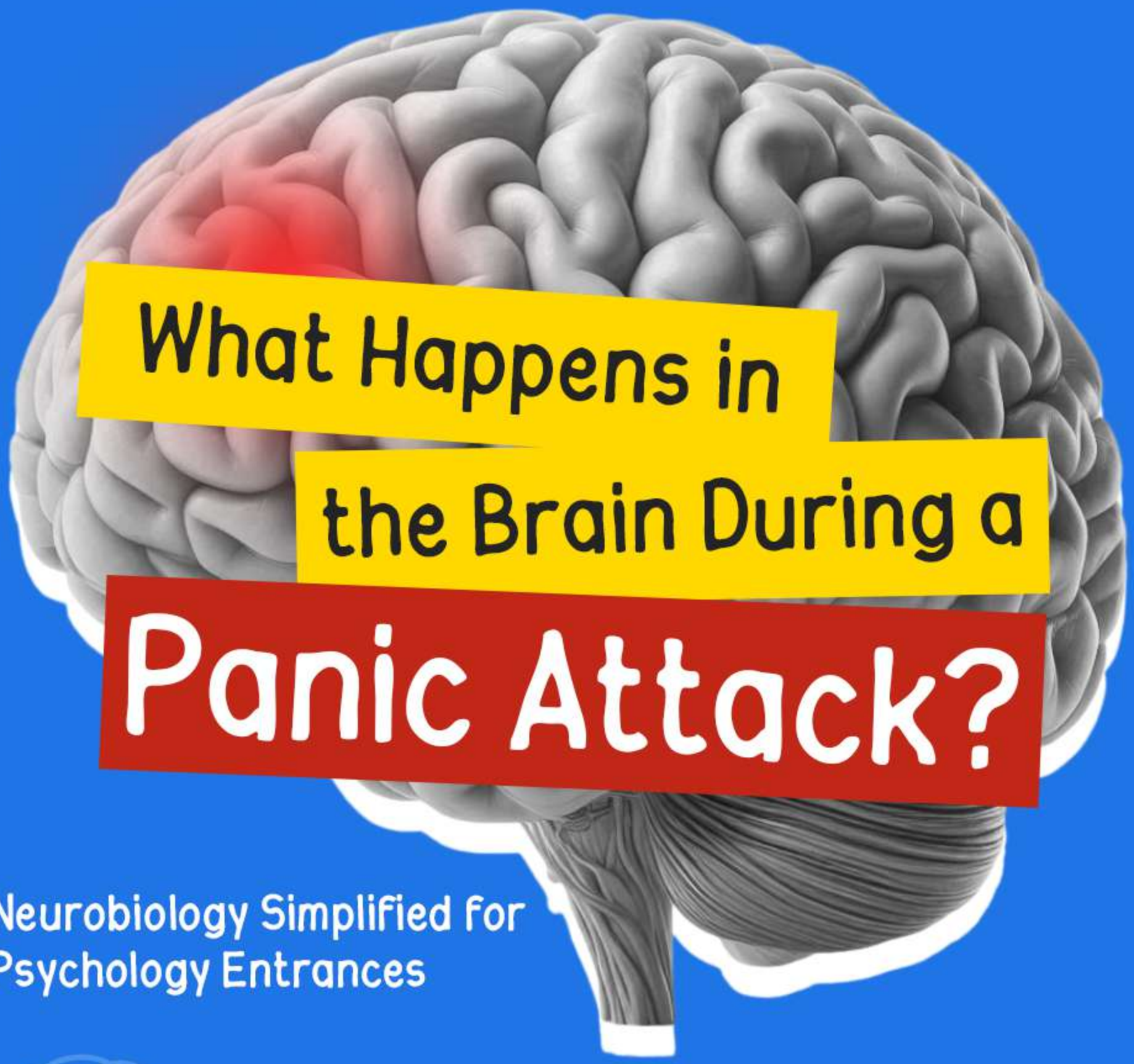
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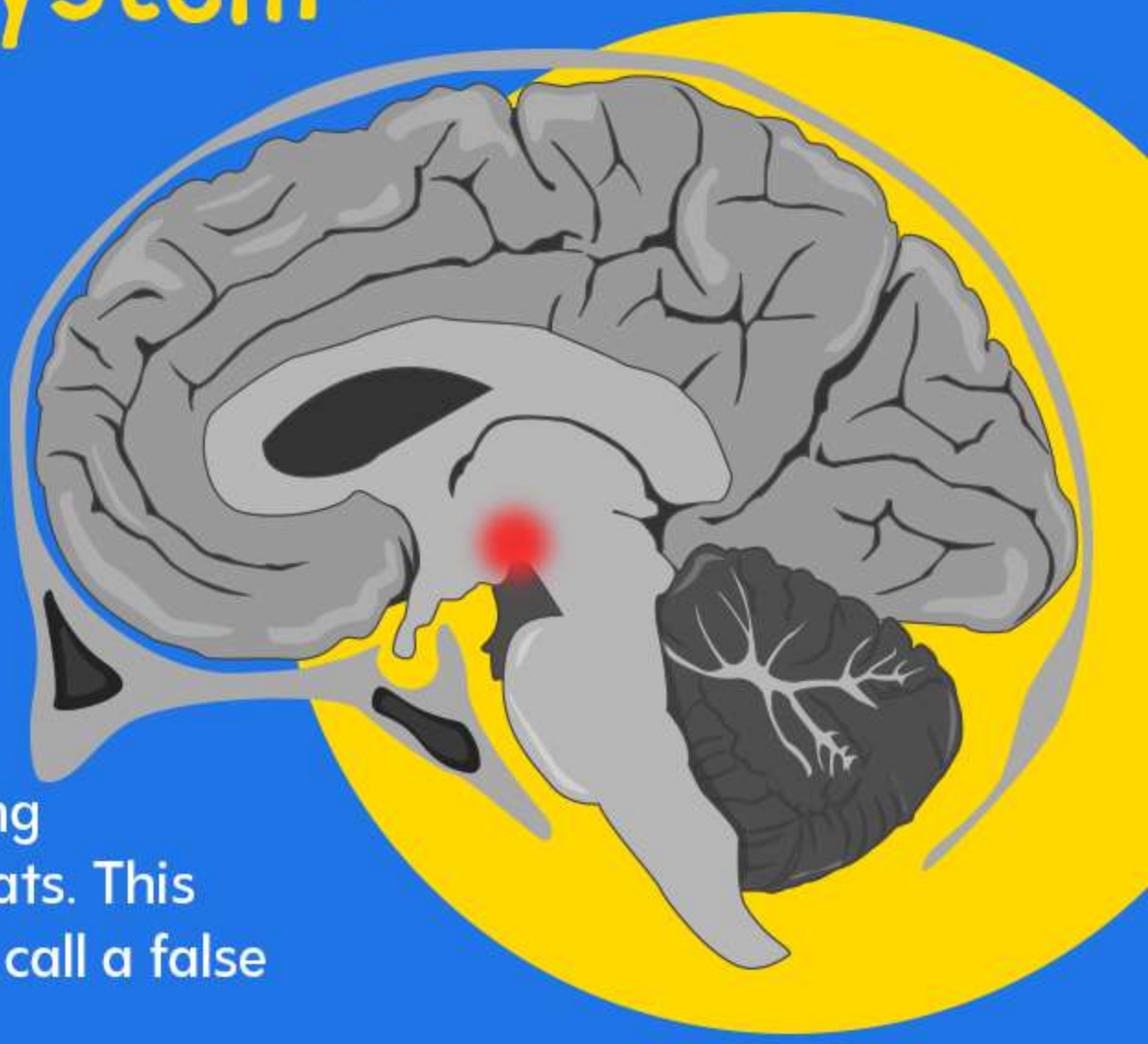
What Happens in the Brain During a Panic Attack?

Neurobiology Simplified for Psychology Entrances

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The Alarm System - Amygdala



Think of the amygdala as your brain's internal alarm system. It constantly scans for danger, even before you consciously realize it.

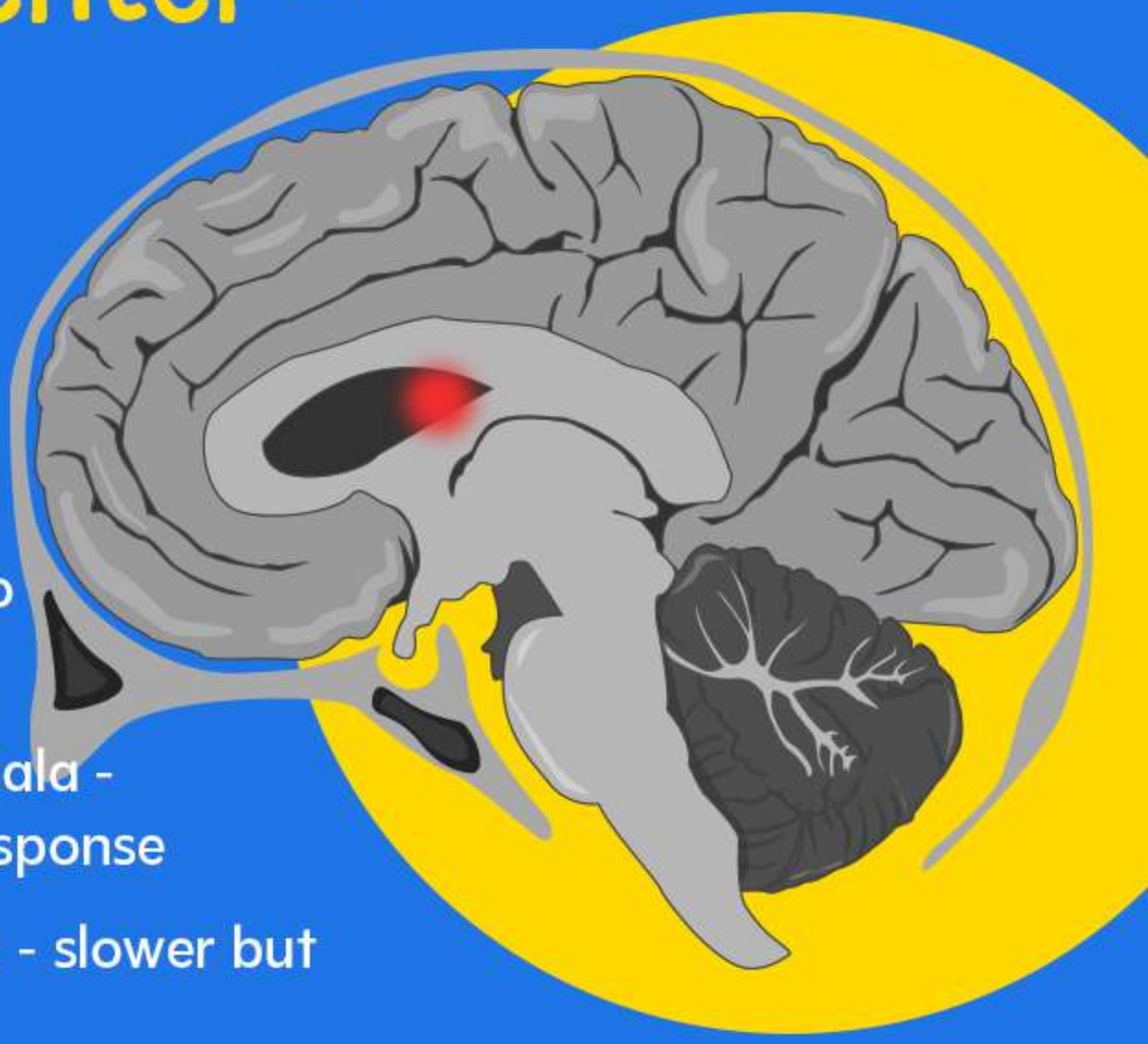
During a panic attack, the amygdala becomes over-active and starts interpreting harmless situations as threats. This creates what psychologists call a false alarm response.

It's also important to remember that the amygdala plays a key role in fear conditioning, linking it to classical conditioning concepts.

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The Relay Center – Thalamus



The thalamus works like a message dispatcher, directing incoming sensory information.

It sends signals through two pathways:

- A fast route to the amygdala - quick but less accurate response
- A slow route to the cortex - slower but more detailed processing

In panic attacks, the fast pathway dominates, which is why reactions feel immediate and overwhelming, even before rational thinking kicks in.

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Reduced Control – Prefrontal Cortex (PFC)

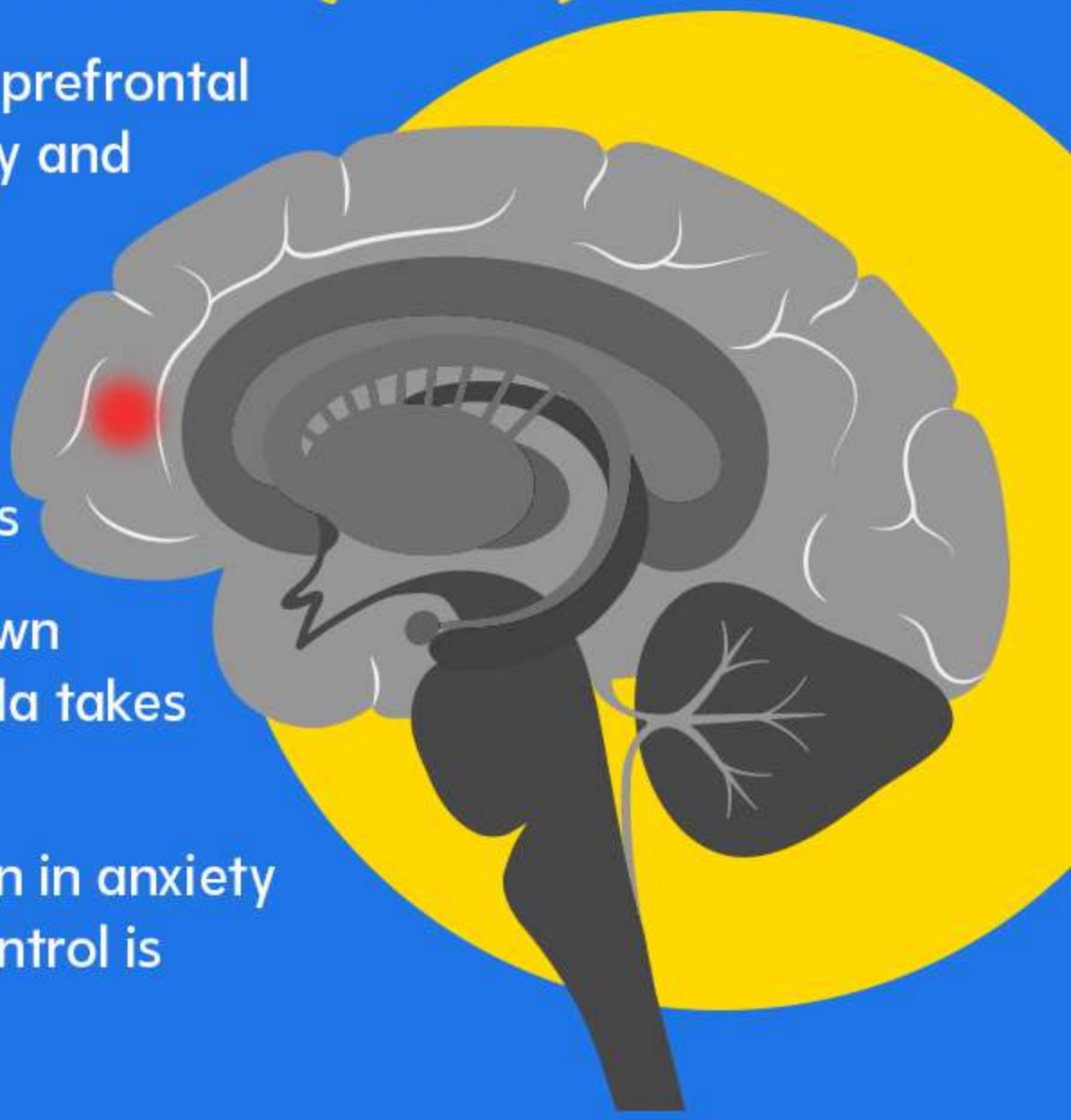
Under normal conditions, the prefrontal cortex helps you think logically and regulate emotions.

But during a panic attack:

- PFC activity decreases
- Rational evaluation weakens

This leads to a loss of top-down control, meaning the amygdala takes over unchecked.

This pattern is commonly seen in anxiety disorders, where executive control is compromised.



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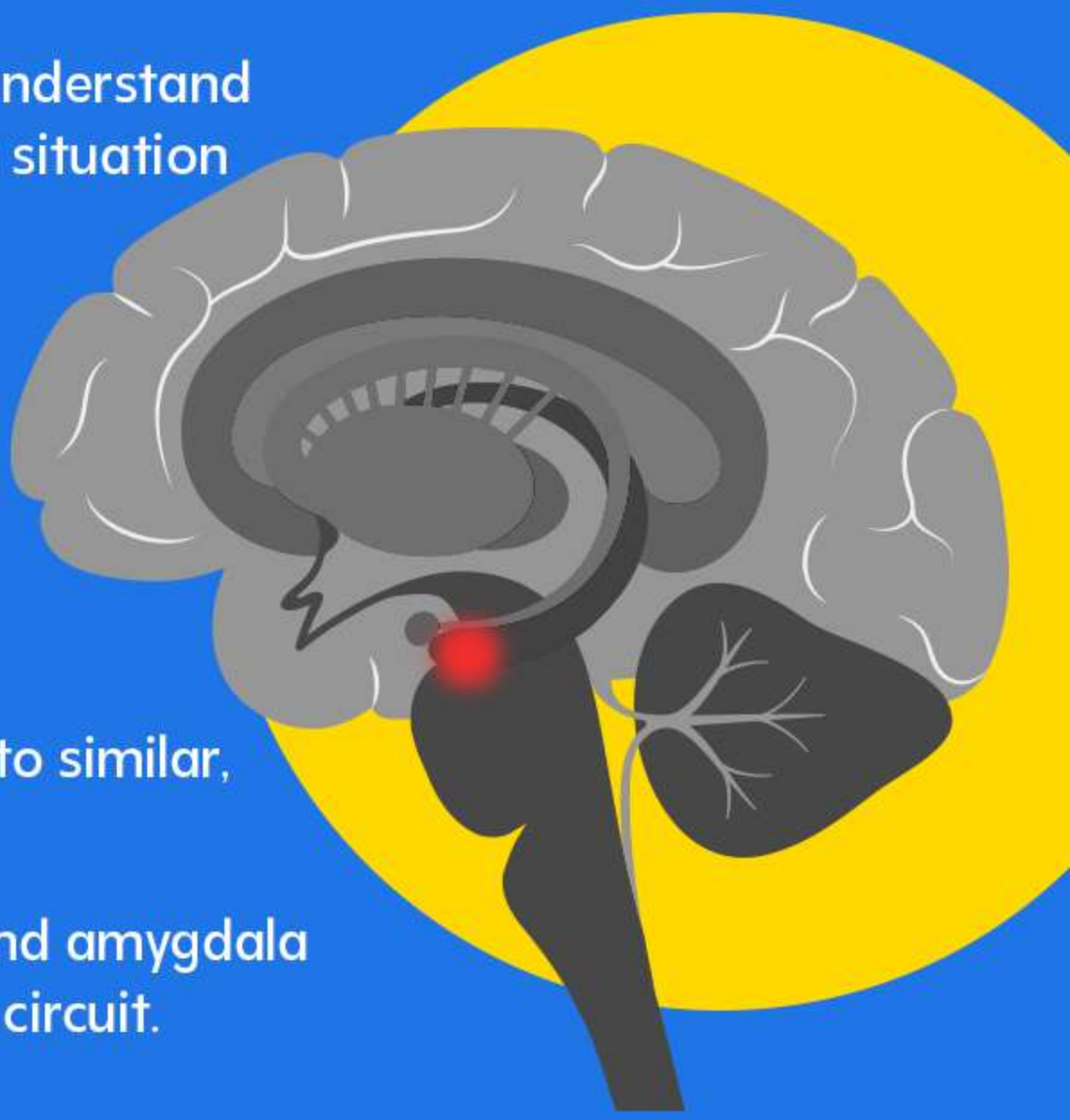
Memory Link – Hippocampus

The hippocampus helps you understand context; it tells you whether a situation is actually dangerous.

When it doesn't function properly:

- It becomes harder to distinguish safe vs unsafe situations
- Fear responses can spread to similar, non-threatening situations

Together, the hippocampus and amygdala form the brain's fear learning circuit.



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The Body Reaction – Hypothalamus

Once the brain detects "threat," the hypothalamus activates the body's stress response system.

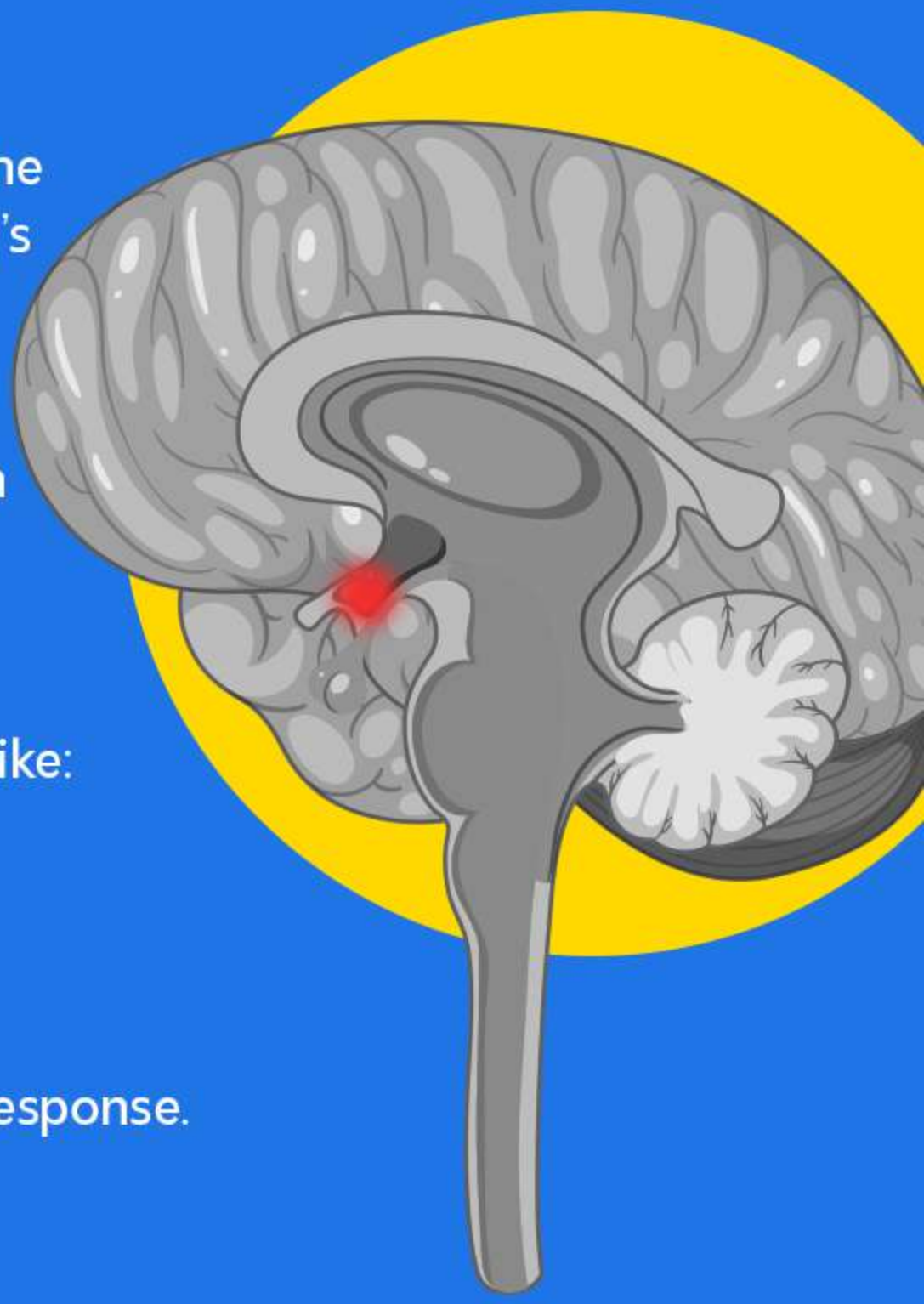
It triggers:

- The Autonomic Nervous System (ANS)
- The HPA Axis

This leads to physical symptoms like:

- Increased heart rate
- Sweating
- Rapid breathing

This is the classic fight-or-flight response.



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Neurochemistry of Panic

Panic attacks also involve key neurotransmitters:

- **Norepinephrine** (↑)-
  increases alertness and arousal
- **GABA** (↓)-
  less inhibition, leading to overactivity in the brain
- **Serotonin (dysregulated)** -
  affects mood and anxiety balance

From an exam perspective:

- **Benzodiazepines** work by increasing GABA
- **SSRIs** help regulate serotonin levels



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