How do meaning, memory, emotions and, especially, human suffering arise from the brain?

. . . as the brain has the consistency of jelly, a sucker is the brain surgeon’s principal tool. . . . The idea that my sucker is moving through thought itself, through emotion and reason; that memories, dreams and reflections should consist of jelly is simply too strange to understand. All I can see in front of me is matter.
—Henry Marsh

How does matter become mind?
How do meaning, memory, emotions and, especially, human suffering arise from the brain? These are unsolved mysteries that animate the field of psychiatry. And neuropsychiatry specifically focuses on this area of inquiry in search of improved diagnostics and therapeutics.

What is neuropsychiatry? And what is a neuropsychiatrist? The idea to write an article that would answer these questions emerged at the American Neuropsychiatric Association’s 2016 annual meeting, an opportunity for psychiatrists, neurologists, psychologists, and neuroscientists to explore their overlapping interests. During a coffee break at this year’s gathering, attendees were remarking that patients—and indeed the clinicians who refer them—seem to be perplexed about the difference between a “neuropsychiatrist” and a “regular psychiatrist.” We set out to dispel confusion about neuropsychiatry, but soon we discovered that this task was not as simple as we had expected.

Neuropsychiatry is both a way of thinking about mental disease and an approach to the practice of psychiatry. In addition, the term neuropsychiatry references the relationship between neurology, neuroscience, and psychiatry. The fundamental conceptual principle for the term neuropsychiatry is the idea that brain is the basis of behavior. But, beyond this pivotal notion, neuropsychiatry is evolving, both as a scientific field of study and as a clinical practice.

We are living at a particularly interesting scientific, technological, and cultural time in the 300-plus-year history of the emergence of neuropsychiatry. Many psychiatrists who are in practice today can recall the transformation of psychiatric practice that was sparked by the availability of effective psychotropic medication. Some psychiatrists began to practice as “psychopharmacologists.” At the time, this was a new area of specialization and needed to be defined for the general public. Now psychopharmacology is an essential aspect of virtually every psychiatrist’s practice. Will the burgeoning field of neuropsychiatry similarly be incorporated into mainstream thought and transform the psychiatric profession? In the future, will every psychiatrist be a neuropsychiatrist?

In this article, we discuss current, common uses of the term *neuropsychiatrist*. We also highlight how it is now possible to obtain subspecialty certification in the field of behavioral neurology and neuropsychiatry.

What is neuropsychiatry?
The general term *neuropsychiatric* describes the work of any scientist, educator, or policy maker who “seeks to advance our understanding of the neurological basis of psychiatric disorders, the psychiatric manifestations of neurological disorders, and/or the evaluation and care of persons with neurologically-based behavioral disturbances.”

The more specific term *neuropsychiatry* refers to the aspect of psychiatry that focuses on the relationship between brain and behavior. Far from being narrow and reductionist, neuropsychiatry involves integrative thinking, taking into account the brain in bi-directional interaction with the environment, including the interpersonal world. Given our scientific understanding that the brain is the organ from which all behavior emerges, neuropsychiatrists are interested in topics that range widely: defining the brain networks that generate neurobehavioral symptoms; uncovering neural and genetic processes by which individuals change with experience; describing the aberrant neural plasticity involved in neuropsychiatric conditions (eg, schizophrenia); elucidating the neuropsychiatric presentations of rare and common genetic diseases; understanding the brain mechanisms that underlie social relations; and so on. Neuropsychiatrists maintain that an understanding of the brain and its functioning is fundamental knowledge for all psychiatrists.
While the brain is the organ basis of psychiatry, our field is not alone in this. Within medicine, neurology and neurosurgery also squarely focus on the brain; outside of medicine, neuroscience and psychology share this area. One way to conceptualize the intersecting interests of these various fields is to picture a Venn diagram comprised of 3 circles—psychiatry, neurology/neurosurgery, and neuroscience/psychology. Neuropsychiatry is represented by the area where these circles overlap. However, from the point of view of the field of neurology/neurosurgery, this same area of 3-circle-overlap is called behavioral neurology or, alternatively, cognitive neurology. From the point of view of psychology, this area would be called neuropsychology or cognitive psychology. This confusing terminology has grown from the disparate yet interwoven histories of these different clinical fields.

Technological advances have made it possible to investigate brain function in a living human and also to study the brain at the level of the gene, the molecule, the cell, and the circuit, as well as behavior. Many fields of science from physics to microbiology, from genetics to data science have turned their attention to this compelling frontier. Collaborative scientific work is key. In clinical medicine, the specialties of psychiatry, neurology, neurosurgery, and neuroradiology are part of this wave of scientific interest and excitement.

**What is a neuropsychiatrist?**

A variety of training pathways can lead to neuropsychiatric practice. The term *neuropsychiatry* does not designate a recognized subspecialty of the American Board of Psychiatry and Neurology (ABPN). However, there is a subspecialty of neurology called Behavioral Neurology and Neuropsychiatry that is open to psychiatrists or neurologists who are diplomats “in good standing of the American Board of Psychiatry and Neurology or equivalent certification by the Royal College of Physicians and Surgeons of Canada and who have had fellowship training in neuropsychiatry or behavioral neurology.” This subspecialty certification is offered by the United Council for Neurologic Subspecialties (UCNS). According to the UCNS:

Behavioral Neurology & Neuropsychiatry is defined as a medical subspecialty committed to better understanding links between neuroscience and behavior, and to the care of individuals with neurologically based behavioral disturbances. Training in Behavioral Neurology & Neuropsychiatry entails the acquisition of knowledge regarding the clinical and pathological aspects of neural processes associated with cognition, emotion, behavior, and elementary neurological functioning, the mastery of the clinical skills required to evaluate and treat persons with such problems, the development of a level of professionalism, interpersonal and communication skills, and practice- and systems-based competencies required for the practice of this medical subspecialty.

The UCNS was formed in 2003 by 5 national organizations of child and adult neurologists who came together to support the establishment of a non-profit organization to oversee the accreditation of neurology subspecialty training programs and also to certify practitioners in those subspecialties. Two sponsoring organizations worked with the UCNS to establish the required content for fellowship accreditation and practitioner certification: the Society for Behavioral and Cognitive Neurology and the American Neuropsychiatric Association.

Behavioral Neurology and Neuropsychiatry was the first of 9 subspecialties to be defined and recognized by the UCNS. Between 2006 and 2012 the UCNS certified 388 physicians in Behavioral Neurology and Neuropsychiatry and, currently, there are 31 approved fellowship programs for training in this area. This relatively new subspecialty is attracting a growing number of psychiatrists and neurologists who undertake fellowship training following residency training. Psychiatrists who are certified in Behavioral Neurology and Neuropsychiatry often refer to themselves as neuropsychiatrists, while neurologists who are thus certified often refer to themselves as behavioral neurologists.

Another path to the practice of neuropsychiatry is dual specialty training, leading to eligibility for ABPN certification in both neurology and psychiatry. Trainees undergo full residency training in both specialties, often including longitudinal practice in dedicated neuropsychiatry inpatient or outpatient services. This dual training would normally take 7 years. However, ABPN-approved combined programs are permitted to exchange elective time in each field for reduction in time requirements to 6 years. There are currently 5 ABPN-approved combined psychiatry/neurology residency programs: Brown University, Medical University of South Carolina, New York University School of Medicine, University of Massachusetts, and University of Texas Southwestern. Double-boarded neuropsychiatrists are currently not eligible to sit for the UCNS board examination unless they also undertake fellowship training.

In addition, there are many psychiatrists who refer to themselves as neuropsychiatrists but who have had neither a Behavioral Neurology and Neuropsychiatry fellowship nor double board training and...
who also are not eligible for subspecialty board certification. Some of these individuals have focused their practices on specialized areas in the diagnosis and treatment of problems at the brain-behavior interface and may be experts by virtue of their devotion to scholarship and their years of clinical experience.

**What does a neuropsychiatrist do?**

One need not be board certified in Behavioral Neurology and Neuropsychiatry or dual specialty trained to approach patients with neuropsychiatric thinking. A psychiatrist who thinks neuropsychiatically will integrate knowledge about brain functioning into his or her assessments, diagnostic formulations, and treatment planning. While this may be helpful with all patients, it is especially useful with those individuals whose presentations straddle the boundary between what is traditionally considered to be neurologic disease and what is traditionally considered to be psychiatric. Consider the following fictional-but-realistic examples:

A 60-year-old man with no psychiatric history arrives with his wife for an initial psychiatric evaluation. The wife is angry because her husband struck her “in the middle of the night,” giving her a black eye. “And this wasn’t the first time!” she reports. The husband is apologetic but confesses that he actually doesn’t remember ever hitting his wife. He does recall having had a “terrifying nightmare,” in which he was being attacked and “had to fight off the enemy.” When he awoke, he remembers that he was standing by the marital bed and that his wife was crying.

Based on a complete history and mental status examination, a formulation for the husband’s behavior could be offered. Diagnostic possibilities would include PTSD, nocturnal seizures, confusional arousals, or malingering. But this couple’s presentation is characteristic of REM sleep behavior disorder—a sleep disorder that often persists for years without being correctly diagnosed. It is highly correlated with the eventual development of parkinsonian syndromes, including dementia with Lewy bodies. Neuropsychiatically informed psychiatrists would be familiar with this condition and could initiate an integrated work-up and treatment plan, including an appropriate sleep study, assessment for underlying neurological disease, and consideration of medication to suppress REM sleep and treat parkinsonism, if present. In addition, the neuropsychiatrist could work with the couple using psychotherapeutic modalities to repair wounded trust and help them make adaptations to address the wife’s safety.

A 70-year-old woman is recovering from a stroke and is referred to a neuropsychiatrist for depression.

Care of this patient would involve a biopsychosocial assessment of the factors contributing to her mood disorder in addition to thoughtful consideration of secondary stroke prevention. In formulating a treatment plan, a neuropsychiatrist would integrate an understanding of biological factors (genetics/family history and personal history of depression and vascular disease), brain-behavior correlations (the implications of stroke localization), and psychosocial factors (taking into account the patient’s psychological dynamics, neuropsychological status, relationships, and social situation). The neuropsychiatrist could facilitate and coordinate a recovery plan that might include medications, psychotherapy, cognitive and/or linguistic rehabilitation, physical therapy, psychosocial supports, and so on.

A 45-year-old minister is pressured by his family to seek help because he has had a crisis of faith and is depressed. The patient reports that he had an automobile accident 6 months earlier and was found in status epilepticus. He was hospitalized for several days and then discharged in stable condition on anticonvulsants. Since then, the minister says that he “can no longer hear the voice of God.” He clarifies that he is “not speaking metaphorically.” The minister no longer experiences the frequent auditory hallucinations that had given him inner strength and clarity about his life’s purpose.

A most likely formulation for this patient’s psychological crisis would include the possibility that he had long-standing temporal lobe epilepsy and that his hallucinatory experiences are now being suppressed by anticonvulsant medication. Exploration of the complex meanings of symptoms and medication would need to be part of a broad treatment plan. That plan might address the risks of discontinuing anticonvulsants, the nature of his spiritual experience, and the possibility that other factors might be contributing to the patient’s depression. An understanding of neurobiology and meaning-making could enhance the process of psychotherapy as well as discussions of medication options.

**Neuropsychiatry within the health care system**

Changes are underway in the US health care system that promise increased integration of specialty medical care, but presently, lack of coordination of care remains common. This fragmentation within the medical system is a significant challenge for all patients and their families, but it is especially
problematic when the patient’s clinical problems are not well subsumed within a single discipline, when the diagnosis is unclear, or when patients have difficulty navigating the health care system. Neuropsychiatrists have much to contribute toward ameliorating these difficulties. Many disorders that bring patients to psychiatrists have an impact on patients’ ability to advocate for themselves within the health care system. The symptoms of a neuropsychiatric condition might impair domains of functioning such as language, motivation, organization, memory, judgment, social comportment, a patient’s insight about his or her disease, and/or the ability to assess reality. Patients and families stand to benefit from a neuropsychiatrist’s expertise in working with patients who have these kinds of deficits—to formulate and diagnose the sources of a patient’s impairments and to utilize integrative thinking to inform complex treatment planning.

Conclusion

Today, psychiatrists who are trained in neuropsychiatry are able to bring integrative thinking about brain and behavior to the care of patients. A recent paper suggested that all psychiatrists begin to consider the following questions: “What person has this brain? How does this brain make this person unique? How does this brain make this disorder unique? What treatment will help this disorder in this person with this brain?” Tomorrow, the hope is that increased understanding of the brain-basis of mental phenomena will lead to expanded approaches to diagnosis and treatment of patients with mental disorders.
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