

The Brookbush Institute publishes 'Squat Depth Recommendations: Based on All Available Research'

Publication of a comprehensive research review comparing the effects of squat depth on hypertrophy, strength, and power.

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Squats at any depth are beneficial for strength, hypertrophy, and power. Movement impairment may significantly influence squat depth. Depth should not be prioritized over optimal alignment or pain."

Dr. Brent Brookbush, CEO of Brookbush Institute

Institute used research to answer the question, WHAT IS THE IDEAL SQUAT DEPTH?

What is the optimal range of motion (ROM) for squats? "Ass to Grass" has become the battle cry of every self-proclaimed "strength coach," but are deep squats really better? Deep squats are definitely harder, and they require a significant amount of work and dedication to perform well. Training with deep squats is certainly necessary for sports that require deep squatting (powerlifting and Olympic lifting). However, the body of research on squat ROM suggests that "squat deep" may be the most over-rated cue in fitness and performance training. So what does the research say?

- This is an excerpt from the article - "[Squat Depth Recommendations: Based on All Available Research](#)"
- It is also included in the course - "[Lower Body Exercise Progressions](#)"
- The course has been approved for CEs and inclusion in the "[Certified Personal Trainer \(CPT\) Certification](#)"

QUICK SUMMARY OF RESEARCH

- Evidence-based Summary Statement: Brookbush Institute's Research-based Position on Squat Depth: Squats at any depth are beneficial for strength, hypertrophy, and power. Movement impairment may significantly influence squat depth. Squat depth should not be prioritized over optimal alignment or pain.
- Brookbush Institute's Position Statement on ROM: Exercise (including squats) should be performed through the largest range of motion (ROM) that can be attained with good form and

without pain.

- Force vs. Work: Because more load can often be lifted with less range of motion (ROM), it is likely that more force will be produced with shallower squats. However, because deeper squats involve more vertical displacement, more work will be performed with deeper squats (note that "work" is defined as force x distance).

- Depth vs. Load: It is likely that increases in depth have a larger influence than load on knee torque, increases in load have a larger influence than depth on ankle torque, and depth and load seem to affect hip torque equally.

- EMG Activity is Mixed: Deeper squats likely increase the EMG activity of the gluteus maximus, rectus femoris, erector spinae, and tibialis anterior, and may not significantly alter the EMG activity of the vastus lateralis, biceps femoris, and gastrocnemius. Additionally, the gluteus maximus, biceps femoris, and soleus may exhibit larger increases in EMG activity with the increases in load possible during shallower squats.

- Hypertrophy: Deeper squats likely result in larger improvements than shallower squats in muscle hypertrophy; however, these differences are likely small, as demonstrated by a lack of consistent findings in the available research.

Strength: Squat strength is ROM-specific, with deeper squats resulting in an increase in strength over a larger range, but the largest increases for a squat ROM result from training with that ROM.

- Power: The effect of training with different squat depths on power (e.g. box jumps, sprints, etc.) is inconclusive, with studies demonstrating larger improvements from both shallower and deeper squats.

Inexperienced Exercisers: Deeper squats may result in larger improvements in hypertrophy, strength, and power for inexperienced or deconditioned individuals. It may be hypothesized that inexperienced or deconditioned individuals do not exhibit a significant difference in load when comparing 1-RM strength for different squat depths due to other limiting factors (e.g., neuromuscular coordination).

- Movement Impairment: Research has demonstrated that movement impairments, including changes in muscle EMG activity, a loss of hip flexion ROM, a loss of hip internal rotation ROM, and especially a loss of dorsiflexion ROM, can significantly decrease squat depth.



Squat Depth Recommendations: Based on All Available Research -

<https://brookbushinstitute.com/articles/deep-squats-good-or-bad>

Note that it is not necessary to trust the Brookbush Institute's review alone. An attempt has been made to locate every relevant research study and include those studies (with annotations) in the systematic review included in the article. Further, the bibliography has been added below. Please feel free to read the research and develop independent conclusions.

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