

# Dualism and the ‘difficult patient’: why integrating neuroscience matters<sup>†</sup>

ARTICLE

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## SUMMARY

Patients with psychiatric illness present a unique challenge to clinicians: in contrast to the traditional medical model, in which patients are conceptualised as being *stricken by* a disease, patients with certain psychiatric illnesses may seem *complicit in* the illness. Questions of free will, choice and the role of the physician can cause clinicians to feel helpless, disinterested or even resentful. These tensions are a lasting legacy of centuries of mind–body dualism. Over the past several decades, modern tools have finally allowed us to break down this false dichotomy. Integrating a modern neuroscience perspective into practice allows clinicians to conceptualise individuals with psychiatric illness in a way that promotes empathy and enhances patient care. Specifically, a strong grasp of neuroscience prevents clinicians from falling into the trap in which behavioural aspects of a patient’s presentation are perceived as being separate from the disease process. We demonstrate the value of incorporating neuroscience into a biopsychosocial formulation through the example of a ‘difficult patient’.

## LEARNING OBJECTIVES

After reading this article you will be able to:

- appreciate historical factors that have contributed to dualism in psychiatry
- appreciate the value of an integrative perspective
- describe how psychological and social factors integrate with a neuroscience perspective in substance use disorders.

## KEYWORDS

Psychotic disorders; psychoanalytic; psychiatric illness; neuroscience; biopsychosocial.

successes – from antibiotics to life-saving surgeries to modern precision medicine – have all reinforced this approach.

This same model remains foundational to training: from the first day of medical school, students are taught basic science with the promise that they will ultimately apply this knowledge to diagnose and treat their patients. Armed with empathy and optimism, they arrive on the wards, ready to leverage years of training to pursue their goal from the outset – to help suffering patients.

But something happens. A disturbing research finding is that physicians may actually experience a decrease in empathy throughout medical training (Hojat 2009). Although the reasons for this are undoubtedly multifactorial, one mechanism may be through their interactions with a subset of complex – or ‘difficult’ – patients.

Take, for instance, Mr A, a 39-year-old man with a history of intravenous heroin use, admitted to the internal medicine service for the treatment of infective endocarditis. Mr A is well known to the residents and attending physicians (trainee doctors and consultants) on the service owing to his frequent admissions, demands for pain medication, verbal outbursts and tendency to leave against medical advice prior to completing his course of intravenous antibiotics. Physicians describe Mr A’s complaints of radiating neck pain, attributed to an old motor vehicle accident, as ‘lacking an identifiable organic source’. His uncooperative attitude is frequently documented as ‘manipulative’ or ‘indicative of a pathological temperament’. Not surprisingly, the medical staff feel frustrated with their inability to help Mr A, to the point where they often question the amount of resources that have been dedicated to someone who continues to make such self-destructive choices. Behind closed doors, they may disparagingly mutter that ‘this is all in his head’.

The third-year medical student rotating on the service may feel stuck. On one hand, Mr A’s infectious and immunobiological problems will align well with the student’s training. But on the other, the patient’s affective and behavioural dysregulation may be baffling. Because these problems are ‘lacking

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Hippocrates is commonly considered the father of modern medicine. His work defined the foundations of the profession: diseases are a natural process, rather than a divine affliction; the role of the physician is to identify the biological cause and to facilitate a corresponding treatment. Across the centuries, an increasing number of medical

an identifiable organic source' they do not readily fit within the basic framework of the medical model – and, accordingly, they may strand the student outside the traditional role of doctor, leaving them feeling helpless and frustrated.

### **Haunted by Descartes' ghost**

To understand why something like a substance use disorder and its sequelae are so easily relegated to 'lacking an identifiable organic source', it is helpful to look back to 17th-century philosophy and, specifically, to the work of René Descartes. Descartes promoted the idea that mind and body were separate entities and that mental activity arose from a substance distinct from the body (Descartes 1641). This idea is now referred to as 'Cartesian dualism' (in contrast to more modern perspectives on the problem (Maung 2019)). Although Descartes had his contemporary detractors, his broad influence as it applied to medicine would go largely unchallenged for the next 250 years.

### **Freud and the psychoanalytic approach**

In the 19th century, new ideas about natural selection and conservation of energy often seemed incompatible with Cartesian dualism. This inspired a new generation of researchers – from Charcot to Broca to Babinski to Kraepelin – to try to bridge the mind-body divide (Smith 2017). One such individual was the young neurologist Sigmund Freud. With training in both neuroanatomy and neurophysiology, Freud seemed to be in a perfect position to integrate the biological with the psychological (Freud 1954 reprint). But when the scientific tools of his day proved inadequate for such an undertaking, Freud's work shifted to exploring psychological models in greater depth (Northoff 2012). His work developing psychotherapy and psychoanalysis set in motion a split – brain from mind – that, following the advent of electroencephalography (EEG), would ultimately lead to the separation of neurology and psychiatry (Eloge 2020). Ironically, for someone who set out to integrate the field, he may have inadvertently exacerbated the severe dualism that would become cemented in psychiatry for another 100 years.

### **Advances in psychopharmacology**

Psychoanalytic thought largely dominated the field until the 1950s, when psychopharmacology took the world by storm. One might have hoped that these new tools could have been integrated into a unified psychiatry – psychodynamic theory and biology side by side – but sadly, it proved to be a wedge.

On the biological side, Schildkraut (1965) and van Rossum (1966) put forth their hypotheses that affective and psychotic disorders were related to aberrant levels of neurotransmitters that could occur independently of a psychological or environmental aetiology. Advances in pharmacological science allowed both Schildkraut and van Rossum to extrapolate knowledge of drug mechanisms into hypotheses of disease mechanisms. If imipramine could treat depression by increasing catecholamines, and reserpine could exacerbate depression by depleting catecholamines, then it followed that depression was a disease of catecholamine deficit. Psychiatry had finally identified a set of biological targets: this ushered in a golden age of research in which drugs were not only treatments but tools to investigate the mysteries of the brain.

### ***R.D. Laing and the challenge to the 'medical model'***

But not everyone was impressed. The British psychiatrist R.D. Laing had little interest in catecholamines. He, along with many other experts of the time, believed that psychiatric illnesses were not biologically driven processes; rather, they were emergent properties of complex psychological, social and family dynamics (this was at the same time as the 'schizophrenogenic mother' model) (Laing 1960). For these reasons, he did not believe that psychiatrists should adhere to the standard medical process of eliciting a chief complaint, conducting a history and examination, testing, diagnosis and treatment. In fact, Laing ultimately coined the term 'medical model' in order to distinguish the work of psychiatrists from that of the rest of medicine (Laing 1971). Looking back, this is an astonishing moment in the history of our field – perhaps the height of the division between physicians of the 'mind' and physicians of the 'brain'.

### ***The biopsychosocial model and modern neuroscience***

In the wake of this fractious debate, George Engel offered a strong corrective: the biopsychosocial model (Engel 1977). Rather than splitting and separating, the framework acknowledges and embraces the interconnectivity between a person's illness, their social situation and their behaviour. On one hand, Engel's solution was the definition of scientific elegance: both simple and applicable. But it also served as a lightning rod for criticism (Ghaemi 2009) – for being overly reductionistic or, paradoxically, for unduly emphasising the separateness of each perspective. The problem stemmed from a lack of mechanistic understanding – it's all well and good to say that the different perspectives are

intertwined, but the devil is in the details – how does it actually work? Until recently, these questions were unanswerable. It was a model before its time.

Modern neuroscience is increasingly providing the crucial data to bridge this divide and to demonstrate the nuanced ways in which bio-, psycho- and social processes are all mediated through the brain. For example, a large body of literature has demonstrated the ability of psychotherapy to alter brain activity in a way that promotes improved emotion regulation (Miller 2020). Early social experiences, such as a history of abuse and/or neglect, can blunt the brain's response to rewards in the environment (such as money or social praise), while increasing sensitivity to drugs of abuse (Oswald 2014; Novick 2018). A burgeoning literature is illustrating that one key mechanism through which experiences influence brain function is alterations in gene expression, otherwise known as epigenetics. This was elegantly demonstrated by Michael Meaney's research group, who showed that variations in maternal care in rodents altered methylation of key genes related to the stress response and anxiety-like behaviour (Weaver 2004). As concluded by Eric Kandel, winner of the Nobel Prize in Physiology or Medicine 2000 for describing how learning is dependent on changes in gene expression in neurons, 'all of "nurture" is ultimately expressed as "nature"' (Kandel 1998).

### The Modern Enlightenment

The Age of Enlightenment was thought to have begun with Descartes. It is ironic, then, that one of his most influential ideas has pervaded medicine in a way that prevents us from understanding patients in a scientific manner. The true challenge for clinicians today is to be able to thoughtfully integrate a patient's experience beyond vital signs and crude diagnostic tests. For example, coming back to the case of Mr A it would be interesting to learn more about his family and early life experiences. Heritability of substance use disorders can be as high as 70% (Bevilacqua 2009). Thus, while environmental factors obviously play a role, it is crucial to keep in mind that these disorders may have a stronger genetic component than breast cancer (Möller 2016), coronary artery disease (Dai 2016), type 1 diabetes mellitus (Cerolsaetti 2019) and most other medical illnesses. As described above, a history of childhood adversity is associated with brain changes that can increase vulnerability to addiction. The prominent role of both genetics and early life experiences should challenge our instinctive tendency to view addiction as a choice. Careful investigation into his pain might reveal that Mr A's previous

injury led to long-term plasticity in his nervous system that has resulted in chronic pain (Baller 2017). Mr A's use of exogenous opioids may also have created a state of opioid-induced hyperalgesia via increased release of excitatory neurotransmitters (Bommersbach 2020). The ability of opioids to directly suppress the immune system may also contribute to his current infection (Plein 2018).

Approaching Mr A's case from a fully integrated biopsychosocial perspective will not necessarily cure his addiction or prevent him from leaving the hospital against medical advice. However, incorporating neuroscience into the formulation allows his clinicians to appreciate that his illness is a medical condition that is within their scope of practice. In turn, this understanding serves to invite empathy, to promote continued inquiry and discourse, and it leaves less room for helplessness and resentment. Lastly, it may allow psychiatrists to advocate for their patients by reminding their colleagues that, while some patients' symptoms may be 'in their head', it is a head that houses the body's most complex organ.

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### Author contributions

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### Declaration of interest

None.

ICMJE forms are in the supplementary material, available online at <https://doi.org/10.1192/bja.2020.60>.

#### MCQ answers

1 d 2 d 3 a 4 e 5 a

## References

- Baller EB, Ross DA (2017) Your system has been hijacked: the neurobiology of chronic pain. *Biological Psychiatry*, **82**(8): e61–3.
- Bevilacqua L, Goldman D (2009) Genes and addictions. *Clinical Pharmacology & Therapeutics*, **85**: 359–61.
- Bommersbach T, Ross DA, De Aquino JP (2020) Perpetual hunger: the neurobiological consequences of long-term opioid use. *Biological Psychiatry*, **87**(1): e1–3.
- Cerolsaletti K, Hao W, Greenbaum CJ (2019) Genetics coming of age in type 1 diabetes. *Diabetes Care*, **42**: 189–91.
- Dai X, Wiernek S, Evans JP, et al (2016) Genetics of coronary artery disease and myocardial infarction. *World Journal of Cardiology*, **8**: 1–23.
- Descartes R (1641) *Meditationes de Prima Philosophia*. Reprinted (2017) as Descartes: Meditations on First Philosophy. With Selections from the Objections and Replies (2nd edn) (trans & ed J Cottingham). Cambridge University Press.
- Eloge JC, Ross DA, Cooper JJ (2020) Afflicted by the gods: the shared history and neurobiology of psychosis and epilepsy. *Biological Psychiatry*, **87**(12): e35–6.
- Engel GL (1977) The need for a new medical model: a challenge for biomedicine. *Science*, **196**: 129–36.
- Freud S, & Bonaparte M, Freud A, et al (1954) Project for a scientific psychology. In *The Origins of Psycho-Analysis: Letters to Wilhelm Fliess, Drafts and Notes: 1887–1902* (eds M Bonaparte, A Freud, E Kris; trans E Mosbacher, J Strachey): 347–445. Basic Books.
- Ghaemi SN (2009) The rise and fall of the biopsychosocial model. *British Journal of Psychiatry*, **195**: 3–4.
- Hojat M, Vergare MJ, Maxwell K, et al (2009) The devil is in the third year: a longitudinal study of erosion of empathy in medical school. *Academic Medicine*, **84**: 1182–91.
- Kandel ER (1998) A new intellectual framework for psychiatry. *American Journal of Psychiatry*, **155**: 457–69.
- Laing RD (1960) *The Divided Self: An Existential Study in Sanity and Madness*. Tavistock.
- Laing RD (1971) *The Politics of the Family and Other Essays*. Pantheon Books.
- Maung HH (2019) Dualism and its place in a philosophical structure for psychiatry. *Medicine, Health Care and Philosophy*, **22**: 59–69.
- Miller CWT, Ross DA, Novick AM (2020) “Not Dead Yet!” – confronting the legacy of dualism in modern psychiatry. *Biological Psychiatry*, **87**(7): e15–7.
- Möller S, Mucci LA, Harris JR, et al (2016) The heritability of breast cancer among women in the nordic twin study of cancer. *Cancer Epidemiology, Biomarkers & Prevention*, **25**: 145–50.
- Northoff G (2012) Psychoanalysis and the brain – why did Freud abandon neuroscience? *Frontiers in Psychology*, **3**: 71.
- Novick AM, Levandowski ML, Laumann LE, et al (2018) The effects of early life stress on reward processing. *Journal of Psychiatric Research*, **101**: 80–103.
- Oswald LM, Wand GS, Kuwabara H, et al (2014) History of childhood adversity is positively associated with ventral striatal dopamine responses to amphetamine. *Psychopharmacology*, **231**: 2417–33.
- Plein LM, Rittner HL (2018) Opioids and the immune system – friend or foe. *British Journal of Pharmacology*, **175**: 2717–25.
- Schildkraut J (1965) The catecholamine hypothesis of affective disorders: A review of supporting evidence. *American Journal of Psychiatry*, **122**: 509–522.
- Smith D (2017) Freud the Philosopher [From Philosophy to Psychoanalysis: A Classic Freudian Move]. Aeon (<https://aeon.co/essays/from-philosophy-to-psychoanalysis-a-classic-freudian-move>).
- van Rossum J (1966) The significance of dopamine-receptor blockade for the mechanism of action of neuroleptic drugs. *Archives Internationales De Pharmacodynamie Et De Therapie*, **160**: 492–494.
- Weaver ICG, Cervoni N, Champagne FA, et al (2004) Epigenetic programming by maternal behavior. *Nature Neuroscience*, **7**: 847–54.

### MCQs

Select the single best option for each question stem

#### 1 Cartesian dualism refers to:

- a a mathematical theorem used in computational psychiatry
- b the idea that biological, psychological and social elements of an individual's illness are interconnected
- c a phrase coined by Freud to describe opposing influences on behaviour
- d the idea that mind and body are separate entities, made of distinct substances
- e a neurobiological concept that explains paradoxical responses to opioid receptor agonism based on drug dose.

#### 2 Biological models in psychiatry that emerged in the 1960s were predicated on:

- a comparisons of patients who were and were not responsive to psychoanalysis
- b research in the neuroanatomy and neuropathology of individuals with psychiatric disorders
- c the observation that both insulin and electroconvulsive therapy could induce seizures
- d extrapolating pathophysiology of illness from the mechanisms of drugs that treated the illness
- e the application of Mendelian genetic principles.

#### 3 The origin of the term 'medical model' can be traced to:

- a R.D. Laing's attempt to distinguish the methods that physicians use in psychiatry from those used in the rest of medicine
- b Hippocrates' work separating the practice of medicine from theology
- c William Osler's *The Principles and Practice of Medicine*
- d George Engel's 'The need for a new medical model'
- e Eric Kandel's research that resulted in his Nobel Prize in Physiology or Medicine.

#### 4 A formative step towards a modern integrative approach to psychiatry can be attributed to:

- a Descartes' ideas on the relationship between mind and body
- b Laing's work on the role of family and social determinants of schizophrenia
- c Meaney's research on epigenetics
- d Schildkraut's catecholamine hypothesis of affective disorder
- e Engel's biopsychosocial model.

#### 5 As regards the neurobiology of substance use and chronic pain:

- a the development of chronic pain following injury is due to long-term potentiation in pain circuits
- b opioid-induced hyperalgesia develops in response to excess GABA inhibition of opioid-receptor-containing neurons
- c variability in the propensity to develop opioid use disorder is mainly due to access to substances and socioeconomic variables rather than genetics
- d early life stress results in changes to the dopamine system that decrease sensitivity to cocaine while increasing sensitivity to opioids
- e opioid-induced increases in immune activity can result in chronic pain and inflammation.