← Epidemiology

Etiology of ADHD

ADHD has a multifactorial etiology and is clinically heterogeneous, suggesting that multiple neurobiological pathways are involved in the development of this disorder [1].

Genetics

- Heritability of ADHD is ~80% [1].
- Polygenic risk scores or single genetic variants are insufficient for diagnosing ADHD [1].

Environmental

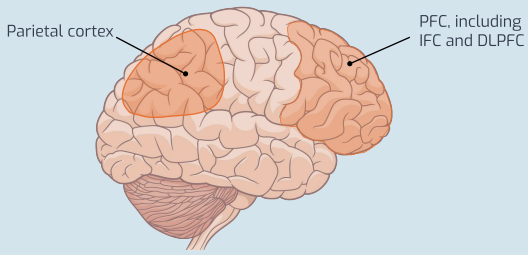
- Rare events (e.g., TBI) may be associated with ADHD [1].
- Many **environmental factors** associated with ADHD have low risk ratios that are **difficult to interpret** [1].

These include events or complications that occur during pregnancy, delivery or early after birth (e.g. low birthweight, perinatal hypoxia and advanced paternal age) [1]

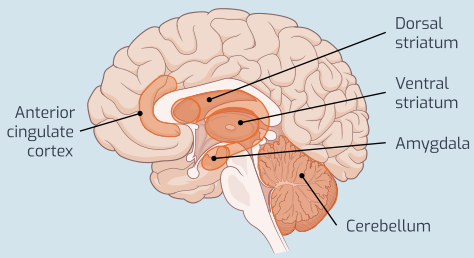
Functional / Structural

Cortical and subcortical regions of the **brain** and **key networks** are affected in ADHD [1].

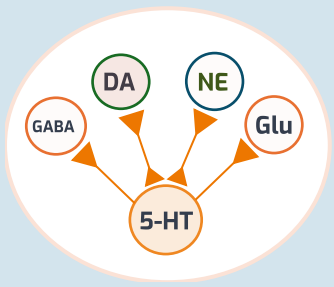
Cortical Regions Implicated in ADHD



Subcortical Structures Involved in ADHD



- **Interplay** between NE, DA, and 5-HT plays a key role in **full clinical presentation** of ADHD [1]
  - 5-HT modulates other neurotransmitters (DA and NE, as well as GABA and Glu)[2]
- 5-HT–DA opposing and synergistic interactions regulate brain network activity [3]
- 5-HT–NE opposing interactions control stimulus-driven neuronal firing [3]



References:

1. Faraone SV, et al. Nat Rev Dis Primers. 2024;10(1):11.
2. Pourhamzeh M, et al. Cell Mol Neurobiol. 2022;42(6):1671-1692.
3. Faraone SV, et al. NeurosciBiobehav Rev. 2025;176:106275.