

HawkGrips  
Fundamentals of Blood Flow Restriction Training  
 Course Syllabus

**I. Primary Instructor(s):**

| <b>Course Instructors</b> | <b>Names, titles</b>                              |
|---------------------------|---|
| Drew Contreras            | DPT, SCS, CMTPT                                   |
| Ted Forcum                | DC, DACBSP, ICCSP, FICC(hon), CSCS, CES, PES, RTP |
| Ken Johnson               | PT  |
| Andrea Lasner             | PT, DPT   |
| Robert Marsico            | PT, Ed. D, OCS                                    |
| Joshua McGinty            | PT, DPT, ATC, OCS                                 |
| Tyler Nelson              | DC, MS, CSCS                                      |
| Joel Novak                | DPT   |
| Laura Ramus               | PT, ATC   |
| Shawn Burger              | PT, DPT, CSCS                                     |
| James Wagner              | OTD, OTR/L, CHT, CPAM, CSCS                       |
| Aric Warren               | EdD, ATC, LAT, CSCS, CES                          |

**Key Consultants/Contributors:**

| <b>Course Reviewers</b> | <b>Names, titles</b>  |
|-------------------------|---|
| Dr. Jim Stray-Gundersen | MD SPORTS MEDICINE & SCIENCE<br><br>CMO, CO-FOUNDER/CO-DEVELOPER B STRONG |

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**II. Financial Disclosures:** Throughout the course, HawkGrips mentions the use of the BStrong Blood Flow Restriction Training Products. For In-Person version, we supply training sets of the BStrong for all attendees to have access to. Products are not sold during the course, but we do offer discounts on the product following the course to all attendees.

**III. Post Professional Learning Level:** Beginner

**IV. Statement of Non-Discrimination:** This course is made available to all physical therapist and physical therapist assistant licensees on a non-discriminatory basis.

**V. Verification of Attendance:** For In-Person, we have a sign in/sign out sheet that we use to verify attendance. We file this sheet in our records, and upload it to our CRM to also keep a digital file of. For Virtual, the course moderator will ensure all attendees are present for the entirety of the zoom session. Before the course starts, the course moderator will do an attendance check.

**VI. Statement of Relevance to PT Practice:** This course is a clinically evidence-based practical hands-on program that is appropriate for Physical Therapy professionals as it addresses up to date clinical application and rehabilitation strategies for individuals recovering from injury, illness, or surgery. This course demonstrates the safety and efficacy of how blood flow restriction training can be applied in the context of physical therapy treatment plans without the stress to tissues that may be healing from a recent injury or surgery.

**VII. Content Specialty Area (Place an X to the right of the ONE that MOST applies):**

|  |                              |   |  |
|--|------------------------------|---|--|
|  | Acute Care/Inpatient         | Home Health   | Primary Care/Medical Screening                   |
|  | Adaptive Sports & Recreation | Imaging (not included US)                           | Prosthetics/Orthotics/Braces & Assistive Devices |
|  | Amputation                   | Lifestyle Medicine (including nutrition & wellness) | Psychology/Behavioral Health                     |
|  | Animal Therapy               | Lymphedema  | Skilled Nursing/Long Term Care                   |

|   |  |  |   |  |                                       |
|---|--|--|---|--|---------------------------------------|
|   | Aquatics   |  | Manual Therapy                              |  | Sports                                |
|   | Billing/Coding/Compliance                        |  | Neurology                                   |  | Tactical Athlete/Military             |
|   | Business & Entrepreneurship                      |  | Occupational Health/Work Comp/Ergonomics/CE |  | Telehealth                            |
|   | Cardiovascular & Pulmonary                       |  | Oncology                                    |  | TMJ Disorders                         |
|   | Diagnostic Ultrasound/Clinical Electrophysiology |  | Pain Science/Chronic Pain                   |  | Vestibular/Concussion/Balance & Falls |
|   | Dry Needling                                     |  | Pediatrics                                  |  | Wheelchair & Mobility Devices         |
| X | General Orthopedics                              |  | Performing Arts/Dance                       |  | Women's Health/Pelvic Floor           |
|   | Geriatrics                                       |  | Pharmacology                                |  |                                       |
|   | Hand Therapy                                     |  | Post-Operative Management                   |  | Wound Management                      |

**VIII. Differential Diagnosis content:** This course contains N/A hours of differential diagnosis content.

**IX. Mode of Instruction (select all that apply):**

|                          |  |
|--------------------------|--|
| <b>In-Person</b>         |  |
| <b>Live Webinar</b>      |  |
| <b>Online Self-Paced</b> |  |
| <b>Hybrid*</b>           | <b>7 (Virtual Option)</b><br><b>8 (In-Person Option)</b> |

## **X. Course Description:**

### **Virtual Option:**

This 4-hour course covers the skills necessary to safely and effectively implement Blood Flow Restriction (BFR) Training. The course is set up in a “learn by doing” format in which participants will receive virtual instruction to perform supervised hands-on demonstrations in the proper use of BFR Equipment and Training. After understanding the history, research, physiology, and implications for use, attendees will put this into practice in a virtual supervised lab session. They will be exposed to exercise protocols and provided with resources to ensure safe training. At the end of the course, attendees will take a 1 hour exam for a certification in Fundamentals of BFR Training.

### **In-Person Option:**

This 8-hour course covers the skills necessary to safely and effectively implement Blood Flow Restriction (BFR) Training. The course is set up in a “learn by doing” format in which participants will receive hands-on instruction in the proper use of BFR Equipment and Training. After understanding the history, research, physiology, and implications for use, attendees will put this into practice in supervised lab sessions. They will be exposed to exercise protocols and provided with resources to ensure safe training. In order to be certified in HawkGrips BFR, attendees will be required to pass a 20 question exam with a passing score of 70% at the conclusion of the course.

BFR is gaining popularity within the rehabilitation setting as its ability to increase muscle strength and size very quickly is well documented. BFR has also been shown to improve nervous system function, bone mineral density, and overall vascular health to name a few other benefits that are very applicable to individuals undergoing formal physical therapy. This course is appropriate for Physical Therapy Professionals as it addresses rehabilitation strategies for individuals seeking a safer way to increase muscle strength.

## **XI. Course Outline (On-Demand Portion)**

| Module # | Module Title  | Learning Assessment | # contact hours |
|----------|---|---------------------|-----------------|
| 1        | Introduction to Blood Flow Restriction Training Video Parts 1-4 (THIS IS THE PRE-COURSE FOR ONLY VIRTUAL OPTION, NO PRE-COURSE FOR IN-PERSON) | Video               | 2               |
| 2        | Introduction to Blood Flow Restriction Training Pre-Quiz (THIS IS THE PRE-COURSE FOR ONLY VIRTUAL OPTION, NO PRE-COURSE FOR IN-PERSON)        | Quiz                | .25             |
| 3        | Fundamentals of Blood Flow Restriction Training Exam (For both In-Person and Virtual)   | Exam                | 1               |
|          |   |                     |                 |
|          |   |                     |                 |
|          |   |                     |                 |

**Course Schedule (Virtual LIVE)**

11:30-11:45 AM Virtual Classroom Setup

11:45-12:00 PM Welcome and review of pre-course (Introduction to BFR Training)

12:00-12:30 PM Applications of BFR

12:30-12:45 PM Mechanisms of BFR

12:45-1:00 PM Safety and Efficacy of BFR

1:00-1:15 PM Break

1:15-1:30 PM Safety Demonstrations and Practice

1:30-2:00 PM Efficacy Demonstrations and Practice

2:00-3:30 PM Upper Extremity, Lower Extremity, and Total Body Exercise

3:30-4:00 PM B Strong App and Q & A

Course Schedule (module duration time units in hours)

- 0.25 Registration and attendee/instructor introductions
- 0.25 Welcome and review of pre-course (Introduction to BFR Training)
- 0.5 Applications of BFR
- 0.25 Mechanisms of BFR
- 0.25 Safety and Efficacy of BFR
- 0.25 Break
- 0.25 Safety Demonstrations and Practice
- 0.5 Efficacy Demonstrations and Practice
- 1.5 Upper Extremity, Lower Extremity, and Total Body Exercise
- 0.5 B Strong App and Q & A

**Course Schedule (In-Person LIVE)**

Course Schedule: (module duration time units in hours)

- 0.5 Registration
- 0.25 Welcome and Introduction to BFR Introduction
- 0.75 History of BFR and Literature Review
- 1.0 Applications of BFR
- 0.25 Break
- 0.75 Mechanisms of BFR
- 1.0 Safety and Efficacy of BFR
- 0.5 Safety Demonstrations and Practice
- 1.0 Meal Break
- 0.5 Efficacy Demonstrations and Practice
- 1.5 Upper Extremity, Lower Extremity, and Total Body Exercise
- 0.25 Break
- 0.75 B Strong App and Q & A
- 1.0 Exam and Closing

Course Schedule

- 7:30-8 AM Registration
- 8-8:15 AM Welcome and Introduction to BFR

8:15-9 AM History of BFR and Literature Review  
9-10 AM Applications of BFR  
10-10:15 AM Break  
10:15-11 AM Mechanisms of BFR  
11-12:00 PM Safety and Efficacy of BFR  
12:00-12:30 PM Safety Demonstrations and Practice  
12:30-1:30 PM Lunch  
1:30-2 PM Efficacy Demonstrations and Practice  
2-3:30 PM Upper Extremity Exercise, Lower Extremity Exercise, and Total Body Exercise  
3:30-3:45 PM Break  
3:45-4:30 PM B Strong App and Q & A  
4:30-5:30 PM Exam and Closing

**XII. TOTAL Course Contact Hours Requested:**

Course Total Hours (In-Person)

Contact Hours: **8.0**

Lecture: 3.75

Lab: 3.25

Exam: 1.0

Break Hours: 1.5

Course Total Hours (Virtual)

Contact Hours: **7**

Lecture: 2

Lab: 2

Video: 2

Exam: 1

Break Hours: .25

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**XIII. Required Materials/Resources:** For In-Person courses, all attendees are provided with a training set and a course manual.

For Virtual, all attendees are provided with a PDF version of the course manual with the option to ship a free physical copy of the manual to their home/location.

**XIV. Course Objectives:**

At the completion of this program the participant will be able to:

1. Describe how the design of B Strong BFR bands doesn't cause arterial occlusion.
2. Explain the benefits of Blood Flow Restriction Training.
3. Explain the mechanisms of Blood Flow Restriction Training.
4. Correctly list at least 4 of the precautions and contraindications to B Strong BFR as presented in the course.
5. Compare the 5 differences between utilizing a wide rigid cuff versus a narrow elastic cuff as presented in the course.
6. Plan an upper extremity, lower extremity, and total body exercise program for a client using BFR training.

**XV. Competency Demonstration:** At the conclusion of the course, students must demonstrate a minimum of 80% proficiency in the final exam following course assessments to achieve a passing grade. The assessments will demonstrate that the student has met the course learning objectives.

| Assessment                      | Description  | Points |
|---------------------------------|--|--------|
| (Virtual Only)<br>Video Portion | Video 1: Introduction and History of Blood Flow Restriction Training (16:33) Video 2: Mechanisms of Blood Flow Restriction Training (28:25) Video 3: Safety and Efficacy of Blood Flow Restriction Training (34:57) Video 4: Applications of Blood Flow Restriction Training (9:26) 15-Question Quiz: approx. 30 min TOTAL: approx. 2 hour 00 mins   | N/A    |
| (Virtual Only)<br>Quiz          | At the end of this presentation the participant will be able to: - Describe the history of Blood Flow Restriction Training. - Describe how the design of B Strong BFR bands doesn't cause arterial occlusion. - Correctly list at least 4 of the contraindications to B Strong BFR as presented in the course. - Explain the local and systemic mechanisms of Blood Flow Restriction Training. - Compare the 5 differences | 100    |



|                   |  |     |
|-------------------|--|-----|
|                   | <p>between utilizing a wide rigid cuff versus a narrow elastic cuff as presented in the course.</p> <p>The attendee will complete a quick 15 question quiz before moving on to the live portion of the course.</p> |     |
| Participation     | Participants are required to attend the In-Person or Virtual course in its entirety.   | N/A |
| Final Exam        | Participants are required to complete and pass a 20 question final exam in order to receive their certification. The questions are a mix of true, false, and multiple choice.                                      | 100 |
| Course Evaluation | In order to receive a certificate for CEUs, participants are required to complete a course evaluation.   | N/A |
| Possible Points   | -----  | 100 |

### Introduction to Blood Flow Restriction Training Pre-Course Quiz (For Virtual Only)

1. Blood Flow Restriction Training is limited to elite athletes due to the fact that it causes occlusion in some cases.
  - a. True
  - b. False**
  
2. Which of the following are relative contraindications for B Strong BFR Training?
  - a. Pregnancy
  - b. Placing a band on a limb with Lymphedema
  - c. Someone with a fever
  - d. All of the above**
  
3. Narrow, elastic bands are designed to impede blood flow, while wide, non-elastic cuffs cut off blood flow.
  - a. True**
  - b. False
  
4. Yoshiaki Sato discovered that through the use of \_\_\_\_\_ during his recovery, these techniques mitigated the expected disuse atrophy.
  - a. Belts & Aerobic exercise
  - b. Belts & Isometric exercise**
  - c. Bands & Anaerobic exercise
  - d. Bands & Aerobic exercise
  
5. Blood flow restriction training has both systemic and local effects.

- a. True
- b. False

6. BFR Training results in a disturbance of homeostasis. This includes

- a. **Reduction in  $pO_2$  and pH**
- b. Reduction in lactate and inorganic phosphate
- c. Unchanged electrolyte gradients
- d. All of the above

7. Which of the following are among the 8 key hormones released during exercise?

- a. Norepinephrine/epinephrine
- b. Glucagon
- c. Insulin
- d. **All of the above**

8. In the years between 2000-2010 it was estimated that there were approximately \_\_\_\_\_ KAATSU masters in Japan.

- a. 150
- b. 100,000
- c. **5,000**
- d. 750,000

9. There have been approximately 300,000 KAATSU sessions performed per day for years in Japan. There have been \_\_\_\_\_ reports of complications.

- a. Only 5
- b. Less than 5
- c. Two
- d. **Zero**

10. When a B Strong BFR band is inflated

- a. The band lengthens and the barrels flatten
- b. The band shortens and the barrels flatten
- c. **The band shortens and the barrels become more cylindrical**
- d. The band lengthens and the barrels become more cylindrical

11. The key to Blood Flow Restriction Training is to create a “Disturbance of Homeostasis” in the working muscle.

- a. True
- b. False

12. The one absolute contraindication for B Strong Blood Flow Restriction training is

- a. Using on a limb with Lymphadema
- b. **Someone who cannot exercise**
- c. Those over the age of 65 years old
- d. Someone suffering from a muscle related injury

13. The local mechanisms of BFR training result in
- a. Stimulation of mTOR pathway to upregulate protein synthesis
  - b. Recruitment of fewer motor units as initial units fatigue
  - c. Recruitment of additional motor units as initial units fatigue
  - d. Both A and C**

14. KAATSU means
- a. KA (additional) AATSU (force)
  - b. KA (additional) AATSU (pressure)**
  - c. KA (minimal) AATSU (pressure)
  - d. KA (additional) AATSU (torque)

15. B Strong BFR bands are specifically designed not to occlude arterial inflow up to the capacity of the pump (500mmhg)?
- a. True**
  - b. False

### **Fundamentals of BFR Training Certification Exam**

When was the idea of BFR conceived?

- a. 1946
- b. 1966**
- c. 1986
- d. 2006

What is the main goal of B Strong BFR Training?

- a. Reduce arterial inflow
- b. Reduce venous outflow
- c. Apply pressure to peripheral nerves
- d. Disturb homeostasis in working tissues**

What should be avoided to perform safe B Strong BFR Training?

- a. Arterial occlusion**
- b. Venous occlusion
- c. Distension of a limb
- d. Muscle cramping

During a B Strong BFR Training session, the skin color changes from its original tone. What color tone indicates arterial occlusion?

- a. Red
- b. Purple**

**c. White**

d. Blue

How long can a B Strong BFR band be inflated on a limb during one bout?

a. 10 minutes

**b. 20 minutes**

c. 30 minutes

d. 40 minutes

When a B Strong BFR band is inflated

a. The band lengthens and the barrels flatten

b. The band shortens and the barrels flatten

**c. The band shortens and the barrels become more cylindrical**

d. The band lengthens and the barrels become more cylindrical

Which of the following is not a specific positive effect of increased growth hormone (HGH)?

a. Up-regulate protein synthesis

b. Muscle hypertrophy

c. Muscle hyperplasia

**d. Angiogenesis**

B Strong BFR bands are specifically designed not to occlude arterial inflow up to the capacity of the pump (500mmhg)?

**a. True**

b. False

What kind of feelings should one expect during a B Strong BFR Training session?

a. Pain running down the back of the leg

**b. "Muscle burn" and discomfort that comes on during the 2nd or 3rd set of an exercise**

c. Unilateral pain

d. Numbness

Blood flow restriction training have both systemic and local effects.

**a. True**

b. False

What is the maximal number of B Strong BFR Training sessions a client can do in a 24 hour period?

a. One

- b. Two
- c. Three**
- d. Four

How many extremities can one perform B Strong BFR Training at the same time?

- a. One
- b. Two
- c. Three
- d. Four**

What factors can influence the pressures used with the B Strong BFR bands? (multiple answers)

- a. Experience with previous B Strong BFR Training Sessions**
- b. Limb occlusion pressure
- c. Arterial blood pressure
- d. Limb circumference**
- e. Pressures used in previous B Strong BFR Training Sessions**

B Strong BFR Training can improve strength in muscles that are proximal (above) the band.

- a. True**
- b. False

B Strong BFR Training has been shown to do which of the following? (multiple answers)

- a. Improve VO2 max**
- b. Strengthen tendons
- c. Improve strength**
- d. Lose body fat**
- e. Improve cognitive function

Who should not perform B Strong BFR Training?

- a. Diabetics
- b. Individuals who have had a stroke
- c. Homozygotes for sickle cell disease**
- d. Cancer survivor

What can cause a disturbance of homeostasis?

- a. Low levels of oxygen
- b. High levels of inorganic phosphate (Pi)
- c. Low levels of ATP
- d. All of the above can cause a disturbance of homeostasis**

Experiencing nausea following a B Strong BFR Training Session is expected.

- a. True
- b. False**

B Strong BFR Training can cause varicose veins.

- a. True
- b. False**

BFR Training results in a disturbance of homeostasis. This includes

- a. Reduction in  $pO_2$  and pH**
- b. Reduction in lactate and inorganic phosphate
- c. Unchanged electrolyte gradients
- d. All of the above

#### **XVI. Course Evaluation (In-Person)**

1. First Name, Last Name
2. Email
3. What is your profession?
4. What is your license number? If you are a student, please put n/a.
5. City of Course Location
6. Date of Course
7. State of Course Location
8. What was your primary Instructor's name?
9. What was your lab assistant's name?
10. Please consider your first instructor. How would you rate the first instructor on Knowledge of Speaker?

11. Please consider your first instructor. How would you rate the first instructor in Quality of Presentation?
12. Please consider your second instructor or lab assistant. How would you rate the second instructor or lab assistant in Knowledge of Speaker? (Leave blank if you did not have a second instructor or lab assistant)
13. The program matter was sufficiently covered
14. The program increased knowledge in areas where greater knowledge was desired
15. The subject matter has practical application
16. Please describe how the subject matter relates specifically to your practice.
17. The activity will improve my patient outcomes
18. Questions I had on today's topic were answered during this activity
19. The visual aids were helpful
20. I would recommend this course to a friend or colleague
21. At the completion of this program the participant will be able to describe how the design of B Strong BFR bands doesn't cause arterial occlusion.
22. At the completion of this program the participant will be able to explain the benefits of Blood Flow Restriction Training.
23. At the completion of this program the participant will be able to explain the mechanisms of Blood Flow Restriction Training.

24. At the completion of this program the participant will be able to correctly list at least 4 of the precautions and contraindications to B Strong Blood Flow Restriction as presented in the course.
25. At the completion of this program the participant will be able to compare the 5 differences between utilizing a wide rigid cuff versus a narrow elastic cuff as presented in the course.
26. At the completion of this program the participant will be able to plan an upper extremity, lower extremity, and total body exercise program for a client using BFR training.
27. Do you feel that the information was based on the best available evidence?
28. If you answered No to the above question, please explain:
29. Do you feel that there was commercial bias or influence in this activity?
30. If you answered Yes to the above question, please explain:
31. What specific aspects of today's activities do you think you will use most to improve your practice?
32. Location
33. Room
34. Accommodations
35. Do you or your company already own BFR equipment?
36. If no, do you or your company plan on purchasing BFR equipment after attending this course?



37. How did you hear about the course? (i.e. HawkGrips website, BStrong website, Sales Rep, etc)

38. Please utilize the space below for other comments or suggestions.

**39. Course Evaluation (Virtual)**

1. First Name, Last Name

2. Email

3. What is your profession?

4. What is your license number? If you are a student, please put n/a.

5. Date of Course

6. What was your primary Instructor's name?

7. Please consider your first instructor. How would you rate the first instructor on Knowledge of Speaker?

8. Please consider your first instructor. How would you rate the first instructor in Quality of Presentation?

9. The program matter was sufficiently covered

10. The program increased knowledge in areas where greater knowledge was desired

11. The subject matter has practical application

12. Please describe how the subject matter relates specifically to your practice.

13. The activity will improve my patient outcomes

14. Questions I had on today's topic were answered during this activity
15. The visual aids were helpful
16. I would recommend this course to a friend or colleague
17. At the completion of this program the participant will be able to describe how the design of B Strong BFR bands doesn't cause arterial occlusion.
18. At the completion of this program the participant will be able to explain the benefits of Blood Flow Restriction Training.
19. At the completion of this program the participant will be able to explain the mechanisms of Blood Flow Restriction Training.
20. At the completion of this program the participant will be able to correctly list at least 4 of the precautions and contraindications to B Strong Blood Flow Restriction as presented in the course.
21. At the completion of this program the participant will be able to compare the 5 differences between utilizing a wide rigid cuff versus a narrow elastic cuff as presented in the course.
22. At the completion of this program the participant will be able to plan an upper extremity, lower extremity, and total body exercise program for a client using BFR training.
23. Do you feel that the information was based on the best available evidence?
24. If you answered No to the above question, please explain:
25. Do you feel that there was commercial bias or influence in this activity?

26. If you answered Yes to the above question, please explain:
27. What specific aspects of today's activities do you think you will use most to improve your practice?
28. Quality of Zoom conference (instructor's audio/visual)
29. Do you or your company already own BFR equipment?
30. If no, do you or your company plan on purchasing BFR equipment after attending this course?
31. Would you like to give an official testimonial for this virtual course?
32. How did you hear about the course? (i.e. HawkGrips website, BStrong website, Sales Rep, etc)
33. What made you decide to attend this course?
34. Please utilize the space below for other comments or suggestions.

#### **XVII. Teaching Sample**

*Include one of the following. Enter a link here or provide access in the space noted in the google form.*

**a. Slides:** attached in submission

**b. Video Clip (for Virtual):** <https://www.youtube.com/watch?v=o60HxnkIWxw>

#### **XVIII. Complete Reference List:**

1. Abe T, Loenneke JP, Fahs CA, et al. Exercise intensity and muscle hypertrophy in blood flow-restricted limbs and non-restricted muscles: a brief review. *Clin Physiol Funct Imaging*. 2012; 32:247-252.
2. Bahreini Pour MA, Joukar S, Hovanloo F, Najafipour H. Long-term low-intensity endurance exercise along with blood-flow restriction improves muscle mass and neuromuscular junction compartments in old rats. *Iran J Med Sci*. 2017; 42: 569-576.
3. Cook SB, Scott BR, Hayes KL, Murphy BG. Neuromuscular adaptations to low-load blood flow restricted resistance training. *J Sports Sci Med*. 2018; 17: 66-73.

4. Ellefsen S, Hammarstrom D, Strand TA, et al. Blood flow-restricted strength training displays high functional and biological efficacy in women: a within-subject comparison with high-load strength training. *Am J Physiol Integr Comp Physiol*. 2015; 309: R767-779.
5. Hughes L, Paton B, Rosenblatt B, Gissane C, Patterson SD. Blood flow restriction training in clinical musculoskeletal rehabilitation: a systematic review and meta-analysis. *Br J Sports Med*. 2017; 51: 1003-1011.
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7. Loenneke JP, Abe T, Wilson JM, et al. Blood flow restriction: an evidence based progressive model (Review). *Acta Physiol Hung*. 2012; 99: 235-250.
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10. Manini TM, Clark BC. Blood flow restricted exercise and skeletal muscle health. *Exerc Sport Sci Rev*. 2009; 37: 78-85.
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12. Neto GR, Novaes JS, Dias I, et al. Effects of resistance training with blood flow restriction on haemodynamics: a systematic review. *Clin Physiol Funct Imaging*. 2017; 37: 567-574.
13. Park SY, Kwak YS, Harveson A, Weavil JC, Seo KE. Low intensity resistance exercise training with blood flow restriction: Insight into cardiovascular function, and skeletal muscle hypertrophy in humans. *Korean J Physiol Pharmacol*. 2015; 19: 191-196.
14. Paton CD, Addis SM, Taylor LA. The effects of muscle blood flow restriction during running training on measures of aerobic capacity and run time to exhaustion. *Eur J Appl Physiol*. 2017; 117: 2579-2585.
15. Patterson SD, Brandner CR. The role of blood flow restriction training for applied practitioners: A questionnaire-based survey. *J Sports Sci*. 2018; 36: 123-130.
16. Pearson SJ, Hussain SR. A review on the mechanisms of blood-flow resistance training-induced muscle hypertrophy. *Sports Med*. 2015; 45: 187-200.
17. Pope JK, Willardson JM, Schoenfeld BJ. Exercise and blood flow restriction. *J Strength Cond Res*. 2013; 27: 2914-2926.
18. Scott BR, Loenneke JP, Slattery KM, Dascombe BJ. Exercise with blood flow restriction: an updated evidence-based approach for enhanced muscular development. *Sports Med*. 2015; 45:313-325.
19. Scott BR, Loenneke JP, Slattery KM, Dascombe BJ. Blood flow restricted exercise for athletes: A review of available evidence. *J Sci Med Sport*. 2016; 19: 360-367.
20. Slys J, Stultz J, Burr JF. The efficacy of blood flow restricted exercise: A systematic review and meta-analysis. *J Sci Med Sport*. 2016; 19: 669-675.
21. Takarada Y, Takazawa H, Sato Y, et al. Effects of resistance exercise combined with moderate vascular occlusion on muscular function in humans. *J Appl Physiol*. 2000; 88: 2097-2106.
22. Yasuda T, Fujijita S, Ogasawara R, Sato Y, Abe T. Effects of low-intensity bench press training with restricted arm muscle blood flow on chest muscle hypertrophy: a pilot study. *Clin Physiol Funct Imaging*. 2010; 30: 338-343.
23. Yasuda T, Meguro M, Sato Y, Nakajima T. Use and safety of KAATSU training: Results of a national survey in 2016. *Int J KAATSU Training Res*. 2017; 13: 1-9.

