Attention deficit hyperactivity disorder (ADHD) is a common disorder in childhood, which progresses to adulthood in about a fifth of cases. For various reasons, adult ADHD is a disorder not comprehensively assessed by psychiatrists, not least because the biological underpinnings are only recently being unmasked.

This selective review targets psychiatrists without a background in neuroscience and aims to describe the neurobiological basis of ADHD.

In total, 40 articles from a PubMed search were selected for inclusion based on sample population and methodology (neuroimaging studies). Studies focusing on adult participants were selected preferentially for inclusion. Seminal articles relevant to childhood populations were included for the purpose of understanding general concepts around ADHD.

The neuropathology of ADHD is not rooted in a single anatomical area, but in multiple parallel and intersecting pathways, which have demonstrated impaired functional connectivity in ADHD brains. Dysfunction in executive function, reward processing, attention networks and default networks play major roles in the neuropathology of this condition. Biological findings vary between individuals, with some showing greater dysfunction at cortical levels and others at subcortical levels, which is in keeping with its clinical heterogeneity.

Improved symptomatology in adulthood is linked to a number of factors. Maturation of the prefrontal cortex in early adulthood contributes to symptom attenuation in many cases, meaning that individuals with cortical dysfunction are more likely to grow out of symptoms, whereas individuals with subcortical dysfunction may be less likely to do so. There is emerging evidence for a similar but distinct disorder arising de novo in adulthood.