-$268,311.
- Psychiatrist Loan Repayment Program offering up to $150,000 over 5 years.
- Flexible work schedules. Private practice permitted.
- Tele-psychiatry positions available at our VTC Suites.
- Optional paid on-call duty at the hospital.
- Opportunities for academic affiliation with SUNY Upstate, Division of Forensic Psychiatry.
- Generous benefits and retirement package.
- Relocation assistance.
- Robust continuing medical education opportunities.
- Satellite Units located throughout the NYS, within commuting distance of all major cities.

For more information, contact Melinda Carey, HR Specialist, at 315-765-3360 or Melinda.Carey@omh.ny.gov
UMass Memorial Health Care and the University of Massachusetts Medical School currently has openings within the Department of Psychiatry. To view these openings directly, please click on either of the two links below.

• UMass Memorial Health Care: https://www.umassmemorialhealthcare.org/careers/physician-opportunities
• UMass Memorial Medical School: http://academicjobsonline.org/ajo/UMASSMED

UMass Memorial Health Care is the largest health care system in Central Massachusetts. We are the clinical partner of UMass Medical School, with access to the latest technology, research and clinical trials. In addition to our fully equipped medical centers, our system also includes home health and hospice programs, diverse behavioral health programs and community-based physician practices.

The Department of Psychiatry is a national leader in public sector psychiatry, child and adolescent psychiatry, neuromedical disorders, biological psychiatry, neuropsychiatry, forensic psychiatry, psychosocial rehabilitation, women’s mental health, and addiction psychiatry. We integrate our clinical, research, teaching and community partnership activities to help individuals and families transform their lives through recovery from mental illness and addiction. We are the largest provider of psychiatric services in central Massachusetts with over 350 faculty and 10 hospitals and community mental health centers.

Our residency program trains 7 residents per year including general psychiatry and specialty tracks for combined adult and child psychiatry and combined neurology and psychiatry. We offer fellowships in Child and Adolescent Psychiatry, Addiction Psychiatry, Forensic Psychiatry, Neuropsychiatry, and Adult Developmental Disabilities.

The Department of Psychiatry is a national leader in public sector psychiatry, child and adolescent psychiatry, neuromedical disorders, biological psychiatry, neuropsychiatry, forensic psychiatry, psychosocial rehabilitation, women’s mental health, and addiction psychiatry. We integrate our clinical, research, teaching and community partnership activities to help individuals and families transform their lives through recovery from mental illness and addiction. We are the largest provider of psychiatric services in central Massachusetts with over 350 faculty and 10 hospitals and community mental health centers.

Applicants should submit a letter of interest and curriculum vitae addressed to:
Sheldon Benjamin, MD
Interim Chair of Psychiatry
University of Massachusetts Medical School
UMass Memorial Medical Center
c/o: Jessica Saintelus, Physician Recruiter
Jessica.Saintelus@umassmemorial.org

As the leading employer in the Worcester area, we seek talent and ideas from individuals of varied backgrounds and viewpoints.

The Department of Psychiatry at Indiana University School of Medicine (IUSM) in partnership with Indiana University Health Physicians (IUHP) is expanding and seeking faculty candidates in adult psychiatry, geriatric psychiatry, child and adolescent psychiatry, addictions psychiatry, adult consult-liaison psychiatry and virtual care psychiatry. Inpatient and outpatient opportunities are available. Applicants must be board-certified or board-eligible by the American Board of Psychiatry and Neurology.

**Why join the IU School of Medicine and IU Health Physicians?**

- IUSM is the largest medical school in the nation.
- IUSM is a research intensive academic institution and the Department of Psychiatry consistently ranks in the top 25 departments of psychiatry nationally in NIH funding.
- IU Health is a top healthcare provider in the nation and the most comprehensive health care system in the state of Indiana.
- IU Health has recently committed to a large strategic investment to improve the behavioral health of the citizens of Indiana.
- A career with IU Health Physicians means an opportunity to work among 80 percent of Indiana’s top doctors.
- Recently restructured and improved compensation package with forgivable loan options and comprehensive benefits.

**Primary Responsibilities and Duties:**

These positions include direct clinical care, teaching, supervision, administrative duties and a rich array of research opportunities. These positions are all active sites for IUSM medical students, IU Psychiatry residents, Psychology interns, and other learners. Creative thinking and collaboration with services within the academic health center and community organizations will be crucial components of these roles.

Interested applicants should send CV to Attn: Thomas W. McAllister, M.D.
Professor and Chair, Department of Psychiatry
tom.majhuhe@iupui.edu
With the continued growth of our Department of Psychiatry and our New General Psychiatry Residency Programs at Ocean Medical Center and Jersey Shore University Medical Center our vision for Behavioral Health is Bright.

Hackensack Meridian Health is a leading not-for-profit health care network in New Jersey offering a complete range of medical services, innovative research, and life-enhancing care aiming to serve as a national model for changing and simplifying health care delivery through partnerships with innovative companies and focusing on quality and safety.

Through a partnership between Hackensack Meridian Health and Seton Hall University, the School of Medicine will re-define graduate medical education, research, and clinical practice; reverse the critical physician shortage in both the New York/New Jersey metropolitan area and the nation; and stimulate economic development in northern New Jersey.

The School of Medicine will be the anchor in the development of a comprehensive health sciences campus that will also include research facilities and biotechnology endeavors – all in service of educating tomorrow’s doctors, discovering novel therapies, and facilitating compassionate and effective healthcare that will meet the ever-changing needs of tomorrow’s patients.

The School of Medicine will be the cornerstone of a dynamic venue for the exchange of ideas, the development of healthcare and research thought leaders and practitioners, and the discovery of novel therapies to meet the medical challenges of the future.

“Ocean Medical Center’s psychiatric program will be a community-based program,” said Ramon Solikhah, M.D., program director for psychiatry as well as founding Chair of Psychiatry & Behavioral Health at the Hackensack Meridian School of Medicine at Seton Hall University. “Our new psychiatry residency program will improve clinical care and ultimately encourage future health care leaders to build practices in the Jersey Shore area.”

As the area’s premier provider of psychiatric services, Hackensack Meridian Behavioral Health Services has provided comprehensive mental health and substance abuse services to the residents of Monmouth, Ocean, Middlesex, and Bergen Counties for over forty years. Due to continued growth and expansion, we are currently accepting applications for Psychiatrists to join our Mental Health and Addiction Interdisciplinary Teams in the following positions:

- Consultation Liaison Psychiatrists: Jersey Shore University Medical Center (Neptune, NJ) and Riverview Medical Center (Red Bank, NJ) and Hackensack University Medical Center (Hackensack, NJ)
- Consultation Liaison Psychiatrists: Jersey Shore University Medical Center (Neptune, NJ) and Riverview Medical Center (Red Bank, NJ) and Hackensack University Medical Center (Hackensack, NJ)
- Staff Psychiatrist for Adult Inpatient Unit: Jersey Shore University Medical Center (Neptune, NJ) and Riverview Medical Center (Red Bank, NJ) and Hackensack University Medical Center (Hackensack, NJ)
- Outpatient Child & Adolescent Psychiatrist: Jersey Shore University Medical Center (Neptune, NJ) and Hackensack University Medical Center (Hackensack, NJ)
- Medical Director/Section Chief, Child & Adolescent Psychiatry: Jersey Shore University Medical Center (Neptune, NJ)
- Outpatient General Psychiatrist: Jersey Shore University Medical Center (Neptune, NJ), Riverview Medical Center (Red Bank, NJ), and Raritan Bay Medical Center (Perth Amboy, NJ)
- Medical Director of Adult Inpatient Unit: Riverview (Red Bank, NJ)
- Emergency Psychiatry: Raritan Bay Medical Center (Perth Amboy, NJ)
- Geriatric Psychiatry – Hackensack University Medical Center (Hackensack, NJ)
- Outpatient/Consultation Liaison Psychiatrist – JFK (Edison, NJ)
- Per Diem/Tele-psychiatry – Hackensack Univerity Medical Center (Hackensack, NJ)
- Staff Consultation Psychiatry – Bayshore Medical Center, (Holmdel, NJ)

In addition to our collegial work environment, we offer a highly competitive compensation package which includes: medical/dental plans, 403(b) retirement plan, and relocation assistance. For immediate consideration, please contact Renee Theobald, at: rennee.theobald@hackensackmeridian.org or call: 732 751-3597.

HackensackMeridianHealth.org

**Department of Psychiatry**
MULTIDISCIPLINARY TELEMEDICINE MEDICAL GROUP LOOKING FOR ADDITIONAL LICENSED TELLESPSYCHIATRISTS. CONTACT US AT 661-840-9270 OR INQUIRE WITH CV AT JOBS@TELEHEALTHDOCS.COM

The doctors of TRADITIONS BEHAVIORAL HEALTH are the largest provider of MD psychiatric services to adult populations in institutional and community based programs in California. We provide services to the seriously and persistently mentally ill and have openings in the San Francisco Bay Area, Santa Barbara, San Diego and Los Angeles. Overall we plan to add 50 more Fulltime psychiatrists in California to bring our medical staff team to 400 psychiatrists. Our packages vary from a minimum of $300,000 per year plus $10,000 in bonuses and a benefit package valued at approximately $90,000, up to $500,000, for the industrious physician. Our generous benefit package includes almost 7 weeks paid time off per year. If you are creative and think outside the box, if you value diversity and cultural competency, if you like innovative programs that are patient driven, using a rehabilitative, rather than illness model, if you want more time to work with patients, to get the best results, then TBI is the company for you. To learn more about the specific job openings and salary and benefit packages, check out our Website at:

www.tbthcare.com or Email your letter of interest and CV to our company President, Gary A. Hayes, Ph.D. at: Dhayes3@tbthcare.com

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$253,600 - $329,700 annually
7 weeks of annual leave
Full benefits & retirement
(Above annual salary includes additional pay for Board Certification and Acute Settings)

Santa Clara Valley Health and Hospital System, a public healthcare system in the heart of Silicon Valley, is seeking BE/BC psychiatrists & PGY-II/IVs for a variety of clinical settings, including emergency psychiatric services, inpatient psychiatric services, outpatient behavioral health clinics, and custody health programs. Opportunities for additional moonlighting also exist within our healthcare system.

As the largest public health care system in northern California, we offer comprehensive healthcare resources to a large and diverse patient population. Psychiatrists are part of a robust team of staff that work in collaboration with other medical specialties to provide integrated health care to patients. Psychiatrists are eligible for numerous benefits including 7 weeks of annual leave, 1 week of educational leave, 12 holidays, $4500 educational funds, health benefits, life insurance and CalPERS retirement plan. If you are interested in working in a dynamic and collegial work environment, please submit a CV and letter of interest directly to:

Dr. Tiffany Ho,
Behavioral Health Medical Director:
tiffany.ho@hhs.sccgov.org
(408) 885-5767

The County of Santa Clara is an Equal Opportunity Employer

Outpatient Adult and Child Psychiatrists are needed for Stanislaus County Behavioral Health & Recovery Services, in the Central Valley less than two hours from San Francisco and Yosemite.

Recovery-oriented treatment provided in a multidisciplinary setting with friendly and dedicated staff members. Recently revised rates with full malpractice coverage and pension plan (PARS) as a Personal Service contractor with an income potential of over $ 325 K per year for adult psychiatrist and over $355 K per year for child psychiatrist for F/T work.

P/T options and the opportunity to combine Tele-Psych with limited onsite work are also available. Excellent work environment with NO Call Requirement, lower than average case load and comprehensive nursing & ancillary support makes this a very pleasant and rewarding opportunity. J 1 applicants are welcome.

Fax CV to Bernardo Mora, MD at (209) 558-4326 or Email: bmora@stanthls.org

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Join us! Are you a psychiatrist looking for a team-oriented, collegial practice supported by leading experts in psycho pharmacology such as Stephen Stahl, MD., Ph.D.? Look no further than the California Department of State Hospitals. We operate the largest forensic psychiatry hospital system in the nation, offering an unparalleled quality of practice while providing care to some of the most complex patients found anywhere. Email your curriculum vitae to DSH.Recruitment@dsh.ca.gov.

We are currently recruiting psychiatrists at our five locations:

Practice and Benefits:
• Annual salaries to the high $200,000s
• Flexible workweek options may be available
• Voluntary paid on-call duty
• Substantial continuing medical education
• Generous defined-benefit pension
• Psychopharmacology support by leading experts and established protocols
• Medical, dental and vision benefits
• Private practice permitted
• Retiree healthcare
• Psychiatrist-led treatment teams
• Patient-centric, treatment first environment
• Relocation assistance may be available

To find out more, please contact Laura Dardashti, MD.
at (916) 654-2609.
You can also email us at DSH.Recruitment@dsh.ca.gov or visit our website at www.dsh.ca.gov
PSYCHIATRIST POSITION

J-1 Visa Opportunity in California

Imperial County Behavioral Health Services is currently recruiting for a full-time psychiatrist. Imperial County is located 90 miles by freeway to the city of San Diego to the west, and 90 miles to Palm Springs to the north. Located in a rich farming area, Imperial County has a population of 180,000 and borders with Yuma, Arizona and with the cosmopolitan city of Mexicali, Mexico population 1.2 million. San Diego State University maintains a satellite campus in Calexico and there are a number of private and public universities located in Mexicali, the state capital of Baja California Norte. Imperial County's location and diversity make it the perfect place for a psychiatrist to relocate under the J-1 Visa program for or for any reason.

The position pays a highly competitive salary, including health benefits for you and your family, and requires no hospital work and minimal after hours work freeing you up for more leisurely activities.

The successful candidate diagnoses and treats patients with mental, emotional, and behavioral disorders. Qualified candidate must have CA medical license or ability to obtain.

Send CV to Imperial County Behavioral Health Services, 202 North 5th Street, El Centro, CA 92243.

J-1 applicants welcome.

For additional information, please contact:

Kristen Smith (442)265-1806
kristensmith@co.imperial.ca.us

www.psychiatristtimes.com

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Earn over $350k/Year

Choose your own hours
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Los Angeles/Orange County Area
Sacramento Area

Comprehensive Psychiatric Services
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Psychiatrist Job Opening In Santa Barbara, CA

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Visit: http://www.getpsychhelpsb.com/
Contact Tom Widroe at 805.680.7772 or tomswidroe@icloud.com

FLORIDA

The University of Miami Miller School of Medicine Department of Psychiatry and Behavioral Sciences is recruiting several full-time psychiatrists at the assistant or associate professor rank to join our faculty. We are in an exciting phase of growth and we are recruiting psychiatrists for several services including inpatient, outpatient, consultation-liaison and emergency room.

Faculty rank and compensation are commensurate with experience. The University of Miami also provides a moving bonus and faculty stipend. The UM Department of Psychiatry is ranked 25th in the nation in NIH Funding and there are extraordinary opportunities inpatient/outpatient, research, resident education and medical school teaching.

Position Requirements:

• M.D./D.O. with Board Eligibility or Board Certification in Adult Psychiatry

• Active State of Florida Medical License

To be considered for a position please send a copy of your CV to Radu Saveanu, M.D., Professor and Vice Chair, Department of Psychiatry and Behavioral Sciences at psychiatry@med.miami.edu

GEORGIA

Coliseum Center for Behavioral Health is seeking a Board Certified Psychiatrist to join our team!

• Employed, inpatient only position offering a competitive compensation package that includes a comprehensive benefit package

• Monday through Friday position patient census split amongst all providers

• Weekend Call 1:4 weekday call 1:5

• Current staff includes 2 NPs and 3 Psychiatrists

• This is a Hospitalist position with expectations of teaching participation.

The unit consists of 42 inpatient beds - 32 Adult and 10 Gero-Psych Inpatient programming consists of an Adult unit, Geriatric unit, STAR (Stress, Trauma, Addiction, Recovery) unit specializing in the treatment of PTSD and a new, busy ECT service. Coliseum Center for Behavioral Health in Macon, Georgia provides mental health services to assist adults with psychiatric disorders in a safe, nurturing environment. For over 30 years, our mental health specialists and psychiatrists have provided individualized treatment plans for our patients, giving them the best chances of a full recovery and stability.

Macon, GA is only an hour drive from Atlanta! It is the 5th largest city in Georgia, situated in the heart of the state, and is the perfect sized city offering many amenities of a larger city with a small town feel. Here you can experience the change of seasons, enjoy outdoor activities year-round and enjoy beautiful lakes and numerous parks.

Macon also boasts great shopping with major department stores, as well as, unique boutiques. Macon is a great place for music lovers as the city hosts many concerts throughout the year. Macon is located off of I-75 and I-16, making it easily accessible for travel.

Please contact Melissa Sampson (904) 702-6627 melissa.sampson@hcahealthcare.com

ILLINOIS

Ecker Center for Mental Health

PSYCHIATRIST – PART TIME

Part time psychiatrist needed for busy outpatient community mental health clinic located in Elgin, IL. See new and established patients for diagnosis, evaluation and medication management. Document clinical notes in electronic medical record; use electronic prescribing system. Hours: Flexible 4 – 12 hours weekly; no weekends, holidays, nights or on-call work.

To apply, please e-mail CV to rgrauzinis@eckercenter.org

MISSOURI

BRAND NEW ADOLESCENT 15-BED INPATIENT PSYCHIATRY UNIT OPENING IN 2019 – Small Town, Big Opportunity – Medical Director position available. Be in on the beginning of a new unit helping to mold and develop the program. Open to employment, or independent contractor arrangement. Located in southeast MO near Cape Girardeau, this is a low cost of living, low crime rate area but close to a local airport that has direct flights to Chicago. It's also only two hours from Memphis and St. Louis. This designated underserved area is also located in the Delta Regional Authority so J1 Waivers can also be obtained through the DRA as well as the state. Position can be inpatient, or inpatient and outpatient.

Please contact Terry Good, Horizon Health, at 804-684-5661; terry.good@horizonhealth.com; Fax: 1-804-684-5663.

NEW JERSEY

NORTHERN NJ - TWO OPENINGS: BAYONNE- Primarily a CONSULTATION-LIAISON POSITION AND JERSEY CITY-OUTPATIENT POSITION - Full time employment with benefits.

Please call for details. Terry Good, 804-684-5661; terry.good@horizonhealth.com; Fax: 1-804-684-5663.
The Department of Psychiatry at Lenox Hill Hospital, a part of Northwell Health, is recruiting a full-time psychiatrist to be Clinical Director of Outpatient Services. Our department has one of the premier outpatient programs in the city located within Lenox Hill’s 64th Street facility (Manhattan Eye and Throat Hospital) on the Upper East Side. The Outpatient Center for Mental Health (OCMH) provides comprehensive services for adults and children, including, psychiatric evaluations, psychopharmacological treatment and an array of individual, group and family psychotherapies.

Our Center for Attention and Learning (CAL) offers sophisticated, foundation-funded neuropsychological testing for school-aged children. We have an expanding Early Treatment Program, co-sponsored by On-Track New York that focuses on the intensive needs of patients with first episode psychosis. The Perinatal Mood and Anxiety Disorders program, affiliated with the outstanding Obstetrical Service at Lenox Hill, delivers psychiatric and psychological treatments to women and infants. We are initiating a new program to address the mental health needs of medical residents at Lenox Hill.

The Northwell Health System is ranked among the top 10 hospital systems by DiversityInc, recognized for its increasing commitment to effective diversity management and culturally competent care.

The Director will oversee a service that includes 5 additional attending psychiatrists, including 3 with training in Child & Adolescent Psychiatry. OCMH trains Psychiatry Residents from Zucker Hillside and Staten Island University Hospital (both Northwell affiliates). Our Psychology Division consists of 7 psychologists, a highly acclaimed internship program, clinical externs, and 6 psychology post-docs (including 3 in the CAL program). The Psychology Division has an active research program.

The Director will oversee all clinical care at OCMH, manage regulatory affairs, and assist in the professional development of clinical staff. This position does involve direct clinical service. The Director will report to the Department Chair and join our Leadership Planning Committee. The Director will also work closely with our Director of Consultation-Liaison to organize ambulatory programs in Epilepsy, Parkinson’s disease, Diabetes, Cancer, Cardiology, HIV, Primary Care, and Transgender Medicine.

We are seeking applicants with outstanding clinical skills who maintain the highest standard for clinical care and who have a passion for leadership and new program development. An interest in teaching and scholarly activity is highly desirable.

We offer highly competitive compensation and excellent benefits. Academic appoint-
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