Exercise Technique: Dumbbell Squat, Dumbbell Split Squat, and Barbell Box Step-up

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SUMMARY
This column provides a detailed description and photographs of the proper exercise technique for a dumbbell squat, dumbbell split squat, and a barbell box step-up.

TYPE OF EXERCISE
Dumbbell Squat: Lower body and multijoint.

PRIMARY MUSCLES USED
Gluteus maximus, quadriceps (vastus lateralis, vastus intermedius, vastus medialis, rectus femoris), hamstrings (semimembranosus, semitendinosus, biceps femoris).

STARTING POSITION
- Select 2 dumbbells of equal weight (Figure 1a).
- Pick up the 2 dumbbells from the rack, the floor or have them handed by a trainer or training partner.
- Maintain consistent spacing between knees throughout the movement; do not allow knees to move outward or inward.
- Arms should hang at the side with dumbbells held firmly in the hands.
- Torso should remain erect.
- Shoulders are back.
- Keep head and neck straight with eyes looking straight ahead.
- Heels of both feet should remain in contact with the floor at all times throughout the descent.
- Keep the knees directly above to slightly in front of the ankles during the descent. Do not allow the knees to move in front of the toes.
- Continue the descent until the backs of the thighs are parallel to the floor, heels begin to lift off the floor. The flexibility of the lower body will determine the actual depth of the descent.
- At the bottom position of the descent maintain control by avoiding bouncing before beginning the ascent.
- Inhale during the descent.

DESCENT (DOWNWARD MOVEMENT)
- Initiate the exercise by slowly flexing the knees and hips (Figure 1b).
- Descend with control.
- Maintain a neutral spine throughout the descent.
- Keep the eyes focused straight ahead with the head erect.

ASCENT (UPWARD MOVEMENT)
- Extend the hips and knees forcefully and with control to ascend (Figure 1c).
- Maintain a neutral spine throughout the ascent.
Arms should remain at the side holding the dumbbells firmly and head erect with eyes looking straight ahead.

Push through the entire foot on both feet with weight evenly distributed from the heels to the toes to ensure that the entire foot remains in contact with the floor.

Avoid having the body weight move toward the toes.

Maintain consistent spacing between knees throughout the movement; do not allow knees to move outward or inward.

Continue the ascent by extending the lower-body joints at a consistent rate until the initial starting position is reached.

Exhale during the ascent.

On completion of the set, return the weights to the dumbbell rack.

### TYPE OF EXERCISE


### MUSCLES USED

Gluteus maximus, quadriceps, and hamstrings.

### STARTING POSITION

- Position the feet shoulder width apart with one leg forward and the opposite leg back. Feet of both the legs should be pointing forward.
- Arms should hang at the side with dumbbells held firmly in the hands.
- Torso should remain upright.
- Before beginning the descent, inhale.

### DESCENT (DOWNWARD MOVEMENT)

- Descend by lowering the hips and flexing the lead leg with control.
- Keep the lead leg knee above the ankle throughout the descent. Knee moving forward of the foot at the bottom of the movement (because of the exerciser pushing forward during the movement and not dropping the hips straight down) should be avoided as this compromises the knee and makes the exercise problematic (Figure 2a).
- Avoid moving the lead leg foot during the movement.
- Maintain an upright torso by activating the abdominal musculature.

### ASCENT (UPWARD MOVEMENT)

- Continue the descent until the lead leg thigh is parallel to the floor and the trail leg knee nearly reaches the floor.
- The flexibility of the lower body will determine the actual depth of the descent.
- At the bottom position of the descent, avoid bouncing or increasing the rate of descent before beginning the ascent (Figure 2b).
- Exhale at the completion of the ascent (Figure 2c).

### TYPE OF EXERCISE

Barbell Box Step-up: Lower body and multijoint (supplemental digital content 1, http://links.lww.com/SCJ/A4).

### MUSCLES USED

Quadriceps, hamstrings, gluteals, and abdominals.

### STARTING POSITION

- Choose a box or a bench with a stable surface and place in front of a squat or power rack.
- Height of box should be approximately knee height or lower (12–18
inches) depending on the ability of the client/athlete. A box higher than knee level may create undue stress at the knee.

- Position a standard barbell at the chest level in a squat or power rack.
- Load the barbell evenly on both the sides and secure weights with collars.
- Step underneath the barbell and position at the base of the upper middle back and the hips and feet directly under the barbell. Feet should be parallel to each other.
- Grasp the barbell using a pronated closed grip slightly wider than the shoulder width.
- Place the barbell evenly above the shoulders at the upper middle back.
- Raise the elbows upward (Figure 3a).
- Stand facing the box; maintain an upright body position with abs drawn in throughout the exercise.
- Extend the hips and knees to lift the barbell off the rack.

- Take a few (2–3) steps forward to directly in front of the box.
- Feet are between hip and shoulder width apart and pointing forward.
- Torso should remain erect.
- Keep chest out and up.
- Shoulders are back.
- Keep head and neck aligned with eyes looking straight ahead.

**ASCENT (UPWARD MOVEMENT)**

- Starting with the left leg, place the left foot firmly on top of the box and step-up.
- With the body weight positioned over the left leg, extend the knee and hip, pushing you up onto the box (Figure 3b).
- Maintain erect posture with hips parallel to box. The knee of the left leg should extend no further than below the hip to avoid hyperextension.
- The left leg follows, and the foot is placed on the box to stabilize the body (Figure 3c).

**DESCENT (DOWNWARD MOVEMENT)**

- Step back off the box with the right leg, keeping all your weight on the left leg (Figure 3d).
- Maintain the same upright body position as you slowly lower toward the floor.
- Once the right foot is firmly placed on the floor behind the box, bring the left leg down so you are back in your starting position (Figure 3e).
- Complete a desired number of repetitions on the left leg then switch to the right leg.

**RETURNING THE WEIGHT TO THE RACK**

- At the completion of the set, return the barbell back slowly to the support hooks of the rack.

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