

SHORT REPORT

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BARBELL HIP THRUST

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ABSTRACT

This column provides a detailed description and photographs of the proper exercise technique for the barbell hip thrust with beginner progressions and advanced variations for athletes. The barbell hip thrust is a lower-body, multi-joint exercise designed to increase muscular conditioning of the hip extensors, spinal erectors, and knee extensors. This exercise may provide benefits to athletes that rely on hip extension during competition, such as basketball, sprinting, football, as well as power and Olympic weightlifters.

Keywords: resistance training; strength and conditioning; power

INTRODUCTION

The barbell hip thrust is a lower-body exercise designed to increase muscular capacity of the hip extensors (1). Due to the unique posture and weight displacement during this exercise, it may be effective at improving sport performance while reducing the risk of knee injury by increasing strength in the hamstrings and gluteal muscles (1,2). The gluteal muscles being a primary agonist in hip extension enables increased strength of this muscle group creating an effective means of increasing hip extension strength. This increase may improve sports performance in athletes that heavily rely on sprinting and jumping movements. An increased ability to dynamically accelerate as well as decelerate the body during sprinting and jumping movements may also decrease the likelihood

of experiencing knee injuries. This is due to the importance of the gluteal muscles in the control and deceleration of the body while landing from a jump or decelerating during a sprint (2).

While the traditional method of performing the barbell hip thrust is important in injury prevention, performing an advanced, single-leg variation may also be useful in preventing lower body injuries from occurring in the hip (3,4,5,6). The increased activation of both the hip abductors and adductors from performing the single-leg variation (4) may increase the stability of the hip joint and subsequently the knee joint as well, reducing the likelihood of injury to these joints and their associated musculature

(3,5,6). The importance of hip and knee stability can be seen in a variety of sports, especially those involving quick, rapid movements such as sprinting, jumping, leaping, bounding, and changing direction. Improvement in lower body joint stability can be useful in preventing injuries as well as rehabilitating injuries to the lower extremities (3,5,6). Therefore, it can serve a valuable role in both a preventative and a rehabilitative strength and conditioning program.

The purpose of this brief review is to outline the proper technique for the barbell hip thrust as well as two beginning progressions for the proper movement mechanics and technique. Once proper technique is achieved with the barbell hip thrust, an advanced variation (described below) may be incorporated for further challenging the athlete as well injury prevention (2,3,4,5,6).

MUSCLES INVOLVED

Primary muscles involved: Gluteus Maximus, Hamstrings Group (Semitendinosus, Semimembranosus, Biceps Femoris), Gluteus Medius (posterior fibers), Erector Spinae; Secondary muscles involved: Adductor Group (Adductor Brevis, Adductor Longus, Adductor Magnus, Pectineus, Gracilis), Quadriceps Group (Rectus Femoris, Vastus Lateralis, Vastus Medialis, Vastus Intermedius) (1).

The horizontal, bent-leg positioning of this exercise places a greater emphasis on the gluteus maximus musculature due to the shortened position of the hamstrings muscle group prior to initiating the movement and the horizontal loading of the external resistance (1).

EXERCISE TECHNIQUE

Starting Position

- Assume a seated position with feet shoulder-width apart, knees flexed to slightly less than 90 degrees, and upper back leaning against a flat bench.
- The gluteus maximus should be in contact with the floor and the barbell should be placed on the hip musculature just below the anterior superior iliac spine where it will remain throughout the movement (Note: *The individual may choose to pad the barbell because of the pressure that the loaded barbell will place on the hip musculature and lower abdominopelvic region. The barbell may be padded with a simple bar pad or with a towel that is wrapped securely around the barbell.*)
- The arms should also be fully extended and about shoulder-width with the hands gripping the barbell to hold it in place (Figure 1).

Concentric Movement (Hip Extension)

- Exhale while extending at the hips with a concentration on squeezing the glutes to raise the body off the floor.
- The shoulder blades should be used as a pivot point and should not slide up or down the bench during the movement.
- Be sure to keep the feet flat on the floor.
- The head and spine should remain in neutral position throughout the concentric movement.
- Continue to extend the hips until they reach full extension, or until the thighs and torso are roughly parallel to the floor, and until the knees are extended to approximately 90 degrees (Figure 2).

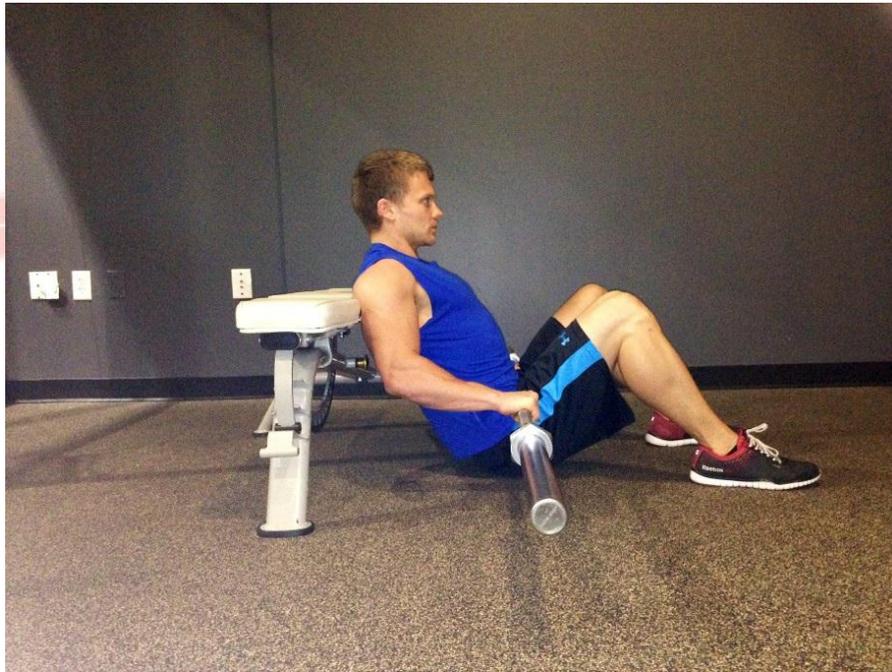


Figure 1. Starting position



Figure 2. Mid-position

Eccentric Movement (Return to Starting Position)

- Inhale while slowly flexing at the hips and flexing slightly at the knees.
- The feet should remain flat on the floor and the shoulder blades used as a pivot point throughout the eccentric movement.
- The head and spine should remain in neutral position throughout the eccentric movement.
- Continue to flex at the hips and knees until the initial starting position is reached in which the gluteus maximus is just above being in contact with the floor (Figure 1).
- By stopping just before the gluteus maximus comes into contact with the floor, muscle tension will be maintained throughout the movement.

PROGRESSION #1

For athletes not familiar with the barbell hip thrust, a beginning variation of placing the upper back on the floor instead of leaning against an elevated bench will help to reduce the range of motion and the intensity of the exercise. To perform this variation, assume a supine position on the floor with the knees flexed to slightly less than 90 degrees, similar to a standard sit-up position. Feet should be placed shoulder-width apart and arms should be extended alongside the body (Figure 3). This beginner progression does not use any external resistance, only the athlete's body weight, thereby allowing the athlete to concentrate on the technique and ensure that correct musculature will be utilized when resistance is added. The athlete will then extend their hips until they reach a fully extended position, and then lower the hips back to the floor (Figure 4).



Figure 3. Progression 1 Starting Position



Figure 4. Progression 1 Mid-Position

PROGRESSION #2

Once the athlete can successfully perform the hip thrust with their upper back on the floor for the recommended number of sets and repetitions (see section below titled “Sets, Repetitions and Progression”) without a breakdown in exercise technique, progression #2 may be advised. This second progression involves performing the hip

thrust with the upper back resting against an elevated bench with no external resistance (Figure 5). This progression is performed with the same technique as described above for the barbell hip thrust, except without placing a loaded barbell on the athlete’s hip musculature (Figure 6). This prepares the athlete to perform the hip thrust with a loaded barbell placed on the hips as a form of additional external resistance.



Figure 5. Progression 2 Starting Position



Figure 6. Progression 2 Mid-Position

ADVANCED VARIATION

While the typical barbell hip thrust is performed with both feet on the floor, lifting one leg while performing this exercise will provide a further challenge to the athlete. Performing single-leg exercises decreases overall joint stability and can increase recruitment of hip abductors and hip adductors, which are important in lower extremity injury prevention (4). An increased strength of stabilization musculature has been shown to directly correlate with an increase in overall balance of both the hip and knee joints, as well as a reduced risk for injury to these joints (3,5,6).

To perform the single-leg hip thrust, begin in the same starting position as the barbell hip thrust. Before initiating the movement, extend at the knee in order to lift one foot off of the floor (Figure 7). Using just one leg, perform the hip thrust movement (Figure 8). It is important to avoid any valgus or varus deviation of the knee joint as well as any torso rotations during the movement. When progressing to this advanced variation, the athlete should begin with their own body weight for resistance. Once the athlete has demonstrated proper technique for the recommended volume of sets and repetitions (described below), an increase in external resistance via a loaded barbell is advised for further progression.



Figure 7. Advanced variation Starting Position



Figure 8. Advanced Variation Mid-Position

SETS, REPETITIONS AND PROGRESSION

To determine the correct exercise prescription, the following variables must match the desired outcome of the athlete, as well as their training status. The guidelines below were developed by the National Strength and Conditioning Association (7).

- Power: 2-6 sets, 3-6 repetitions, 2-5 minute rest period (intermediate and advanced training status individuals only)
- Strength: 3-5 sets, ≤ 6 repetitions, 2-5 minute rest period
- Hypertrophy: 3-5 sets, 6-12 repetitions, 60-90 second rest period
- Endurance: 2-3 sets, 12-25 repetitions, ≤ 30 second rest period

When the desired goal is strength, hypertrophy, or endurance, novice individuals should perform 1-3 sets. Intermediate and advanced athletes are recommended to perform 3 or more sets while maintaining proper form.

In terms of progression, the two-for-two rule may be applied. Once an athlete can complete two or more repetitions than the recommended amount in the final set of the exercise in two subsequent training sessions, an increase in external resistance is advised (7).

An alternative to progression via an increase in external resistance is a single-leg variation of the barbell hip thrust. Once the athlete has demonstrated proper technique for the recommended volume of sets and repetitions, the advanced variation described above is advised.

PRACTICAL APPLICATION

The barbell hip thrust can benefit athletes in multiple ways. Due to the horizontally loaded position of the exercise, it has been shown to increase gluteal strength and power, which may improve sprinting speed and acceleration (1). The barbell hip thrust may also be used as a supplemental exercise to traditional lower-body compound exercises, such as squats and deadlifts, when the athlete's goal is an increase in hip extension strength and power. Increasing the strength of the hip extensors may also decrease the reliance on the knee extensors to absorb impact forces while decelerating the body during landing or decelerating from a sprint (2). This may reduce the risk for non-contact knee injury due to an increased efficiency of the athlete's landing and deceleration mechanics (2). When performed as a more advanced, single-leg exercise it can aid in the prevention of both hip and knee injuries due to an increase in the stability of the hip and knee joint. Therefore, the barbell hip thrust may serve a valuable role in lower extremity injury prevention as well as lower extremity rehabilitation (3,4,5,6). The barbell hip thrust is useful for athletes that rely on powerful hip extension movements as well as sprinting speed and acceleration and deceleration. Competitive sports that can benefit from incorporating the barbell hip thrust into their training programs include basketball, sprinting, football, as well as power and Olympic weightlifters.

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