



BLOOD FLOW RESTRICTION

Blood flow restriction (BFR) is a rehabilitation technique that involves using a tourniquet to reduce arterial blood flow and restrict venous blood flow during resistance training or exercise. Previously it was primarily used to promote muscle development, however, as the understanding of its physiological benefits and mechanisms has improved, BFR has been used for additional clinical applications. BFR allows for a decrease in joint stress while still improving strength, making it beneficial for individuals recovering from surgery, injuries, or those with limited load capacity as it accelerates recovery and prevents muscle wasting. Additionally, there is emerging evidence suggesting that BFR may also enhance cardiovascular fitness and reduce pain [Cognetti et al, 2022](#).

RESOURCES

The Sports Medicine
Broadcast: [Blood Flow
Restriction Facts](#)

The PATS Podcast: [Blood
Flow Restriction Training with
Dr Lorenz](#)

National Academy of
Sports Medicine (NASM):
[The Science of BFR Training](#)

FREE COMMUNICATIONS PROGRAM

Blood Flow Restriction in Competitive Athletes, Does It Work? A Systematic Review ([Pardo et al, 2022](#)) S-297. Outcome measures have suggested BFR exercise at low loads has been effective in enhancing morphology and strength response in muscle tissues. While further research is needed, BFR with low load resistance training can elicit improvements in muscular size and strength in settings where high-intensity or high-load training may not be appropriate. Continued adherence to rehabilitation guidelines and complementary patient-centered care plans will help optimize its effect.

Blood Flow Restriction Training Effect on Post-Surgical Knee Arthroscopy: A Critically Appraised Topic ([Markie et al, 2022](#)) S-299. Blood-flow restriction training utilization can aid clinicians struggling to improve outcomes for their patients by providing an alternative solution to high load strength training during post-surgical rehabilitation.

The Effects of Blood Flow Restriction in Improving Shoulder Muscular Strength Versus Traditional Exercise Strengthening: A Critically Appraised Topic ([Young et al, 2022](#)) S-305. BFR is increasing in popularity as part of rehabilitation plans and has a positive effect on the strength of the shoulder.

from RECENT ARTICLES

"Low-Load Blood-Flow Restriction Exercise to Failure and Nonfailure and Myoelectric Activity: A Meta-Analysis" [Santos Cerqueira et al, 2022](#). In nonfailure low-load resistance training BFR has been found to enhance muscle excitability. However, higher muscle excitability is observed during high-load resistance training compared to low-load resistance training with BFR, regardless of reaching muscle failure. It is important to consider failure as a variable in low-load BFR training, as it directly affects myoelectric activation and indirectly influences strength and muscle mass gains.

"Blood Flow Restriction Training" [Lorenz et al, 2021](#). BFR training is a beneficial method to enhance strength and muscle growth in the initial stages of rehabilitation, particularly when patients may not tolerate higher loads. When used correctly, the risk of injury or adverse events associated with BFR training is comparable to traditional exercise approaches. Moreover, research indicates that BFR training can go beyond the outcomes of traditional resistance training, improving function and reducing pain in individuals with joint injuries.

"Blood Flow Restriction Therapy and Its Use for Rehabilitation and Return to Sport: Physiology, Application, and Guidelines for Implementation" [Cognetti et al, 2022](#). BFR promotes muscle hypertrophy by leveraging the combined effects of metabolic stress and mechanical tension, leading to increased muscle growth. It also offers additional advantages in terms of cardiovascular fitness and pain management. To maximize the effectiveness and appropriate use of BFR, it is crucial to maintain adherence to protocol guidelines and further investigate its physiological aspects and diverse applications.

"An Overview of Blood Flow Restriction Physiology and Clinical Considerations" [Martin et al, 2022](#). BFR has gained considerable popularity, but healthcare professionals should have a good grasp of its physiological principles and clinical implications. Current evidence indicates that BFR is generally safe and valuable for enhancing muscle hypertrophy, increasing muscle strength, and improving function during rehabilitation.

ATHLETIC TRAINING RESEARCH AGENDA



Use of BFR is a research priority of the Athletic Training Research Agenda under **Health Care Competency:** Applying effective interventions. [Learn More](#)

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