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## Review article

The evolving discipline and services  
of neuropsychiatry in the United Kingdom

Arambepola NMA, Rickards H, Cavanna AE. The evolving discipline and services of neuropsychiatry in the United Kingdom.

**Background:** The last few decades have seen a renaissance in the development of neuropsychiatric services on a global scale.

**Methods:** This paper reviews the existing literature on the changing role of the clinical neuropsychiatrist and discusses the evolving theory and practice of neuropsychiatry in the United Kingdom.

**Results:** The rapidly evolving specialty of neuropsychiatry is currently facing a number of challenges. These include, but are not limited to, uncertainties about the curricular requirements for clinical neuropsychiatrists and the changing roles within the wider scenario of health-care service provision.

**Discussion:** An informed historical perspective on this multifaceted discipline allows key insights into its future development.

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Keywords: clinical practice; future directions; neurology; neuropsychiatry; neuropsychology; psychiatry

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## Summations

- The discipline of clinical neuropsychiatry is currently undergoing a scientific renaissance on a global scale.
- Knowledge about the history and current trends of neuropsychiatry service provision in the United Kingdom provides useful insights into the present and future directions of this discipline.
- The evolving professional role of the neuropsychiatrist reflects the balance between the clinical phenomenological tradition and the development and implementation of sophisticated diagnostic and treatment tools.

## Considerations

- Despite the increasing popularity of neuropsychiatry, there is little agreement about the exact role and curricular requirements of clinical neuropsychiatrists.
- The shape of neuropsychiatry service provision can change significantly across different clinical and research settings.
- Multidisciplinarity in neuropsychiatry can be challenging in terms of integrating neuropsychiatry care with other health-care services.

### Defining neuropsychiatry

Even at a glance, one would realise neuropsychiatry to be a multidimensional speciality. A glimpse into its history shows a sombre past, with shifting territorial boundaries and identity. Its undervalued and misunderstood identity at present can be likened to an ever-changing chameleon, as it has had to continuously change and refine its fundamental principles to fulfil the complex needs of the masses. Yet throughout its dynamic past, neuropsychiatry has remained a major contributor to the understanding of mental illness and continues to have a unique role in its management.

What does it mean to be a neuropsychiatrist at present? In the current medical setting, a neuropsychiatrist has to be a competent practitioner of multiple disciplines in approaching a service user with complex needs. Clinical neuropsychiatrists combine the strengths of various disciplines in approaching the patient with the aim to treat him/her more holistically.

Neuropsychiatry borrows its essential skills from neurology, psychiatry and neuropsychology. First, an accomplished neuropsychiatrist has obtained his 'strong scientific tradition, attention to detail, and clamour for demonstration of facts' from neurology (1). He inherits the essential characteristics of objectivity and empiricism from the similarly rich tradition of such practice in neurology. Second, the 'excellent descriptive tradition, patient focus, and the ability to deal with ambiguity and communication skills' of a neuropsychiatrist is inherited from its other parent speciality, psychiatry (1). A neuropsychiatrist has an 'appreciation of individual variation, [and the] ability to deal with ambiguity' and strives to comprehend 'the multiple causation of behavioural disturbance' (2). The basis for such a skill originates from the similar tradition in psychiatry. Third, one will not be a neuropsychiatrist without a highly developed ability to assess a patient holistically (1). Such a developed skill set of a neuropsychiatrist hints to its evolution from existing specialities and its adaptation as means of survival in its strife to establish itself as a speciality of its own right.

To assess the influence of neuropsychiatry in medicine, one must initially look at its definition as well as the basis for its present territorial boundaries; in other words, one must look at both its foundation claim (and its perception of mental illness) and its current clinical role. The unbiased evaluation of the current need for such a speciality may validate its present function. Comparison of the optimum level of service provision for neuropsychiatry and its current level highlights its unmet potential. It may identify

neuropsychiatry as a sustainable evolving science, with potential to improve clinical practice. Yet, prior to evaluating the need for neuropsychiatry and its potential, one must define its boundaries, as only through appreciation of what it encompasses may one critique its nature and function.

The first definition of neuropsychiatry that one may consider is the most simplistic. Superficially, if one may assume 'psychiatry as a protean discipline' (3), then one may logically conclude 'neuropsychiatry [as] one of its incarnations' (3). With the same line of thought, it can be justified as 'another discipline created by society to perform certain anthropological, managerial and policing duties' (3). Yet such a vague definition does not capture the true essence of a field with the ability to change the current paradigm of mental illness, nor does it explain its core beliefs which define its niche in medicine. Additionally, it does not satisfactorily answer the need for an independent speciality amidst the current remnants of the archaic Cartesian belief of the dualism of mind and body (4) represented by the current volatile coexistence of neuropsychiatry with psychiatry and neurology.

Second, one may view neuropsychiatry as an 'amalgam of neurology and psychiatry, dealing with disorders that cross the boundary between the two disciplines' (5). However, it is still an insufficiently narrow and naive view of a complex speciality. It may also be unsatisfactory due to its identity as the mediator of 'an artificially created division' (5) that may only deal with the outcasts of neurology and psychiatry. Although such a definition unfortunately does reflect a barrier to referral and aspects of service provision in neuropsychiatry in the United Kingdom at present (4), it is not an appropriate one. Neither does such a definition respect the unique diagnostic skill set used in neuropsychiatry nor its ability to fulfil the criteria for a sovereign medical speciality.

Perhaps the most appropriate definition is one which can capture the breadth of the speciality along with its fundamental scientific roots. Hence neuropsychiatry has been defined as a speciality which

'concerns itself with the complex relationship between human behaviour and brain function, and endeavours to understand abnormal behaviour and behavioural disorders on the basis of an interaction of neurobiological and psychological-social factors' (5)

and therefore 'deal[s] with brain diseases [with a definable basis], which manifest with disturbances in cognition, emotion [and/] or behaviour' (5).

### Between neurology and psychiatry

Although such a broad definition may define psychiatry as well as neurology, it provides an idealised definition of neuropsychiatry as a speciality bridging the differences of the highly matured specialities of neurology and psychiatry. Additionally, it provides us with a vision of the care of 'mental illness' prior to the distinct division of psychiatry and neurology in the late 20th century with the development of neuroscience and psychotherapy. On hindsight, the alienists caring for those deemed insane within centralised asylums built (and even before) under the 1845 Lunatic Asylum and Pauper Lunatics Act in the United Kingdom (6) as well as the earliest clinicians caring for patients with behavioural and cognitive 'abnormalities', with indeterminate causes, were neuropsychiatrists. It was their approach to and their assessment of the patient, without the luxury of determining definite organic explanations for cognition and behaviour (or the absence of one) which allows one to define them as neuropsychiatrists.

However, the reality of the identity for neuropsychiatry and its niche alongside the established fields of neurology and psychiatry is more specific and is explicit. In current health-care provision, neuropsychiatrists purely limits their care provision to patients with psychiatric effects of neurological disorders, neurological presentation in psychiatric disorders, psychological factors affecting physical status or instances of coexisting psychiatric and neurological conditions (1). The exact niche of neuropsychiatry shall be further discussed.

In looking at its history, one may not be able to directly trace back to the exact beginning of neuropsychiatry, however, its foundation claim and its evolution can be traced back through the history of medicine. As neuropsychiatry has been revitalised in the last decades, the comprehension of its roots is essential to the realisation of its contribution to the understanding of mental illness. Hence the writer shall explore the foundation claim for neuropsychiatry, and the origin of neuropathology-based psychiatry of the 19th century with the hope of conveying the essence of the speciality. The writer shall explore how the change of what constitutes as the 'the mind' had and continues to alter the management of mental illness and how archaic disparity in definition may have translated into territorial friction between psychiatry, neurology and neuropsychiatry.

The foundation claim for neuropsychiatry can be linked to the origin of the mind-body argument. Initially the claim that the 'body [brain] houses the human soul [or mind]' and the theory that the

'changes in the conformation or constitution of the body [brain] cause mental disorder' were considered independent of each other (1). These two claims were justified with two contrasting commonly held opinions of the composition of 'mind': the plain concept of matter and the baroque concept of matter (3). The resulting strife over decades to explain how matter gives rise to the mind and how an 'abnormality' of matter may cause mental illness formed the foundation claims for psychiatry and neurology. Neuropsychiatry which grew from the roots of psychiatry and neurology has had to endure the continued struggle to explain mental illness from its stance.

Baroque concept of matter represents the idea that 'matter includes dynamic qualities of the type that can explain the origin of mind' (3). Contrastingly, the plain concept of matter proclaims that matter as 'a bundle of atoms... has not got any hidden qualities that can be used to explain what issues out of matter-like mind' (3). The competing views of the two schools of thought gave birth to the revolution of the neurosciences which shaped the current path of neuropsychiatry.

The baroque concept of matter was a prominent theory, from the 17th century until the 19th century, when it went out favour with the work of authors such as Karl Wernicke. Initially, the prominent 17th century baroque thinkers T. Willis and Sir T. Sydenham brought the concept to the forefront of medicine. Willis theorised a link between melancholia and a 'fault of the brain, and the disorder of the animal spirits resting in it... attributed to the passion of the heart' (3). Sydenham theorised that mania 'comes from weakness and vapidness of blood, brought on by over-long fermentation' (3). Such theories gave way to the theories of P. Cabanis whose theories 'compromises a full array of forces and properties from whose physico-chemical combination even the most complex living organisms may emerge' (3). Finally, following the earlier thinkers, the work of A.J. Bayle in the 19th century influenced the understanding of the mind, by linking mental illness and discrepancies in the physical status of patients diagnosed with dementia (3).

On the other hand, the plain concept of matter served as the basis for later theories that divided the fields of neurology and psychiatry in the 18th and the 19th century. It came to the forefront of medicine in the 18th century following the work of D. Harley and W. Battie. Harley hypothesised a connection between an idea and the 'vibrations' within the nervous system (3). Hence an inaccuracy of perception may simply be explained by a disordered or a damaged brain:

'...we distinguish the recollection and anticipation of things relating to ourselves, from those of things relating to



other persons chiefly by the difference of strength in the vibrations' (3).

Battie's work rejected the commonly accepted view of nerves and the function of the cerebrum as a gland. In the context of this text, his main contributions to the mind–body argument were his conclusions following the work of Harley. One such contribution was his theory that insanity and hallucinations resulted purely from 'nervous over-excitation' followed by them 'becoming insensitive' (3).

Such deferring views on what 'the mind' truly is was a driving factor to the development of early psychiatry and neurology, and may have contributed to the current abstract multidimensional perception of mental illness carried by neuropsychiatrists. Such a broad working definition may have influenced their current paradigm of treating multiple manifestations (whether neurological or psychiatric) of an illness, with or without a localised neurological disorder. Although such characteristics of care may have ancient roots, in order to understand the current view of mental illness, one must also consider how such factors would have influenced neurology and psychiatry.

Although the plain and baroque concepts of matter went out of fashion in the 19th century, its influence on the mind–body argument has had repercussions on the development of neurology and psychiatry. One can theorise the effects of how such contrasting views may have moulded neuropsychiatry in to the sub-speciality it is today. The objectivity of the plain-matter thinkers may have influenced the current biomedical model used in neurology which highlights the organic aspects of illness which may result in subsequent psychiatric disorders. Contrastingly the search for aspects of one's life that transcends mere deficiencies in the brain matter as means of diagnosing mental illness is commonly used by modern psychiatrists. Perhaps, today's objective of providing more holistic care to service users may have necessitated the development of a hybrid speciality with the benefit of a mixed view of mental illness than the traditional polarised view. Today's neuropsychiatrists have the difficult role of fulfilling the high expectations of being able to manage the many facets of mental illness and organic brain disorders. However, if neuropsychiatry is able to successfully manage these patients with complex needs, it would readily find its niche in medicine with the ability to help a significant minority.

An important piece in the development of the philosophical aspects of neuropsychiatry is the change of focus in psychiatry from the 19th century. Between the 19th and the 20th century, psychiatry changed from 'a field based on structural

neuropathology to psychoanalysis to community and social psychiatry' (7). Such substantial change in service provision and management of mental illness was a herald to the current UK neuropsychiatry service. The immense growth in community psychiatry has created a niche in service provision for neuropsychiatry for the understanding and management of psychiatric co-morbidities of traditional 'neurological' patients. Although these factors had an influence on the shift of paradigm which laid the foundation claims of neuropsychiatry, it is the work of Karl Wernicke that cemented its role in medicine from the 19th century.

Karl Wernicke was one of the first individuals, with enormous influence in the development of both neurology and psychiatry, that looked at patient care with the perspective and the skill set of a neuropsychiatrist. Wernicke's creation of a 'model to encompass all brain-related diseases (whether purely psychiatric or neurological), a pathophysiological model to link the brain to behaviour' as well as the 'neuropsychological approach' to assess mental illness, laid the foundation from which modern neuropsychiatry became revitalised in the 20th century (3). His aim to provide more complete care to patients with psychiatric and/or neurological needs can be likened to the multiple roles that a modern neuropsychiatrist have to play in patients' care.

Neurology and psychiatry, with their clear-cut boundaries have been dominant fields of medicine since their conception; yet such definition of a speciality with defined territories is an obsolete concept at present. The change in the public health needs has deemed that a multidisciplinary approach is necessary to provide sufficient care to service users. The ineffective nature of the older altruistic model of patient care, the realisation of the complexity of the needs of some patients and the high patient expectations have carved a niche for such versatile clinicians as neuropsychiatrists. The poor assessment of the complexity of the needs of some patients in the absence of neuropsychiatry is described fittingly by the Necker cube phenomenon. The Necker cube phenomenon describes how rival perception of a patient (represented by the cube), from a psychological paradigm and then from a neurological paradigm, would only be able to view two independent facets of a single cube (8). This is evident in the differing description of the 'same phenomenon: [as] "dementia praecox grimacing mannerism" from Norman's 1928 psychiatric textbook and "Post-encephalitic Parkinsonism with a mandibular tic" from Kinnier Wilson's 1940 neurology textbook' (8). One may only assume that a clinician without such limitations as a fixed one-dimensional view of illness can provide more holistic care as expected by modern medicine.

It would be a form of naivety to assume that an amalgamated approach to treating all mental illness may be entirely addressed by a single speciality. Yet there is a clear need for a specialised field, in the form of neuropsychiatry, in fulfilling the complex needs of a significant minority of service users. In these cases, neuropsychiatrists need to collaborate with neurology and psychiatry and decisively coordinate all efforts to improve the quality of life. The next sections will henceforth describe the actual need for neuropsychiatry services in specific patient populations and settings, before moving to the present niche in health-care provision for neuropsychiatry in the United Kingdom.

### The evolving role of neuropsychiatry

Although the nature of brain-based disorders and the definition of such disorders has been the topic of discussion from distant past to the present, one factor has remained true through time. It is the stigmatisation of mental disorders and the lack of 'sufficient acceptance of psychiatric treatment by patients' (7) in general. Such consequences may be attributed to 'the arbitrary and baseless cleavage of brain-based disorders into two disparate medical specialities' (7) yet it may not. The contrasting views on the aetiology or of pathology or the 'conceptual disintegration of separating brain-based disorders into neurological or psychiatric conditions' (7) are key aspects of public perception of mental illness.

The more detailed consequences in disparity of perception and paradigm in psychiatry and neurology are as follows. First consequence of public confusion and misunderstanding is that it leads to 'lack of parity in the reimbursement for psychiatric treatments with those for other medical conditions' (7). The second consequence is the labelling of patients whereby a significant minority of patients may go untreated or without their complex underlying needs being met. An example is a patient with the diagnosis of Parkinson's disease, on being labelled as having a movement disorder such a patient may not receive the appropriate consideration for the 'high prevalence of psychosis, depression, and dementia' (7) in that particular patient population. Another example is the lack of consideration of the potential needs pertaining to 'cognitive, mood, and motivational dysfunctions' in a patient diagnosed with schizophrenia (7). Patients suffering as a direct result of such disparity are the main and ideal subgroup of patients who would benefit at large by an effectively managed neuropsychiatric service.

Clinical presentations that are currently treated by neuropsychiatric services include the following:

psychiatric effects of neurological disorders, neurological presentation in psychiatric disorders, psychological factors affecting physical status (e.g. chronic pain) and instances of coexisting psychiatric and neurological conditions (1). Some examples of psychiatric consequences of neurological conditions are organic psychiatric disorders with confirmed brain pathology or neurological disease with psychological reactions (1). On the other hand, examples of neurological presentation of psychiatric disorders are patients with somatoform, dissociative or factitious disorder (1). However, no significant research has been done on the incidence of neurological symptoms in purely 'psychiatric' patients (7). These are four instances when the approach of a neuropsychiatrist may deliver the best care; this can be attributed to the consideration of both the neurological and psychiatric needs of the patient.

Some specific examples portraying the need of the neuropsychiatric approach to patient care are in the case of 'brain trauma of sufficient severity to result in neurological symptoms (Opponent et al) and Huntington's disease and degenerative cerebellar disease (Leroy et al)' (7). In the first instance, the study

'found that 48.3% developed an axis I disorder... including major depression (26.7%), alcohol abuse or dependence (11.7%), panic disorder (8.3%), specific phobia (8.3%), and psychotic disorders (6.7%). Additionally, 23.3% of the patients developed at least one personality disorder following their injury-avoidant (15.0%), paranoid (8.3%), and schizoid (6.7%)' (7).

The findings of the Leroy et al. study were that 77% of patients diagnosed with degenerative cerebellar disease and 81% of patients with the diagnosis of Huntington's disease 'manifested psychiatric disorders' in comparison to 41% of patients with no known neurological impairment (7). Additionally, the finding that in Edinburgh,

'general neurology out-patients were shown to have a prevalence of 47% for anxiety and depressive disorders... [while] Bridges & Goldberg (1984) estimated the prevalence of psychiatric illnesses in neurological in-patients at 39%' (4)

may question the current applicability of such research, it does highlight an existing problem that is apparent in in-patient populations even at present. Such evidence, are mere three instances when

the management of a patient more holistically is desirable.

The writer appreciates that ‘territorial claims are dynamic processes that are resolved by historical developments and shifts in thinking’ (2) as was discussed in regard to neuropsychiatry’s foundation claim, its definition and its responsibility in the care of a diverse array of disorders. The present day management of illness by neuropsychiatry is limited to a specific set of disorders, and its existence does give the best possible care to that significant minority whom neurology or psychiatry may not be fully equipped to manage. It would be in the best interest of the patient, the main stakeholder, for neuropsychiatry to coordinate care in such cases, as neuropsychiatry is based on ‘special skills [or unique approach], without which particular clinical disorders cannot be managed’ (2).

### **The United Kingdom scenario**

What is the current level of neuropsychiatry service provision? What are its optimum standards in the United Kingdom? Although neuropsychiatry has earned the respect of its critics within the recent decades, its optimum level of service provision, although theorised, has not yet been achieved. Furthermore, with the ‘emerging consensus that a realistic rate of referral to a neuropsychiatry service would be about 20-30 per 100,000 population’ (4) the need for a functioning and effective regional neuropsychiatry services has been highlighted. Such a finding is based on an audit conducted by the North Staffordshire neuropsychiatry service and a similar audit conducted by the South London, Kent, Surrey & Sussex neuropsychiatry services (4). With such a recognised public need, one must then consider the nature of the current neuropsychiatry services to observe its influence in medicine. Such an assessment highlights the need to improve services for the future.

A recent paper by Agrawal et al. states ‘current provision of neuropsychiatry services remains patchy and grossly inadequate’ (4) and it is a fair conclusion to make at present from a variety of sources. The heavy emphasis on ‘rehabilitation following acquired brain injury’ by national clinical guidelines (by Royal College of Physicians) recognises the higher incidence of psychiatric disorders at large in that specific patient population (9). The guidelines further specify the higher need for specialist neuropsychiatric support that should complement the efforts of local mental health teams (9). The National Service Framework for Long-term Conditions states,

‘people with long-term neurological conditions who would benefit from rehabilitation are to receive timely, ongoing,

high quality rehabilitation services in hospital or other specialist settings to meet their continuing and changing needs’

which includes the specialist services of neuropsychiatry (10). Yet it infers to the need for improvement of such services. It also recognises the current insufficiency of such specialised services.

Finally, a separate study by Agrawal et al. (2008) states that

‘two-thirds of neuropsychiatry services that had existed for more than a decade, a significant portion had not expanded in recent years and a significant number was forced to reduce in size’ (11).

Such plateaued progress of these assessed practices was attributed to the main focus of ‘national service framework for mental health on providing comprehensive community services to the public’ (11). It highlights the change in focus of mental health services, in favour of providing local services. Such evidence also highlights the present disparity between the heightened continuous local need and the current state of service provision at specialised regional centres. It also highlights the disparity between the theoretical guidelines for best practice and the unfortunate reality of declining service provision in neuropsychiatry in some regions of the United Kingdom.

The optimum strategy of neuropsychiatric service provision has been theorised by the hub and spoke model of care. The efficacy of the model and its application relies on a central regional neuropsychiatry service (hub) functioning alongside local psychiatrists with a special interest in neuropsychiatry (spoke) (4). The local aspect of the model is to be managed by various clinicians ranging from general psychiatrists and old age psychiatrists to learning disability specialists who would ‘run a local special interest clinic in neuropsychiatry with ready access to tertiary advice and opinion’ (4). Such combination of outreach clinics and local special interest clinics are aimed at meeting the referral rate for a specific locality, with the hub subsequently serving as an administrative, educational, clinical and research base. Some conditions that would be addressed sufficiently by such use of resources are ‘brain injury rehabilitation, epilepsy, memory disorders, functional neurological syndromes, developmental neuropsychiatry, [and] sleep disorders’ (4). Such a model, with each regional hub and spoke being driven by a multidisciplinary approach may fulfil the needs of that particular population. Finally, one must also address the estimated need of 5–10 in-patient beds



per 1 million, which may require an adaptation of in-patient services within a region. Achievement of such a comprehensive neuropsychiatric cover should be the main focus in meeting the future needs.

The drive for the development of neuropsychiatry is manifold. It may come in the form of increased rate of neuroscientific discoveries and it is possible that with the increasingly aging population in the United Kingdom at large and increasing pressure from patient advocacy groups there may be higher NHS interest in such specialist services due to increase in public demand and genuine unmet need (7).

### Present challenges and future directions

The benefits of a well-functioning neuropsychiatric service which fulfils the referral rate of a clinical population are manifolds. Specifically, such benefits become apparent if the application of neuropsychiatry at a local level improves to the optimum-theorised level. First and most importantly, it shall lead to a more 'comprehensive neurological and psychological care of patients', which in turn shall reduce mortality and costs in unnecessary investigations (1). Additionally, it shall lead to better quality of life for a significant minority of patients, who prior to such improved provision would have been cared for insufficiently by either neurology or psychiatry independently. This would ultimately lead to improve the quality of life of carers as well as of service users (1). Second, it shall remove undue pressure on health-care services by reducing unnecessary admissions and potentially reducing the length of patient stays (1). Therefore, such change in service provision is an aspect of neuropsychiatry that requires careful consideration due to its future implications.

The development of new technology may have an important role to play in the diagnosis and treatment of neuropsychiatric conditions (12). First, specific and rapid advances in magnetic resonance imaging (MRI) have facilitated the diagnostic process. Another example is the use of diffusion-weighted imaging in investigating 'the integrity of the blood-brain barrier' (2). More examples are the use of exogenous contrast tracking or arterial spin labelling in investigating brain perfusion, and the use of functional MRI to investigate brain function (2). Second, more common future use of such techniques as transcranial magnetic stimulation as well as vagus nerve stimulation (for depression) and deep brain stimulation (for obsessive-compulsive disorder) may revolutionise the treatment of neuropsychiatric patients (2). The technological leaps of

the 21st century may revolutionise the diagnostic process of neuropsychiatry, and the promise of new technological developments comes with the promise of substantially improved care for some service users.

In the context of technology, one must always be wary of the technology alibi highlighted by the work of E. Georget in the 19th century. Georget believed that though mental illness may have direct correlations to specific lesions in the brain, technology at times is lacking and is therefore the limiting factor to progress (3). If one assumes such a theory to reflect reality, then one may conclude that the exponential growth which neuropsychiatry is currently experiencing, perhaps may be attributed to the exponential development of technology within the last decade. In the same line of thought, further development of technology may serve as a driver for future developments in neuropsychiatry, and may herald a new era in the management of mental illness.

Neuropsychiatry has contributed to the current understanding of mental illness with its appreciation of the need for an objective as well as a subjective view in assessing and managing mental illness. It has been a silent contributor to the treatment of mental illness; yet has shown its potential to improve the lives of a significant minority of service users who may not be sufficiently treated by either neurology or psychiatry (13). Although its service provision is insufficient at present in the United Kingdom, it has the potential for exponential growth in recent future. Such development may usher in a new era in medicine, one in which the more inclusive management of mental illness may finally remove the stigma associated with it.

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