

Amygdalar-Frontal Pathway

The 'amygdalar-frontal pathway' refers to the neural connections between the 'amygdala', a key limbic structure involved in emotion processing, and the 'prefrontal cortex' (PFC), which is critical for executive function and emotional regulation.

Functional Anatomy

- **Amygdala:**
 - Processes emotional stimuli, especially fear and threat.
 - Detects salient environmental cues.
- **Prefrontal Cortex (PFC):**
 - Involved in decision-making, impulse control, and emotion regulation.
 - Relevant regions include the ventromedial (vmPFC), dorsolateral (dlPFC), and orbitofrontal cortex (OFC).
- **Connectivity:**
 - Bidirectional communication:
 - 'Bottom-up': emotional salience signals from the amygdala to the PFC.
 - 'Top-down': regulatory control from the PFC to the amygdala.
 - Key white matter tracts:
 - Uncinate fasciculus
 - Cingulum bundle
 - Extreme capsule

Clinical Relevance

Alterations in this pathway are implicated in various psychiatric and neurological conditions:

- Anxiety disorders
- Major depressive disorder
- Post-traumatic stress disorder (PTSD)
- Substance use disorders
- Neurodevelopmental disorders (e.g., autism, ADHD)

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