

# THE BFR MASTERY PROGRAM

OCCLUSION TRAINING  
TECHNIQUES FOR MASS



*Julian Smith the*  
**QUADGUY**

PRESENTED BY THE QUAD GUY & LIFTING LAB





**© 2017 Lifting Lab® All Rights Reserved.**

No part of this publication may be reproduced, distributed, or transmitted in any form or by any means, including photocopying, recording, or other electronic or mechanical methods, or by any informational storage or retrieval system without the prior expressed written permission of the publisher.

## **DISCLAIMER AND/OR LEGAL NOTICES**

The information contained in this guide is not medical advice and is for educational purposes only. The information presented to you is based off of personal experiences of the authors as well as current research and data. The exercises and advice contained herein are meant for healthy adults only. Before performing any exercises stated in this guide you should consult your physician to ensure the information provided is appropriate for your individual circumstances. If you have health issues or pre-existing conditions please consult your physician before implementing any of the information provided in this guide. This guide is for informational purposes only and the authors do not accept any responsibilities for any liabilities or damages, real or perceived, resulting from the use of this information.

## **WORDS OF CAUTION**

Studies show that in the general population and even in injured recovering populations of people, blood flow restriction training appears to be relatively safe and beneficial. It should be avoided in certain cases in the presence of deep vein thrombosis, individuals with high blood pressure, pregnancy, or on extremities with varicose veins. One study advises "prolonged ischemia can lead to necrosis of muscle tissue. As such, it may be sensible to avoid performing continuous blood flow restriction training for very prolonged periods of time." Readers of this guide are responsible for exercising caution and using their own discretion when implementing BFR training for competitive sports or rehab purposes.

# INTRODUCTION BY JULIAN SMITH

If you've followed me for any length of time, you know that I keep the BS to a minimum. My gym bag arsenal is light. Blood flow restriction training (BFR) is one of the few exceptions! This guide will leave you with a clear understanding of how to properly and safely use the custom BFR cuffs, and why they work so well!

BFR training, which originated in Japan as KAATSU training, is just now beginning to make its way into gyms in the US. When you see me using a set of bands on Instagram you might be thinking 'What's on his arms? Is this guy really wearing tourniquets?!' The answer is: absolutely.



BFR training utilizes your circulatory system in a way that makes your mind think the muscle is working harder than it is.

This is one of the simplest and most effective training techniques ever used the sport of bodybuilding. One of the only true natural 'muscle hacks' backed by legitimate research. Its popularity among the Japanese has led to over 100 studies and counting.

In my 15 years of bodybuilding, I've never come across a program that fully explains BFR training, and because of that I avoided it! BFR training can seem intimidating (naturally) and without proper education, I wasn't willing to take a stab at it on my own. Since incorporating it into my training this year, I've received a ton of interest and a LOT of questions. Some that I'm just not qualified to answer!

I'm proud to partner up with Lifting Lab to create this program. They've sorted through all the current research and information, and boiled down only the most effective and most applicable principles. This program will cover all your bases and get you up to speed! These BFR exercises are designed to introduce new stimulus to help bring up your arms and legs.

Julian Smith

A handwritten signature in black ink, appearing to read 'Julian Smith', with a horizontal line underneath.

# TABLE OF CONTENTS

We have sorted through a ton of research so you don't have to. The first part of the guide will explain the science behind BFR training in laymens terms. Once you understand the principles, you won't be intimidated to strap on a set of cuffs. Before long, you won't want to hit the gym without them.

## PART 1 THE BASICS OF OCCLUSION TRAINING

[01] WHAT IS OCCLUSION TRAINING?.....	pg 5
[02] HOW DOES OCCLUSION TRAINING..... WORK?	pg 5-6
[03] WHERE SHOULD OCCLUSION..... BANDS BE PLACED?	pg 6
[04] HOW TIGHTLY SHOULD OCCLUSION..... CUFFS BE APPLIED?	pg 7
[05] HOW MUCH WEIGHT SHOULD I USE?.....	pg 7
[06] HOW DO BFR SETS WORK?.....	pg 8
[07] CAN I USE BFR WITH INJURIES..... OR DURING A DELOADING PHASE?	pg 8
[08] HOW IT SHOULD FEEL.....	pg 9

After acquiring a basic understanding of occlusion training and the science behind it, you will be ready for the program. This portion is focused on the application of your new knowledge in the most effective way possible to maximize your growth.

## PART 2 THE ULTIMATE OCCLUSION TRAINER

[01] PROGRAM OVERVIEW.....	pg 10
[02] PRIMER WEEK.....	pg 11-12
[03] PARTIALS.....	pg 13-14
[04] SUPERSETS.....	pg 15
[05] DROP SETS.....	pg 16-17
[06] STRETCH TRAINING.....	pg 18-20
REFERENCES.....	pg 21



# THE BASICS OF OCCLUSION TRAINING

## [01] WHAT IS OCCLUSION TRAINING?

**The terms “Blood Flow Restriction Training (BFR)” and “Occlusion Training” are interchangeable and both refer to the venous restriction that occurs in an extremity during training with an occlusion device.**

To understand occlusion training, you first must have a basic understanding of the circulatory system. In very simple terms, the circulatory system is comprised of arteries and veins. Arteries carry blood from the heart to the rest of the body and veins carry it back to the heart. The important thing to understand is that your arteries are deeper in your arms and legs than your veins, which are closer to the surface of the skin. This means that by applying the correct pressure in the correct locations with occlusion straps, you can stop venous blood flow return out of the muscle but still allow it to enter through the arteries. At first this may sound gimmicky and dangerous, but the research behind it is extensive and has consistently proven to increase muscle mass with the added bonus of a fantastic pump and without the strain of heavy lifting.

## [02] HOW DOES OCCLUSION TRAINING WORK?

**Occlusion Training causes extreme accumulation of lactic acid in the target muscles.**

Lactic acid causes muscle growth by triggering the brain to secrete growth hormones. Occlusion training capitalizes on this by trapping lactic acid in the muscle that would normally be flushed out by venous blood flow.<sup>[1]</sup> This means BFR training stimulates a greater growth response with less weight than conventional weight training. Essentially, you get all the positive hypertrophy effects without any of the muscle trauma and stress that occurs in normal training.

**Occlusion Training forces the muscle to recruit larger, fast twitch muscle fibers.**

Slow twitch muscle fibers are used for endurance and lighter movements, while fast twitch fibers are engaged under heavy loads and fatigue as a result of high intensity movements. This is an important note because fast twitch muscle fibers have far more potential for growth, which is why conventional muscle building programs prioritize increasing loads and intensity. However, BFR training forces the use of fast twitch muscle fibers by fatigue rather than heavy weights. Research proves that oxygen levels drastically decrease within a muscle when it is occluded.<sup>[2]</sup> This quickly renders most of the slow twitch fibers (which rely on oxygen) useless. Instead, the body must recruit fast twitch muscle fibers to do the work, which have a higher potential for hypertrophy anyway.<sup>[3]</sup>

## [02] HOW DOES OCCLUSION TRAINING WORK? (continued)

### Occlusion Training increases the release of growth hormones.

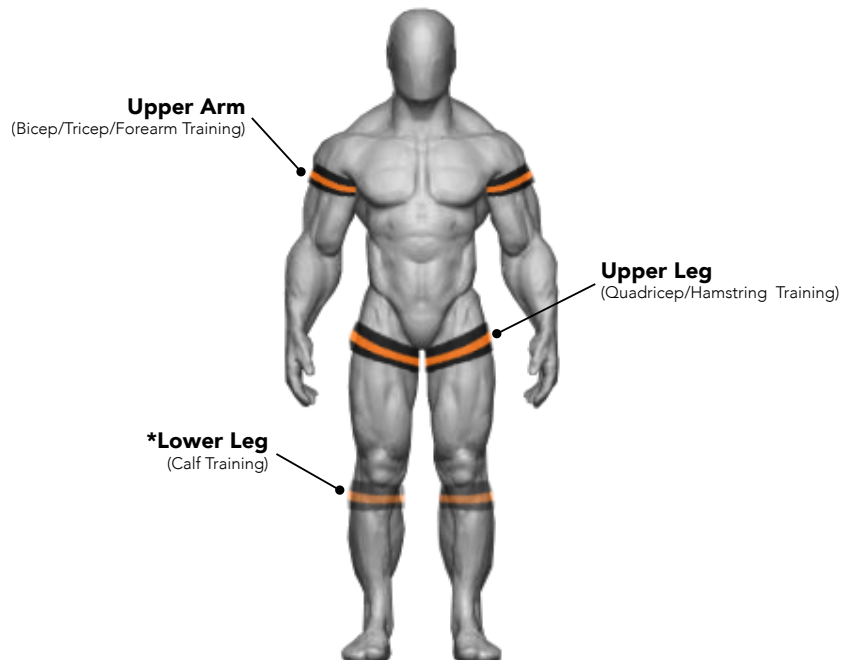
It's not clear whether acute elevations in ostensibly anabolic hormones affect muscle growth in any meaningful way, but the results of this study <sup>[11]</sup> were eye-catching enough to at least give it a mention. Low-load BFR training to failure caused an increase in growth hormone 290x higher than resting levels, and approximately 4x higher than low-load training to failure without BFR.

### Occlusion Training causes cellular swelling, which leads to muscle growth.

Similar to metabolic stress, cell swelling has been identified as a mechanism that can cause hypertrophy. <sup>[12]</sup> Muscle thickness increases roughly 11.5-12% directly after a BFR workout, due to the increased fluid in the muscle, indicating (to use a scientific term) a buttload of cellular swelling. This concept will manifest itself as an insane pump, and with BFR pumps are more beneficial to growth than ever. You can actually feel it working.

## [03] WHERE SHOULD OCCLUSION CUFFS BE PLACED?

The occlusion training cuffs should be placed around the limb at the end of the target muscle that is closest to your core. (See diagram below)



\*Note: many sources say that there is no need to wrap lower on the leg for calf training because the entire limb will be occluded regardless. However, by placing the cuff lower on the target limb (just below the knee for calf training) the target muscle may be more quickly drained of available oxygen and the beneficial effects of occlusion training may take place sooner. It is a matter of personal preference.

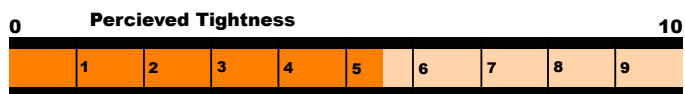


## [04] HOW TIGHT SHOULD OCCLUSION CUFFS BE WRAPPED?



**The objective of BFR is to temporarily occlude the venous return of blood flow and not completely stop blood flow of the deeper arteries that bring blood into the muscle.**

Tightening a wrap during practical BFR is very subjective, but using the “perceived wrap pressure tightness scale” that one study put in place in 2013 you can ensure you are near the optimal pressure.<sup>[4]</sup> On a scale of 1-10, a pressure between 5-6 is said to be optimal for arm training while 6-7 is recommended for leg training. It is important to note that the research says there isn't any additional benefit to going tighter. Subjects using pressures of 40% and 80% experienced the same amount of muscle growth.<sup>[9]</sup> Your wrap feeling a bit too loose is much safer and more beneficial than feeling a bit too tight. If your wraps feel uncomfortably tight at rest or cause the extremity to tingling they are too tight and need re-adjustment before beginning the exercise.



## [05] HOW MUCH WEIGHT SHOULD I USE?



**Less than you think! But, it will vary from exercise to exercise, so be sure to read the program carefully.**

Most lifters will need a shift in mindset when picking up weights during blood flow restriction training. Keep in mind that studies have shown BFR to increase muscle size and strength using training loads as light as 20% of a 1 rep max.<sup>[5]</sup> However, our goal is growth and intensity, so we will tell you the exact % to use. Just because you will be using lighter loads does not mean it will be a fun easy series of sets. Slow-twitch muscle fibers will be pre-exhausted and the weight will begin to seem heavy, as the target muscle has to recruit anaerobic fast-twitch fibers. Most lifters will not need much weight to achieve fatigue and a serious pump.

## [06] HOW DO BFR SETS WORK?

**Most experts recommend a training protocol like the one below.**

Studies show that shorter rest periods (about 30 seconds) produce the optimal blood flow and lactic acid accumulation in the muscle.<sup>[6]</sup> Do not remove the occlusion cuffs until all BFR sets are completed. However, be sure to remove the cuffs immediately after all occlusion sets are completed. The cuffs should not be left on longer than 10 minutes at one time. Again, we will instruct you exactly how to perform every set, the weight to use, and rest periods.

## [07] CAN I USE BFR WITH INJURIES OR DURING A DELOADING PHASE?

**Absolutely. In fact, it is a good idea.**

We highly recommend occlusion training for individuals with joint issues or recovering from injuries and for those in a deloading portion of a program. The lighter loads of occlusion training allow those with what they thought of as limitations to successfully build or rebuild muscle the way that traditional weightlifting can without risking injury or undue stress.<sup>[13]</sup> If this sounds like you, we recommend making your workout entirely occlusion training when working the muscle groups/limbs that have issues. Also, because recovery from BFR is much faster, you can BFR train each muscle up to 3 times per week.





# HOW IT SHOULD FEEL

## THE LEARNING CURVE

When you're getting into BFR training, it's easy to worry about how it's supposed to feel and if you're doing it correctly. Think back to when you first started lifting. You and a buddy were trading off barbell curls until you got a crazy pump and you thought, "THIS is how it's SUPPOSED to feel." You probably got that feeling down, and now when you hit the gym you're looking for it.

You probably didn't have perfect squat form when you first learned how, so don't get frustrated when you try BFR training for the first time. It's not as complex as a compound movement, but it's a bit subjective. It takes a few workouts to get comfortable with the 'feel' and really start to challenge yourself. Properly tightening the cuffs can vary greatly from person to person depending on their build and body type. If you have a higher amount of body fat on your limbs, you may have to continue adjusting to achieve proper tightness.

## HOW BFR TRAINING SHOULD FEEL IN THE MUSCLE

During an occluded set things will feel normal at first, but a burn will set in after a few reps. The contraction will build as you continue pumping out reps. The muscle will begin to feel full, and if you're training quads or hamstrings they may start to ache. As you keep pushing through that pain period, the muscle will feel so full that you'll only be able to get partial reps despite your best effort. This type of failure will feel different than your muscle giving out under heavy loads. Remember, we're using pretty light weight here. As those fast twitch muscle fibers engage in the oxygen reduced environment, the muscle will feel like it just fizzles out on you during partial reps - that's when you know you're doing it right.

When you correctly perform occlusion sets it should feel like filling a balloon with air. There is enough pressure applied to keep the air (blood) from escaping through your veins near your skin, but also loose enough that air (blood) can still be added through your arteries which are deeper

in your arm or leg. The sets may be painful and grueling but the pump while resting between sets should be incredible.

If you feel tingling or sharp pain, your cuffs are too tight and you need to loosen them up. It's easier to over-tighten on the arms (your arteries are much deeper in your legs). The Lifting Lab Arm Builders have custom buckles that easily account for this - just tap the metal buckle once or twice and it will provide the couple of millimeters you need to hit the perfect tightness. You'll get a feel for this after a few workouts and this program accounts for that learning curve.

## IMPROVING MIND-MUSCLE CONNECTION WITH BFR

BFR also improves "mind muscle connection", which is the ability to really feel a muscle contracting and level of muscular control. The more that you can feel and control a muscle, the greater you will be able to focus stress on that muscle, the better your pumps and workouts will be, and the more you can increase your chances of adding significant amounts of muscle mass.

We all have muscles in our extremities that we have a better connection with than others and, no surprise, our favorites tend to be better developed. For the weaker connections (e.g. hamstrings and triceps on most people) occlusion training is a game changer. Creating a better pump and filling those muscles up with blood and lactic acid allows us to amplify the feeling and sensation of that contraction. Over time, it helps build up that mind-muscle connection with weaker muscle groups in the arms and legs.

## PROGRAM OVERVIEW



### THE ULTIMATE OCCLUSION TRAINER

The awesome thing about blood flow restriction training is that it can be used to amplify any bodybuilding program you're currently working with. We've designed this program to be flexible and easy to bolt on to what you're currently doing. Simply refer to this guide each workout and select the muscle group you're targeting. You'll find the finishing movement(s) along with the weight you should be using, the rest period, and any notes. Each week after the primer week, we incorporate different techniques. You can begin this cycle over again when you finish all of the weeks, or you can begin mixing and matching. The only exception would be if you have minor injuries or aches and pains that are keeping you away from moderate or heavier loads. If that's you, you can use these occluded exercises as your workout to help prevent muscle atrophy.<sup>[13]</sup>

The series of sets you'll be using will only take you about five minutes, but you'll benefit from increased intensity, muscle activation, and the extra volume. You'll be adding 50-80 extra reps to each body part during the week, and by using blood flow restricted movements, your muscle thinks it's using moderate to heavy loads. You're

able to get a lot more work done here in very little extra time. The programming has been designed so after completing the first 5 week cycle, you can drop the primer. By implementing Blood Flow Restriction in this way, you have a simple and effective structure to follow, it changes every week so you're not doing the same thing, and only takes you 5-10 minutes in exchange for essentially free volume and metabolic stress.

BFR training isn't like strength programs you've probably followed in the past where we program for an incremental increase each week. During the second week when we get into the techniques, they are all challenging in their own way, not technically better or harder than another. We borrow best practices from all of the research we've boiled down in this guide on BFR training, but combine it with other bodybuilding techniques that are also proven to be effective. There is no one "perfect recipe" for blood flow restriction training, but these sequences will be effective while your workouts will stay exciting.



# PRIMER WEEK - ARMS

In your initial week of occlusion training you will probably have to re-adjust your cuffs multiple times and will be just starting to get used to the concept, so we recommend you use the exercises below. After you get the hang of putting them on and the feeling, you will be ready to move on to the more complicated techniques. Make sure to push yourself! 'Failure' will feel more like an inability to contract the target muscle fully, not necessarily failure to complete another rep. It should not be painful in a bad way, but will definitely be an intense burning sensation like you've never felt before.

## BICEPS

### Occluded EZ Bar Curls

Rep Scheme: 4 sets of 20

40% of your 1RM

Rest Period: 30 sec between sets



## TRICEPS

### Occluded Cable Rope Pushdowns

Rep Scheme: 4 sets of 20

40% of your 1RM

Rest Period: 30 sec between sets



## FOREARMS

### Occluded Barbell Wrist Curls

Rep Scheme: 4 sets of 20

40% of your 1RM

Rest Period: 30 sec between sets



# PRIMER WEEK - LEGS

In your initial week of occlusion training you will probably have to re-adjust your cuffs multiple times and will be just starting to get used to the concept, so we recommend you use the exercises below. After you get the hang of putting them on and the feeling, you will be ready to move on to the more complicated techniques. Make sure to push yourself! 'Failure' will feel more like an inability to contract the target muscle fully, not necessarily failure to complete another rep. It should not be painful in a bad way, but will definitely be an intense burning sensation like you've never felt before.

## QUADRICEPS

### Occluded Leg Extensions

Rep Scheme: 4 sets of 20  
40% of your 1RM  
Rest Period: 30 sec between sets



## HAMSTRINGS

### Occluded Leg Curls

Rep Scheme: 4 sets of 20  
40% of your 1RM  
Rest Period: 30 sec between sets



## CALVES

### Occluded Standing Calf Raises

Rep Scheme: 4 sets of 20  
40% of your 1RM  
Rest Period: 30 sec between sets





## WEEK 2 - PARTIALS - ARMS

Partial reps are an awesome way to increase intensity and create a really awesome pump. With this technique, you will have a total target rep range that you should not be able to reach with the weight that you choose and will finish off the set with partial reps. For example you may be aiming for 20 triceps extensions but will fail to get a full rep around 12 reps. At this point you will immediately perform 8 partial reps, coming as close as you can to a full rep without momentum. Your total rep count would then be at the goal of 20 reps. This is the most straightforward way to think of the set, but we encourage you to do partials at the end of each set until you literally cannot move the weight. At minimum it should take at least 10 partials to reach that point of complete positive failure. There's no sugar-coating it, these will burn like crazy, but the pump is otherworldly.

### BICEPS

#### Occluded Close Grip Cable Curls

Rep Scheme: 5 sets of 20

50% of your 1RM

Tempo Notes: smooth and controlled without momentum

Rest Period: 30 sec between sets



### TRICEPS

#### Occluded Cable Rope Pushdowns

Rep Scheme: 5 sets of 20

50% of your 1RM

Tempo Notes: smooth and controlled without momentum

Rest Period: 30 sec between sets



### FOREARMS

#### Occluded Reverse Wrist Curls

Rep Scheme: 4 sets of 40

50% of your 1RM

Tempo Notes: smooth and controlled without momentum

Rest Period: 30 sec between sets



## WEEK 2 - PARTIALS - LEGS

Partial reps are an awesome way to increase intensity and create a really awesome pump. With this technique, you will have a total target rep range that you should not be able to reach with the weight that you choose and will finish off the set with partial reps. For example you may be aiming for 20 triceps extensions but will fail to get a full rep around 12 reps. At this point you will immediately perform 8 partial reps, coming as close as you can to a full rep without momentum. Your total rep count would then be at the goal of 20 reps. This is the most straightforward way to think of the set, but we encourage you to do partials at the end of each set until you literally cannot move the weight. At minimum it should take at least 10 partials to reach that point of complete positive failure. There's no sugar-coating it, these will burn like crazy, but the pump is otherworldly.

### QUADRICEPS

#### Occluded Close Stance Goblet Squats (With Heels Elevated)

Rep Scheme: 4 sets of 20  
50% of your 1RM

Tempo Notes: smooth and controlled without momentum

Rest Period: 30 sec between sets



### HAMSTRINGS

#### Occluded Wide Stance Smith Machine Squats

Rep Scheme: 4 sets of 20  
50% of your 1RM

Tempo Notes: smooth and controlled without momentum

Rest Period: 30 sec between sets



### CALVES

#### Occluded Standing Calf Raises

Rep Scheme: 4 sets of 30  
50% of your 1RM

Tempo Notes: controlled and squeeze at the top

Rest Period: 30 sec between sets





## WEEK 3 - SUPERSETS

Supersets are fairly common, especially in arm training. Everyone wants that superhero pump where your arms feel swelled double in size from your shoulder to wrist. Occlusion training not only makes those types of feelings easier to achieve but also makes the idea even more beneficial for gains. Alternate between each exercise listed and do not remove the cuffs until all sets are completed for both movements. Calves are excluded from this section because the muscles on the front of the calf are very small, and difficult/awkward to train.

### BICEPS/TRICEPS

#### Occluded Barbell Curls/ Occluded Triceps Pushups

Rep Scheme: 4 sets of 20 each  
35% of your 1RM  
Rest Period: 30 sec between sets



### FOREARMS

#### Occluded Barbell Wrist Curls/ Occluded Reverse Wrist Curls

Rep Scheme: 3 sets of 25 each  
35% of your 1RM  
Rest Period: 30 sec between sets



### QUADRICEPS/ HAMSTRINGS

#### Occluded Close Stance Leg Press/ Occluded Walking Lunges

Rep Scheme: 3 sets of 20 each  
(20 per leg on lunges)  
35% of your 1RM  
Rest Period: 30 sec between sets





## WEEK 4 - DROP SETS - ARMS

This technique utilizes double drop sets on each exercise. You're probably already familiar with this concept. Drop sets are a very efficient way to increase volume without compromising intensity. Occluded drop sets will begin with a weight that you can perform the first number of reps, before lowering the weight to complete the next number of reps (without resting), and again lowering one final time to complete the last drop. On this final drop, the weight you select may seem too light at first. Since the contraction is the most effective part of the occluded movement, hold the weight initially as long as possible. However many seconds you hold your pause, rep out that same amount. For example if you hold a curl for 20 seconds, then attempt to complete 20 reps before the set is finished. If you thought drop sets were grueling before just wait until you try them like this and occluded.

### BICEPS

#### Occluded EZ Bar Curl

Rep Scheme: 3 sets of drop sets  
Drop set Scheme: 12/12/hold/  
as many reps as # of seconds  
held  
60% of your 1RM (start weight)  
Rest Period: 30 sec between  
sets



### TRICEPS

#### Occluded EZ Bar Skull Crushers

Rep Scheme: 3 sets of drop sets  
Drop set Scheme: 12/12/hold/  
as many reps as # of seconds  
held  
60% of your 1RM (start weight)  
Rest Period: 30 sec between  
sets



### FOREARMS

#### Occluded Barbell Wrist Curls

Rep Scheme: 2 sets of drop sets  
Drop set Scheme: 20/20/hold/  
as many reps as # of seconds  
held  
60% of your 1RM (start weight)  
Rest Period: 30 sec between  
sets



## WEEK 4 - DROP SETS - LEGS

This technique utilizes double drop sets on each exercise. You're probably already familiar with this concept. Drop sets are a very efficient way to increase volume without compromising intensity. Occluded drop sets will begin with a weight that you can perform the first number of reps, before lowering the weight to complete the next number of reps (without resting), and again lowering one final time to complete the last drop. On this final drop, the weight you select may seem too light at first. Since the contraction is the most effective part of the occluded movement, hold the weight initially as long as possible. However many seconds you hold your pause, rep out that same amount. For example if you hold a curl for 20 seconds, then attempt to complete 20 reps before the set is finished. If you thought drop sets were grueling before just wait until you try them like this and occluded.

### QUADRICEPS

#### Occluded Leg Extensions

Rep Scheme: 3 sets of drop sets  
Drop set Scheme: 8/8/hold/as many reps as # of seconds held  
60% of your 1RM (starting weight)  
Rest Period: 30 sec between sets



### HAMSTRINGS

#### Occluded Leg Curls

Rep Scheme: 3 sets of drop sets  
Drop set Scheme: 8/8/hold/as many reps as # of seconds held  
60% of your 1RM (starting weight)  
Rest Period: 30 sec between sets



### CALVES

#### Occluded Seated Calf Raises

Rep Scheme: 2 sets of drop sets  
Drop set Scheme: 12/12/hold/as many reps as # of seconds held  
60% of your 1RM (starting weight)  
Rest Period: 30 sec between sets





## WEEK 5 - STRETCH TRAINING - CALVES/FOREARMS

This technique requires you to perform one occlusion exercise per muscle group and then a heavy non-occluded stretch exercise afterward to induce maximal growth. The research shows that during BFR training, the portion of the rep where you are contracting the muscle actually delivers the most growth (this is the opposite of traditional heavy lifting where the eccentric portion of the rep causes the most stimulus).<sup>[10]</sup> By performing an occluded exercise, removing the bands, and stacking on a movement that accentuates a stretch in the muscle, we take full advantage of both the concentric and eccentric portions of the rep. You'll have the best pump of your life before moving onto a brutal heavy slow exercise. The amount of blood in your muscles and joints actually make heavy training afterward safer and reduce the chance of injury as well as increase your mind muscle connection. It's a crazy sensation to slowly control heavy weight and stretch a muscle against an unreal pump. You will feel the difference.

### CALVES

#### **Occluded Standing Calf Raises**

Rep Scheme: 4 sets of 20

Tempo Notes: controlled with a squeeze at the top

40% of your 1RM

Rest Period: 30 sec between sets



*Remove cuffs and follow with:*

#### **Seated Calf Raises**

Rep Scheme: 2 sets of 12

Tempo Notes: 5 second negatives

Rest Period: 1 min between sets

### FOREARMS

#### **Occluded Barbell Wrist Curls**

Rep Scheme: 3 sets of 30

Tempo Notes: controlled with a squeeze at the bottom

40% of your 1RM

Rest Period: 30 sec between sets



*Remove cuffs and follow with:*

#### **Farmer Walks**

Rep Scheme: 2 sets of 1 minute

Rest Period: 1 min between sets



# WEEK 5 - STRETCH TRAINING - BICEPS/TRICEPS

## BICEPS

### Occluded Alternate Dumbbell Curls

Rep Scheme: 4 sets of 15 reps (per arm)

Tempo Notes: controlled with a squeeze at the top  
40% of your 1RM

Rest Period: 30 sec between sets



*Remove cuffs and follow with:*

### Barbell Curls

Rep Scheme: 2 sets of 12

Tempo Notes: 3 second negatives

Rest Period: 1 min between sets

## TRICEPS

### Occluded Dips (assisted if needed)

Rep Scheme: 4 sets of 20

Tempo Notes: controlled with a squeeze at the bottom  
40% of your 1RM

Rest Period: 30 sec between sets



*Remove cuffs and follow with:*

### Cable Rope French Press

Rep Scheme: 2 sets of 12

Tempo Notes: 3 second negatives

Rest Period: 1 min between sets

# WEEK 5 - STRETCH TRAINING - QUADS/HAMSTRINGS

## QUADRICEPS

### Occluded Leg Extensions

Rep Scheme: 4 sets of 20  
Tempo Notes: controlled with a squeeze at the top  
40% of your 1RM  
Rest Period: 30 sec between sets



*Remove cuffs and follow with:*

### Sissy Squats

Rep Scheme: 2 sets of 20  
Tempo Notes: 5 second negatives  
Rest Period: 1 min between sets

## HAMSTRINGS

### Occluded Leg Curls

Rep Scheme: 4 sets of 20  
Tempo Notes: controlled with a squeeze at the top  
40% of your 1RM  
Rest Period: 30 sec between sets



*Remove cuffs and follow with:*

### Stiff Leg Deadlifts

Rep Scheme: 2 sets of 8  
Tempo Notes: 5 second negatives  
Rest Period: 1 min between sets

## REFERENCES

- [1] Schoenfeld, BJ (2013). Potential mechanisms for a role of metabolic stress in hypertrophic adaptations to resistance training. *Sports Med*, 43(3), 179-194.
- [2] Takarada Y, Takazawa H, Sato Y, Takebayashi S, Tanaka Y, and Ishii N. Effects of resistance exercise combined with moderate vascular occlusion on muscle function in humans. *J Appl Physiol* 88: 2097–2106, 2000.
- [3] Kawada S and Ishii N. Changes in skeletal muscle size, fiber-type composition and capillary supply after chronic venous occlusion in rats. *Acta Physiol* 192: 541–549, 2008.
- [4] Lowery, R. P., Joy, J. M., Loenneke, J. P., de Souza, E. O., Machado, M., Dudeck, J. E. & Wilson, J. M. (2014). Practical blood flow restriction training increases muscle hypertrophy during a periodized resistance training programme. *Clinical Physiology and Functional Imaging*, 34(4), 317-21
- [5] Loenneke JP and Pujol TJ. The Use of Occlusion Training to Produce Muscle Hypertrophy. *Strength & Conditioning Journal*. 31(3): 77-84, June 2009.
- [6] Loenneke JP, Wilson JM, Marin PJ, Zourdos MC, & Bemben MG (2012). Low intensity blood flow restriction training: a meta-analysis. *Eur J Appl Physiol*, 112(5), 1849-1859.
- [7] Neto, G. R., Santos, H. H., Saouza, J. B. , Junior, A. T., Araujo, J P., Aniceto, R. R. & Sousa, M. S. (2014a). Effects of high intensity blood flow restriction exercise on muscle fatigue. *Journal of Human Kinetics*, 41, 163-72.
- [8] Pope, Z. K., Willardson, J. M. & Schoenfeld, B. J. (2013). Exercise and blood flow restriction. *Journal of Strength and Conditioning Research*, 27(10), 2914-26. Blood Flow Restriction
- [9] Lixandrão, M. E., Ugrinowitsch, C., Laurentino, G., Libardi, C. A., Aihara, A. Y., Cardoso, F. N., ... & Roschel, H. (2015). Effects of exercise intensity and occlusion pressure after 12 weeks of resistance training with blood-flow restriction. *European Journal of Applied Physiology*, 1-10.
- [10] Thiebaud RS, Yasuda T, Loenneke JP, Abe T (2013). Effects of low-intensity concentric and eccentric exercise combined with blood flow restriction on indices of exercise-induced muscle damage. *Interven Med Appl Sci*, 5, 53-59.
- [11] Takarada, Yudai, et al. "Rapid Increase in Plasma Growth Hormone after Low-Intensity Resistance Exercise with Vascular Occlusion." *Journal of Applied Physiology*, American Physiological Society, 1 Jan. 2000, [jap.physiology.org/content/88/1/61](http://jap.physiology.org/content/88/1/61).
- [12] Yasuda, Tomohiro, et al. "Effects of Blood Flow Restricted Low-Intensity Concentric or Eccentric Training on Muscle Size and Strength." *PLOS ONE*, Public Library of Science, [journals.plos.org/plosone/article?id=10.1371/journal.pone.0052843](http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0052843).
- [13] Takarada, Y, et al. "Applications of Vascular Occlusion Diminish Disuse Atrophy of Knee Extensor Muscles." *Medicine and Science in Sports and Exercise.*, U.S. National Library of Medicine, Dec. 2000, [www.ncbi.nlm.nih.gov/pubmed/11128848](http://www.ncbi.nlm.nih.gov/pubmed/11128848).