

## VIEWPOINT

# The Convergence of Neurology and Psychiatry

## The Importance of Cross-Disciplinary Education

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The collaboration between neurology and psychiatry, 2 medical specialties that share the same organ, has wavered throughout history. Hippocrates viewed mental disorders as arising from the brain. However, focus during the Middle Ages and later cartesian mind-body dualism separated most disorders of the mind from the province of medicine. The fields converged in the 19th century with the advent of natural sciences and the emergence of neuropathology. Broca, Wernicke, Charcot, Alzheimer, Kraepelin, and Freud were all pioneering physicians who practiced both fields.

The emphasis in psychiatry on the brain diminished in mid-20th century and resulted from the post-World War II dominance of psychoanalysis, together with the inability to identify the neuropathology in major psychiatric disorders. Reflecting the separation of neurology and psychiatry, the *Archives of Neurology and Psychiatry*, first published in 1919, divided in 1960 into the *Archives of Neurology* and *Archives of General Psychiatry*, the forerunners of *JAMA Neurology* and *JAMA Psychiatry*.<sup>1,2</sup>

Over the past half century, advances in basic and clinical neuroscience, including neuroimaging, network connectomics, molecular genetics, epigenetics, and neuroplasticity have blurred the boundaries between

for major psychiatric disorders. Novel teaching approaches, such as the National Neuroscience Curriculum Initiative,<sup>5</sup> clinical-pathological conferences, and neurobiopsychosocial formulations applied to both psychiatric and neurologic conditions,<sup>6</sup> are promising developments. Brain-behavior relationships are bidirectional and cut across both disciplines; psychosocial factors are critical for developing patient-centered treatment plans. The subspecialties of behavioral neurology and neuropsychiatry, open to both neurologists and psychiatrists, have emerged at the intersection of clinical neuroscience.<sup>7</sup>

At a 2005 conference on "The Convergence of Neuroscience, Behavioral Science, Neurology and Psychiatry,"<sup>8</sup> a consensus emerged on "the importance of cross-disciplinary education at every level from the aspiring college student interested in brain science to exploring new models for postgraduate education in the clinical and basic neurosciences." It was noted that "Although revolutionary changes were advanced by some, most participants favored incremental change." In 2017, Heckers<sup>9</sup> asserted "the training of psychiatrists in the US is still brainless" and advocated for "neuroscience literacy to become as crucial for good psychiatric practice as empathy already is." In 2019, Josephson<sup>1</sup> announced plans to share relevant articles between *JAMA Neurology* and *JAMA Psychiatry* and stated "never before have neurology and psychiatry so needed publications that recognize the rich partnership between the fields—one that was once a historical footnote but now appears to be an exciting future."

However, incremental changes have proven insufficient. Educational efforts at both the medical school and residency levels have remained short sighted. Both neurologists and psychiatrists need strong training in core principles of clinical neuroscience (traditionally stronger in neurology), as well as listening, and interview skills and psychosocial determinants of illness (emphasized more in psychiatry). A substantial reconfiguration of training is needed in both medical school and during residency. A strengthened curriculum of clinical neuroscience education in the fourth year of medical school (for those already planning a clinical neuroscience-related residency) could permit an enriched student experience in neurology, psychiatry, and neurosurgery. Rotations would include child neurology and psychiatry and electives in subspecialty areas such as neuroradiology, neuropathology, neuromodulation, and allied subspecialty outpatient clinics. Emphasis on outpatient engagement would be

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the 2 disciplines and have led to efforts for renewed convergence. Defining neurology as the study of the brain and psychiatry as the study of the mind is no longer tenable. Brain circuits do not distinguish between neurologic and psychiatric disorders; clearly, practitioners at the mind-brain interface should develop diagnostic and therapeutic expertise across the clinical neurosciences. Currently however, shared learning between neurology and psychiatry is limited in medical school and in residency training at most US educational programs. Training accreditation, made by a board that is shared by neurology and psychiatry, has resulted in suboptimal lengths of neurology training in psychiatry and of psychiatry training in neurology. There is little, if any, training in neurosurgery for psychiatry residents and vice versa.

Recent approaches to develop biomarker-based classifications in psychiatry, such as the research domain criteria<sup>3</sup> and identification of biotypes in psychotic disorders,<sup>4</sup> are advancing a biological basis

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important because much of hospital-based clinical education deals with the most difficult and unusual patients.

A substantial transformation is also needed in joint training in neurology and psychiatry residency programs. After a required year or less of general medicine, the following 2 years of clinical neuroscience could encompass both fields with special attention to areas of overlap. The following 2 years could differentiate into neurology and psychiatry specialization followed by further fellowship-based subspecialization as desired. This continues a cross-disciplinary clinical thread spanning the entirety of residency, including longitudinal relationships with patients and peers. Such subspecialization could include joint fellowships (eg, neuropsychiatry and behavioral neurology training), an important area of training for both fields. The interdependence of mental, medical, and social health could be emphasized. Integrative department structures, teaching conferences, clinical-pathology correlations, and didactics could be critical program components.

This model could serve to shift the fields from a lesion-based model toward a network-based one, from a unidirectional framework toward a bidirectional framework of interactions, from exclusive reliance on categorical diagnoses toward transdiagnostic dimensional perspectives, from silo-based approaches toward interdisci-

plinary ones, and from biologically isolated methodologies toward integration of neuroscience with psychosocial and cultural factors.<sup>7</sup> These changes may lead to an increased number of medical students drawn to these specialties and could potentially create new leadership and more fundamental knowledge. This model is presented in the context of the mutual challenge given that psychiatric and neurologic disorders are highly prevalent, expensive to society, and among the most disabling illnesses in all of medicine throughout the world per estimates from the World Health Organization.

Institutional, structural, and cultural changes must occur to accommodate this reconfiguration. Barriers to change include persistent mind-body dualism, the complexities and uncertainties of psychiatry that have yet to translate into clinical practice, public and professional stigma (within psychiatry and neurology as well), and the lack of parity in reimbursement and federal funding. Rigid educational traditions set more than a century ago, engrained cartesian concepts, and protective instincts regarding professional turf remain challenges. The time for change is now. Open debate followed by actionable suggestions is needed. Novel experimental approaches are encouraged. Rather than further contracting into separate fields, the convergence of neurology and psychiatry should span the unique intersections of humanity, philosophy, and science.

#### ARTICLE INFORMATION

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