

Neuropsychiatry – An Emerging Field

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Abstract

Neuropsychiatry is an emerging field at the intersection of neurology and psychiatry, driven by the unprecedented advances in neuroscience. The arbitrary demarcation between neurology and psychiatry, which largely existed only in the last century and a half, has become less tenable. We discuss the definition and scope of this emerging field. We also review the development of clinical neuropsychiatry in Singapore in the context of historical developments and recent changes in the field from other countries. At a more practical level, we discuss a few of the clinical settings in which neuropsychiatry operates, in particular, the stigma associated with psychiatric disorders locally, and the significant number of patients with psychiatric or psychosomatic symptoms presenting to neurology and general practice clinics. The stigma may be ameliorated by better understanding of the neurobiological basis of psychiatry. We see the future of neuropsychiatry in Singapore, as in other developed countries, as one approach to understand and manage complex brain disorders. We advocate training for both psychiatry and neurology residents in their counterpart fields, which will lead to greater understanding of both fields, and enhance collaboration in clinical care and research.

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Introduction

Neuropsychiatry can be described as the interface between neurology and psychiatry – the intersecting field of enquiry for both the brain and the mind. In more practical terms, it often, though not necessarily, narrows down to psychiatric comorbidities of neurologic diseases (e.g. depression in a patient with stroke) and complex brain disorders with significant neurological and psychiatric problems (e.g. Tourette's disorder, various dementia disorders, auto-immune disorders with central nervous system (CNS) involvement, traumatic brain injury, mental retardation). A day-to-day example would be in the case of a patient with Alzheimer's disease and behavioural problems, and where the best treatment setting should be. The underlying premise is that neurological and psychiatric disorders share a common anatomical location and neuronal substrate. This paper focuses only on clinical neuropsychiatry as we would not have done justice to the research aspects in this paper.

The convergence of neurology and psychiatry in the form of neuropsychiatry comes in the wake of unprecedented advances in the neurosciences, especially the genetic and

molecular characterisation of brain function and dysfunction, and the ability to visualise them through neuroimaging. This has made arbitrary demarcations between neurology and psychiatry less and less tenable. This is ironic because in the Western medicine tradition there has been no historical divide between neurology and psychiatry up until the past century. In most of the great traditions of Asian medicine too, such as Ayurveda and traditional Chinese medicine, the ontological distinction between the mental and the physical as different types of medical problems does not exist.

Neuropsychiatry in Singapore is still in its infancy, with less than half a dozen psychiatrists professing to be neuropsychiatrists or having interests in neuropsychiatry. There is, as far as we know, no self-professed behavioural neurologist. While the number of sub-specialties recognised by the Singapore Medical Council and the Academy of Medicine Singapore has been increasing, we are not proposing that neuropsychiatry become another 'boutique' subspecialty. However, we would like to bring to the attention of our colleagues in Singapore the development

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of this exciting field, and to advocate for approaches towards understanding and managing complex brain disorders that transcend traditional boundaries of neurology and psychiatry. We hope this will lead to better understanding and collaboration in research, education and patient care.

Definition and Scope of Neuropsychiatry

Is there a specialty where Alzheimer's disease or Tourette's disorder or traumatic brain injury, exclusively 'belong' to? On the neurology-psychiatry spectrum, peripheral nerve disease would be clearly on the neurology end; and perhaps 'existential angst' for psychiatry. However, many conditions which traditionally fall into neurologists' domain, e.g. epilepsy, Parkinson's disease, Huntington's disease, and multiple sclerosis often have significant psychiatric co-morbidities which merit equal assessment and treatment, preferably jointly by physicians of both specialties together with non-physician professionals.

While we can safely say that neuropsychiatry is the overlap between the 2 fields, one of the difficulties we encountered in writing this article is that there is yet a consensus definition or scope for neuropsychiatry. One formulation we agree with is that neuropsychiatry refers to 'brain diseases which manifest with disturbances in cognition, emotion and behaviour, and that these brain diseases have a definable basis, using extant technologies'.¹

Beyond simple definitions, we also try to describe a scope for this field. Hence we offer, as one possibility, the scope as defined in the core curriculum for training in behavioural neurology and neuropsychiatry.² It was proposed that, at a minimum, the following should be included:

1. Focal neurobehavioural syndromes (e.g. aphasias, apraxias, agnosias, aprosodias, apathy, executive dysfunction, and orbitofrontal syndrome);
2. Major neuropsychiatric syndromes (e.g. delirium, the dementias, and the major primary psychiatric disorders, including those with atypical or refractory presentations);
3. Neurological conditions with cognitive, emotional, behavioural features (e.g. dementias, movement disorders, stroke, epilepsy, multiple sclerosis and traumatic brain injury); and
4. Comorbid neuropsychiatric and neurological conditions (e.g. Down's syndrome and Alzheimer's disease, obsessive-compulsive disorder and Tourette's syndrome, Huntington's disease and alcohol abuse).

The full syllabus can be found at: http://www.ucns.org/certification/pdfs/core_curr_beha.pdf

It is a rather large compendium of topics for which there are several excellent tomes on neuropsychiatry to assist

candidates prepare for the certification examinations. Hence, at the risk of oversimplification, we would describe a neuropsychiatrist as a psychiatrist who has interests in the areas listed above, has studied most of those topics in some detail, and encounters them regularly in clinical practice or research, or both. The neuropsychiatrist is usually familiar with the brain anatomy, nervous system physiology and biochemistry, and the neuroimaging modalities. He or she may also employ electrophysiologic tools for diagnosis and treatment.

Historical Perspectives

Before the Schism

The forebears of neuropsychiatry have a long and illustrious history that predates the creation of the separate fields of neurology and psychiatry. Baker argues that for more than 2000 years in Western medicine, neurology and psychiatry were part of a unified branch of medicine.³ Hippocrates (460-377 BCE) described delirium, psychosis, mania, phobias, and theorised that 'four humours' were responsible for both physical and mental health, and saw no distinction between physical and psychological disorders.

The term 'neurologie' was coined in 1664 by Thomas Willis, famous for his eponymously named Circle of Willis. Willis wrote about the connection between mental disorders and the body. The term 'psychiatrie' was coined much later, in 1808 by Johann Reil, a German physician and later professor of psychiatry, from the Greek "psyche" (soul) and "iatros" (doctor). Psychiatry developed as a clinical and academic profession in the 19th century, particularly in Germany with the first psychiatry department established in Berlin in 1865. They sought to systematically apply concepts and tools from general medicine and neurology to the study and treatment of abnormal mental distress.^{4,5}

In France, Jean-Martin Charcot (1825-1893), at the Salpêtrière, was particularly interested in hysteria which he ascribed as a neurological problem, and in the therapeutic uses of hypnosis. He also left his mark through several famous students, such as Sigmund Freud, Joseph Babinski, and Georges Gilles de la Tourette. Freud (1856-1939) himself trained as a neurologist, founded psychoanalysis and popularised the 'talking cure'.

The Schism in 19th and 20th Centuries

Freud and his followers shifted the paradigm of psychiatry from structural neuropathology towards psychological models of understanding and treatment, and much further down the road to community and social psychiatry as well. However, there were dissenters, e.g. Emil Kraepelin, a contemporary of Freud, who advocated that psychiatric diseases are mainly caused by biological and genetic disorders.

Even before the advent of psychoanalysis, the mode and geography of practice of the early psychiatrists had already deviated from that of the neurologists. While neurology was largely practiced in large, urban general hospitals juxtaposed with other medical specialties, many psychiatrists had shifted to ministering to the ‘insane inmates’ in asylums, often located in isolated, stand-alone facilities. Hence, the precursor of the Royal College of Psychiatrists (UK) was called the ‘Association of Medical Officers of Asylums and Hospitals for the Insane’, formed in 1841. It should be noted that these asylums also housed ‘epileptics’, ‘syphilitics’ and ‘mental retards’.

Following the ideological and practical split, in academic medical centres separate departments of neurology and psychiatry were formed with often little interest in collaborating in research, education or clinical care.³ In the 1940s, the *Archives of Neurology and Psychiatry* were separated into 2 journals. The training programmes were literally separated by an artificial division between disorders that were either ‘organic’ or ‘functional’.⁶

For psychiatry, the pendulum started swinging back towards neurological approaches by mid to late 20th century, one of the seminal events being the synthesis of efficacious antipsychotics, chlorpromazine in 1950 being the first. However by then, the schism between neurology and psychiatry had become codified by training programmes, specialty boards and examinations, and by administrative and socioeconomic factors.

In the UK and British-based systems, neurology generally fell under the umbrella of internal medicine, quite distinct from psychiatry. In the UK the neurology specialisation occurs after attaining membership to the Royal College of Physicians; whereas psychiatrists are examined by the separate Royal College of Psychiatrists. In the US, there was a semblance of cohesion, through the specialists’ examining body, the American Board of Psychiatry and Neurology (founded in 1934) with considerable testing overlap to this day.⁷

Rapprochement and a New Field

The past 2 decades witnessed various efforts at rapprochement between neurologists and psychiatrists and especially at finding areas common to both.

In the US, an interest group was formed within the American Psychiatric Association, that culminated in the creation of the American Neuropsychiatric Association in 1988 as a distinct and independent entity.⁸ Across the Atlantic, the first meeting of the British Neuropsychiatry Association took place in London in the same year. Both are open in their memberships – welcoming neurologists, psychiatrists, physicians of other specialties, non-physician neuroscientists and neuropsychologists. Then in 2004, the

United Council of Neurologic Specialties (UCNS) in the US accorded recognition of the neurologic subspecialty ‘Neuropsychiatry and Behavioral Neurology’, with certification examinations commencing in 2006. Of special interest is that both neurologists and psychiatrists are eligible for this certification. With formal training and certification scheme came syllabuses, examinations, fellowship programmes, and accreditation. The syllabus for this certification examination is the one we described earlier in this article.

Development of Psychiatry and Neuropsychiatry in Singapore

The British established Singapore as a port in 1819. Early psychiatry in Singapore was essentially an outpost of British psychiatry but modified to local conditions. A 30-bed Insane Hospital was erected in 1841, which was renamed the Lunatic Asylum in 1861.^{9,10} Dr William Ellis was medical superintendent of the Lunatic Asylum in Singapore from 1888 to 1909. He wrote, “In the Straits Settlements syphilis is the most prevalent (in the Lunatic Asylum)”.¹¹ In Singapore, malaria fever was introduced as a treatment for Global Paralysis of the Insane (GPI) in 1931. Penicillin was first employed for GPI in Singapore in 1954. Furthermore, colonial records also showed that neurosurgery for mental disorders was carried out at the Singapore General Hospital in the 1960s.

After independence in 1965, local doctors were sent to the UK and Australia for training in psychiatry. Amongst the first generation of local psychiatrists trained in the UK, Drs Chee Kuan Tsee and Ong Thiew Chai had strong interest in neurobiological basis in psychiatry which would greatly influence their work and subsequent trainees. In 1982, it was decided that the then University of Singapore would conduct specialty examinations for psychiatry under the Master of Medicine (MMed) programme. However, locally qualified psychiatrists could still go abroad for exposure and further specialisation. One psychiatrist who did his overseas fellowship in the Neuropsychiatry Unit of the Maudsley Hospital in London is an author of this paper (BYN). He joined Singapore General Hospital (SGH) and started the neuropsychiatry service, which was the setting for psychiatrists to work closely with neurologists, neurosurgeons, neuropsychologists, rehabilitation physicians, occupational therapists and physiotherapists to jointly manage patients with neurological conditions. In 2007, repetitive transcranial magnetic stimulation was introduced in SGH for patients with intractable depression. Neuropsychiatry has found a natural niche in the consult-liaison setting of general hospitals, and indeed thrives in close association with neurology departments. In addition to the physical proximity, there is proximity of mindset, easy collegiality, joint rounds, and ready access to

electrophysiological testing and neuroimaging.

In Singapore as in other British-based systems discussed earlier, neurology is a subspecialty of internal medicine. As a prerequisite for neurology training, doctors have to complete the Master of Medicine (Internal Medicine), or attained membership to the Royal College of Physicians. Psychiatry, on the other hand, is a primary specialty through the Master of Medicine (Psychiatry) or equivalent foreign examinations. Advanced trainees, post-Masters may develop subspecialties through further experiential training in Singapore and overseas.

In Singapore, as in many other Asian and even some Western societies, psychiatric illnesses have been associated with stigma. Patients and their families would often prefer to consult neurologists rather than psychiatrists. Nevertheless, many neurological disorders are associated with concomitant psychiatric symptomatology, consistent with the premise of an underlying brain dysfunction. Not infrequently, it is the psychiatric symptoms that most adversely affect quality of life. As an illustration, depression and anxiety are the most frequent psychiatric co-morbidities in patients with epilepsy. Epidemiological studies from the US indicate that over 20% of patients with epilepsy have a depressive disorder.¹² Statistical analysis on local epilepsy patients have yet to be done. Other neurological diseases also have prominent psychiatric symptoms, such as Parkinson's disease and Huntington's disease. Likewise many paediatric psychiatric disorders, e.g. attention deficit-hyperactivity disorder and Tourette's disorder, are treated by paediatric neurologists and child psychiatrists and both lay claim to this overlapping territory.

The current practice in Singapore, as it is in most countries, is for neurologists to treat the psychiatric co-morbidities that they are familiar with and to refer to their psychiatry counterparts when the psychiatric problems are complex or intractable. On the other hand, psychiatrists are often uncomfortable with neurological problems; hence, it is not uncommon to see referrals by psychiatrists to neurologists asking them to 'please rule out organic brain disease'. Communication between neurologist and psychiatrist in this situation is crucial and facilitated by physical and ideological proximity.

Moreover, a sizeable percentage of patients who present to neurologists' clinics have vague complaints of giddiness, numbness and weakness that do not lead to satisfactory and discrete neurological diagnoses even after exhaustive work ups. They may be labelled psychosomatic, which is not particularly helpful. It is likely that some of these patients have more psychiatric issues than neurological ones, and would have been diagnosed with 'neuroses' in the pre-DSM IV era. Scarce attention is paid to these patients in textbooks of neurology or in training programmes. Moreover

while neuroscience is providing some understanding to many of the neurological diseases, they remain illnesses with important psychological and social dimensions.¹³

Some authors argue that the distinction between neurology and psychiatry may be held by some of the public and even professionals arising from a stigmatised view of psychiatric disorders. Perhaps it suits some to be able to consider 'real' neurological diseases arising from brain pathology as distinct from psychiatric disturbances arising from weak moral fibre or bad breeding.¹⁴ This is even more so in Singapore and many other Asian countries. Then it could be argued that the advent of neuropsychiatry may 'neurologise' psychiatric disorders and ameliorate stigmatisation.

The developments in neuropsychiatry are particularly timely as the Singapore government has identified neurosciences to be one of the key pillars of biomedical development for the future. By embracing new ideas and approaches that transcend traditional boundaries, neuropsychiatry has tremendous promise in Singapore and all around the world.

The Future for Neuropsychiatry

Sachdev^{15,16} has noted psychiatrists and neurologists operate very different patient management strategies, which are based on skills honed by years of experience, and any attempt to join them would dilute them both. Moreover, the ability to maintain a broad knowledge and skill base for both neurology and psychiatry with the explosive increase in scientific knowledge may not be possible.

Neurologists have a tradition of clinical examination skills, empiricism, rigor and objectivity of eponymous diseases. Psychiatrists have a tradition of rich description of mental phenomena, well-developed interviewing skills, and the appreciation of individual differences and the interpersonal context. They also have in their armamentarium a wide range of psychological and behavioural therapies.

Neurologists and psychiatrists are likely to remain distinct specialties despite the convergence of the underlying neuroscience and the recognition of neuropsychiatry as a distinct field. However, we propose that psychiatrists, especially those with an interest in neuropsychiatry, adopt the neurologists' mindset in terms of rigorous scientific thought processes in assessment and diagnosis, but combine it with psychiatrists' empathic interviewing and psychotherapy skills. This will be a platform to develop and enhance the biopsychosocial model of brain diseases, and multimodal treatment approaches. In particular, neuropsychiatrists can provide detailed assessment of psychiatric comorbidities, risks, suicidality and caregiver support that are complementary and helpful to neurologists in various clinical settings. This is especially true for many

of the neurologic conditions, which are relapsing and remitting or inexorably deteriorating in nature, and available treatment is limited. We also strongly recommend that during residency, psychiatry trainees spend some time in neurology and vice versa. Lastly but importantly, psychiatrists should become well versed in the neuroscience research tools, e.g. in neuroimaging, genetics and molecular approaches that have given us tremendous insights into the functioning of the brain.

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