

# **BIO-LOGICAL EXERCISE™ FOR TACTICAL ATHLETES**

A New Approach to Strength, Performance, Recovery & Readiness for Military, Police, Firefighters & First Responders

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### **An Applied Physiology White Paper**

For Fitness, Clinical, and Performance Populations

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#### *Educational Disclaimer:*

*This document is intended for educational purposes only and does not replace individualized medical evaluation, diagnosis, or treatment.*

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### **1. TACTICAL PERFORMANCE DEMANDS MORE THAN STRENGTH**

Military personnel, police officers, firefighters, and first responders face physical demands unlike almost any other profession.

Their jobs may require:

- Explosive strength
- Muscular endurance
- Speed and agility
- Carrying and moving heavy loads
- Repeated physical effort
- Rapid recovery
- Performing under fatigue
- Maintaining physical readiness year-round

And unlike competitive athletes, tactical professionals do not always know when they will be required to perform.

There is no scheduled kickoff.

No starting whistle.

No guarantee of being fully recovered.

A firefighter may suddenly need to climb multiple flights of stairs carrying equipment.

A police officer may transition from sitting in a patrol vehicle to sprinting, restraining, lifting, or carrying.

A military service member may need to perform while carrying substantial equipment over difficult terrain.

A first responder may need strength and endurance at the end of an already exhausting shift.

For decades, the traditional approach to preparing for these demands has been familiar:

*Lift more.*

*Run more.*

*Train harder.*

*Get stronger.*

And that approach works.

But tactical professionals face another challenge.

The same body being trained in the gym must also absorb the physical demands of the job.

Heavy lifting.

Running.

Equipment.

Long shifts.

Repetitive occupational stress.

Injuries.

Limited recovery.

The challenge, therefore, is not simply creating greater physical capacity.

It is creating greater physical capacity while managing the total stress being placed on the body.

Modern exercise science is beginning to ask an important question:

*Can we create meaningful muscular and performance adaptations with less external mechanical load?*

Blood Flow Restriction (BFR) training gives us a fascinating way to explore that question.

## 2. What Is BFR, and Why?

Why Tactical Organizations Are Looking at BFR

- ✓ Build and maintain strength
- ✓ Train with lighter resistance
- ✓ Reduce mechanical loading demands
- ✓ Improve muscular performance
- ✓ Maintain physical readiness
- ✓ Train with minimal equipment
- ✓ Support rehabilitation and return to duty

Blood Flow Restriction training uses specialized bands or cuffs placed around the upper arms or upper legs to partially restrict venous blood flow while maintaining arterial inflow.

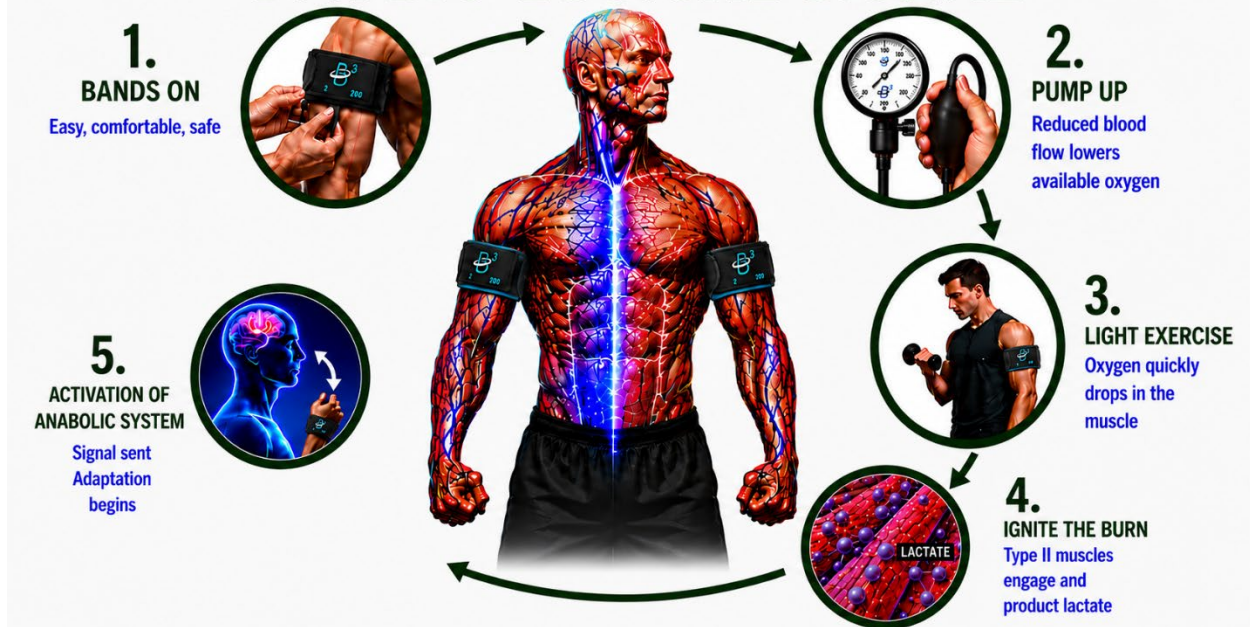
This creates a unique biological environment inside the working muscle.

Instead of relying entirely upon heavy external resistance to challenge the muscle, BFR changes the internal environment in which the muscle is exercising.

1. Available oxygen decreases.
2. Metabolites accumulate.
3. Fatigue occurs more rapidly.
4. Additional muscle fibers are recruited as the exercise continues.

As a result, relatively light resistance can create a significant muscular stimulus. This is particularly interesting for tactical populations because *strength and physical readiness are essential, but access to heavy equipment and the ability to tolerate heavy mechanical loading are not always guaranteed.*

# BFR BIO-LOGICAL SIGNAL



## 3. BIO-LOGICAL EXERCISE™

The Difference Between a Tool and a System

Blood Flow Restriction (BFR) is a training technology.  
**BIO-LOGICAL EXERCISE™** is a performance system.

Think of it this way...BFR is the vehicle.  
**BIO-LOGICAL EXERCISE™** is the operating manual.

The BFR bands create the biological environment.

**BIO-LOGICAL EXERCISE™** teaches individuals, coaches, strength professionals, and rehabilitation specialists how to use that environment to create the appropriate biological signal for a specific objective.

This distinction becomes particularly important with tactical professionals.

Simply putting on BFR bands does not answer the most important questions:

1. How much exercise is enough?
2. How much resistance should be used?
3. When should the objective be strength and performance?
4. When should the objective be maintaining physical capacity?
5. When should the priority be minimizing additional mechanical stress?
6. How should BFR be used when equipment or training time is limited?
7. How can BFR be incorporated during rehabilitation and return to duty?

Those questions led to the development of **BIO-LOGICAL EXERCISE™**.

After more than a decade of working with athletes, rehabilitation professionals, health professionals, and individuals of virtually every fitness level—and after conducting more than 3,500 BFR training sessions—one consistent pattern emerged:

The greatest results did not come from simply using BFR.

They came from applying the right biological signal, at the right time, for the right purpose.

That philosophy became the foundation of **BIO-LOGICAL EXERCISE™**.

Rather than focusing primarily on heavier weights, longer workouts, or greater training volume, **BIO-LOGICAL EXERCISE™** focuses on creating biological signals capable of stimulating the body's adaptive systems.

The objective is simple:

Produce meaningful adaptation while minimizing unnecessary stress.

For tactical professionals, this creates an entirely different way to think about exercise.

The question is no longer simply: *How much work can we make this individual perform?*

The better question may be: *How much biological signal does the body actually need to create the desired adaptation?*

#### **4. THE SCIENTIFIC FOUNDATION OF BFR**

Before looking specifically at military and tactical populations, it is important to understand the broader scientific foundation behind Blood Flow Restriction training.

**Peer Review:** Exercise and Blood Flow Restriction Pope ZK, Willardson JM, Schoenfeld BJ  
**Published in:** *Journal of Strength and Conditioning Research*, 2013

In this peer-reviewed review, Pope, Willardson, and Schoenfeld examined the growing body of research involving exercise combined with Blood Flow Restriction.

The research included:

- Low-intensity resistance exercise
- Walking
- Cycling
- Strength development
- Muscle hypertrophy
- Acute physiological responses
- Long-term muscular adaptations

#### **Major Findings**

The authors reported that a growing body of research demonstrated that *low-intensity exercise combined with BFR can increase muscular strength and hypertrophy.*

Of particular importance, low-intensity resistance exercise with BFR challenged the traditional assumption that significant improvements in strength and muscle development require only higher-intensity loads.

The review also examined several potential mechanisms involved in the BFR response, including:

- Metabolic stress
- Muscle fiber recruitment
- Endocrine responses
- Neural responses
- Cellular mechanisms associated with muscular adaptation

### **Why It Matters**

This is the foundation for understanding why BFR may be particularly valuable for tactical populations.

Traditional resistance training typically increases the challenge placed on muscle by increasing external load.

BFR provides another approach.

By changing the internal biological environment of the working muscle, relatively light exercise can create a muscular stimulus capable of producing strength and hypertrophic adaptations.

For military personnel, police officers, firefighters, and first responders, that distinction becomes important.

These individuals need strength.

But they also operate in professions where their bodies are already exposed to significant physical demands.

**BFR introduces the possibility of creating meaningful muscular adaptation without always requiring greater external mechanical load.**

That concept provides the scientific bridge from general BFR research to emerging research specifically involving tactical populations.

[Pope, Willardson & Schoenfeld — Exercise and Blood Flow Restriction](#)

### **Tactical Research**

Blood Flow Restriction has been studied extensively across strength training, rehabilitation, athletics, aging, and clinical populations.

More recently, researchers have begun investigating its application specifically within **military and tactical populations.**

The findings provide an important scientific foundation for considering how BFR might fit into tactical performance, field-based training, rehabilitation, and physical readiness.

## **STUDY 1 — TACTICAL PERSONNEL**

### **Blood Flow Restriction and Athletic Performance in Tactical Personnel**

**Study:** *The Effect of Blood Flow Restriction Combined With Different Resistance Training on the Improvement of Athletic Performance in Male Tactical Personnel*

**Published:** 2026, *Frontiers in Physiology*

#### **Study Population**

- 60 healthy male tactical personnel
- All had systematic resistance-training experience
- 8-week intervention
- 3 training sessions per week

The researchers concluded that **moderate-load BFR may represent a practical strategy for improving performance while reducing mechanical loading demands.**

[Read the Tactical Personnel Study](#)

## **STUDY 2 – TACTICAL PROFESSIONALS**

### **BFR walking vs carrying tactical load**

**Study:** Dicks et al., 2023 — *Comparable Acute Metabolic Responses when Walking with Blood Flow Restriction and Walking with Load Carriage: Implication for Tactical Professionals*

**Published in:** *International Journal of Exercise Science*.

The researchers specifically discuss military personnel, firefighters and law enforcement officers as tactical professionals. They note that law enforcement and firefighters may carry approximately 7–25 kg of occupational equipment, including body armor and protective equipment.

Twelve men performed treadmill walking under three conditions:

BFR walking

15% body-weight load carriage

BFR + 15% load carriage

The researchers concluded that low-intensity walking with BFR shares metabolic characteristics with loaded walking and may therefore provide a strategy for increasing training intensity in people who routinely train with load carriage.

[Read the Walking Study](#)

## **STUDY 3 – MILITARY PERFORMANCE**

### **Minimal-Equipment BFR and Military-Relevant Performance**

**Study:** *Effects of Minimal-Equipment Resistance Training and Blood Flow Restriction on Military-Relevant Performance Outcomes*

**Published:** 2024, *Journal of Strength and Conditioning Research*

#### **Study Population**

#### **54 ROTC cadets and midshipmen**

Importantly, **40.7% of the participants were female.**

#### **Major Findings**

The researchers concluded that individuals could improve performance and body composition using **portable, field-expedient resistance-training equipment.**

[Read the Military-Relevant Performance Study](#)

## **5. WHY THIS MATTERS**

Tactical professionals already place enormous stress on their bodies.

- Physical training.
- Running.
- Heavy equipment.
- Lifting and carrying.
- Long shifts.
- Repetitive occupational stress.
- Interrupted sleep.
- Injuries.
- Limited recovery.

For many tactical professionals, the challenge is not finding another way to make exercise harder.

**The challenge is producing the adaptation necessary to remain strong, capable, and ready without continually increasing the total stress placed on the body.**

That is where BFR becomes particularly interesting.

Traditional resistance training creates adaptation primarily by increasing the external mechanical challenge placed on the muscular system.

BFR gives us another way to influence the **internal biological environment** of the working muscle.

This does not mean replacing heavy resistance training.

Instead, BFR creates **another training option**.

When equipment is limited.

When time is limited.

When joints or injuries limit heavy loading.

When an individual needs to maintain muscle and physical capacity.

Or when adding more mechanical stress may not be the best answer.

For tactical professionals, physical readiness isn't something that matters only on training day.

**It has to be available when the job demands it.**

## **6. Beyond Strength**

The potential application of BFR to tactical populations extends beyond simply building bigger or stronger muscles.

When appropriately integrated into an overall tactical performance or rehabilitation program, BFR may provide another way to:

- Improve or maintain strength
- Train using lighter external resistance
- Develop muscular performance
- Supplement conventional strength and conditioning
- Train with portable, minimal equipment
- Maintain physical capacity when access to a gym is limited

- Reduce external mechanical loading demands
- Continue certain forms of training during rehabilitation
- Assist the progression back toward occupational physical performance

The existing evidence leads us to an important question: How do we develop and maintain physical capacity without unnecessarily adding to the stress the body must already absorb?

**BFR** provides another tool.

**BIO-LOGICAL EXERCISE™** provides a system for deciding how and when to use that tool.

## HOW BIO-LOGICAL SIGNAL BUILDS STRENGTH



### 1 MUSCLE ACTIVATION

Even light resistance activates Type II muscle fibers when the right signal is created.



### 2 LACTATE BUILDS

Restricted blood flow causes lactate to accumulate, creating the familiar "burn."



### 3 BIO-LOGICAL SIGNALS TRIGGERED

Lactate and metabolic stress trigger the release of Growth Hormone (HGH) and other anabolic signals.



### 4 MUSCLE ADAPTS AND GROWS

Your body responds by building stronger, more efficient, and more resilient muscle.



### 5 STRENGTH INCREASES

More muscle. More power. Better performance. All from less weight, less stress, and less time.

## **7. THE 1–5–10 METHOD™ FOR TACTICAL ATHLETES**

After more than a decade of working with Blood Flow Restriction and conducting more than 3,500 BFR training sessions, one pattern became clear:

Not every training session should have the same purpose.

- Some days a tactical professional needs to prepare the body to perform.
- Some days the priority is maintaining strength and physical capacity while minimizing additional stress.
- Other days the objective is long-term strength, endurance, and physical development.

That realization led to the 1–5–10 Method™, a simple framework designed to match the biological stimulus to the individual's immediate objective.

### **1 MINUTE — THE ACTIVATOR™**

Prepare the body to perform.

The 1-minute protocol is designed to create a short biological signal before physical activity, training, or duty.

The objective is not fatigue.

It is activation.

- Prepare the muscles for activity
- Increase muscle recruitment
- Create a rapid physiological response
- Prepare the body to perform

### **5 MINUTES — THE ADAPTATOR™**

Build and maintain without unnecessary stress.

Not every day needs to be a maximum training day.

The 5-minute protocol creates a greater biological stimulus while keeping the exercise short and the external resistance relatively light.

For tactical professionals, this provides another option when time is limited, equipment is unavailable, or adding more mechanical load may not be desirable.

- Build and maintain muscle
- Maintain strength and physical capacity
- Train with lighter resistance
- Create adaptation with minimal equipment
- Reduce unnecessary training stress

## **10 MINUTES — THE ACCELERATOR™**

Develop long-term physical capacity.

The 10-minute protocol creates the greatest training stimulus within the 1–5–10 Method™.

The objective is long-term development.

- Build strength and muscle
- Improve muscular endurance
- Develop physical work capacity
- Create a greater training stimulus
- Build long-term physical readiness

The 1–5–10 Method™ is not simply three different workouts.

It is a way of deciding how much biological signal the body needs based upon the objective of that day.

1 Minute — Prepare

5 Minutes — Maintain & Adapt

10 Minutes — Build & Develop

## 8. The BFR Tactical Exercises

The following diagram highlights eight primary exercises that can be incorporated into **BIO-LOGICAL EXERCISE™** protocols for tactical athletes.

# THE TACTICAL 8

EIGHT EXERCISES. A STRONGER TOMORROW.  
A simple foundation that can be incorporated into the 1-10 Method™ for Tactical Athletes.

| LOWER BODY                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                    | STRENGTH   STABILITY   ENDURANCE   REAL-WORLD READINESS                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <h3>1. SQUATS</h3>  <p>DISCIPLINE<br/>BUILDS<br/>READINESS</p> <ul style="list-style-type: none"><li>● Strength</li><li>● Power</li><li>● Lower-body endurance</li></ul> | <h3>2. WALKING LUNGES</h3>  <p>MOVEMENT<br/>BUILDS<br/>RESILIENCE</p> <ul style="list-style-type: none"><li>● Single-leg strength</li><li>● Stability</li><li>● Work capacity</li></ul>          | <h3>3. STEP-UPS</h3>  <p>HIGHER<br/>CAPACITY<br/>GREATER<br/>IMPACT</p> <ul style="list-style-type: none"><li>● Climbing strength</li><li>● Leg endurance</li><li>● Functional capacity</li></ul> | <h3>4. CALF RAISES</h3>  <p>STRONG<br/>FOUNDATIONS<br/>GO FURTHER</p> <ul style="list-style-type: none"><li>● Lower-leg strength</li><li>● Muscular endurance</li></ul>    |
| UPPER BODY                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                    | STRENGTH   CONTROL   CAPACITY   OPERATIONAL PERFORMANCE                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                |
| <h3>5. PUSH-UPS / CHEST PRESS</h3>  <p>PUSH<br/>FURTHER</p> <ul style="list-style-type: none"><li>● Chest</li><li>● Shoulders</li><li>● Triceps</li></ul>               | <h3>6. BACK ROWS</h3>  <p>A STRONGER<br/>BACK<br/>SUPPORTS<br/>EVERY MISSION</p> <ul style="list-style-type: none"><li>● Back</li><li>● Shoulder stability</li><li>● Pulling strength</li></ul> | <h3>7. BICEPS CURLS</h3>  <p>STRENGTH<br/>IN EVERY<br/>HANDLE</p> <ul style="list-style-type: none"><li>● Arm strength</li><li>● Pulling and carrying support</li></ul>                          | <h3>8. TRICEPS EXTENSIONS</h3>  <p>STRONGER<br/>ARMS<br/>A STRONGER<br/>YOU</p> <ul style="list-style-type: none"><li>● Arm strength</li><li>● Pushing capacity</li></ul> |

## 9. About the Author

### Clinical Background and Philosophy

Dr. Mike DeBord is an educator, clinician, and innovator with more than two decades of experience in exercise science, rehabilitation, and human performance.

As Founder of B3 Sciences, he has spent more than a decade studying the practical application of Blood Flow Restriction across athletes, older adults, rehabilitation patients, and individuals living with chronic disease.

His work led to the development of the **1–5–10 Method™**, a practical system designed to make Blood Flow Restriction simple, repeatable, and accessible for individuals of every fitness level.

Building upon thousands of training sessions and years of clinical observation, Dr. DeBord introduced the broader concept of **BIO-LOGICAL EXERCISE™**—an approach that emphasizes creating precise biological signals rather than relying primarily on greater load, longer workouts, or higher training volume.

His philosophy is simple:

The body responds to biology.

When the correct biological signals are applied safely and consistently, remarkable adaptations become possible.

## 10. Why the B3 Sciences Bands?

**BIO-LOGICAL EXERCISE™** is built upon one fundamental principle: creating the right biological signal while minimizing unnecessary mechanical stress. The Blood Flow Restriction device used to deliver that signal is therefore an important part of the overall system.

The B3 Sciences Multi-Chamber Bands were selected as the preferred Blood Flow Restriction system for **BIO-LOGICAL EXERCISE™** because their design aligns with the physiological principles discussed throughout this paper. Their semi-elastic, pneumatic, multi-chamber construction is designed to distribute pressure more evenly around the limb while maintaining arterial inflow and restricting venous return—the physiological foundation of effective Blood Flow Restriction.

Published research has increasingly emphasized the importance of cuff architecture, pressure regulation, and pressure distribution for achieving consistent and repeatable Blood Flow Restriction. Compared with narrower or non-pneumatic devices, broader, pneumatic pressure distribution may improve comfort, consistency, repeatability, and reduce unnecessary focal tissue stress.

The design characteristics of the B3 Sciences Bands align with published recommendations supporting:

- Even circumferential pressure distribution
- Lower effective occlusion pressures
- Improved user comfort
- Predictable vascular responses
- Safe, repeatable application

While many Blood Flow Restriction devices are available, the B3 Sciences Bands represent my preferred equipment for implementing the **BIO-LOGICAL EXERCISE™** system and the 1-5-10 Method™. Together, the equipment, methodology, and sport-specific protocols create a practical system designed to help tactical athletes consistently produce the right biological signal for performance, recovery, and long-term physical readiness.



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