The Exercise Technique Column provides detailed explanations of proper exercise technique to optimize performance and safety.

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Snatch Balance Technique

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ABSTRACT

THE SNATCH BALANCE IS A TOTAL-BODY STRENGTH AND POWER EXERCISE THAT CAN BE PROGRAMMED IN SEVERAL WAYS, DEPENDING ON THE ABILITY OF THE ATHLETE AND JUDGMENT BY THE COACH. THIS LIFT CAN BE USED IN A PROGRESSION TOWARD LEARNING THE FULL SNATCH, USED TO HELP ATHLETES STRUGGLING WITH TECHNIQUE PATTERNS AND POSITIONAL STRENGTH IN THE FULL SNATCH, OR USED IN PLACE OF THE FULL SNATCH TO ELICIT POWER, STRENGTH, AND SPEED DEVELOPMENT. VARIATIONS OF OLYMPIC-STYLE LIFTS ARE ADVANTAGEOUS FOR TRAINING TOTAL-BODY EXPLOSIVE STRENGTH AND POWER BUT HAVE LESS TECHNICAL COMPLEXITY THAN THE FULL LIFTS. SPECIFICALLY, THE SNATCH BALANCE REQUIRES THE ATHLETE TO GENERATE FORCE INTO THE GROUND, PERFORM RAPID TRIPLE EXTENSION AT THE HIPS, KNEES, AND ANKLES TO PRESS THE BARBELL OVERHEAD, AND CATCH THE BARBELL IN AN OVERHEAD SQUAT POSITION.

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INTRODUCTION AND MUSCLES INVOLVED

The snatch balance requires considerable muscle recruitment and incorporates muscles of the posterior chain, including major muscles of the hamstrings, glutes, calves, back and shoulders, as well as muscles of the quadriceps and core. Explosive strength for this movement is mediated by the rapid triple extension performed at the hip, knee, and ankle joints.

Power during this lift is primarily drawn from the hip extensors. For the snatch movement, the hip extensors must produce the highest power demands (6,11,14). Muscles involved in hip extension include the biceps femoris, semimembranosus, semitendinosus, and gluteus maximus (9). Knee extension occurs simultaneously with hip extension to generate power. Knee extension is mediated by the quadriceps group, including the rectus femoris, vastus intermedius, vastus lateralis, and vastus medialis (9). Extension (plantarflexion) at the ankle follows extension at the hip and knee joints to achieve triple extension. The gastrocnemius, plantaris, soleus, tibilias posterior, fibularis brevis, and fibularis longus muscles create plantar flexion at the ankle (9).

Activation of other muscle groups is necessary to provide stability for the athlete to safely complete this lift. Muscles that stabilize perform isometric contractions that provide support by producing tension within the muscle and structures to which they attach (10). Activating back musculature is imperative to provide stability for catching the bar in the overhead position. The latissimus dorsi, trapezius, levator scapulae, rhomboids, and serratus anterior work together to position the pectoral girdle (9). In addition, proper positioning of the shoulder provides further support to maintain the barbell in the catch position. The supraspinatus, infraspinatus, subscapularis, and teres minor are critical to provide stabilization, keeping the head of the humerus in the optimal position within the shoulder girdle (5). It should be noted that the snatch

Figure 1. Starting position (lateral view). Starting position of the snatch balance in which the barbell rests on the upper trapezius with a snatch width. Feet are placed directly under the hips.

Figure 2. Starting position (front view).

balance is contraindicated among athletes experiencing shoulder disorders or instability. The shoulder has the greatest range of motion among the joints in the human body, resulting in excessive range of motion. As a result, the shoulder is particularly susceptible to injury (5). This risk is magnified when the shoulder joint is involved with weight-bearing activity, particularly during repetitive lifting under heavy loads (7).

The importance of core activation should also be highlighted, as increased core stability is associated with a better foundation for force production (5). An activated core is required to transfer power and stabilize the athlete during the lift, particularly in the catch position. Synergistic activation of global and local musculature of the trunk provides support for the spine (1). Maintaining support of the spine is imperative for proper form and protecting the athlete. Activating the internal and external obliques, transverse abdominis, and rectus abdominis compresses the abdomen to provide stability for the vertebrae (9).

BENEFITS

The snatch balance offers many benefits and can be programmed to develop total-body strength and power for athletes with various lifting experience. This exercise can be used for athletes who need assistance with specific points of the full snatch lift, used as a progression for athletes learning how to complete the full snatch, or can be used as a strength and powerlift to use in place of the full snatch.

The use of Olympic-style lift variations provides a less complex way for athletes to develop the power, strength, and speed adaptations associated with weightlifting (10,12,14). Furthermore, variations are ideal for coaches because their athletes can achieve the same training outcomes, but the teaching process requires less time than that required for the full lift (14). For these reasons, a coach who wishes to incorporate Olympic-style lifting into their program can

Figure 3. Quarter squat dip (lateral view) generating force vertically downward into the lifting surface before driving up into triple extension.

Figure 4. Quarter squat dip (front view).

consider using the snatch balance in place of the full snatch lift. This exercise requires the athlete to perform very similar movement patterns to the full snatch. The same principle of rapid hip and knee extension with plantar flexion is required to generate and transfer enough power to displace the barbell to the overhead position. As a result, the lifter needs to rapidly pull themselves down and catch the decelerating barbell (6). These similarities are apparent between the snatch and snatch balance, but the latter requires less bar displacement and technical complexity. Furthermore, it is important to highlight that triple extension is principal to Olympic-style lifting movements and is considered a significant tool for generating power and explosive performance that translates to sport (4,14). Positive effects on rate of force development result from the lower extremity exerting force into the ground to generate power transfer vertically. This has high transferability to jumping and plyometric activity (14). The snatch balance is advantageous for incorporating this rapid triple extension with less technical complexity, as previously mentioned.

If the coach is progressing an athlete to perform the full snatch, this exercise can also be used as a progression tool to accustom the athlete to snatch-specific movement patterns. It is beneficial to train specific movement techniques before progressing to the full lift for the athlete to complete the lift with full technical efficiency (2,13). Effectiveness of Olympic-style lifting decreases when the lift is performed with poor technique (14). Breaking down the lift into specific phases and positions can be used to ease coaching instruction and to prevent overwhelming the athlete. This also provides a structural framework to point out critical variables of the lift (6).

Common snatch progression exercises include implementing the snatch pull and snatch high pull to

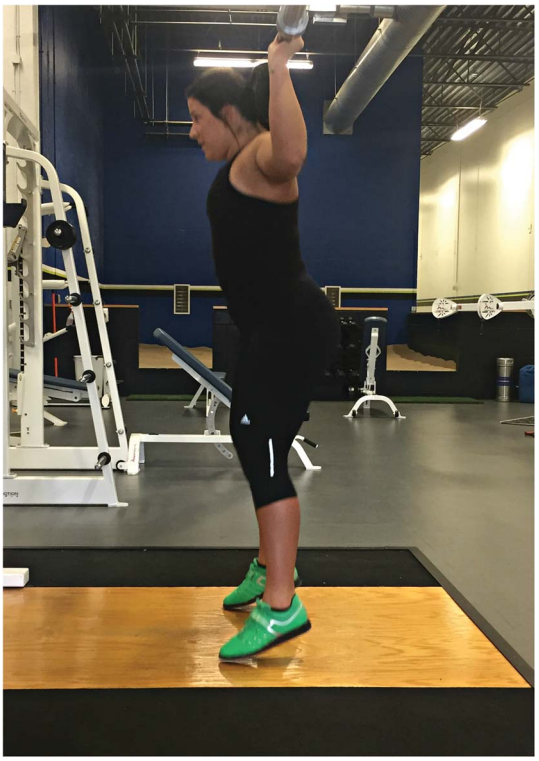

Figure 5. Triple extension (lateral view). Triple extension at the hip, knee, and ankle occurs while the barbell is pressed overhead.

Figure 6. Triple extension (front view).

master the first and second pull phases of the full snatch as well as the overhead squat (OHS) to mimic the catch position (2,13). A specific time frame for progressing the athlete does not exist. Rather, the coach chooses to progress the athlete once they can properly execute the exercise with technical efficiency and confidence (2,8,14). However, snatch-specific progressions typically take 2–3 weeks to develop adequate movement patterning (2).

The OHS is suggested to be a functional movement that can enhance performance (1,2). The OHS emphasizes strength within the posterior chain and stabilizing to maintain the barbell overhead. The snatch balance should be considered as the next programming exercise to stress other snatch-specific movement patterns as well as increase complexity before learning the snatch. The OHS helps the athlete get comfortable in the squat position with the barbell overhead, but the snatch balance adds a new element of neuromuscular demand. The snatch balance requires the athlete to drive their weight into the floor, triple extend, press the barbell overhead simultaneously, pull themselves under, and catch the barbell in a power position. Arguably, the snatch balance is a progression that requires more technical difficulty than the OHS. One of the biggest challenges when learning the full snatch is learning how to fluidly drop under the barbell to receive it in the bottom position (2). This lift highlights the necessity to quickly drop under the barbell. In addition, the snatch balance develops positional strength that can be translated once the athlete learns the full snatch technique.

Coaches may also consider this exercise beneficial for athletes who have already learned the full snatch lift. If the athlete has already progressed to performing the full snatch, but is struggling with positional strength or technical patterning, the snatch balance can be considered as a helpful

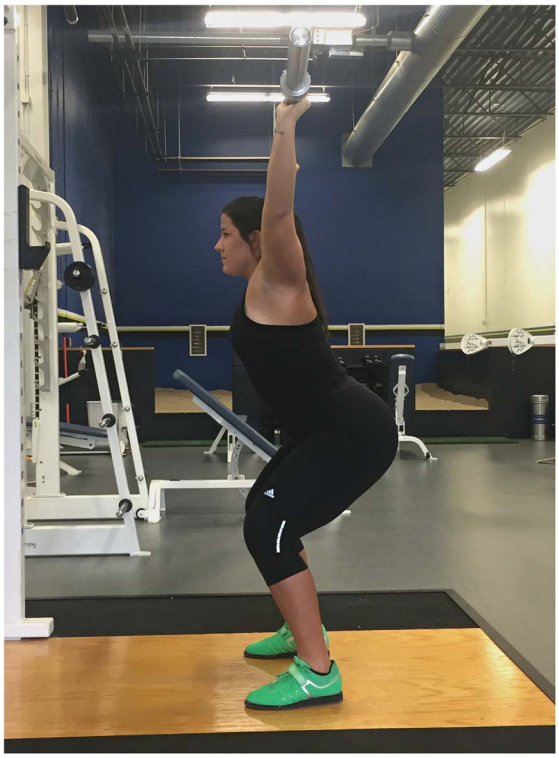

Figure 7. Catch position (lateral view). Athlete presses under the barbell to receive it in the overhead, quarter squat position. Feet are now shoulder-width apart.

Figure 8. Catch position (front view).

programming tool. As previously mentioned, the snatch balance incorporates a similar movement pattern to the full snatch: exerting force into the ground, rapid triple extension, dropping below and catching the barbell, as well as stabilizing to stand and complete the lift. Because these aspects are identical between the snatch balance and the full snatch, this exercise can be supplemented for strengthening snatch-specific movement patterns.

TECHNIQUE

The starting position of the snatch balance requires the athlete to stand upright with feet placed under the hips, holding the barbell with a snatch-width grip as it rests on the upper trapezius (Figures 1 and 2). It should be emphasized that the athlete's weight should be kept in line with the hips during the lift. The movement begins as the athlete performs a quick "dip and drive" movement (Figures 3 and 4). The dip and drive motion results from the athlete sitting their hips back and pushing themselves into the ground using the heel and midfoot to generate force against the lifting surface before extending the hips, knees, and ankles. This triple extension is visible in Figures 5 and 6. Triple extension pushes the bar off the shoulders so the lifter may then press themselves under the bar. The barbell should be caught overhead in the quarter squat position as feet shuffle from hip- to shoulder-width distance (Figures 7 and 8). Feet should be in a flat-footed position upon the catch, with weight back, in line with the hips. For optimal energy transfer, the barbell should rise vertically without horizontal displacement.

The catch position of the lift requires full extension at the elbows and extension at the wrist. In this position, the athlete can be encouraged to reach toward the ceiling to further engage the scapular stabilizers (14). Once stable, the athlete can then stand erect with the barbell overhead. To lower the bar, the athlete should

slowly return the barbell to the starting position on the upper trapezius in a controlled manner. The strength coach should emphasize the importance of controlled barbell descent to prevent injury. Once the athlete has returned the bar to the starting position, feet should be repositioned under the hips before initiating the next repetition.

During this exercise, it is important for the athlete to acknowledge changes in their center of gravity (COG). Because the start position of the snatch balance is standing erect, center of mass is comparable to COG in anatomical position, estimated to be 55–57% of standing height (10). COG will then fall during the dip movement but rise quickly with the drive movement. This is based on the principle that COG for the entire body shifts slightly in the direction of movement (10). The athlete's COG will then settle during the catch position. It should be noted that the movement of reaching overhead from anatomical position with both arms causes the COG to move upward slightly, about 2 or 3 inches (10). However, the positioning of the catch in the OHS position pulls the athlete closer to the floor, offsetting the effect of a raised COG. Proper technique execution should result in vertical displacement of the barbell overhead, optimizing energy transfer (11,15). Any horizontal displacement of the barbell is highly associated with horizontal displacement of the athlete's COG (4,15). Therefore, it is appropriate to highlight the importance of proper weight transfer in a vertical direction.

PRACTICAL APPLICATIONS

Although the snatch balance is a variation of the full snatch, it is still a relatively complex movement that requires considerable neuromuscular involvement and coordination. For this reason, it is important to focus on technique, movement pattern efficiency, and preparedness of the athlete rather than weight lifted.

The use of a PVC pipe or unloaded barbell is recommended for the athlete to initially learn the movement pattern of the snatch balance (i.e., facilitate neuromuscular adaptation). Coaches who program this lift as a progression tool for learning the full snatch should monitor speed and technique of the athlete before adding weight to the bar. Once proficient with the lift, weight should be added in small increments (~2.5 kg) to keep the focus on technique and peak power as opposed to the amount of weight lifted. As the athlete continues to train, progressive overload will facilitate strength adaptations. If strength is evident and the athlete displays technical proficiency, this lift can provide stimuli for enhancing power by using an external load (14). As a result, the coach may decide to implement the snatch balance as a main power lift within the training session to promote total-body explosive power. In addition, this exercise can be integrated into warm-up for the full snatch lift. It is suggested that coaches have their athletes use an unloaded bar as a specific warm-up before performing the full snatch to reinforce movement patterns.

Because this lift is technically demanding, it should be performed early in the training session while the nervous system is fresh. In addition, volume should be taken into consideration when programming this lift. Effectiveness decreases if performed using the wrong volume or intensity (8,14). In general, the authors recommend performing 3–5 sets of 5 repetitions for this lift. However, volume can be altered based on goals of the annual training plan. Coaches may consider implementing the snatch balance in the basic strength phase to build neuromuscular attributes necessary for developing muscular power. Volume suggested for this phase is 3 sets of 5 repetitions (3). In addition, the snatch balance can be programmed into the strength-power phase using suggested volume of 3 sets of 3 to translate strength adaptations from the maximal strength phase into power demands of the sport (3).

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