

What is Trauma?

Trauma refers to the **emotional, psychological, and physiological effects that remain** after exposure to an incident (or series of incidents) that are emotionally disturbing or life-threatening. Trauma symptoms can disrupt ones' coping abilities and impact everyday functioning.

Simple Trauma:

Typically refers to a single traumatic incident and may result in a diagnosis of PTSD.

Two Types of Trauma:

Complex Trauma:

Usually caused by long-lasting trauma that continues or repeats over months or even years. Frequently referred to as complex PTSD (CPTSD) and often results because of childhood trauma.

Although the development of simple versus complex trauma is different, the impact on ones' brain and body is similar. For ease of communication, the following examples will focus on singular traumatic events.

So, What Happens When We Experience Trauma?

Previously, we looked at how the amygdala (or brain alarm) fires in response to a threat. This happens before we are even conscious. Our bodies automatically pump full of cortisol and adrenaline, ready to 'fight or flight'. It is not until our frontal cortex (or self-aware watch tower) signals to our unconscious emotional brain that it is safe to relax, that our bodies will begin to ease and unwind. But what if it's not safe to relax? What if we are forced to remain in a state of 'fight or flight' for a prolonged period, or worse, forced into freeze, collapse, or immobilization due to the helplessness and terror of the situation?

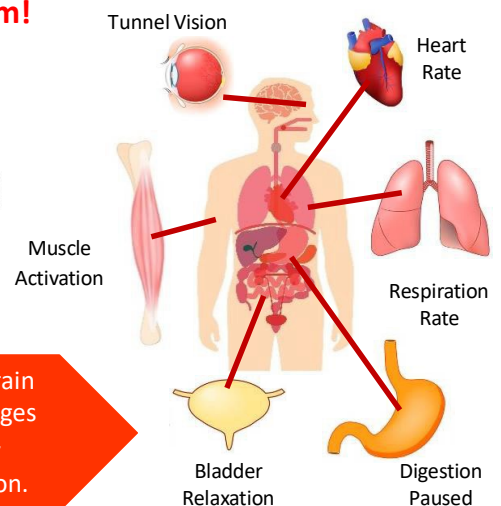
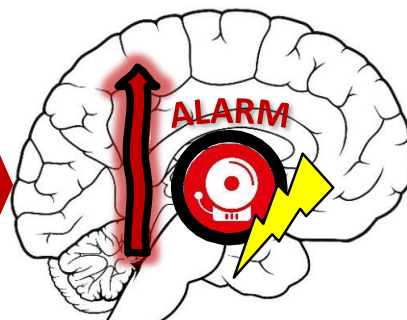


Case Study:

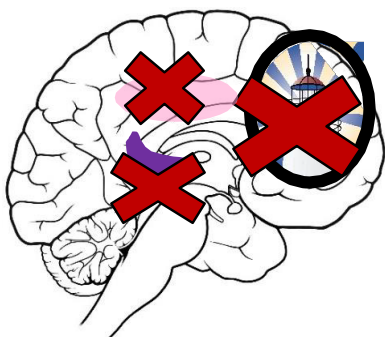
Two drivers are involved in a serious car accident. One driver has a passenger. The two drivers remain conscious throughout the incident. There are prominent odors of gasoline and smoke. The extent of their injuries is unknown. Emergency services arrive shortly after with sirens.

The Amygdala Hijacks the System!

When confronted with terror, our brain's alarm system (the amygdala) will hijack the brain, causing the body to secrete inordinate amounts of adrenaline and cortisol. This response overwhelms the system and communication between brain areas breaks down.



Numerous Functions Shut Down.



The unconscious emotional brain is in charge and activates changes in emotional arousal, body physiology, and muscular action.

The **frontal lobe** shuts down including the areas required to express feelings with words. The **thalamus**, responsible for integrating sensations (such as sounds, sights, and touch) into an integrated autobiographical memory goes offline. The **hippocampus**, needed for the correct storage of memory from short-term to long-term is inaccessible. Communication between various brain structures is blocked and traumatic experiences are being absorbed as incoherent fragments of sounds, visions, physical sensations, and smells.

Two Responses to Trauma?

As shown before, the emotional brain will override the system causing the activation of arousal (via the autonomic nervous system) throughout the whole body. However, not everybody will respond the same way when experiencing a traumatic event. People will either move into a survival/protection state of 'fight or flight' (mobilization) or 'freeze' (immobilization). **We cannot choose our response!** Interestingly, the response we typically resort to during a traumatic event is a strategy or behavior we may have learnt during childhood (e.g., a child copes with her father's verbal abuse by blanking out her mind versus another child who learns to defend himself from his brother's attacks by fleeing or fighting back.) People who have experienced childhood trauma are more likely to 'freeze'. Let us consider these two responses in relation to the previous case study.



'Fight or Flight' Mobilize (Run or Fight).

The sympathetic nervous system causes a surge of energy (heart and respiration rate increase, and blood rushes to main muscle groups).

The man in the first car, rushes out of the wreck to alert other cars that may be approaching, stopping further collisions. Cars are coming thick and fast. His passenger is trapped, heavily bleeding with his legs crushed. He is unconscious and he cannot free him despite his efforts. He fears the worst. He can smell gasoline and smoke. The man frantically calls for help from people who begin to gather. He paces and calls his friends name, hoping to rouse him. People warn him to move away from the vehicle fearing an explosion. Some time passes before a bystander points out he is bleeding and badly injured himself. When the fire truck arrives, he screams, panicked, and directs them.



'Freeze' Immobilize or Shut Down "Don't move. It's not safe."

The reptilian brain instructs the body to freeze. The parasympathetic nervous system engages enough to slow heart and respiration rate leading to weakness, shaking, trembling and physical collapse. High cortisol may cause nausea and loss of bowel control or diarrhea.

The woman in the other car stares at her steering wheel. Her senses numb. People are talking to her, but it sounds like they are far away. Things appear dream-like and strange, hazy and grey. She does not move or respond despite being conscious. The ambulance services transfer her to hospital. She remains in a dream like state, numb and dissociated, until her family arrives. She is kept overnight under observation.

Normal Memory Versus Trauma Memory

A fundamental concern relating to trauma is memory, remembering too much (repeatedly hijacked by the overwhelming arousal of the incident endured) and remembering too little (fragmented memory and missing pieces). When our system is hijacked by the emotional brain, communication between different areas of the brain is interrupted, stopping the integration of sensations, thoughts, and emotions experienced during a traumatic event. **This is referred to as dissociation.** Let us examine the difference between normal and traumatic memory.



Normal Memory



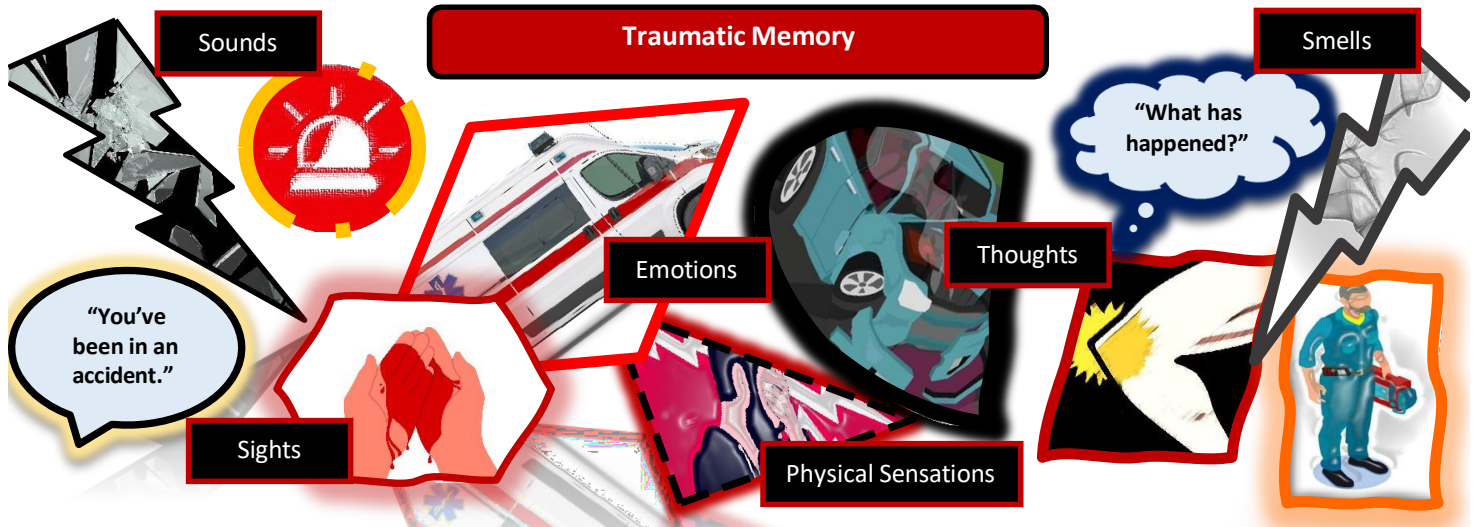
Memory is time stamped as a past event.

Start

Middle

End

Our brains love to store memories of events that have high emotional arousal. Provided our systems are not overwhelmed, the hippocampus and other areas of the brain (e.g., the thalamus and dorsolateral prefrontal cortex) will coordinate to integrate various aspects of an event (such as time, place, sequence, thoughts, emotions, sounds and smells) and store it in long term memory as a coherent narrative. **Normal memories have a beginning, a middle, and an end.** These memories are 'time stamped' as have taken part in the past. The event is over.



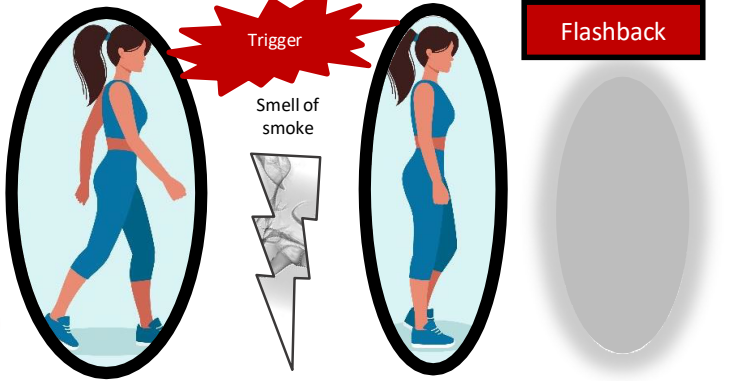
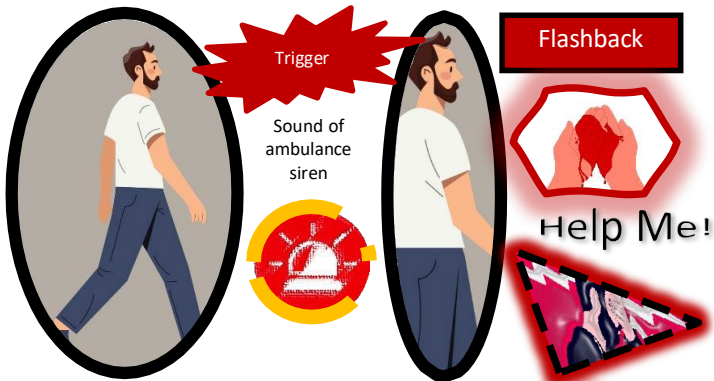
When the amygdala hijacks the system and various brain functions shut down, the different sensations that enter the brain at the time of the trauma are dissociated and not properly assembled into a story. There is no beginning, middle or end. The trauma information has been blocked from reaching the hippocampus (consolidates short term memory to long term memory). The information does not pass by the dorsolateral prefrontal cortex, the area of the brain responsible for putting a ‘time stamp’ on a memory, allowing us to recognize that an event has past and is now over. So, what happens to the disorganized fragments of trauma that circulate in our system? The answer to this question is where trauma healing begins.

The Ongoing Impact of Trauma and Dissociation

When traumatic memory remains dissociated (and not integrated into a comprehensive whole), trauma victims can become unsuspectingly overcome with terrifying flashbacks. **Flashbacks** refer to the reexperiencing of traumatic sensations and emotions **as if the traumatic event were recurring right now**. The terror and fear experienced is equivalent to that which was experienced during the initial event. Anything that may resemble a trauma memory, such as a familiar sound or sensation can ‘trigger’ a flashback.

Example One: Man from First Car
Man walks down the street and **hears ambulance siren**.

Example Two: Woman from Second Car
Woman walks down the street and **smells smoke**.



The man is bombarded with unwanted images and sensations. His heart skyrockets and he loses his breath. His vision narrows and his muscles tense. He is overcome with terror and fear. It is happening all over again.

The woman stops. She stares into the distance, trancelike. She is unaware of what is going on around her. Her body is numb, and her mind is blank. She slowly gains awareness and continues feeling hazy and dissociated.

As demonstrated above, flashbacks can vary. When ‘triggered’ by a sound, sight, smell or physiological sensation, our bodies will respond as though we are right back at the traumatic event. Our flashback will resemble the survival response we had at the time. Given that our traumatic memories are ‘fuzzy’, triggers tend to generalize. For example, every time a war veteran sees rubbish on the road, they may automatically assume a bomb. Or someone who has been in a car crash may fear loud bangs. Potential triggers become feared and avoided.