

# Multiple Modality Imaging of Long Term Effects from Childhood Traumatic Brain Injuries

## Introduction

Research and clinical case studies have been conducted to explore the long term effects from traumatic brain injuries.<sup>3</sup>

Studies have suggested that early childhood head trauma may have significant consequences, specifically developmental delays and increased likelihood for post-traumatic stress disorder (PTSD) as they grow older.<sup>3</sup>

Radiologic imaging plays a critical role in detecting brain trauma.

## Types of Injury

Penetrating brain injuries: anything that penetrates the brain matter, such as a bullet or shard of glass.

Non-penetrating brain injuries: the brain moves inside the skull or strikes the inner surface of the skull, causing the brain tissue to compress.<sup>2</sup>

## Initial Response

When trauma occurs, the body's natural stress response is to release norepinephrine and cortisol. These chemicals serve in calming the brain.<sup>2</sup>

## Reaction

The hippocampus and amygdala volumes shrink.<sup>4</sup>

## Symptoms

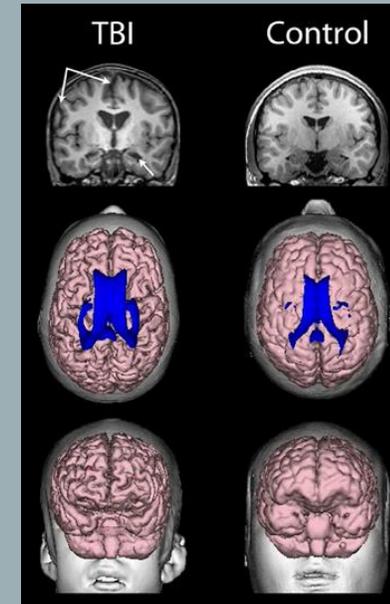
The decreased volumes presented a direct correlation to symptoms such as increased anxiety, depression, decreased cognitive function and decreased social interactions.<sup>4</sup>

## Imaging Advantages

**MRI** → Generally more sensitive than CT for detecting neuronal and functional damage.<sup>5</sup>

**CT** → Initial injury encounter, evaluates bones and detects acute hemorrhaging.<sup>5</sup>

**PET** → Provides functional information and used to guide long-term therapy by establishing a prognosis.<sup>5</sup>



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Image: Marked bilateral hippocampal atrophy on TBI patient.<sup>1</sup>

## Conclusion

Imaging has several roles: postoperative neurophysiologic sequelae, functional abnormalities from head trauma, long-term prognosis, rehabilitation, and new therapies.

## References

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