

## Developing Strength through the Military Press

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### Abstract

*The Military Press allows developing upper body strength through vertical stretching of the arm that lifts a weight, from the bottom to the top.*

*In this regard, we wish to highlight the benefits of this exercise for both the scapulo-humeral muscles and for the whole kinetic chain, in order to develop trunk stability, mobility and strength.*

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**Keywords:** Military Press; Mobility; Strength; Trunk Stability; Sport; Motor activity; Adolescence; Sport activity and disability.

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### Introduction

The Military Press movement, also known as an overhead press or shoulder press, plays an important role in movement science, both as a training method for developing strength and as an exercise for re-educating shoulder movement. In fact, it is a multi-joint movement, engaging the entire upper body and involving the lower limbs, which, even if they do not contribute to the press, help keep the trunk stable, and therefore support the action itself. While performing the movement, the coordination and mobility of the upper limbs, as well as the activation of shoulder muscles, upper chest, arms and deep abdominal muscles will be necessary.

The purpose of this work is to describe the Military Press and the importance of this movement for the physical training in different sports, for motor learning processes and for developing conditional and coordination skills.

### 1. Strength

Strength, which is the ability of an individual to overcome or counteract an external load with muscular effort, is a conditional ability that needs to be always trained, both to be developed and to be kept constant over time. There are three macro-groups of factors contributing to movement, and therefore to strength:

1. Structural factors: hypertrophy and different types of muscle fibers (slow, fast or intermediate);

2. Nervous factors: the number of fibers recruited by the nervous system during the action, the synchronization with which the fibers of the same muscle contract and the intermuscular coordination, i.e. the coordination between different muscles;

3. Stretch: the myotatic reflex, thanks to which, through a stretching-shortening mechanism, stimulation is promoted at the neurogenic level, thus allowing for the development of high levels of strength in a very short time and the elastic components

of the muscle itself, which, after stretching, return the energy they have stored. But strength also includes physiological and psychological aspects; in fact, in physiology, strength is understood as the ability of a muscle to develop tension to overcome and/or oppose an external resistance. It follows that the types of strength, muscle work and muscle tension are different and are influenced by multiple factors. Therefore, a precise notion of the concept of strength is only possible if put in relation to its action or objective. For this reason, we must consider both general strength, which is the level of strength developed by the main muscle groups, and local strength that refers to the use of individual muscles or muscle groups. Consequently, the specificity of the sport also differentiates general strength from special strength. General strength refers to the strength of the main muscle groups, while special strength corresponds to the muscle groups involved in a motor act intended to achieve a result. Consequently, the resulting movement regime will determine a dynamic strength, or a static one. By dynamic strength, or dynamic muscular work, we mean that type of work aimed at the contraction or stretching of the muscle itself. On the contrary, by static strength, or static muscular work, we refer to a movement characterized by a muscular tension without a significant contraction or lengthening of the muscle itself, applied even voluntarily, in a position where the resistance is fixed and cannot be changed. It follows, therefore, that the relationship between the body mass and the external load or movement that we wish to achieve will be fundamental too, so we will still have a subdivision between absolute strength and relative strength. Absolute strength is the force exerted independently from bodyweight, while relative strength is the force exerted in relation to bodyweight, therefore to body mass. In short, in the various sports and disciplines, strength will never be a "pure" expression, but will always be given by a combination of multiple factors in relation to performance. Therefore, for these reasons, training methodology focuses on dynamic strength, which can be classified into three types of strength: maximal strength, rapid strength and strength endurance. Like dynamic strength, static strength undergoes a further classification into two types of forces: maximal static strength and static strength endurance. In conclusion, while maximal strength is the highest level of force that the neuromuscular system is able to generate with a single voluntary muscle contraction, resistant strength is the ability of the neuromuscular system to overcome a resistance with the highest possible contraction velocity. So strength endurance is the ability of the entire organism to withstand a fatigue during sustained strength work. A. Hill, in 1933, studied for the first time the relationship between force and velocity, highlighting their dependence in a curve. Through the curve it is possible to identify the point at which the muscle develops maximum power (power = strength x speed), an element that in sports practice translates into the correct determination of the loads with which to perform a physical exercise, to avoid stress from incorrect overload and to promote the athlete's performance, health and psycho-physical well-being.

## **2. Joint mobility**

"Joint mobility is that athlete's ability and quality allowing him or her to execute movements with great amplitude in one or more joints autonomously or with the intervention or support of external forces" (Weineck, 2013). It can be the glue and support between conditional and coordination skills, and being also an autonomous ability, it does not require energy substrates or particularly established motor schemes.

However, it is influenced by many factors related to bone tissue, joint structures, muscles, nerve structures, age, gender, and psyche. Despite this, it is often directly related to muscle elasticity. The latter, in fact, does not make the joint free in its mobility range and degrees of freedom, if a muscle or a muscle group cannot stretch sufficiently. It is well known that sport-specific movements require fluid and smooth movements, especially in those disciplines where the expressiveness of the movement requires dexterity and especially a perfect technical gesture, such as rhythmic or artistic gymnastics. In fact, male gymnasts, despite their hypertrophy, have excellent mobility and muscular elasticity. It follows that the more muscular elasticity and therefore mobility one has, the more his or her locomotor apparatus is in a state of general well-being. Therefore, one of the fundamental prerequisites of joint health is movement, carried out with specific training and to the benefit of the joint structures themselves, such as joint capsules, tendons and ligaments. However, what greatly affects joint mobility is both muscle tone and the ability to stretch muscles. In fact, in the muscle, there are nerve structures called muscle spindles, the task of which is to keep the muscle tone active, sometimes to the detriment of elasticity, a property that is under the control of the golgi tendon organ. The latter, during contraction (especially the isometric one), stimulates the inhibitory interneurons in the spinal cord, which in turn inhibit the alpha motoneurons that innervate the muscle, so the muscle contraction decreases or ceases. Therefore, it is in the search for balance between tone and elasticity that a good joint mobility will be determined, the objective of which will be to be an essential part of motor performance based on correct posture; this will generate smooth movements and a good quality of the subject's psychophysical well-being, greatly reducing the risk of injury and thus avoiding unnecessary interruptions in training programs.

### **3. Military Press**

Traditionally, it is so defined because of the position of the lower limbs, which recalls the military style: heels put together, toes slightly open and gaze straight ahead. Over time, this movement has been made more functional, and the vertical push or stretching of the upper limbs can be performed in different positions; however, the most commonly used of these positions is the upright one. Some electromyographic (EMG) studies determined that stretching the arms from the upright position allows lifting lower loads than from the sitting position (evaluating 1-RM), especially when practiced with dumbbells (Saeterbakken and Finland, 2013). This movement can be performed using different equipment such as a barbell, dumbbells, or kettlebells. The Military Press, until 1972, represented the third test of weightlifting competitions, along with the Snatch and the Clean and Jerk, also considered one of the main exercises for assessing strength. Afterwards, it was excluded from the competitions because the athletes, in order to improve their performance and therefore to reach a successful competition, would alter the correct position caused by the greater load; in this way, the natural stretching of the arms would be altered, causing a hyperlordosis in order to recruit the pectoral muscles with serious risks of damage to the spinal column, thus affecting the functionality of the movement. Moreover, it was difficult for the judges to evaluate its validity. Nevertheless, the Military Press is an excellent exercise to develop hypertrophy, especially of the deltoid muscle, but it is also an important tool to optimize the coordination of the scapulo-humeral joint and to avoid rotator cuff tears and muscle imbalances. For the effective functionality of this movement, the trunk and lower limbs

must remain static and should act as stabilizers, thus ensuring that the upper limbs perform the dynamic action of the movement.

## Conclusions

Strength training represents an indispensable pillar of training methodology. Currently, with the advent of functional training, training methods use more and more training means in favor of the development and maintenance of both coordination and conditional skills, with exercises aimed at achieving the multi-joint and polyaxial target of the human body. This target is useful to ensure the training of kinetic chains and the specificity of movements, which characterizes each sport. Nevertheless, some exercises are the basis of movement science education and general training methodology. In fact, the use of the Military Press as a way to build strength, maintenance and prevention is significant, both in a competitive and in an amateur perspective, precisely because it fosters a physical well-being perspective aimed at building motor learning processes through educational plans for growth, and indirectly targeted at enhancing first the person and then the athlete, thus also improving his/her psychosocial sphere. That said, the Military Press achieves objectives such as strength, power, mobility, muscle elasticity and prevention with a single movement, thus ensuring a simultaneous nerve connection of both the lower and upper body, through tension and stability.

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