

# The Brookbush Institute Publishes a NEW Glossary Term: 'Hypertrophy'

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NEW YORK, NY, UNITED STATES,  
December 4, 2025 /EINPresswire.com/

-- Excerpt from Glossary Term:

[Hypertrophy](#)

- Related Course: [Hypertrophy Training: Evidence-based Model](#)

- Additional Article: [Correcting an Asymmetrical Weight Shift \(AWS\)](#)



Hypertrophy -

<https://brookbushinstitute.com/glossary/hypertrophy>

## DEFINITION

Hypertrophy: Hypertrophy is an increase in muscle mass/size due to an increase in the volume and cross-sectional area (CSA) of individual muscle cells. The increase in cross-sectional area can be attributed to an increase in contractile proteins and structural elements (myofibrillar hypertrophy), as well as an increase in glycogen storage and elements related to metabolism (sarcolemmal hypertrophy). Hypertrophy is an adaptation of both cardiac and skeletal muscle fibers in response to progressive increases in workload.



During hypertrophy training, most time should be spent with moderate loads, followed by heavy loads, with some lighter load training when necessary to reduce intensity or introduce a new stimulus."

*Dr. Brent Brookbush, CEO of Brookbush Institute*

## SEMANTIC CLARIFICATION

Hypertrophy vs. hyperplasia

- Muscle hypertrophy: Increase in size of existing muscle fibers, typically measured as fiber cross-sectional area or muscle thickness. Hypertrophy is the primary mechanism of muscle growth in response to resistance training and other forms of exercise.

- Muscle hyperplasia: Increase in the number of muscle fibers. Animal models suggest hyperplasia can occur under extreme conditions; evidence in humans is limited and

controversial.

### Myofibrillar vs. sarcoplasmic hypertrophy

- Myofibrillar hypertrophy: Growth driven mainly by increased contractile protein content (actin and myosin) and myofibril packing. This is considered the dominant contributor to strength-relevant muscle growth. PMC+1
- Sarcoplasmic hypertrophy: Disproportionate expansion of non-contractile components (sarcoplasm, enzymes, glycogen, fluid). Some high-volume protocols may transiently favor sarcoplasmic expansion, but current evidence suggests it is not a separate, superior "type" of growth; myofibrillar accretion remains central for long-term strength and function.

### Normal vs. pathological hypertrophy

- Normal (physiological) hypertrophy: Physiological hypertrophy is the adaptive enlargement of skeletal muscle in response to growth, resistance training, and other repeated mechanical loading, supported by adequate nutrition and recovery. Strength, work capacity, and metabolic health generally improve in conjunction with gains in size, and the underlying muscle architecture remains organized. Normal hypertrophy also occurs in other tissues (for example, "athlete's heart" in endurance and strength athletes). In the heart, physiological hypertrophy is characterized by preserved or enhanced cardiac function and a balanced increase in chamber size and wall thickness without fibrosis or clinical dysfunction.
- Pathological hypertrophy: Pathological hypertrophy refers to enlargement of muscle or organs that are driven by disease processes or chronic, non-resolving stress, and is often accompanied by impaired function. In the heart, pathological hypertrophy is associated with fibrosis, altered cell signaling, and an increased risk of heart failure, arrhythmias, and adverse cardiovascular events, even though the myocardium is larger.

### Hypertrophy vs. strength

- Hypertrophy: Morphological change (bigger muscle fibers).
- Strength: Functional outcome (force production), influenced by hypertrophy, neural adaptations, tendon and connective tissue properties, and skill.
- Hypertrophy supports strength gains over time, but early strength changes are often dominated by neural adaptations.

### FREQUENTLY ASKED QUESTIONS(FAQs)...

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Brent Brookbush

Brookbush Institute

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