HSUL Practical Teaching Guide – Hinge

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 **Hinge**.

Session Objectives

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

1. What is a Hinge?
2. Why Train the Hinge Movement?
3. Hinge Cues
4. Hinge Technique Faults
5. Regression and Progression of the Hinge
6. Practical Session Hinge

Additionally, the athlete will demonstrate competence in the Hinge Pattern during the Practical Application Session.

What is a Hinge?

A hinge is a movement when you move at the hips while maintaining a relatively neutral spine. Like the picture to the right, which is a deadlift, he is pushing his hips back while maintaining a neutral/ straight back; this will load the hip muscles while the back and core muscles are stabilizing to maintain a stacked position. These exercises tend to be more of a pulling action as opposed to a push. The major movers of a hinge are your hips (posterior chain), not your back!

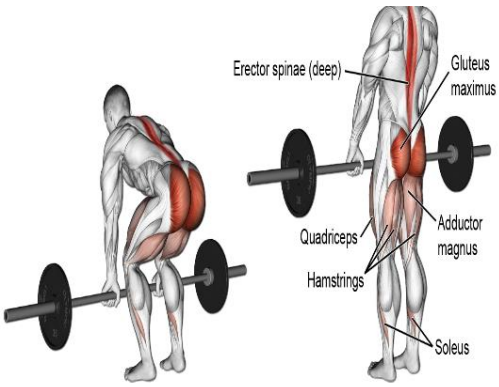

Figure 1. Anatomy of a Deadlift

Figure 1. Depicts an athlete performing a conventional deadlift, and highlight some of the working muscles on the posterior chain (glutes & erectors). Notice the backward movement of the hips with a neutral/ straight back.

Why train the Hinge Movement?

In modern life, most of what we do is anterior (front) dominated. Muscles on the front side tend to dominate the muscles on the back. Maintaining a strong backside will help balance the ratio between the front and back. Weak or inactive posterior chain muscles (glutes and hamstrings) can wreak havoc on your body, causing poor posture, leading to improper breathing mechanics, hip/ knee/ ankle dysfunction, and improper gait mechanics. Training the hinge correctly and maintaining a proper balance between the front and the backside can decrease potential injury risks and enhance performance. Every day, you will hinge multiple times, picking up clothes off the floor and even picking your pack up to hike. Learning

how to perform this movement correctly will enhance your ability to hinge during combat/ job-specific tasks and daily life.

Hinge Cues

There are 7 cueing components to teaching a hinge (these are specific to a conventional deadlift).

(1) *Engage the Feet* **(Figure 2.)**

- The "foot tripod" refers to 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. 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 2. Depicts an athlete performing a barefoot Kettlebell deadlift. Notice her right foot, specifically the ball of the big toe in contact with ground. She is activating the tripod. The arch is up off the floor, and the muscles around the arch are contracting. Her hips are back, she is in an optimal "stacked" position, and her shoulders are over the weight. She is ready to hinge.

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

(3) *Breathing into your "Stack" or the Valsalva Maneuver*

- Once the stack has been established, the athlete needs to learn to breathe into the stack to stabilize the spine. This is done by taking a breath into the ribcage, filling air into the stomach (front to back, and side to side).
- Once completed the athlete will attempt to push the air out of their stomach while closing their throat and holding their breath. As they're holding their breath, they should be actively squeezing their glutes, and engaging their abs. Executing this correctly will lock the stack position in place, and use the air to increase the intra-abdominal pressure to stabilize their spine.

Figure 2. Barefoot Hinge

(4) *Bar over the Mid Foot, Shoulder Blades over the Bar* **(Figure 3.)**

- In the set up during the deadlift, the athlete should start with the bar over their mid foot or first shoe lace. This will put the bar in the most optimal position for pulling. The athlete's shoulders blades or scapula should be directly over the bar and in line with the mid foot before starting the pull.

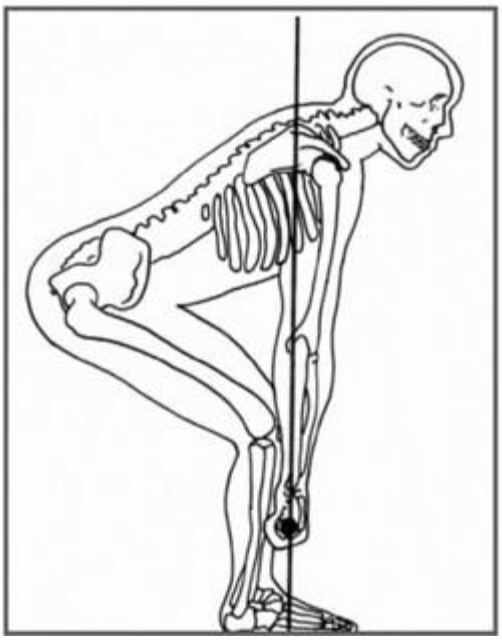

Figure 3. Skeleton Deadlift

Figure 2. Depicts a skeleton during the set-up of a conventional deadlift. There is a straight line from the shoulder blade to the mid foot. This picture represents an optimal set up for pulling.

(5) *Pull your Hips down to the Bar*

- After finding the stack and using the Valsalva maneuver to stabilize their spine, the athlete will pull themselves down to the bar. As the athlete pulls themselves down they should feel tension in their posterior chain (glutes and hamstrings) prior to start of the movement. This tension is a pre-stretch of the posterior chain, to optimize the hinge the athlete should squeeze their glutes and hamstrings to tension them further prior to the start.

(6) *Take the Slack out of the Bar*

- The 5th cue during a deadlift is for the athlete to pull their hips down to the bar, this already created the pre tension in your body to get ready for the pull. Once the athlete has pulled their hips down to the bar, they should engage their lats by pulling their shoulder blades together towards their spine and down towards their butt.
- There will be a small gap between the weight and the bar, and if done correctly, the athlete will feel the weight of the bar before they begin the hinge. There should a distinct noise of the bar hitting the weights. If the athlete "takes the slack out of the bar" correctly, they would fall backwards if the bar were removed.

(7) *Push the Floor away*

- The last cue is to push the floor when initiating the movement. When done correctly this cue will allow the athlete to utilize their hips instead of their back during the pull. Pushing the floor away will initiate hip extension and allow the chest to stay over the bar and maintaining an optimal hinge.

<u>Anti-Rotation Technique Faults</u>

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

(1) *Bad Set Up*

- Set up is everything in a Hinge. If the athlete's setup before the movement is off, it is very hard to fix it during the lift. Take time to set up correctly. Use your cues:

- Engage the Feet	-Breathe into the stack	-Take the slack out of the bar
- Maintain the Stack	-Pull your hips down to the bar	-Push the floor away

- Bar over the Mid Foot, Shoulder Blades over the Bar

(2) *Low Hips*

- When performing a hinge, the athlete's chest should start higher than their hips, their hips in turn should start higher than their knees. Utilizing this positioning will put the athlete in the most mechanically advantageous position to pull the weight efficiently.
- No matter the set up position the body will always put itself into a proper pulling position. If the athlete is utilizing the above cue's they will already start in the proper position. If the athlete is out of place their body adjust. An example is, if their hips start too low on a on the initiation of a hinge, their hips will rise up first and get into an optimal pulling position. Than the bar will move off the ground.
- This movement of hips first will raise their hips higher than their knees and force their back to initiate the lift instead of their hips. The body will always find the path of least resistance, this is problematic. To avoid this, start with your chest above the hips, and hips above the knees. If the athlete starts in this position they will be able to maintain this proper pulling position using the other cues to complete a proper hinge.

(3) *Improper Bracing/ Loss of Stack*

- Performing the "stack" as mentioned above helps stabilize the spine; when done incorrectly, your spine is at risk. The bracing technique can be taught without load. If you're struggling with bracing during a hinge, see the cue above "How to Breathe into your Stack".
- Once the breathing portion is in check, establishing and maintaining a proper stack is next. Remember the stack is aligning the rib cage with the pelvis, and staying in that position during the entirety of the movement. This can be achieved through practicing the stack without load. See "how to stack" in supplemental education for practice.

(4) *The Bar Starts too far away from your Mid line*

- Most hinge variations require the load to stay close to your hips or (center of mass). Moving the load away increases the potential for spinal injuries. As the weight travels further away from your center of mass the more stress will be put on the core to stabilize the spine.
- This is addressed in the set up. When performing a hinge such as a deadlift, the bar should be directly over top the first shoe lace. This will ensure bar is in the most optimal position to lift.

(5) *Using you Back instead of your Hips*

- When performing a hinge the athlete's rib cage and pelvis need to remain stacked for the entirety of the movement. If the bar starts too far away, or their hips are too low will force their spine to take over for the hips. Remember the emphasis of hinge is on utilizing the hips to move weight. If the athletes hips aren't the driver of any hinge, you should regress the load and the movement to teach the proper hinging pattern.

(6) *Going too Heavy*

- No matter the movement, if an athlete can't do it correctly, don't add more weight. Strength is relative to proper movement. Athletes are only as strong as how well they can move the weight. If the athlete is moving poorly under load, it's a matter of time till something gives. Regress the weight and perform the movement correctly before increasing load.

Regression & Progression of the Hinge

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 progression-regression model for a Hinge is:

(Least Skill / Strength Required) *Body Weight Hinge with a PVC/ Stick on their back → Body Wight Hinge → Banded Hip Hinge → Plate RDL → DB/ KB RDL → Hex Deadlift → Conventional Deadlift → Sumo Deadlift → Good Morning* **(Most Skill / Strength Required)**

After you have mastered the Hinge you can progress to a single leg hinge, below is a progression regression model for single leg hinges.

An example progression-regression model for singe leg hinge is:

(Least Skill / Strength Required *Wall Assisted Single Leg Hinge → Band Assisted Single Leg Hinge → PVC/ Stick on back Single Leg Hinge → Body Weight Single Leg Hinge → Plate Single Leg Hinge Double Arm Loaded Single Leg Hinge (DB/KB) → Contralateral Loaded Single Leg Hinge → Ipsilateral Loaded Single Leg Hinge →Barbell Single Leg Hinge (RDL) → Barbell Good Morning Single Leg Hinge* **(Most Skill / Strength Required)**

Practical Session Hinge

During the practical session you 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. Hinge exercises are a movement were you move at the hips and maintain a relatively neutral spine. In general hinges are movements that will cause you to push your hips back and cause a stretch and then a contraction on the way up. 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.

- Glute Bridge
- Banded Pull Through
- Kettlebell Swing
- Hip Thrust
    - Body Weight → Loaded
- Single Leg Glute Bridge
- RDL
    - Body Weight + Wall → Plate Reach RDL → DB RDL → BB RDL
- Single Leg RDL
    - Both feet on ground → Rear foot on wall → Rear Leg in Air
- Sumo Deadlift

- Good Morning
    - Body weight reach to wall → Hugging Plate → Goblet → BB
- Conventional Deadlift