

PHANTOM REACTION

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1. Core Definition and Phenomenology

The **Phantom Reaction** is defined as a complex psychological and physiological disturbance experienced by individuals following the traumatic or surgical loss of a limb or other major body part. This reaction is characterized primarily by the persistent, often vivid sensation that the missing member remains physically attached to the body. While the term is often used interchangeably with Phantom Limb sensations, the reaction encompasses the full spectrum of phenomena, including both annoying and acutely painful sensory experiences localized within the non-existent structure. The psychological impact involves the individual's difficulty in reconciling their physical reality with their internal representation of the self.

The phenomenology of the phantom reaction is highly variable but virtually universal among acquired amputees. Studies have consistently demonstrated the high prevalence of this experience; for instance, historical research by Noyes and Kolb (1963) revealed that approximately 98 per cent of amputees experienced a persistent, defined feeling that the limb was still present immediately following the operation. This reaction is not merely a vague memory; rather, definite feelings, ranging from movement to temperature, are localized with precision in the phantom limb. The persistence of this detailed perceptual experience underscores the deep-seated neurological and cognitive mechanisms governing our sense of bodily integrity.

2. Underlying Mechanisms: The Body Image Theory

The leading explanation for the existence of the phantom reaction centers on the persistence of the **Body Image**, or body schema. Every individual develops a complete and integrated mental map of their own body as a physical whole. This internalized anatomical blueprint is deeply ingrained in the somatosensory cortex and remains remarkably stable over time. When a limb is removed, the physical reality changes instantaneously, but the psychological and neurological image of the body, which dictates how the brain expects to receive sensory input, lags significantly behind. Consequently, the brain continues to interpret neural activity--even residual activity from the severed nerve endings or cortical reorganization--as originating from the missing member.

The robustness of this internalized body map is evidenced by critical clinical observations. Significantly, individuals who are congenitally born without a limb, or those who undergo amputation very early in infancy before the body schema is fully established and consolidated, typically do not experience the phantom reaction. This stark contrast highlights that the experience is not an innate default state of the nervous system upon missing tissue, but rather a result of the deprivation of an established, pre-existing anatomical representation. The brain attempts to

maintain the integrity of its accustomed map, leading to the subjective experience of the missing part remaining present, even in the absence of peripheral anatomical structures.

3. Key Sensory Manifestations

The sensations localized within the phantom limb are diverse and often evolve over time. The most common manifestation reported initially is a mild, non-distressing **tingling** or a feeling of pressure. Other prevalent sensations include a "pins-and-needles" sensation, which can often be aroused or exacerbated by touching or manipulating the remaining stump tissue. This phenomenon suggests that afferent nerve activity stimulated at the site of the residual limb is misrouted and projected onto the cortical map corresponding to the missing extremity.

A particularly intriguing aspect of the phantom reaction is the phenomenon of **referred sensation** or referred pain. In some cases, patients report that pain associated with disease or disturbance in an entirely different organ, such as the stomach or gallbladder, is felt intensely in the phantom limb. This clinical observation suggests a complex, interconnected pathway in the central nervous system where visceral input converges onto somatic projection areas within the brain, demonstrating the plasticity and occasional miswiring of sensory processing following major anatomical loss. These referred sensations can complicate diagnosis and treatment, as the pain source is entirely unrelated to the perceived location.

4. Factors Influencing Onset and Persistence

The intensity and persistence of the phantom reaction are influenced by a combination of physiological, psychological, and environmental factors. As noted, the necessity of an established body map is the primary prerequisite for the reaction to occur. Beyond the initial presence of the sensations, the subsequent trajectory is heavily influenced by the patient's psychological resilience and their capacity for adaptation. Emotional health plays a crucial role in the automatic revision of the body concept.

Conversely, when the phantom sensations become intensely annoying or painful--manifesting as debilitating feelings of twisting, pulling, burning, cramping, or itching--this often serves as a key indicator of underlying psychological distress or difficulties with adaptation. Persistent, agonizing phantom pain frequently suggests that the patient is having significant difficulty accepting the permanent nature of their defect and adjusting to life with a prosthetic limb or coping with the functional limitations. Furthermore, such persistent pain can be correlated with acute family, social, or occupational problems stemming directly from the loss, indicating a broader psychosocial struggle that manifests somatically.

5. Trajectory and Resolution of Phantom Sensations

For an emotionally healthy individual, the trajectory of the phantom reaction is one of gradual attenuation and resolution. As time passes, the individual's brain begins the complex process of revising the body schema to align with the new physical reality. The phantom appendage typically begins to feel as though it is shrinking--a phenomenon known as telescoping--and gradually seems to recede toward the stump. Ultimately, for many, the distinct feeling of the missing member disappears entirely.

However, even long after the primary sensation of the full limb has vanished, residual manifestations may persist. Manipulation of the stump, such as during cleaning or fitting a prosthetic device, may still produce a transient sensation of movement or position in the missing extremity. This protracted persistence suggests that while the large-scale conscious perception of the phantom limb fades, the underlying neural pathways and cortical representation associated with motor function may remain active and subject to external stimulation for extended periods, sometimes indefinitely.

6. Complex and Painful Phantom Phenomena

While mild phantom sensations are a normal part of post-amputation adjustment, the development of chronic, debilitating **painful phantom limb sensations** represents a significant clinical challenge. These pain states are often described as excruciating and resistant to traditional pain management strategies. The persistence of these highly negative sensations is sometimes associated with unresolved psychological issues, including specific fantasies concerning the disposal or fate of the amputated limb, suggesting a deep psychological trauma linked to the loss event itself.

The chronic nature of painful phantom reactions demands careful psychological and psychiatric evaluation. The pain, if allowed to continue unchecked, can severely impede rehabilitation efforts, prevent successful fitting and use of prostheses, and lead to secondary issues such as depression, anxiety, and social withdrawal. Therefore, the presence of intensely painful phantom sensations should prompt clinicians to look beyond purely physiological interventions and address the underlying emotional and adaptive difficulties the patient is facing in integrating the loss into their identity.

7. Clinical Management and Therapeutic Approaches

Patients experiencing complex or intensely painful phantom reactions usually benefit significantly from targeted psychological treatment alongside physiological interventions. The specific form of therapy employed is highly individualized, determined by the nature, severity, and extent of the psychological disturbance accompanying the physical loss. The goal of psychological treatment is

generally to help the patient revise their body concept, accept the defect, and integrate their loss into a functioning self-image.

Several psychological and pharmacological techniques have historically been, and continue to be, utilized in the management of persistent phantom pain. The techniques most commonly used include: **narcotherapy** (the use of medication to facilitate emotional release), **hypnosis**, and suggestion often accompanied by tranquilizing drugs to reduce anxiety and increase receptivity to therapeutic input. In severe, treatment-resistant cases, more intensive interventions such as electroshock therapy were historically utilized, although modern protocols often prioritize mirror therapy, graded motor imagery, and advanced pharmacological strategies targeting neuropathic pain pathways in conjunction with cognitive behavioral therapy (CBT).

Further Reading

Noyes, R., & Kolb, L. C. (1963). Long-term follow-up of the phantom limb in children. *Archives of General Psychiatry*, 8(3), 260-266. (Available via APA PsycNet: <https://psycnet.apa.org/record/1963-09756-001>)

[Phantom Limb \(Wikipedia\)](#)

[Body Image \(Wikipedia\)](#)