

HSUL Practical Teaching Guide – Squat

The Warrior Athlete Strength and Conditioning program will train athletes through the framework of *Foundational Movements – Squat, Hinge, Lunge, Push, Pull, Rotate, Plank, and Anti-Rotate*. Increasing an athlete's competency across these *Foundational Movements* are one aspect of decreasing injury risk and increases in performance.

This session will cover **Squat**.

Session Objectives

At the end of this session, the athlete should have a functional knowledge of the following topics:

1. What is a Squat?
2. Why Train Squats?
3. Squat Cues
4. Squat Technique Faults
5. Regression and Progression of Anti-Rotation
6. Practical Session Squat

Additionally, the athlete will demonstrate competence in the squat pattern during the Practical Application Session.

What is a Squat?

Squatting is arguably the one of the most important movements you will learn and teach in this course. Squatting is maintaining a stacked rib cage and pelvis while bending at the knees and ankles. There are 2 main variations of squats we will learn and teach, a single leg squat, and a double leg or (bi-lateral) squat. We will be addressing a double leg squat in this practical portion.

Figure 1. Depicts an athlete performing a barbell bi-lateral (both feet) back squat. This is sometimes regarded to as the “King” of exercises. It allows the athlete to load the spine and hips, and requires the body to work as one coordinated unit to lower and lift the weight. Notice his form, he has the bar on the meat of his traps, his hands are grasping the bar and attempting to break it over his back, his head and chest are at neutral, his rib cage is stacked over his pelvis, his heels are flat on the ground, and his knees are over his toes.



Figure 1. Boots & Utes Squat

Why train the Squat?

Squatting is a total body expression of the ability to control all the joints in a coordinated fashion. In **Figure 1.** the athlete is expressing hip, knee and ankle bending all while maintaining a stacked rib cage and pelvis. In the development of children they learn how to stand and squat before they learn how to walk. As stated above squatting correctly requires the expression mobility and control of your joints. If an athlete cannot squat, they most likely have compensations during gait (walking) which equates to

compensations in mostly all movements. Squatting requires maximal movement of the lower body and minimal movement of the upper body. To squat well, athletes need to be mobile, while creating stability and rigidity to in their core to stabilize their spine while moving.

This translates movement in everyday life, combat and specific job duties. Every day athletes will get into a squat pattern, so building competency and resiliency in that movement is very important. Squatting movements also transfer well into athletic movements such as sprinting, jumping, change of direction, and many more.

Squatting Cues

There are 7 cueing components of Squatting.

(1) Engage the Feet (Figure 2A. & 2B.)

- The “foot tripod” is 3 points of contact between the athlete’s foot and the ground – the ball of the big toe, the ball of the pinky toe, and the heel (specifically the lateral heel). Once the athlete has their weight distributed evenly across those 3 points, the athlete should spread their toes as far as possible and grip the ground with the foot.
- The athlete should then engage the foot muscles, creating a connection between the foot and the ground by attempting to pull the 3 points of contact towards the middle of the foot, which will raise the arch off the ground (imagine an eagle grabbing a fish with its talons and grab the floor).



Figure 2A. Relaxed Foot



Figure 2B. Engaged Tripod

Figure 2A. & 2B. Depicts a relaxed foot, and a foot that is engaging the “tripod”. In **2B.** “engage the tripod” notice the three points of contact ball of the big toe, ball of the pinky toe, and the heel. The arrows in **2B.** are depicting the heel and the balls of the feet coming together to raise of the arch. Looking closely you can also see the muscles of the foot contracting. This picture depicts what should be happening in your shoes or boots during a lift such as a farmer carry or squat.

(2) Find and Maintain the Stack (or Rib Cage Down) (Figure 3.)

- The stack refers to keeping the rib cage “down” or stacked in an optimal position over the pelvis. When the ribs and pelvis stack over each other, they stabilize the spine through breathing and bracing. The stack turns the thorax into a cylinder; adding air into the cylinder through a breath creates pressure around the spine to stabilize it. The athlete can think about a balloon- the more air in the balloon, the more firm the balloon becomes.

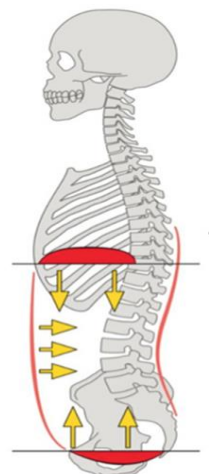


Figure 3. Depicts the stacked position which stabilizes the spine and pelvis. The yellow arrows indicate the space where is air trapped in your ribcage by your core muscles which stabilizes the spine. When an athlete arches their back and “loses the stack,” the core muscles cannot

Figure 3. Anatomy of the stack

maintain pressure to stabilize the spine, leading to decreased ability to generate force (i.e. to perform) and potentially leading to injury.

(3) *Get Tight*

- After establishing the tripod and the stack next cue is to get tight. Whether it is a barbell, bodyweight, goblet, or buddy squat tension is required before the descent. Tension the body from head to toe, engage the tripod and squeeze the glutes.

(4) *Breathing into your Stack “Valsalva Maneuver” (Figure 3.)*

- After establishing the stack, the athlete needs to learn to breathe into this position to stabilize their spine. This is done by taking a breath into the entire stomach (front & back, and side to side), and low back.
- Next force the air out in those points (front back and side to side) while holding the breath. Squeeze the glutes, and engage the abs. This locks the stack position in place and uses the air to increase the intra-abdominal pressure to stabilize the spine.

(5) *Break the Bar (think lat pulldown)*

- After establishing the tripod, stacked, and fully braced, engage the lats to lock the bar in place. Attempt to break the bar over the shoulders by driving the elbows towards the spine and down towards the butt. Make sure as the lats are being engaged, and the stack is not lost.

(6) *Drive Through the Floor on the Way up*

- After hitting depth, push the tripod into the ground, specifically emphasizing the big toe joint. Cueing the big toe joint will help keep the foot, glutes, and core connected.

(7) *Knees over Toes*

- A common misconception is that the knees should not go over the toes. There are variations of squats that the knee should stay behind the toes to maintain a vertical shin. In general, most squatting variations the knee should go over the toes unless instructed otherwise.
- The knee should travel over the toe as far as your ankle and hip mobility will allow.
- During any athletic movement, the knee tracks over the toes. Not training the knee over the toes will limit performance enhancement and increase injury potential.
- When performing squats, ensure the knees track forward between the big toe and second toe. Drive it as far forward as you can while maintaining the heel on the ground.

Squat Technique Faults

Some common Squat technique faults the athlete should be informed of include:

(1) *Bad Set Up (feet too wide or too close)*

- Before performing any squat variation, athletes need to get into an optimal starting position. A common technique fault is to start with the feet too wide or too close, leading to poor mechanics while squatting.

- Squatting stance will be based of lever length, mobility, and a multitude of other factors. The easiest place to start is with your athletes feet hip width apart. If there are issues in this stance adjust as needed.

(2) Not Getting Tight Enough on the Start (bad set up)

- A common technique fault is not getting tight first, specifically your feet, glutes, and lats. If the athlete is not actively grabbing the ground with their feet, squeezing their glutes, and driving their elbows towards the spine and down towards the butt.
- If the athlete is not tight enough this can lead to excessive arch in their low back, knees caving in, or their feet collapsing inside towards your big toe. All increase chances for injury when done under load.

(3) Heels Coming Off the Ground (loss of tripod)

- Once the set-up is complete, athletes begin their descent into the squat. One common fault in is shifting their weight too far forward, causing the heel to come up off the floor.
- The heel will come off the floor due to poor motor control, limited ankle and hip mobility or a combination of both. A fix for mobility issues is to incorporate ankle and mobility drills or slide a small 2.5-10 lb. plate under the front heel during a single-leg squat.
- When using weight plates under the heels, start with the heavier weights (they're usually thicker, making squatting easier). Once the weights are in place, sit the weight into the heels on the down phase of the squat. Over time as mobility increases, the size of weight plates under the heel decreases progressively challenging mobility.

(4) Poor Bracing (loss of the stack)

- A significant technique flaw in the single-leg squat is a loss of the stack through improper breathing. Before the descent of your squat, you need to fill your thorax with air to create pressure inside your ribcage, stabilizing your spine. When done correctly, the air in the rib cage is forced out in a 3D fashion. You should inhale and fill your stomach, sides of your ribcage, and lower back. As you fill up, you should be actively pushing against your ab wall. When done while holding your breath, it will lock your spine in place.
- The last portion of proper bracing is engaging your glutes. Squeeze glute muscles to stabilize the pelvis. To maintain proper control of the pelvis, regress the movement into multiple steps during positioning while creating the "Stack." See "How to Stack."

(5) Knees Caving In

- One of the most common technique faults during a squat is the knees caving in. During a squat when the knees are at 90 degrees they will track slightly in towards each other, if they make it all the way in line with the big toe this presents a problem.
- A few reasons for these problems include limited ankle and hip mobility, poor hip strength, improper technique, and poor ankle/ hip control. In most cases, the fix is a mix of mobility drills, specific strengthening exercises, and technique work.
- To truly solve these problems coaches, FFIs, and Unit leaders will need to trouble shoot. Coaches address poor ankle mobility by implementing ankle mobility drills found in the "ankle recovery" list.

- Trouble shooting should start at the ankle by using 2.5-10 lb. plates under the heels to see if that helps. Athletes can also perform hip and ankle mobility drills from the recovery portions of the practical sessions.
- Another potential issue impacting the single-leg squat is poor hip strength. Sometimes, some muscles become stronger than the opposing muscles, for example the glutes lose the ability to work optimally with the hip flexors work overtime. To correct this issue, implement hip-strengthening exercises found in the activation section of the exercise library.
- If athletes struggle with the squat due to poor technique or motor control (defined as lack of coordination-ability to control the body in space), try regressing the exercise to an easier, less complex version. If the athlete continues to struggle to perform the movement correctly, decrease the exercise's reps, load, speed, or intensity. Helping athletes increase their coordination early in training can pay huge dividends when increasing speed, strength, and power.

(6) Loss of Tightness

- During a squat maintaining tightness throughout the movement is very important. Anytime you lose muscular tension your joints tend to take over. Loss of tension in your core usually leads to your chest collapsing and your spine will be put into a position of extension.
- Maintaining tension on the way down during a squat is like stretching a rubber band. Engaging the tripod, firing the glutes, maintaining the stack, and breaking the bar are all cues used to create tension like the rubber band.

(7) *"Head Up Chest Up"*

- The "Head up, Chest up" cue is common and well-intentioned but seems to lead to poor results. This cue usually leads to athletes looking up at the ceiling and pushing their chest up, which puts them in an extended position (excessive arch in their low back), this leads to the loss of the stack.
- Wherever the head and eyes go, the chest will follow. To better coach the squat, cue athletes to pack the chin. For example, imagine someone is trying to cut your nose off, and you pull your head slightly back and turn on the muscles in your neck. Once you pack your chin, try to maintain a neutral head position throughout the entire movement.

(8) *Collapsing Chest*

- A common fault during a squat is the chest collapsing forward. Breathing and bracing appropriately are the fix. Breathe into the entire rib cage and close off air ways (nose and mouth). This traps the air inside the rib cage and stabilize the spine. As athletes finish the rep breathe out, and repeat the process. Proper bracing will keep the chest from collapsing.

(9) *Going too Heavy (usually with back squats)*

- No matter the movement, if athletes can't perform it correctly, don't add more weight. Strength is relative to proper movement. Athletes are only as strong as how well they can move weight correctly.
- If they are moving poorly under load it's a matter of time till something gives. This happens a lot during back squats, learn and teach the movement before adding weight. If athletes are struggling, regress the weight or exercise to make it easier so they can learn to perform the movement properly first, then get stronger.

Regression/ Progression of Squat

One limitation of pre-designed programs is that the strength coach who created the program cannot make changes day-to-day as needed. When learning and performing any exercise, some athletes will quickly learn how to perform it correctly and some will not. If an athlete is struggling to perform an exercise correctly there are two options: (1) lower the weight or intensity, or (2) regress the exercise so the athlete can perform an easier variation. Once the athlete has learned and can consistently perform the regressed exercise they can have progress back to the original exercise.

An example of a progression-regression model for Squatting is:

(Least Skill / Strength Required) *Hands Supported* → *Body Weight* → Sumo Squat → *Goblet Squat* → *Front Squat* → Back Squat → *Overhead* **(Most Skill / Strength Required)**

Note on Squatting: Anytime Marines struggle to squat correctly many of these problems can be solved by using 2.5-5 lbs weight plates under the athlete's heels. This will increase their ankle, and hip mobility.

Practical Session Squat

During the practical application session the athlete will learn fundamental exercises that will carry over into other exercises in that category. For example, learning the back squat and front squat will have carry over in a goblet squat.

Squats are one of the most important exercise categories you will learn. They are one of the best exercises used to increase force production for humans. They are not the end all be all, but an integral part of decreasing injury rates and enhancing performance.

Below is a list of the exercises we will cover in the practical portion. Some of the exercises have teaching progressions that can be used if Marines are struggling to learn the movement.

- Body Weight Squat
- Back Squat
- Buddy Squat
- Front Squat
- Goblet Squat
- Skater Squat