

# PERIODIZATION OF



# Flexibility Training



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# PREFACE

Do your athletes and fitness clients have the range of motion required to perform the movements they want to perform safely and effectively?

The most obvious reason to develop flexibility before strength, speed, power or endurance is because if an athlete/client does not have the flexibility to optimally perform a given movement, then they cannot train and – safely and effectively - develop strength, speed, power or endurance in that movement. Thus, optimal levels of flexibility should be developed before strength, speed, power or endurance.

Have you seen the studies that indicate that high volumes of static stretching can reduce strength and power? The highlight of these studies is that flexibility training can be counter-productive to the progress of the athlete/client, if the wrong type of flexibility training is performed at the wrong time.

Periodization of flexibility training means **that the type and priority of flexibility training varies through different training phases to SUPPORT – instead of work against – adaptations to the other forms of training that are performed.**

**Periodization of Flexibility Training** is - to our knowledge - the only workshop that discusses periodization of flexibility training in a hands-on, yet strongly science-based format that gives you:

1. An in-depth understanding of the purposes of flexibility training.
2. An appreciation of how to use flexibility training to support – not work against – other forms of training.
3. Unique flexibility exercises and training methods to use in the various phases of the macrocycle.

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# INTRODUCTION

Sections 1 and 2 provide a definition of flexibility and the three main types of flexibility that exist.

Section 3 gives an overview of the 7 main purposes for performing flexibility training.

Sections 4 and 5 give a brief overview of physiological factors associated with flexibility training.

Sections 6 to 8 discuss the factors that support Periodization of Flexibility Training as well as specific strategies for Periodization of Flexibility Training.

Section 9-1 discuss details of Periodization of flexibility exercises, flexibility workout structure and specific methods that are currently used with the FPM.

# SECTION 1

## What is flexibility?

Flexibility is the available range of motion (ROM) within a specific movement, in a specific joint, under specific conditions: <sup>(1)</sup>

- Active or passive movement
- Velocity of movement
- Duration of movements (as in a race)

In many cases, the available range of motion is greater during passive compared to active conditions. With increasing velocity (and frequency) of movement, maintaining range of motion requires increasing degrees of strength to accelerate and decelerate the limbs. Also, increasing levels of coordination are required to accurately turn on and turn off the agonist and antagonist muscles. Similarly, strength endurance and coordination are required to maintain range of motion as the duration of movement in a race increases.

**Example:** Testing active vs. passive ROM in horizontal abduction in the shoulder joint (See video S1.)

**Experiment:** To experience the influence of strength endurance to maintain ROM in longer duration activities simply start sprinting on the spot, lifting knees as high as possible. You will notice that as fatigue sets in, the range of motion decreases.

With respect to flexibility, more is not necessarily better:

- It is possible that there is an optimum level of flexibility required for injury prevention. <sup>(1)</sup>
- The need for flexibility differs between different sports: “Many athletes run or lift skillfully, employing their springs (passive tissues). If this is the case, never stretch these athletes beyond the range of motion required in their event.” <sup>(2)</sup>

Karsten’s previous position as the Strength and Conditioning Coach for Team Denmark provided him with the opportunity to work with a male, professional badminton player (ranked in the top 10 in the world). This athlete had mild degeneration of the left hip and had a weekly massage (supplementary to daily flexibility and mobility work) to keep the muscles around the hips loose. He had his massage on Thursdays. During Friday practices he had to be careful because his coordination was “off” because his muscles were so much looser than normal.

There is no conclusive evidence to support two common claims about flexibility training: 1) that flexibility training will prevent DOMS or 2) prevent musculo-tendinous injury. <sup>(1)</sup>

## SECTION 2

### What types of flexibility exist?

Relating to the definition in Section 1, flexibility, under various conditions, is defined in the literature as “types” of flexibility.

See **video S2-1** which highlights the difference between the three forms of flexibility with a focus on hip extension.

#### Static-passive flexibility

Static-passive flexibility is the range of possible movement around a joint and its surrounding muscles and tissues during a passive movement (a partner, gravity or muscles other than the ones crossing the joint provide the force needed to create the movement).<sup>(3)</sup> Static-passive flexibility is occasionally referred to as passive flexibility.<sup>(4)</sup> Limitations in static-passive range of motion can be due to “passive insufficiency.” For example: passive tissue properties, neural influences and stretch tolerance. (See also section 5)

#### Static-active flexibility

Static-active flexibility is the ability to assume and maintain extended positions using only the tension of the agonists while the antagonists are being stretched.<sup>(5)</sup> Limitations in static-active range of motion can be said to be due to active insufficiency – strength of the agonists.

#### Dynamic flexibility/Mobility

Dynamic flexibility refers to the available range of motion during active movements. Therefore, it requires voluntary muscular actions from muscles crossing that joint.<sup>(3)</sup>

Dynamic flexibility is occasionally referred to as active flexibility, flexibility-speed (achieving ROM during fast movements) or ballistic flexibility.<sup>(1)</sup>

#### Strength flexibility

Strength flexibility is the ability to exert force with the antagonists at the end range of motion of a movement in order to control the movement and return to the start position.

Box Begin: What is the difference between joint mobility exercises and dynamic flexibility exercises? Joint mobility exercises are performed mainly in an unloaded environment (open chain) and focuses exclusively on the joint (joint health – for more information see Victory Loves Preparation). Dynamic Flexibility focuses on a movement and can be performed loaded or unloaded. Thus, while there can be a great difference between the two forms of exercises there are also similarities. Box eND

## SECTION 7

### What are the principles for long and short-term periodization of flexibility training?

Based on the different purposes of flexibility training and an understanding of the factors that support periodization of flexibility training, Section 7 looks at how flexibility training is periodized, with an emphasis on similarities and differences to the periodization of other components of the training program.

#### 7a. Long-term periodization (across macrocycles)

Except for sports like gymnastics that require exceptional degrees of flexibility, the optimal levels of flexibility for a particular sport might be achieved within the first year of training. Thus, in contrast to several other bio-motor abilities that are relevant to the sport, actual developmental flexibility training may take up a very limited portion of long-term training.

The long-term periodization of flexibility training may be described in three major stages.

**Stage 1:** The purpose of flexibility training is to achieve a balanced length tension relationship around all joints. (See also Section 3, the second purpose of flexibility training.) This stage should take up no more than a few weeks of training and is never repeated unless flexibility is lost.

#### **Do you find that it is difficult to develop flexibility in your athletes/fitness clients?**

If your experience is that it is challenging to develop flexibility in your athletes/fitness clients, then the first things to consider is if they are stretching often enough and long enough. Please see Section 10 for suggested training frequency and training volume.

**Stage 2:** The purpose of flexibility is to develop sport-specific range of motion, dynamically and or statically. (See also Section 3, the seventh purpose of flexibility training.) In some sports with limited flexibility requirements, an athlete may clear this stage within the first year of training. In sports with more extensive flexibility requirements, this stage can be repeated in subsequent macrocycles until the required levels of flexibility are achieved.

#### **Sport specific flexibility requirements**

**Case 1:** In 2010 Karsten consulted briefly with a young Canadian level gymnast. She passed all the basic flexibility assessments, yet her coaches referred to her as being “tight”. Karsten was initially puzzled but then realized that they referred to her ability to perform the various gymnastic movements. Thus, the coaches referred to her movement sport specific or movement specific flexibility.

**Case 2:** Karsten taught beginner Olympic weightlifting classes between 2009 and 2013. Occasionally, a distance runner would sign up for the classes with the aim of improving their running. These runners had a distinct squat pattern; with lack of dorsiflexion (the knee stopped prematurely) during the eccentric phase. This shows that tighter calves is an adaptation to running and in many cases a good one, as the tighter calves may act as stiffer springs to support running economy. (See also Section 1)

**Stage 3:** The purpose of flexibility training in Stage 3 is to maintain range of motion and release residual muscle tension after workouts. (See also Section 3, the first purpose of flexibility training.) Since both sports and every day activities, particularly sitting, can result in residual muscle tension, Stage 3 is essentially a lifelong stage.

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