



**POWERBUILDING**

# TECHNIQUE HANDBOOK

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# ABOUT ME

Jeff is a professional drug-free bodybuilder and powerlifter. Through his science-based Youtube channel which has gathered a fan-base of over two million subscribers, Jeff shares the knowledge he has gathered through university education and field experience with others who are passionate about the science behind building muscle, losing fat and gaining strength.

He earned the title of Mr. Junior Canada for natural bodybuilding in 2012 and as a powerlifter, Jeff held the Canadian national record for the bench press in 2014. As a powerlifter, Jeff has claimed a 502 pound squat, 336 pound bench press and a 518 pound deadlift with an all time best Wilks score of 446.

With a Bachelor of Science degree in biochemistry, Jeff has gathered the requisite scientific knowledge to complement his practical experience acquired through training and coaching. Jeff has coached women's



bikini and men's bodybuilding national and provincial champions, professional natural bodybuilders and nationally and IPF Worlds qualified raw powerlifters. He has presented seminars on Block Periodization, concurrent training and nutrition and training for natural bodybuilding in academic settings including the 2019 Ultimate Evidence Based Conference (UEBC), Lehman College and the University of Iowa. He has aspirations of completing a PhD in exercise science or a related field.

Jeff currently lives in Ontario, Canada, where he is producing YouTube videos and programs for people around the world.



# TECHNIQUE OVERVIEW

In this guide, you will learn why technique is so important when running this Powerbuilding Program, what “good technique” actually means and how to execute the Big 3 movements with proper technique for strength progression.

Whether you see yourself primarily as a bodybuilder or first and foremost as a powerlifter, I think technique is the most fundamental variable in this program.

## WHY TECHNIQUE IS SO IMPORTANT

For the bodybuilder, we know that the progressive overload principle is paramount for driving hypertrophic adaptation forward. This vital training fundamental should be thought of as not just adding more weight to the bar, however, but adding more tension onto the muscle itself. Dr. Brad Schoenfeld



refers to this as the “mechanical tension mechanism of hypertrophy” [1].

“Overloading” a movement by allowing form to break down does not necessarily imply that more tension has been added to the muscle, since the use of excessive momentum and the involvement of assisting muscles can help “move the weight.” For this reason, technique on every exercise should be standardized so that as you progress through the program, you are not allowing slips in technique to masquerade as “progressive overload.” There are a few common ways that trainees will alter form, just to add more weight:

1. Cutting the range of motion (ROM) shorter and shorter
2. Increasing momentum;
3. Allowing other muscles to heavily assist the target muscle; and
4. Losing focus on movement by getting “overhyped.”

If you find yourself falling into any of these traps (as we all do from time to time), it is important that you put an honest check on your movement execution and recognize that you may in fact be progressively cheating, not progressively overloading.

For the powerlifter, practicing good technique is arguably even more important than it is for the bodybuilder! This is because strength is a skill and like any other skill you want to get better at, you need to practice and refine it over time. To illustrate, let’s compare powerlifting to basketball. To maximize accuracy on free throws, for example, each individual player will need to find their unique combination of hand positioning on the ball, degree of elbow flare, ball arc and follow through that will increase the likelihood that the ball goes in the hoop. Similarly, to maximize strength in the Big 3, each lifter will need to find their unique combination of stance width, grip width, hip height, lifting posture, and so on. It simply isn’t enough to just brute force the weight from point A to point B. As powerlifters, the goal is to move the weight from point A to point B as

efficiently as possible, and in order to do that, we must seek to master our best lifting technique.

## WHEN CHEATING IS ACCEPTABLE

There are a few instances where controlled cheating on some secondary and tertiary exercises makes sense. Generating slight momentum from the hips at the bottom of a lateral raise, for example, can be useful for getting the dumbbells moving in approximately the bottom quarter of the ROM, but the dumbbells should be controlled using the side delt through the top three quarters and all the way down on the eccentric. Similarly, on rows, because the strength curve of the lats is skewed to be strongest at the bottom and weakest at the top, it is acceptable to use some mild momentum at the hips to finish out the top quarter of the range of motion. But again, the eccentric should always be very strictly controlled. Likewise on lat pulldowns, a 10-15 degree lean-back on the concentric is acceptable if it creates a more natural resistance path for you. However, an effort should be made to keep any deviation from “textbook form” consistent (i.e. if you lean back about 15 degrees on Week 1, you shouldn’t be leaning back 30 degrees in Week 8.)

In summary, while I think it is acceptable to allow for some controlled “cheating” on a few secondary and tertiary exercises to help overcome biomechanical limitations in the range of motion, primary exercises (especially squats, bench presses, deadlifts and overhead presses) should be purposefully and intentionally mastered and controlled on every single rep.

## TECHNIQUE AND SAFETY

Since building muscle and increasing strength is a time-consuming process,

it's important to stay as healthy as possible for as long as possible. I think that success in the strength game is mostly a function of just continuing to make incremental progress over years of training, without having too many setbacks resulting from injury. Consistently practicing proper technique on light work will ensure that you have ingrained the proper lifting habits when lifting the really heavy stuff.

With that said, I think some trainers do overstate the link between technique and injury. Some folks seem to believe that any deviation in form at all will guarantee them a trip to the hospital. In reality though, the link between lifting technique and injury is not as well established in the scientific literature as some would have you believe [2, 3]. The reason I bring this caveat up is so you do not approach heavy lifts with fear. The human body is an incredibly adaptive machine and there is no reason to fear technique breakdown like the plague. In fact, pain science tells us that becoming convinced that certain training modalities will cause injury may in fact increase risk of injury via the nocebo effect.

From a practical perspective, I think we need to find a middle ground between being so obsessed with "perfect technique" that you're scared to lift and being so nonchalant with technique that you end up overcommitting muscles and soft tissues to loads they aren't accustomed to carrying. The best way to do this is to make an effort to learn and practice proper technique for each lift, while realizing that if some form deviation occurs in the moment during a hard set, you most likely won't need to get out the ice pack.

## **DETERMINING IF YOU HAVE "GOOD FORM"**

As we've discussed, some trainers take the extreme stance that zero momentum

or cheating should be used when lifting, regardless of how well controlled the cheating is. Others insist that because the goal is to overload, cheating is acceptable since it allows you to move more weight. I think they are both right and wrong, depending on the exercise. Here are my technique rules for each exercise type:

Primary Exercises - Practice perfect technique on all reps (squats, bench presses and deadlifts) as much as possible.

Secondary and Tertiary Exercises - Mild momentum is permitted to get the weight moving, but always control the weight on the eccentric.

Exactly what constitutes “good form” will depend on the specific exercise being performed and the person performing the exercise. Still, a helpful practice is to record your lifts and compare your technique to the technique demonstrated in the videos provided. While keeping in mind that you should “feel exercises” in the muscle, not in tendons or ligaments, you can also have a more experienced friend or coach give you feedback.

For form instruction on specific exercises, I recommend my Technique Tuesday series:

[https://www.youtube.com/watch?v=vcBig73ojpE&list=PLp4G6oBUcv8yGQifkb4p\\_ZOoACPnYslx9](https://www.youtube.com/watch?v=vcBig73ojpE&list=PLp4G6oBUcv8yGQifkb4p_ZOoACPnYslx9)

In addition, the main program PDF also contains a list of video demos for all of the exercises found in this guide.

With exercise-specific technique variations aside (e.g. maintaining a neutral back during a squat, minimal swaying during a bicep curl, keeping the barbell in contact with the lower leg and thigh during a deadlift, etc.) there are three main

principles that constitute “good form”:

## 1. CONTROLLING THE NEGATIVE

Controlling the negative essentially means that you are lowering the weight under your own control, not under the control of gravity alone. This is an important concern both for safety reasons and, as some literature suggests, the eccentric (negative) portion of the lift may be the most important for muscle growth as well [4, 5].

A 2015 meta-analysis by Schoenfeld, Ogborn, and Krieger found that rep durations between 0.5-8 seconds all lead to similar amounts of hypertrophy [6]. This suggests that you can choose a tempo that feels comfortable for you, while maintaining full control of the weight throughout the entire repetition. My personal recommendation is to aim for a one to two second negative and a one to two second positive on most lifts, with the main criteria being that you are consciously and actively controlling the weight throughout the full range of motion. For primary lifts like bench presses and squats, you should aim for a more “explosive” concentric and focus more on the movement of your entire body in three-dimensional space, rather than on a specific lifting tempo. Deadlifts are the one possible exception where the eccentric does not need to be controlled to the same degree. On deadlifts, simply hold the bar on its way down and maintain bar position directly over the middle of your foot, allowing the bar to descend at a speed that feels natural for you.

## 2. FULL RANGE OF MOTION

Although research does suggest that partial range of motion training (“half reps” or “quarter reps”) can be a useful training tool for strength development [7-10],

and we will utilize them to some extent on “reverse-21’s” for biceps and triceps, for the most part, we will benefit maximally from consistently training through a full range of motion. This basic habit across all exercises will allow for a more complete understanding of the movement pattern and ensure roughly equal strength abilities at all points through the movement’s range of motion.

From a safety perspective, it’s also important to note that a full range of motion will usually require the use of lighter weights. Using the bench press as an example, you will be able to lift much more weight if you only bring the bar half way to your chest than you will by bringing the bar all the way down to touch your chest. This “extra weight” on the bar may cause additional stress on the joints and soft tissues without any additional benefit in terms of hypertrophy. Highlighted in a 2013 study by Bloomquist and colleagues, researchers found that going through a full range of motion resulted in greater increases in muscle mass than using a partial range of motion [8]. Granted, there is counter-evidence suggesting that as long as intensity (relative effort) is equated, full and partial ranges of motions lead to similar hypertrophy [9, 10]. This might imply that the most important reason to use a full ROM is that loads can be moderated for the same (or slightly better) hypertrophic benefit, while protecting the joints and soft tissues.

### **3. PROPER BREATHING**

Knowing how to breathe during a lift is something many lifters struggle with. It is common to see people either holding their breath for far too long during a set, or having the pace of their breathing totally out of sync with the pace of their reps.

My simple recommendation on most lifts is to inhale before or during the eccentric (negative) and exhale during or after the concentric (positive). This

may feel awkward at first so I recommend paying close attention to your breathing during your warmup sets so that you can better “ingrain” those proper breathing habits for your heavier sets. If your temptation is to hold your breath while lifting, consciously remind yourself to breathe and consider “marking the breath” by saying to yourself “breathing in” as you lower the weight and “breathing out” as you lift the weight back up.

The Valsalva technique is when you forcibly exhale against a closed glottis during the concentric portion of a lift. Powerlifters use the Valsalva technique on squats, bench presses and deadlifts to increase the amount of weight lifted by increasing pressure in the abdomen. Using the squat as an example: After you walk the bar out and set your feet, you would take a deep breath in before you descend and then hold your breath on the negative, while pressing your tongue against the roof of your mouth. You would then keep your breath held throughout the positive and let your air out once you reach the top of the positive (or approximately three quarters of the way through the positive).

In the intermediate-advanced stage of lifting, I would recommend using the Valsalva maneuver on primary exercises (squat, bench press and deadlift) to your own comfort level, since it will very likely help increase the weight you are using and may increase stability during the lift as well. However, keep in mind that this breathing technique is associated with a greater increase in blood pressure, so use it at your own discretion and be particularly cautious if you are at risk of hypertension.

## **THE MIND-MUSCLE CONNECTION**

When it comes to movement execution and proper technique, the mind-muscle connection is a widely debated topic. Should you focus “internally” by thinking

about what muscles you're supposed to be targeting with each exercise? Or, should you focus "externally" by thinking about using your body as a whole? As usually is the case, I think that the answer is not black and white and depends on the exercise in question.

In this program, the mind-muscle connection should not be used on primary exercises like squats, bench presses, deadlifts and overhead presses, as these are highly technique-focused exercises that will activate a large muscle mass regardless of attentional focus. For these movements, it is better to focus on the movement of your entire body in 3D space and simply execute the exercise with proper technique and through a full range of motion.

For secondary and tertiary exercises, you can use the mind-muscle connection to increase activation of the target muscle as you feel appropriate. Research has shown increased muscle activation when subjects are instructed to use "internal cueing" (such as squeezing your glutes as hard as possible to get the barbell to move in a hip thrust) as opposed to "external cueing" (such as simply moving the barbell upwards) [11, 12]. Recent data has also suggested that use of a mind-muscle connection can be useful for enhancing muscle hypertrophy [13]. So, while it may not be appropriate for all exercises, practicing and cultivating a strong mind-muscle connection is well-advised on isolation exercises and secondary compounds, if your goal is to achieve the best muscular development possible.

## TECHNIQUE IS INDIVIDUAL

Before moving onto my recommendations for technique on the Big 3 lifts, it is important to emphasize that technique is highly individual based on individual



biomechanics and limb proportions. For example, no matter how much someone with long femurs practices squat technique drills, he or she will always lean forward more on their squat than someone with shorter femurs. Similarly, someone with a big rib cage will always have a higher contact point and shorter ROM on the bench press than someone with a shallow rib cage. And, when it comes to the deadlift, a trainee with short arms will be required to have a lower starting hip position to reach the bar than a lifter with long arms.

In this sense, we should consider the technique guidelines below as general principles, not inviolable commandments, never to be broken. Ultimately, you will need to take these general principles and adapt them to your body and its unique biomechanics. It may take longer than the length of this 10 week program to fully figure this out. In fact, this may be one of those things better described as a “journey,” rather than a destination. Throughout our entire lifting career, we should be regularly adjusting and refining, getting ever closer to that technical ideal for each of us.



# THE SQUAT



# SQUAT MECHANICS

Referred to by many trainers as the “king” of lower body exercises, the squat is the first lift performed by competitors in a powerlifting meet. I think the squat gets its reputation as a superior exercise from its large range of motion, high potential for overload and involvement of large muscle masses. Attesting to its incredible capacity for overload, elite level natural athletes, such as Ray Williams, have claimed squat maxes of over 1000 pounds in competition. While the squat is considered a lower body exercise, it also involves muscles of the back and core as stabilizers (especially the spinal erectors).

## WHICH JOINT ACTIONS ARE BEING PERFORMED IN A SQUAT?

1. Knee extension: “straightening” your knee like in a leg extension;

2. Hip extension: “straightening” your hips underneath your midsection; and
3. Hip external rotation: “opening” hips up and pushing your knees out.

## WHICH MUSCLE GROUPS PERFORM THESE JOINT ACTIONS?

### 1. THE QUADRICEPS

The quads’ primary function is to extend the knee (taking the leg from a bent position to a straight position). It is important to note that since the rectus femoris (the most superior head of the quads) crosses both the knee joint and hip joint, it will not act as a primary mover, but rather a stabilizer in the squat.

### 2. THE ADDUCTORS

This will come as a surprise to many, but the adductors (specifically the adductor magnus) may be stronger contributors to hip extension in the squat than the glutes or hamstrings [14]! As we will see, since the hamstrings cross both the knee and hip joint, they are unable to effectively extend the hip joint, making them stabilizers rather than prime movers.

### 3. THE GLUTEALS

The primary functions of the glutes are hip extension and external rotation. Although research has shown that deeper squats tend to lead to more glute involvement, [15] this may only be the case when the same load is used across varying squat depths [16].

## IMPORTANT STABILIZERS IN THE SQUAT INCLUDE:

**THE HAMSTRINGS:** As mentioned, because the hamstrings cross both the knee joint and the hip joint, in the squat they are unable to contribute

meaningfully to hip extension. As you perform a concentric rep, the hamstrings are lengthening at the knee while shortening at the hip, meaning that their length remains near constant throughout the range of motion.

**THE ERECTOR SPINAE:** The spinal erectors will stabilize the torso and prevent spinal flexion (lower back rounding). This fact highlights the idea that the squat is not an effective abdominal exercise. If the abs were to actively contract during the squat, they would compete with the erector spinae, pulling you into a more flexed (and more dangerous) spinal position. Granted, co-contraction of the rectus abdominis will occur during the squat, similar to how the biceps co-contrast in a skull crusher exercise. But saying that the squat is a good exercise for the six pack would be like saying the skull crusher is a good exercise for the biceps.

**MUSCLES OF THE SCAPULAE:** the muscles surrounding the scapulae (trapezius, rhomboids, rear deltoids) prevent anterior tilting and scapular protraction, which can be seen when your upper back collapses forward, causing your chest to “cave in.”

**THE CALVES AND ANTERIOR TIBIALIS:** the musculature of the lower leg will provide stability as your ankle goes through a plantarflexion range of motion.

# SQUAT ANATOMY

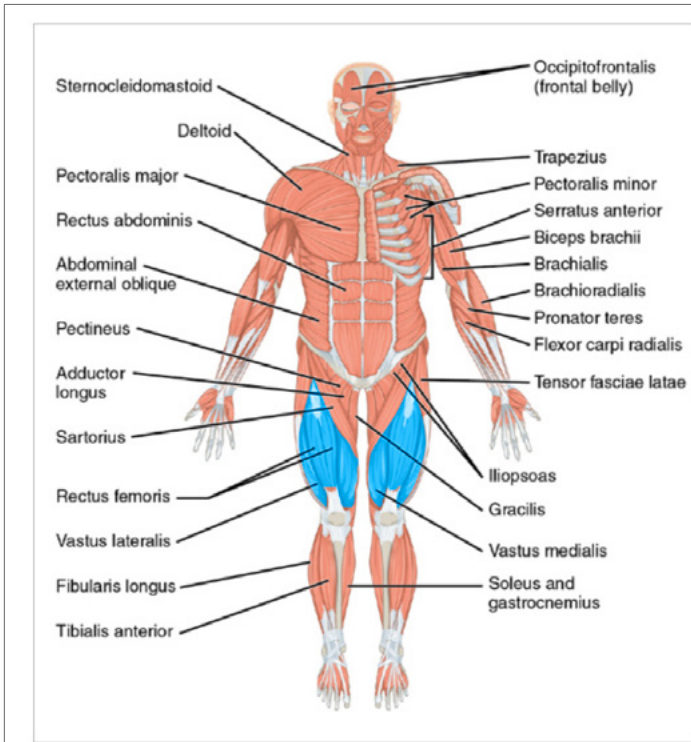


Figure 1A: The Primary Anterior Muscles Active in the Squat (Highlighted in Blue)

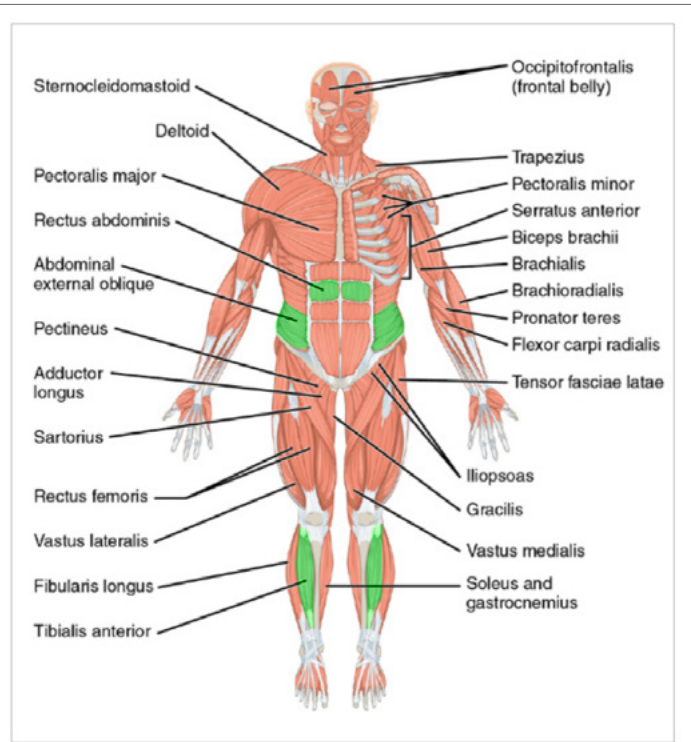


Figure 1B: The Stabilizing Anterior Muscles Active in the Squat (Highlighted in Green)

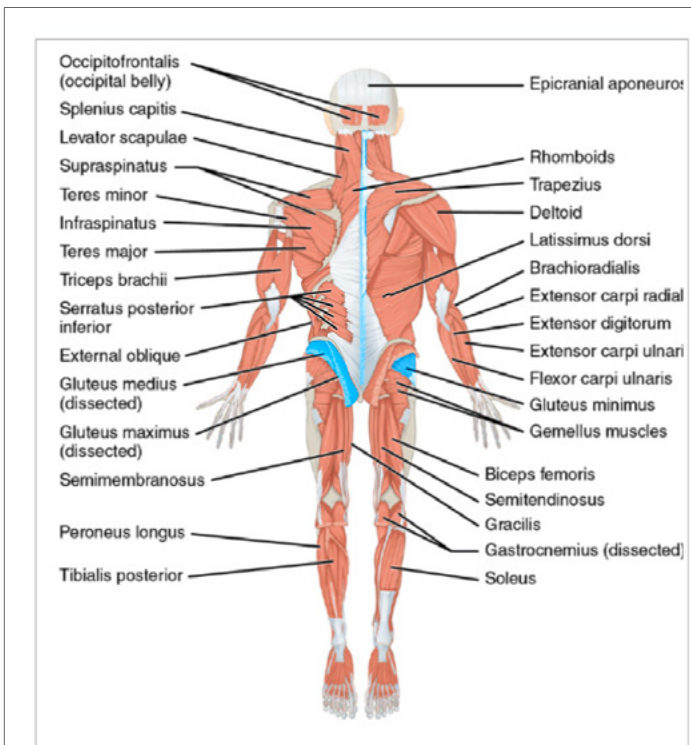


Figure 2A: The Main Posterior Muscles Active in the Squat (Highlighted in Blue)

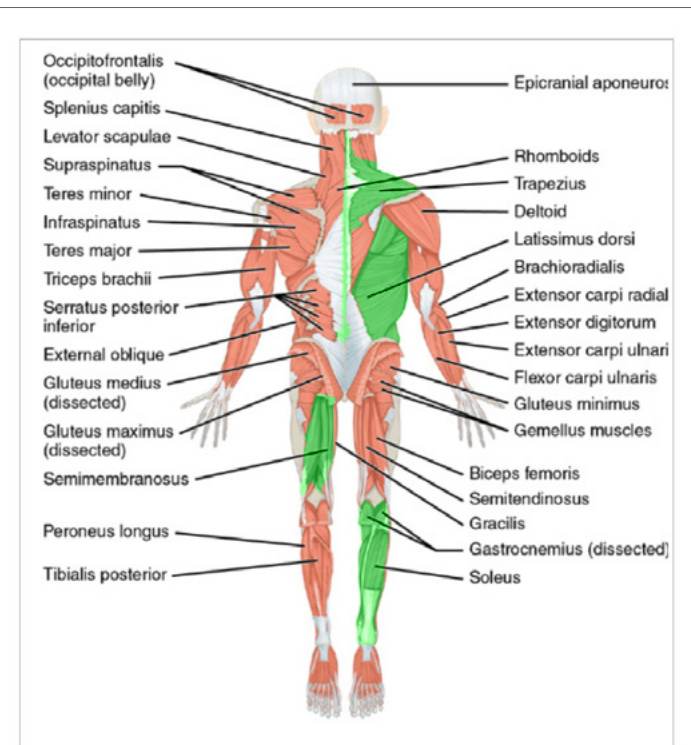


Figure 2B: The Stabilizing Posterior Muscles Active in the Squat (Highlighted in Green)

# SQUAT TECHNIQUE

Now that we understand the anatomy and biomechanics responsible for performing the squat, we can cover exactly how to perform the squat properly. Please refer to my squat technique [video](#) for a visual description of the movement.

We're going to split the squat up into two separate stages: the set up and the execution.

## THE SETUP

For simplicity, we will cover high bar squat mechanics first. At the end of this section, I will outline a few key technique differences between high bar versus low bar squat; the rest can be assumed to be the same.

1. Set the bar up on the rack so that when you stand up, the bar completely clears the hooks. The bar should be positioned around armpit height on the rack.
2. Always begin with a pre-lift check: ensure the bar is perfectly centered, the weights are properly loaded, evenly balanced on both sides and you have a spotter present if you are training with heavy loads or high efforts.



*Unrack: When you stand up, the bar completely clears the hooks*

## THE EXECUTION

Now that the squat has been set up, it's time to actually execute the set. We're going to break down the squat execution into four phases:

1. Unrack
2. Brace
3. Descend (eccentric/negative)
4. Squat (concentric/positive)

## UNRACK

### 1. FIRST, SET-UP FOR THE UNRACK.

a. Grab the bar evenly. If your bar has a ring on the outer knurling, use that as a reference point. Typically, for a high bar squat, the closer the grip is to



your shoulders, the more stable the bar will be. Larger individuals or those with limited shoulder mobility may need to take a wider grip.

b. Stand with your feet directly underneath the bar (or slightly in front of it) with a shoulder width stance.

c. While retracting your shoulder blades, place the bar on your upper traps to rear delt area. If you push up on the bar, the bar shouldn't slide or shift around at all.

d. Take in a breath and brace your core (Valsalva maneuver). If you are wearing a belt, think about pushing your midsection out against the entire surface area of belt, not just the middle part of your stomach.

## **2. UNRACK THE BAR AND WALK IT OUT**

a. While holding your breath, push your hips forward to stand fully upright.

b. Take one medium length stride back with your left foot, then one small step back with your right foot so that it's about two inches behind your left foot. Lastly, take another small step with your left foot to align your heels. Your feet should be planted with about 15-30 degrees of foot flare.

c. Squeeze your glutes to externally rotate your hips. You can think of this as "screwing" your feet into the floor. If done properly, you will notice that your knees aren't pointing forward, but forward and slightly out.



*Unrack by pushing your hips forward.*

## BRACE

### 3. NOW THAT YOU'VE WALKED THE BAR OUT, BRACE BEFORE STARTING THE ECCENTRIC.

- a. Take another breath in, focusing on pushing your midsection out to cover the entire surface area of the belt (if you are wearing one).
- b. Brace your upper back against the bar by driving your upper back into the bar.
- c. Additionally, you can think about pulling the bar apart with your hands to enforce scapular retraction.
- d. Brace your feet into the ground by making even contact with your heels, big toe, and pinky toe. You visualize this by thinking about pushing through the middle of your foot.



*Before the descent, balance your weight evenly across your entire foot.*

## DESCEND

### **4. NOW THAT YOUR BODY IS AS RIGID AND STABLE AS POSSIBLE, YOU CAN BEGIN THE ECCENTRIC.**

- a. Start by pushing your knees both forward and out, while at the same time, sitting your hips straight down.
- b. Maintain constant pressure between your heels, big toe, and pinky toe against the floor.
- c. Keep your head slightly extended throughout the entire range of motion. You can think of this as gazing your eyes slightly up. This will help with keeping your upper back tight.
- d. Throughout the eccentric, your knees should be tracking in line with your

- femur and ankle. If you draw a straight line down, your joints will be stacked.
- e. The bar path should be as vertical as possible.
  - f. As a minimum standard for hypertrophy and general strength, I recommend your squat depth be at least parallel to the ground. For regulation powerlifting technique however, you need to get the hip crease below the knee. That is, you will have to go below parallel before beginning the concentric (squat) phase.
  - g. The eccentric should not be excessively slowed down. It should only last about one second and the motion should be reversed as soon as you reach the appropriate depth.



*Push your knees both forward and out.  
The knees can safely travel in front of the toes.*

## SQUAT

### 5. THE CONCENTRIC OR "SQUATTING" PHASE IS THE REVERSE OF THE

## **ECCENTRIC PHASE.**

- a. Drive your knees out in the same direction as your toes.
- b. Maintain constant pressure through your heels, big toe, and pinky toe.
- c. Forcefully explode on the concentric: think about jumping when you are at the very bottom. Of course, you do not want to actually have your feet leave the floor.
- d. You will “ride out” the stretch reflex, meaning you should not pause in the bottom of the squat, but you also do not want to uncontrollably bounce off of your ankles or calves.
- e. Once you break past the sticking point or about half way up, you can exhale.
- f. Begin your next rep by re-bracing and repeat for reps.

## **CONSIDERATIONS FOR LOW BAR SQUATTERS**

Squatting with a low bar position means you position the bar about two to four inches further down on your rear delts, rather than on your upper traps. I think that many trainers make too much noise about the differences between high bar and low bar. Ultimately, it comes down to personal preference. Most powerlifters squat with a low bar position because it typically allows for up to ten percent more load to be lifted. For bodybuilders however, I tend to prefer the high bar position simply because it allows for very similar muscle activation with lighter loads and potentially less demand on the lower back.

If you’ve never tried low bar squats, I would recommend at least trying them to see if the change in position feels strong and comfortable to you. Otherwise, most generally, I recommend that powerlifters squat low bar (unless they’re stronger with high bar) and bodybuilders squat high bar (unless they also have powerlifting goals).

When it comes to technique differences between high bar and low bar, there are a few key things to emphasize:

HIGH BAR	LOW BAR
Barbell is positioned up on the upper traps	Barbell is positioned further down on the rear delts
Grip (hands) can be closer together	Grip (hands) can be slightly wider
Eye gaze should be straight ahead	Eye gaze should be slightly down
Back should stay more upright throughout the lift	More forward lean is necessary throughout the lift
Break at the hips and knees at the same time	Option to break at the hips slightly first
Sit hips straight "down"	Sit hips further back
Shoulder width feet stance	Outside of shoulder width feet stance
Generally results in a deeper squat (ATG squat)	Generally less depth on the squat (slightly below parallel)



*Difference in bar placement for the high bar squat and low bar squat*

## WHERE IS THE STICKING POINT IN THE SQUAT?

The sticking point in the squat usually occurs in the bottom 20 percent of the

ROM for everyone, regardless of training experience and strength ability. Most people can get about 15-20 percent of the way up, at which point the momentum from the stretch reflex dissipates, bringing further upward movement to a halt.

## HOW DO YOU BREAK THROUGH THE STICKING POINT?

This question is nearly synonymous with, “How do you hit a PR when you squat?” For most people in most situations, simply building bigger and stronger quads, adductors and glutes is the answer. With that said, there are a few specific techniques and drills that can be uniquely helpful for busting through the sticking point and setting new PRs:

### I. PAUSE SQUATS

Pause squats are included in the program to enforce explosive power out of the bottom of the squat. The pause at the bottom will eliminate the stretch reflex, forcing you to rely more on pure concentric strength to get the bar moving from a dead stop.

### II. SPEED SQUATS

Speed squats are included for a similar reason: to develop explosive power out of the hole, without accumulating excessive muscular fatigue from very heavy loads.

### III. CHECK FOR FORM DEVIATIONS

The most efficient bar path is nearly perfectly vertical, with the bar centered over the middle of the foot when viewed from the side. If you notice any spinal flexion (lumbar or thoracic rounding) when squatting, your bar path may be less vertical than ideal, leading to suboptimal performance. We will cover this in

more detail in the Common Technique Errors section.

#### **IV. GET YOUR HIPS “UNDER THE BAR”**

One helpful cue for breaking through the sticking point that I personally use is to think about thrusting my hips forward as I slightly push my knees out into the direction of my toes. Don't overthink this cue to the point that you drive your knees way out and lose your balance but the goal should be to get your hips back under the bar to lessen the demands on the potentially limiting hip musculature. If you're never tried this, try it for yourself and see if it helps. This [video](#) may better help you wrap your head around the cue. While watching, pay attention to how just shifting his hips forward a little bit helped him finish out the lift.

## **COMMON SQUAT TECHNIQUE ERRORS**

In this section, we will cover the most common squat mistakes in chronological order as they would be likely to happen during a set.

### **SET UP ERRORS**

#### **1. NO UPPER BACK TIGHTNESS**

Upper back tightness is critical for a safe and effective squat. If you notice your hips shooting up early, this may stem from inadequate upper body tightness. If the scapulae protract and anteriorly tilt (due to lack of upper back tightness), the hips can shoot up to compensate, often resulting in lower back rounding, as well. This is not an ideal body position from a strength or safety perspective.



To maintain upper back tightness throughout the lift, keep your grip relatively close to the shoulders, retract your shoulder blades during the setup and think about driving your back up into the bar (as you would in an “isometric good morning hold”).

## **2. INAPPROPRIATE FOOT POSITION**

Although foot position will be highly dependent on your specific anthropometry and mobility, you should aim to utilize the same foot position on every single rep. Some of the most common foot positioning errors are:

### **\* TOO NARROW OF A STANCE**

Planting the feet too close together makes it nearly impossible to hit depth without form deviation. In nearly every case, your knees will either travel extremely far in front of your knees (which isn’t necessarily problematic, but most people simply don’t have the ankle mobility to actually do so), or you will have to squat with significant amounts of knee varus (when your knees are being pushed laterally outside your feet) which may be just as or more dangerous than knee valgus (caving).

### **\* TOO WIDE OF A STANCE**

Having too wide of a stance is more common for people with longer legs. Most often, taking a very wide sumo stance will make it more difficult to reach full depth due to inadequate hip mobility (especially with the high bar squat). If you can comfortably reach depth with a wide stance, however, there is nothing inherently problematic with it.

### **\* FOOT PRONATION (“LOSING YOUR ARCH”)**

Foot pronation will almost always manifest itself as knee valgus in the squat. This is why the cue of maintaining even pressure through your heel, big toe, and pinky toe is so important: if you lose contact with your pinky toe, your foot is pronating. In most cases, wearing a squat shoe with a sturdy, elevated heel will automatically fix this issue.

### **\* LACK OF ANKLE DORSIFLEXION MOBILITY**

This is not necessarily a “form error” per se, but rather a mobility deficit that can lead to various technical problems. If you lack the mobility to keep your heels planted in the bottom of the squat, a foam rolling and dynamic warm-up routine, focused on the calves and hamstrings before squatting, will increase ROM acutely. Investing in squat shoes with an elevated heel can serve as a simple and effective “quick fix”, as will elevating your heels onto a one inch high plate.

## **EXECUTION ERRORS**

Keep in mind the order of each phase as we go through the most common errors:

- 1: UNRACK**
- 2: BRACE**
- 3: DESCEND**
- 4: SQUAT**

## **1. UNRACKING ERRORS:**

The most common unracking error is setting up the hooks either too high or too low. When you unrack, you should not have to go onto your tippy toes to get the bar off the hooks. By the same token, you want to minimize the distance you have to “squat the bar up” off the rack so you don’t waste energy before the actual lifting begins.

## **2. BRACING ERRORS:**

When handling lighter loads, you still want to be consistent with the walk out and bracing phase. Rushing into the set before properly setting up your feet and hips can lead to an asymmetrical, uncoordinated squat for heavier working sets.

When bracing, avoid “flexing your abs down,” since this will pull your spine into flexion, creating unnecessary shearing force and putting you into a weaker lifting position. Instead, push your gut out against your belt (if you have one) as you take in a deep breath of air.

The bar shouldn’t be simply loosely resting on your back. If you feel the bar digging into your spine, you probably aren’t bracing your upper back properly. Pull your grip in as close as you comfortably can and ensure that the bar is locked into position through scapular retraction.

## **3. DESCENDING ERRORS (ECCENTRIC)**

The most common error in the descending phase is not externally rotating and abducting at the hip. To correct this, you can think about pushing your knees out in the same direction as your toes.

Inconsistent depth is another issue many trainees experience. Whether going for a new one rep max or a light warm-up set, you should be squatting as deep as you comfortably can. As the load gets heavier, do not shorten your range of motion just so you can lift more weight. Remember, adding more weight to the bar only counts as true progressive overload if form and range of motion are constant.

Although it is smart to use the stretch reflex for a slight “bounce” at the end of the eccentric, you should be in complete control at the bottom of the movement. Excessive bouncing between the concentric and eccentric can lead to knee pain and cause inconsistencies in technique. While there is no simple way of quantifying exactly how much bouncing is “too much,” if you really struggle with paused squats, that may be an indication that you are bouncing too hard on normal squats.

#### **4. SQUATTING ERRORS (CONCENTRIC)**

Concentric errors on the squat usually stem from improper bracing and/or descending. If you execute the bracing and descending phases properly, as you stand back, the concentric should come quite naturally.

While it is extremely common to hear the cue to “push through your heels” (and it may have more utility with the low bar squat) with the high bar squat, you should actually be pushing through the midfoot, since pushing through the heels will shift your center of gravity back too far. This often results in the hips rising prematurely and the lumbar spine going into flexion (rounding). While minor spinal flexion (buttwhink) may not be inherently problematic or injurious, the inefficient bar path will decrease strength potential and quad activation [17].

With the basic squat mechanics, techniques and errors covered, now let's turn our attention to the most important lift for answering that crucial question for impressing gym bros: "How much ya bench?"



# THE BENCH PRESS



# BENCH PRESS MECHANICS

The barbell bench press is one of the most popular upper body exercises for testing overall strength and is the second lift performed by competitors in a powerlifting meet. While the bench press is appropriately considered an upper body or chest exercise, it is often undermined how much proper execution of the bench press involves muscles of the triceps, deltoids and even stabilizers like the back, core and lower body.

## WHICH JOINT ACTIONS ARE BEING PERFORMED IN A BENCH PRESS?

1. Transverse shoulder adduction (bringing your arm across your body like in a pec flye);
  2. Shoulder flexion (raising your arm up like in a front raise);
  3. Elbow extension (“straightening” your elbow like in a tricep pushdown);
- and

4. Shoulder internal rotation (rotating your arm in toward your body).

## WHICH MUSCLE GROUPS PERFORM THESE JOINT ACTIONS?

### 1. THE PECTORALIS MAJOR

Both the sternal (mid/lower) and clavicular (upper) heads of the pecs are active in the bench press [18]. The pectoralis major's primary function is to adduct the shoulder in the transverse plane (bring the elbows in closer to one another).

### 2. THE ANTERIOR DELTOIDS

The anterior deltoid's primary function is to flex the shoulder (raise your arm up toward your head).

### 3. THE TRICEPS BRACHII

The triceps brachii's primary function is to extend the elbow (taking the arm from a bent position to a straight position).

## IMPORTANT STABILIZERS IN THE BENCH PRESS INCLUDE:

**THE LATISSIMUS DORSI:** The lats will be active primarily when the shoulder is behind the torso at the very bottom end of the range of motion and assist in stabilizing the shoulder and assisting the pecs with internal rotation throughout the ROM.

**THE LOWER, MID, AND UPPER TRAPEZIUS:** The mid and upper traps perform scapular retraction, keeping the setup tight throughout the press. The lower traps maintain isometric scapular depression which prevents scapular protraction (upper back rounding forward) and scapular elevation (shoulders shrugging upward).



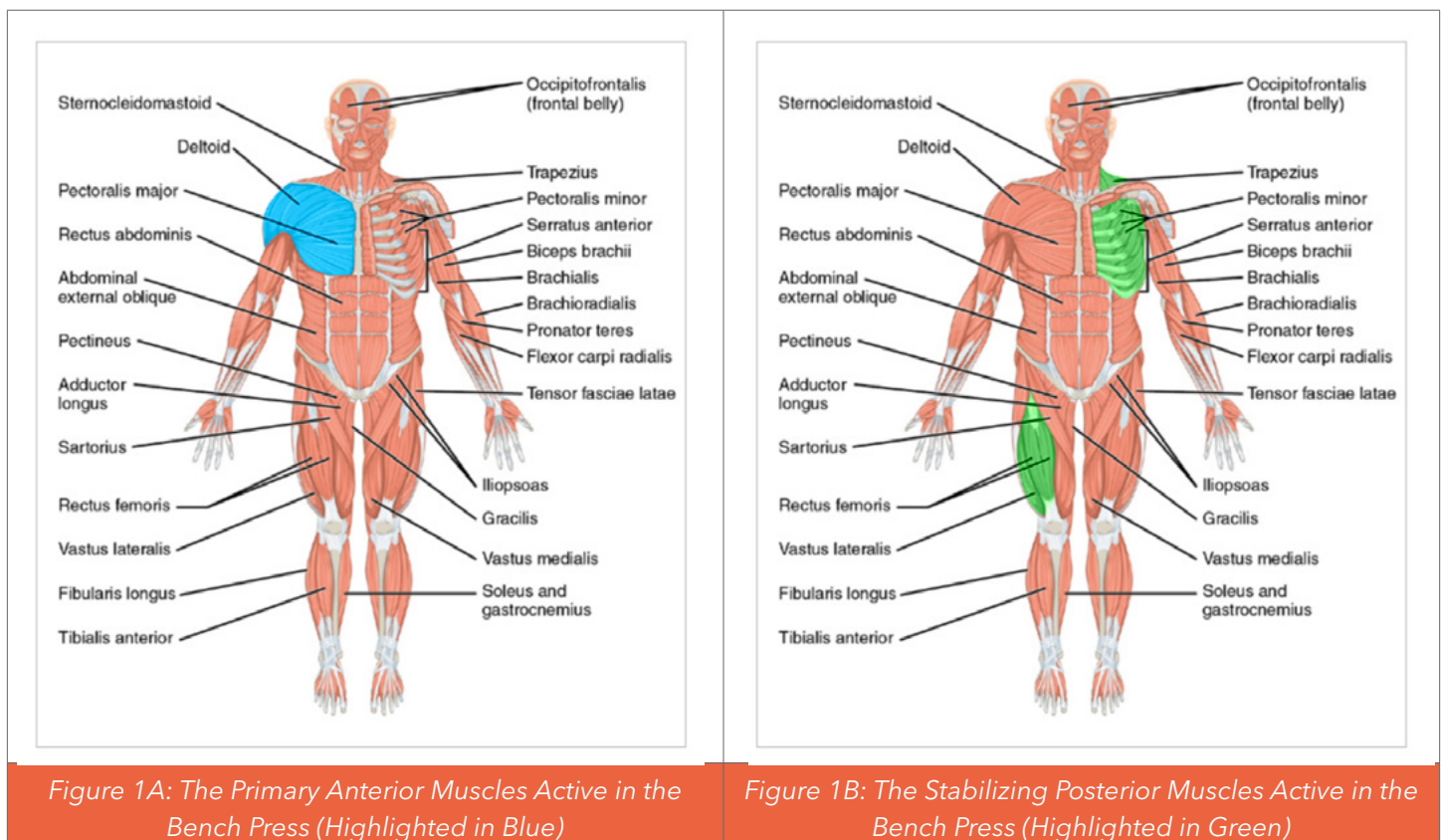
**THE SERRATUS ANTERIOR:** Prevents “scapular winging,” which causes protraction of the scapulae (upper back rounding forward).

**ROTATOR CUFF:** The muscles of the rotator cuff provide shoulder stability, preventing excessive internal or external rotation.

**LOWER BODY MUSCULATURE:** Leg drive helps keep the torso stable and creates force to be transferred to the upper body pushing muscles.

**ERECTOR SPINAE:** The erector spinae stabilize the arch by maintaining lumbar extension isometrically.

## BENCH PRESS ANATOMY



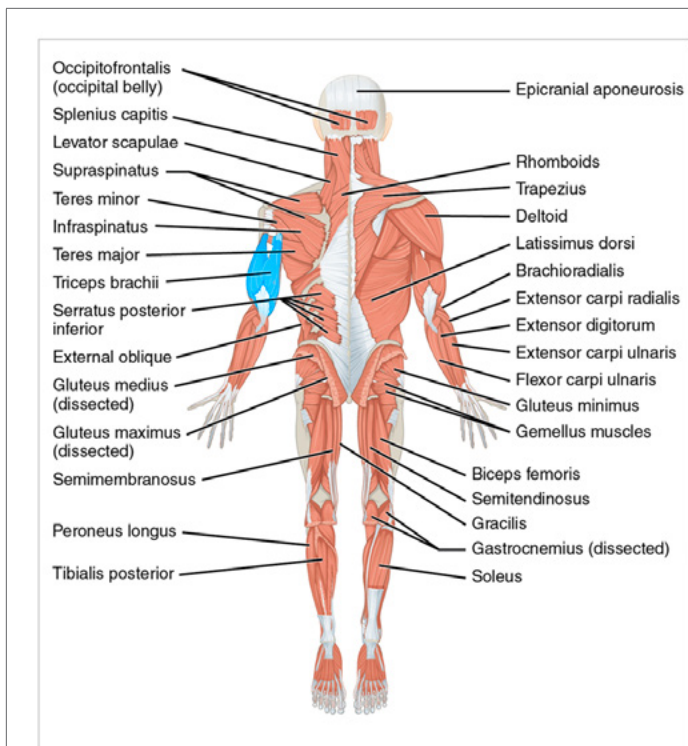


Figure 2A: The Main Posterior Muscles Active in the Bench Press (Highlighted in Blue)

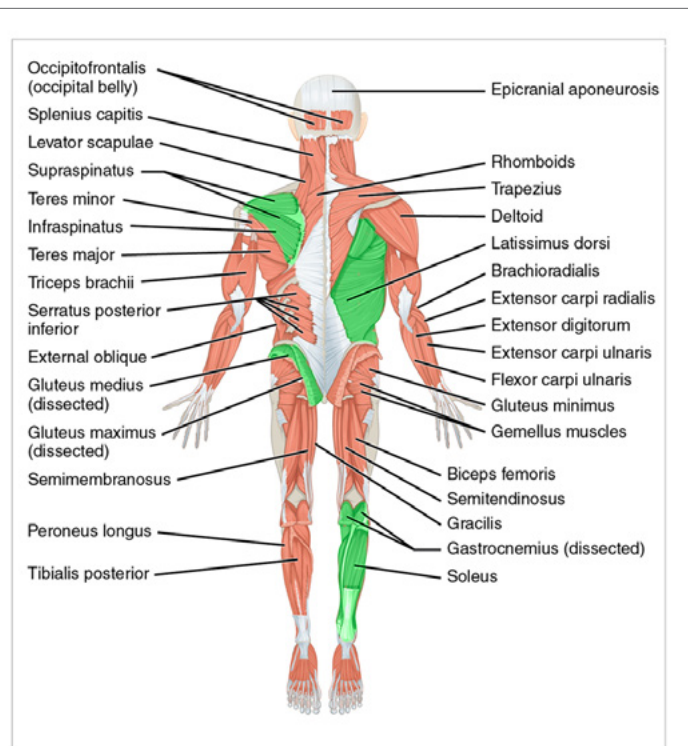


Figure 2B: The Stabilizing Posterior Muscles Active in the Bench Press (Highlighted in Green)

## BENCH PRESS TECHNIQUE

Now that we understand the anatomy and biomechanics responsible for performing the bench press, we can cover exactly how to properly perform the bench press. Please refer to my [bench press technique video](#) for a visual description of the movement.

We're going to split the exercise up into two main components: A. the setup and B. the execution.

### THE SET UP

First, it is important to note that what follows is just one way to set up the bench press and there are other ways to achieve the same endpoint (which is a safe, stable and powerful arch).

1. Always begin with a **pre-lift check**: ensure the bar is perfectly centered, the weights are properly loaded and evenly balanced on both sides, and if you are training with heavy loads or high efforts, you have a spotter present.

2. Lie flat on the bench with your head back behind the bar, your feet up on the bench and **squeeze your shoulder blades** together, keeping them in this retracted position throughout the whole setup and execution of the lift.

3. **Set up your arch** by lifting your arms up and grabbing the bar with a shoulder width grip OR you can reach back and push against the uprights of the bench. I personally prefer to simply grab the bar to set up my arch.

a. Lift your hips up high while thinking about pulling your shoulder blades to your butt, which will help force you into scapular depression.

b. Push your upper body forward while keeping your feet in place. You can go up on your toes to get more arch if you find it helps.

c. At this point you should have your back planted down on the bench and your eyes should be directly under the barbell.

4. **Position your lower body for leg drive** by lowering one foot at a time, positioning your feet as far back as you comfortably can, while keeping your legs in close to the bench when viewed from front on.

a. For regulation powerlifting technique, your heels must be planted on the ground, so you may have to externally rotate your feet or point your toes out to get the heels down.

b. Drive your feet into the ground as if you were leg pressing the floor down and out.

c. Make sure you've dropped your hips down so that your butt is touching the bench.

5. **Take your grip width**. Research has found that wider grips will target the

sternal head of the pecs and anterior delt more, while a closer grip will target the triceps and clavicular (or upper) chest more [19].

- a. In general, you'll want to grab the bar with about 1.25 - 1.75 times shoulder width grip. If you are competing in powerlifting, maximum grip width is when your index finger is on the outer knurling ring of the bar.
- b. It's important to choose a grip which feels safe for your shoulders. A 1.5 times shoulder width grip has been shown to reduce the risk of shoulder injury without compromising lifting performance [20].
- c. To figure out what feels and works best for you, it makes sense to use a variety of grip widths in training, until you find that perfect fit for you.
- d. Another important factor in determining grip width should be whether or not your joints are "stacked" from the rear position, where the wrists are roughly positioned over the elbows in the bottom of the press. It's worth noting however, that some advanced powerlifters don't always keep the joints perfectly stacked so they can take a wider grip and reduce the range of motion.

## 6. **Do a quick positioning double check.**

- a. When viewed from the top, your joints should be "stacked" on top of each other. That is, the hand, wrist, upper arm, and shoulders should be connected in a straight line.
- b. When viewed from the side, your wrists should be directly below your knuckles. Think about "punching the ceiling" to enforce this position. Digging in the bar directly above the base of your thumb can help to secure your grip, while allowing for minimal wrist extension.
- c. Right before the lift off, I'll do one final check to make sure my shoulder blades are retracted and depressed by cranking my elbows forward. I think of this as "screwing my back" into position.



*End position for a powerlifting-style bench press setup.  
Note that despite the arch, the glutes must make contact with the bench.*

## **WHAT IF I ONLY HAVE MUSCLE BUILDING (NOT STRENGTH) GOALS? (SETUP DIFFERENCES FOR BODYBUILDING ONLY)**

Since the above setup will allow you to overload the target muscles with maximum load, for those strictly interested in bodybuilding, the same general setup can still apply. I think bodybuilders tend to exaggerate the difference in range of motion between an arched setup and a flat back setup because if you compare the joint angles in the arched bench press and the flat back bench press, the position of the humerus relative to the torso at the end range of motion is very similar, despite the fact that the bar will have travelled further in the flat back press. Considering this, even as a bodybuilder, you should work on building your arch and not fret about limiting your range of motion when using it.

However, with that said, assuming maximizing strength isn't a primary goal of yours, you can optionally make the following adjustments to the setup:

1. You can take a less extreme arch. (Simply keep your shoulder blades retracted throughout the lift and maintain some arch in your lumbar spine.)
2. You can take a slightly more narrow grip to increase the range of motion. Granted, the actual hypertrophic effects of this modification will likely be small.
3. If your arch is more shallow, your feet can be further forward. (Note how this will diminish leg drive and result in lower poundage, but may be more comfortable with the smaller arch.)



### **BODYBUILDING-ONLY SET UP**

*End position for the "bodybuilding-only" setup.*

*Most people running this program will see better strength gains by working on the powerlifting-style bench press setup.*

## THE EXECUTION

Now that the bench press has been set up, it's time to actually execute the set. We're going to break down the bench press execution into 4 phases:

1. Unrack
2. Brace
3. Descend (eccentric/negative)
4. Press (concentric/positive)

### UNRACK

1. First, unrack the bar by:
  - a. having the spotter help you lift out, not up. You should not lose setup tightness or positioning during the lift off.
  - b. If unracking yourself, you may want to keep your butt elevated for the lift off component and then drop your hips down once you've unracked. In any case, it's well advised to have a spotter handy when going near maximal effort.
2. Bring the bar forward out of the rack until it's positioned roughly at nipple level.
  - a. At this point, ensure you have four main points of contact: your head, upper back, glutes, and feet should all be planted.

### BRACE

3. Now that you're in position, take a deep breath into your gut, pressing the air out against your sides or against your belt, if you have one. To expand your rib cage as much as possible, at this point you can also cue yourself to

“puff out your chest.”

a. To better understand this, imagine someone trying to poke your stomach and sides in, while you use your breath to push their finger back out in all directions.

4. Grip the bar as hard as you can.

a. You can optionally cue to “bend the bar” or “rip the bar in half.” This will activate your upper back muscles to help maintain tightness during the descent. It will also ensure everything is “locked in” place as you breathe in and hold your air.



*After the unrack, the bar should be positioned roughly at nipple level and you can optionally use the cue to “bend the bar” (indicated by arrows above) to engage your upper back muscles and get the elbows slightly tucked for the descent.*



## DESCEND

5. Holding your breath, drop your elbows down at about a 45° angle relative to your torso when viewed from the top.
  - a. From person to person, there can be slight variation between tucking or degree of flaring, but a 45° angle is a great place to start.
  - b. When viewed from the side, the bar should be traveling down and slightly forward.
  
6. Lower the bar until it touches your torso, making contact with your lower chest or upper abdominal area.
  - a. On certain days, this program calls for a two to three second pause on the chest. The bar should be motionless throughout the entire duration of the pause. Don't allow the bar to slowly sink into your chest during the pause.
  - b. On other days, the program does not specifically call for a pause. Still, on these days, you should aim for a controlled, short 0.5-1 second pause on the chest for all reps. Do not allow the bar to bounce off your chest. If you need to bounce the bar off your chest, the weight may be too heavy or you may need to get better control of the bar on the eccentric.
  
7. You are now ready to begin the concentric (press) phase



*Drop the elbows at about a 45 degree angle and make contact on your lower chest/lower sternum area.*

## PRESS

8. After pausing on your chest, **explode the bar up and slightly back**, driving your heels into the floor.
9. Think about pressing the bar back toward your face and off your chest, rather than driving the bar straight up. You can also think about “pushing the floor away from you with your feet” to help initiate leg drive and enforce this “back and up” bar path.
  - a. Note: you shouldn’t press the bar so far back that it hits the rack or you lose control. Simply bring the bar back into balance over the shoulder joint, restoring the starting position.
10. Once you’re accelerating past the sticking point, you have the option to exhale, but if you prefer, you can hold your breath until you completely lock it

out before releasing your air.

11. As you near the end range of motion, the bar should complete the arc back toward the original start position, with the bar over your nipples.

12. Repeat the process, starting with the bracing phase and then moving into the descending phase and pressing phase again for however many reps the program calls for on that day.

## **BENCH PRESS STICKING POINT**

### **WHERE IS THE STICKING POINT IN THE BENCH PRESS?**

On the way up, you may encounter a sticking point, especially if training at high efforts, where the lift will feel most difficult. Research shows that the sticking point tends to be in the first 20-40 percent of the concentric range of motion [21], but its precise location will be individual. Typically, the more advanced you are, the lower it will be, and the newer you are to training, the more it will be in the mid-range [22].

### **HOW DO YOU BREAK THROUGH THE STICKING POINT?**

Similar to the squat, the most practical answer to this question is to simply build bigger and stronger pecs, delts and triceps. For this reason, there are a variety of accessory lifts included in the program to help develop these muscles to their fullest potential. Dips are an exercise that will provide a greater degree of stretch on the pecs than the powerlifting-style bench press, and as such, makes for a great accessory lift for maximizing pec development. Floor presses are particularly useful here as well because they begin with the concentric phase, meaning your prime movers are forced to initiate the press from a dead stop,

eliminating any elastic reflex that may be assisting you out of the bottom of a powerlifting bench press and forcing your muscles to turn on in this difficult part of the ROM. Close grip bench presses are also included to provide a greater range of motion for the target muscles to work through. Including exercise variations such as these can be very effective for breaking through sticking points by stressing the prime movers at slightly different time points in the range of motion and by promoting muscular hypertrophy in general.

Apart from simply making the main muscles bigger and stronger, there are a few specific techniques on the bench press itself that can be uniquely helpful for busting through the sticking point and setting new PRs:

- I.** As you approach the sticking point, make sure you're pressing the bar back and up (not just straight up) as this will get the bar back closer to your shoulder joint and into a more efficient bar path.
- II.** You can try flaring your elbows out a bit more as you hit the sticking point. This will get your pecs more involved to help the triceps.
- III.** Thinking about moving the bar off your chest with max speed will also likely help you blast through the point where deceleration would normally happen.
- IV.** In general, just keep working on your bench press form. As you progress through the program, you will progressively and incrementally get stronger as your technique improves.

# COMMON BENCH PRESS TECHNIQUE ERRORS

In this section, we'll go over the most common mistakes trainees make during the setup and execution. We'll go in chronological order as they would likely happen during the set.

## SET UP ERRORS

### 1. NO UPPER BACK TIGHTNESS

Upper back tightness is critical for a safe and effective bench press. Although you don't need to arch your lower back as much as anatomically possible, you should get your upper back as tight as you can to get your shoulders in a safe and strong lifting position.

Many people retract their scapulae adequately, but fail to depress their scapulae. One way to ensure you are adequately depressing your scapulae is to make sure your chest is "puffing up" prior to gripping the bar.

### 2. NO LEG DRIVE

The most common error to do with the legs is simply not setting the legs up at all. Many people will perform the bench press with their feet crossed up in the air or with their feet way out in front of them on the floor. Since they decrease stability during the lift, resulting in less overload potential, avoid both of these technique violations (unless specifically programmed as a bench press variation).

As you fatigue, if you notice that your legs start squirming around, this is a signal that you are not properly using leg drive. Rather than having your feet

sit passively on the ground, you should be actively pressing them down and out against the ground with your heels. This action will transfer force all the way from the floor, up and into the bar, forcing it to move up and slightly back. Think, “for every action, there is an equal and opposite reaction”: pushing the floor down and away from you will cause the reciprocal effect of pushing the bar up and back.

If you’re a competitive powerlifter or have goals of competing in powerlifting, depending on what federation you join, you will have to keep your heels planted on the ground throughout the press. It is common to see lifters go up onto their toes, without having their heels contact the ground. While pressing off your toes is not necessarily problematic for those with non-competitive goals, if you have powerlifting aspirations, your heels will need to be planted. It may be necessary to externally rotate your hips (point your toes out) so that you can get your entire heel on the ground.

Another common error related to leg drive is positioning the feet too far forward. To maximize tightness on the bench, you want your feet as close to the hips as possible. This will allow for a more powerful arch, increased leg drive, and more stability overall.

### **3. IMPROPER GRIP**

Many benchers run into all sorts of pitfalls when it comes to grip. Starting with the basics, you want to ensure your grip width is even on both sides. If the bar you are using has a ring in the knurling, use it as a guide to ensure you have even hand placements on both sides. Since the knurling ring position can vary from bar to bar, if possible, use the same barbell every time you bench.

Many trainees also neglect to “stack their wrists,” allowing the palms and

knuckles to bend backward, thus creating an unstable wrist position and a weaker grip. Wrist wraps can increase wrist stability but good technique should be mastered first before turning to more advanced training gear. I caution you to not use the equipment as a “band-aid” to cover up bad lifting habits. Stacking the wrists may feel awkward at first, as it may feel like the bar is going to slip out of your hands. You can also think about “pressing your thumb back” into the bar, which will force you to take a very firm grip and force your wrist into a stacked, neutral position. You should have roughly even pressure in your pointer finger and pinky finger on the bar. If you aren’t putting enough pressure with your pinky, the bar can put your wrist into an uncomfortable amount of radial deviation, which can cause wrist pain.

## EXECUTION ERRORS

Keep in mind the order of each phase of execution as we go through the most common errors:

- 1: Unrack
- 2: Brace
- 3: Descend
- 4: Press

### 1. UNRACKING ERRORS

The most common unracking error is losing upper back tightness while elevating the scapulae to reach the bar overhead. This can stem from having the bar starting in a position too high up on the rack, or by lifting the bar “up” and off of the pins rather than “out” off the pins. Having a spotter assist with the lift off can help minimize the risk of losing scapular retraction and depression during the unrack. You should be running a mental checklist to make sure your upper back isn’t losing tightness and you haven’t lost your

lumbar arch before you begin the eccentric phase. If you notice your arch has flattened out or your upper back has shifted backwards on the bench pad, you may want to re-rack the weight, consider lowering the bar to a lower pin position and start your lift off over again.

## **2. BRACING ERRORS**

Similar to the leg drive error, the most common error to do with bracing is simply forgetting to brace at all. Many people just pump out their reps without any real intention or focus on each phase of the lift. While this may be fine for certain exercises, a very highly technical lift like the bench press requires a greater degree of attention at all timepoints in the set.

The bracing phase can be thought of as a brief 0.5-1 second “timeout” where you quickly ensure everything is still locked in place, pull in a big breath of air, and begin the eccentric with intention. Granted, holding the bar at the top for too long will create unnecessary fatigue, so you want to make sure the bracing phase is just long enough to get everything set for the descent.

Skipping the bracing phase also often leads to a misgrooved eccentric, meaning the bar doesn't follow a natural, smooth path down and slightly forward, touching the same contact point on the chest in each rep.

## **3. DESCENDING ERRORS (ECCENTRIC)**

The most common error on the eccentric phase is either overtucking or undertucking the elbows. As mentioned previously, when viewed from the top, you want about a 45 degree elbow tuck, with 90 degrees meaning the elbows are flared out in the direction of the bar and 0 degrees meaning the elbows are completely tucked in at the sides.



If asymmetrical elbow tracking (one elbow is more tucked than the other) is something you struggle with, ensure you are symmetrically retracting and depressing your upper back. Intentionally monitoring the symmetrical aspect of the descent is often able to immediately fix this imbalance. If your elbows are still tracking asymmetrically, consider slowing the eccentric down slightly when using lighter loads, such as on warmup sets, which can help enforce proper elbow tracking. Granted, we all have asymmetries and minor imbalances in the lift that are not necessarily problematic unless they are impeding your performance and stability.

Another common error is losing control of the bar in the bottom 20 percent of the movement. If you are hearing a “thud” when the bar makes contact with your torso, you may be giving up the weight to gravity in the bottom of the ROM. In general, you want to think about doing “pause-and-go” reps; not “bounce-and-go” reps.

#### **4. PRESSING ERRORS (CONCENTRIC)**

I think the most common pressing error is initiating the press incorrectly. Many trainees will not bring the bar all the way down to their chest and, as such, begin the press prematurely. Others allow the bar to sink too far into their chest, needlessly increasing the total bar path distance.

As an advanced technique, it is acceptable to use a slight “sink” into your chest, as long as the bar does not sink after you have ended your pause. If you’re going to sink the bar, only allow it to sink up to a maximum of approximately one inch and do not initiate the press by having it sink further. For most trainees running this program, it is better advised to simply allow the bar to come to a “soft pause” on the chest. This will sufficiently stretch the

pecks, allow for the maintenance of bar control and put you in a good position to begin the press.

Another common error is exhaling too early. You want to keep your breath held until about half way up the concentric, or once you've reached full lockout. Premature exhalation will cause your chest to cave in and decrease overall torso rigidity.

Many trainees also fail to press the bar explosively off of the chest - an error that can lead to premature fatigue. When pressing the bar off your chest, imagine there being a karate chopping board three or four inches off of your chest that you must break through with the barbell. This mental cue may force you to press the bar off your chest with as much explosive power as possible on every rep.



# THE DEADLIFT





# DEADLIFT MECHANICS

The deadlift is one of the most “pure” tests of full body strength and is the third and final lift performed by competitors in a powerlifting meet. Most people will be able to lift significantly more weight on a deadlift, compared to a squat and it is the only powerlift that begins with the concentric (lifting) phase rather than the eccentric (lowering) phase. From a muscular development standpoint, the deadlift will have just about every muscle in your body firing to some degree, but should still be considered mainly a lower body exercise, since its main joint actions are hip extension and knee extension.

# WHICH JOINT ACTIONS ARE BEING PERFORMED IN A DEADLIFT?

1. Hip extension: “straightening” your hips underneath your midsection;
2. Knee extension: “straightening” your knee like in a leg extension;
3. [Isometric] shoulder extension: keeping your arms from moving out in front of you;
4. [Isometric] spine extension: preventing your back from rounding;
5. [Isometric] scapular elevation: preventing your shoulders from dropping down; and
6. [Isometric] finger flexion: gripping the bar with your fingers and forearm flexors

## WHICH MUSCLE GROUPS PERFORM THESE JOINT ACTIONS?

### 1. GLUTEALS

The glutes are very strong hip extensors, which will, together with the hamstrings, take care of the hip extension component of the deadlift. The glutes tend to be more responsible for the lockout portion, as research shows that the glutes tend to fire the hardest when in or near full hip extension [23].

### 2. HAMSTRINGS

The hamstrings will also perform a large brunt of the work on deadlifts. Unlike the squat, which trains both hip extension and knee extension roughly equally, the deadlift is a much more hip dominant lift, since the knees are not nearly as flexed (“bent”) in the starting position. Therefore, unlike the squat, the hamstrings don’t enter **active insufficiency** and can more forcefully contribute to hip extension in the deadlift.

### **3. ERECTOR SPINAE**

As they prevent the spine from rounding throughout the ROM, the erector spinae, or “erectors” for short, get hammered with the deadlift.

### **4. LATS**

Similar to the erectors, the lats are contracting isometrically to prevent your shoulder joint from going into flexion. Keeping your lats “packed” down will also pull tension into your upper body, ensuring that everything moves as one unit (your hips and torso rise at the same time). Even though they are an important contributor to the deadlift, the lats can be seen more as a dynamic stabilizer rather than a prime mover.

### **5. QUADS**

While the knees don’t go through nearly as much range of motion as they do on a squat, the heavier loads achieved on deadlifts ensure that the quads still get hit with a reasonable overloading stimulus. Research shows that the sumo deadlift stance tends to emphasize the quads more, while the conventional deadlift tends to emphasize the spinal erectors more. We will later revisit technique differences between these two variations.

### **6. FOREARM FLEXORS**

The flexors of the forearm will be responsible for maintaining an isometric contraction that keeps the fingers gripped around the barbell. Although the use of straps will reduce the involvement of the forearms, they will still have to do some work to prevent the barbell from slipping.

# DEADLIFT ANATOMY

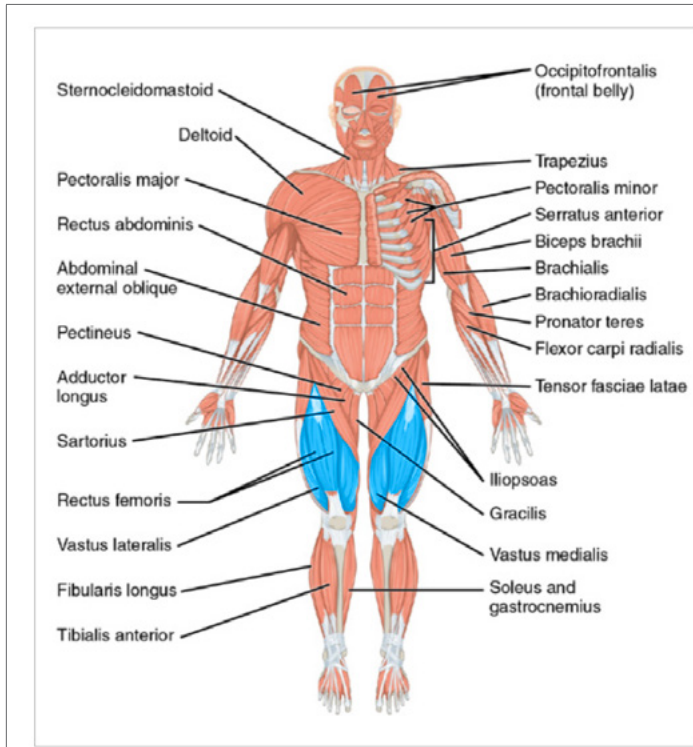


Figure 1A: The Primary Anterior Muscles Active in the Deadlift (Highlighted in Blue)

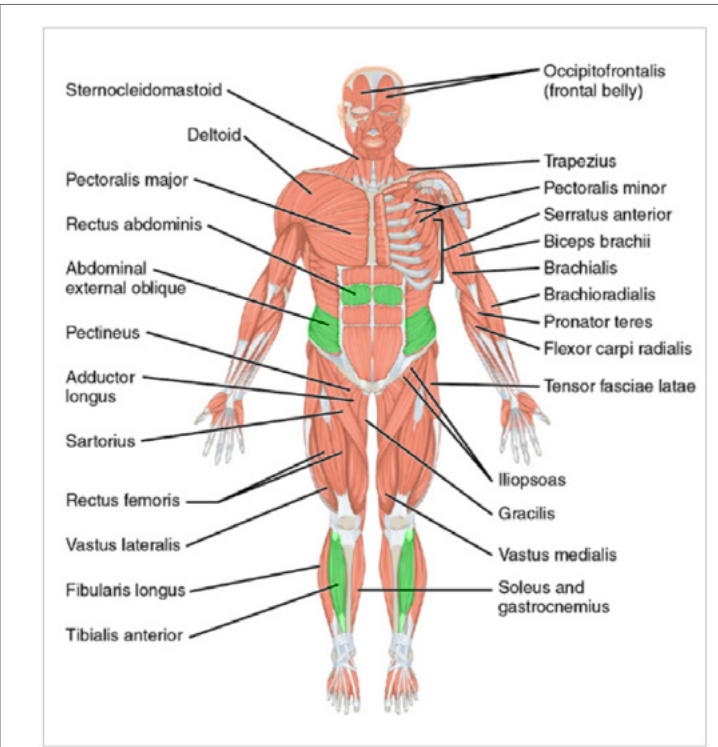


Figure 1B: The Stabilizing Anterior Muscles Active in the Deadlift (Highlighted in Green)

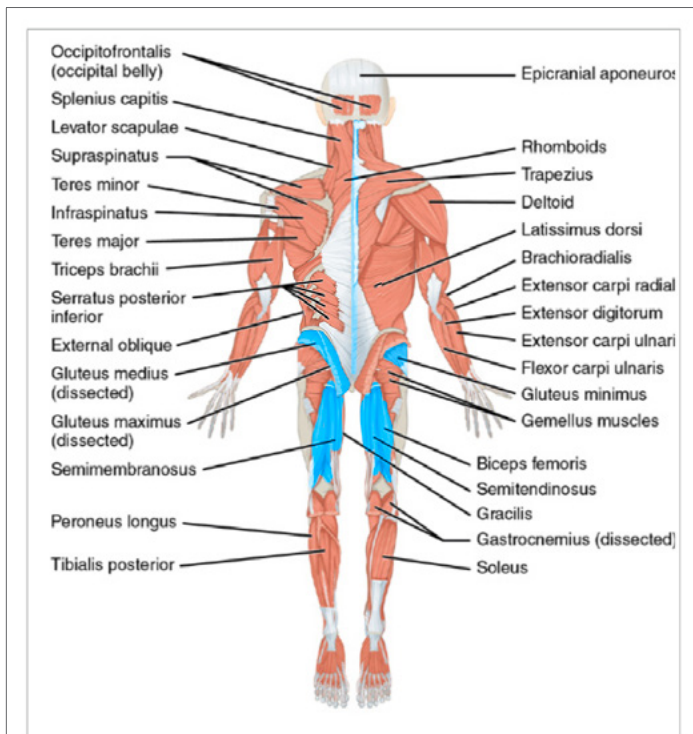


Figure 2A: The Main Posterior Muscles Active in the Deadlift (Highlighted in Blue)

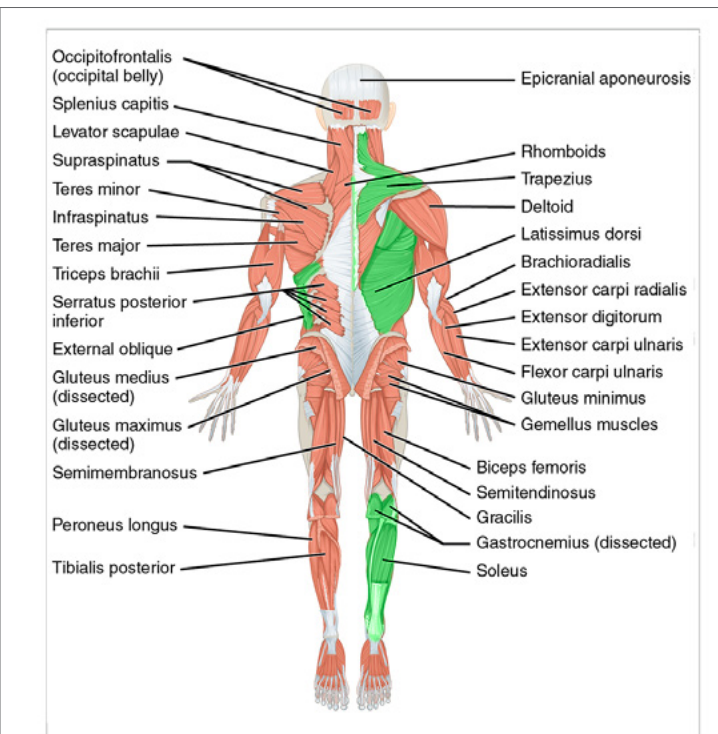


Figure 2B: The Stabilizing Posterior Muscles Active in the Deadlift (Highlighted in Green)

# DEADLIFT TECHNIQUE

Now that we understand the anatomy and biomechanics responsible for performing the bench press, we can cover exactly how to properly deadlift. Please refer to my deadlift Technique Tuesday videos for a visual description of the movement.

Here is the link for the [sumo deadlift](#).

Here is the link for the [conventional deadlift](#).

Because the far majority of the deadlift setup and execution will be the same for the convention and sumo deadlifts, I will explain in detail the setup for any deadlift in general and then, as we go through, highlight the few technique differences between the two stances.

As before, we're going to split the exercise up into two main components: A. the setup and B. the execution.

## THE SET UP

First, it is important to note that what follows is just one way to set up the deadlift and there are other ways to achieve the same endpoint (which is full body tightness, stability and balance).

1. Before anything, I recommend lifting in a flat soled shoe like Chuck Taylors or deadlift slippers, using high socks to avoid shin scrapes and, optionally, [a 10 millimeter lever belt](#), which will increase torso rigidity and force transfer as you pull.

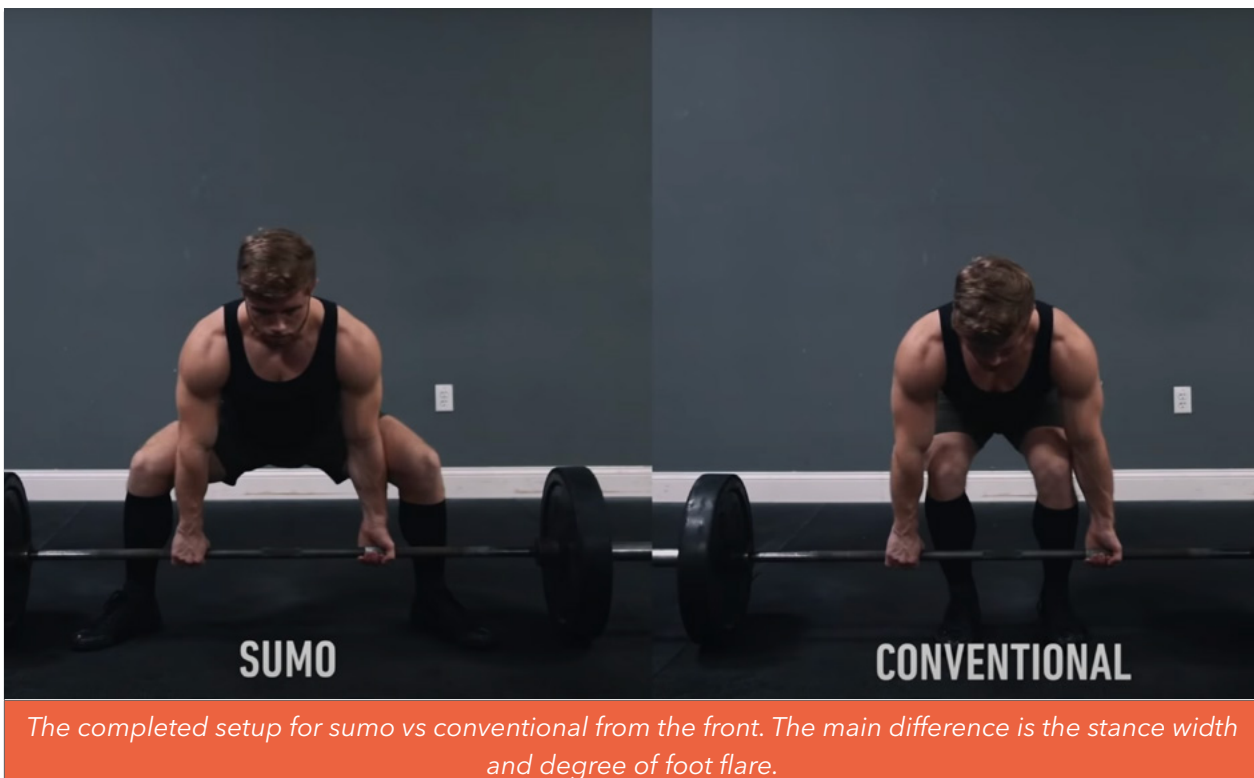


2. Approach the bar and stand where your shins are about half an inch behind the bar, with the bar roughly centered over the tongue of your shoes when you look down.

3. Take your stance width.

If pulling sumo, take as wide of a stance as you comfortably can, while still having your knees stacked vertically over top of your ankles. Point your toes out in the direction of the front of the plates.

If pulling conventional, take a stance slightly closer than shoulder width and point your toes straight ahead.



4. Take your grip on the bar by setting your hips back, as you would in a stiff leg deadlift. Once you can't get your hips back any further, allow your knees to come forward slightly until your shins make light contact with the bar without knocking it forward.

You want to grip the bar with your arms hanging straight down, right at

shoulder width, regardless of whether your feet are positioned for sumo or conventional.

When it comes to grip, you have several options:

**\*Option A** -- Alternate (over/under) grip: use an overhand grip on one hand and an underhand grip on the other. This approach will allow you to lift more weight by preventing the bar from rolling in your fingers. This grip may lead to muscular asymmetries over time in some lifters, although this isn't inherently problematic from a safety standpoint. If concerned about symmetry for aesthetic reasons, periodically vary which hand is overhand and which is underhand.

**\*Option B** -- Hook grip: Wedge your thumb between your fingers and the bar. This approach can have a painful adjustment period until you deaden the nerves in your thumb. This grip is very popular amongst competitive powerlifters and avoids the potential asymmetry pitfall of the over/under grip.

**\*Option C** -- Straps: Straps allow you to use a double overhand grip without needing to use the hook grip technique and therefore avoid that potentially painful adaptation period. The downside with regular strap use is that your raw grip strength can suffer and you may not see the same forearm development unless you train them directly.

I personally use straps sparingly on volume work and generally use the over/under grip for top sets and max effort work.

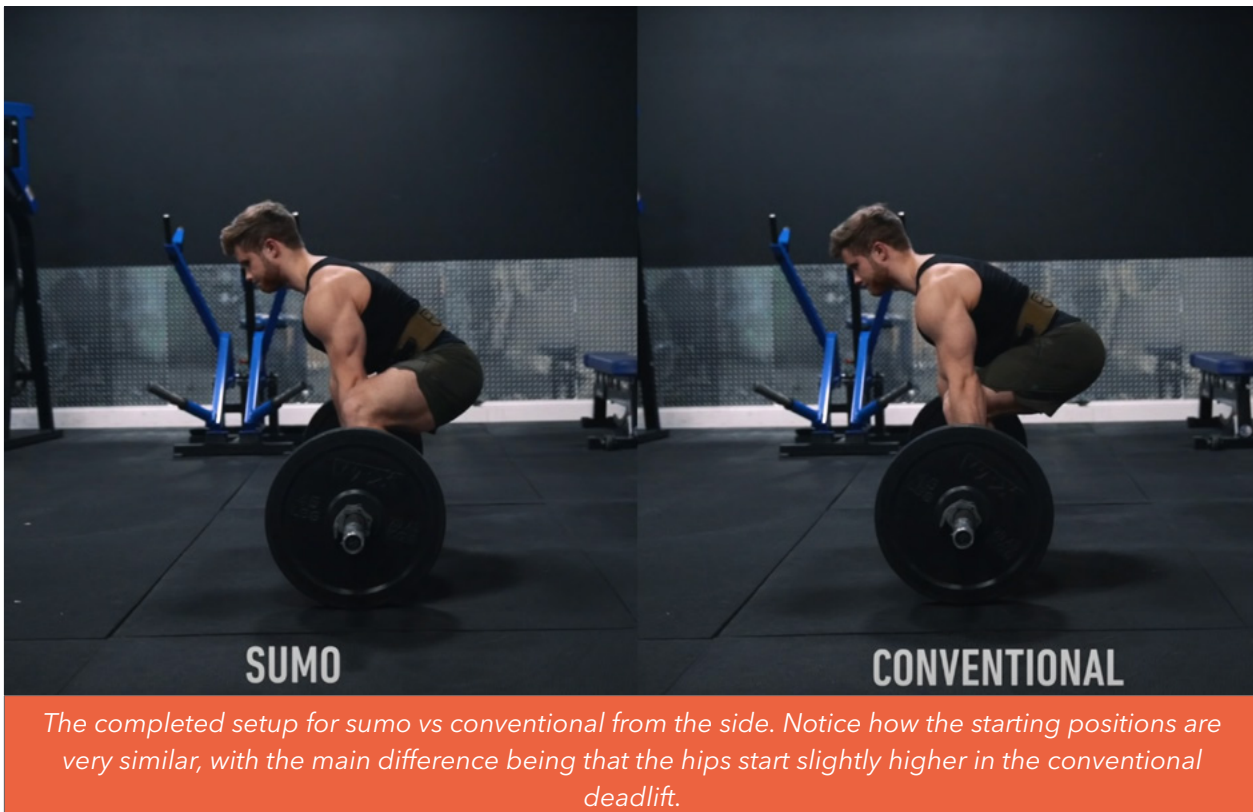
Note: To avoid having the bar slip out of your sweaty fingers, regardless of the grip option you choose, you should use chalk or liquid chalk when lifting.

5. To prevent the bar from drifting out in front of you as you lift, "pack your lats" by thinking about pulling the bar in close to you.

6. Pull your lower back into a neutral position, creating a stretch in your

hamstrings, and then maintain this flat lower back position through the rest of the lift. Moderate thoracic (upper) back rounding is acceptable and not dangerous. However, if you initiate the pull with a slightly rounded thoracic spine, don't allow it to round further throughout the lift.

7. Take a deep breath down into your gut. At this point, you have the lift fully set up and you're ready to initiate the pull.

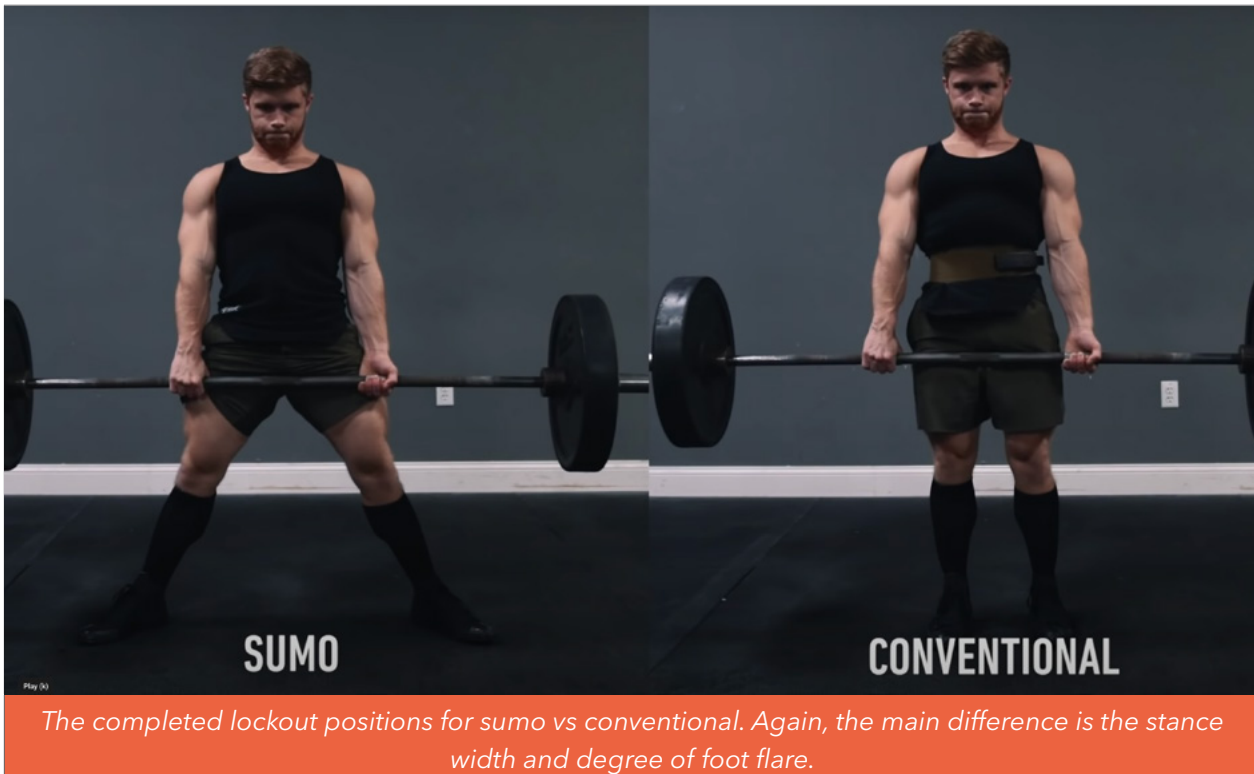


## THE EXECUTION

1. Initiate the pull by “pulling the slack out of the bar” so it slightly bends under your grip before the plates actually leave the floor. Avoid yanking on the bar in a “grip and rip” manner. You'll likely come up solid against the weight of the plates before they leave the ground and thereby potentially throw you out of position, quickly depleting your energy.

2. Once you've pulled the slack out, explode up with the weight, leading with your chest up. Focus mainly on simply driving your hips forward, while holding an isometric contraction in your lumbar spine (to prevent your lower back from rounding), in your shoulder blades (to prevent your upper back from rounding) and at your shoulder (to keep the bar in tight against your legs).
3. Drag the bar straight up against your shins so that it moves in a perfectly straight line, centered over the middle of your foot.
4. Lock out the lift at the top by ensuring your knees and hips are straight and your chest is lifted up with your shoulders slightly back. Don't overdo the lockout by leaning backward excessively, hyperextending your lower back, squeezing your shoulder blades together or shrugging the weight up. Just hold your chest high; that's it.
5. After holding the lockout for one or two seconds, it is time to complete the negative. Initiate the eccentric phase by setting your hips back first! Then, as the bar is clearing your knees, let your knees bend as the bar drops straight down against your shins.
6. On the negative, you can either let the bar fall more freely, with your hands simply guiding it back into the starting position, or you can slightly resist the negative, having it last for about one second. This will ensure that the plates land in the right spot as the bar tracks back down against your legs.
7. Without bouncing the plates off the ground, after each rep, allow the plates to come to a full and complete reset on the ground.
8. Begin the next rep by taking a deep breath in, pulling the slack out of the

bar, driving your hips forward, locking the bar out, setting your hips back and following the bar back down in a straight line.



## DEADLIFT STICKING POINT

### WHERE IS THE STICKING POINT IN THE DEADLIFT?

Although individual strengths and weaknesses can cause different sticking points in different lifters, most people tend to get stuck at the beginning, unable to get the bar off the ground. Even if you're having trouble with clearing the knees or with the lockout phase, this can also often be traced back to a strength deficit off the floor: you may be exerting yourself so hard off the ground, that you're fatigued by the time you get to the lockout.

Mechanically speaking, the deadlift should get easier as you move the bar higher off the floor, as it is closer to your center of mass. Because of

biomechanical and strength discrepancies amongst individual lifters, however, it is common for different trainees to struggle at different time points in the range of motion. If you are one of those lifters who can get the bar moving off the floor just fine, but can't seem to finish the lockout strong, it may be due to a weak grip and/or weak end-range hip extension strength (likely owing to poor glute activation).

## HOW DO YOU BREAK THROUGH THE STICKING POINT?

If you struggle getting the bar moving off the floor, my advice is slightly different depending on if you pull conventional or sumo. When pulling sumo, I generally encourage lifters to be very "patient" off the floor. Sometimes it can take two or three seconds after you've pulled the slack out of the bar for the plates to actually start moving up. Just because the plates aren't jumping off the floor right away, don't give up on the lift too early. If you can get the plates moving, and your grip isn't a limiting factor, you can usually lock the lift out when pulling sumo.

When pulling conventional, I tend to give the opposite advice: once you've pulled the slack, be more explosive and get the plates moving with as much velocity off the floor as possible, without losing tightness or positioning. Because the conventional pull tends to go through a longer range of motion, if the lifter was unable to get the bar moving with enough velocity off the floor, it is more common for him or her to lose steam toward the lockout.

If you struggle with locking the bar out, it is important to first identify the cause. If it is due to grip fatigue or weak glutes, you may want to strengthen those muscles with specific drills such as heavy barbell holds and/or hip thrusts.

In addition to the technique cues above, utilizing more variety in your training can also help break through the sticking point. Here are a few examples of exercise variations used in this program and how they can help various sticking points on the deadlift:

## **I. PAUSED DEADLIFTS**

Paused deadlifts are helpful in busting through sticking points because they make the lift more challenging in the “stickiest” part of the lift: just off the floor. When doing these, you will pause for two - three seconds as soon as the plates leave the floor, forcing you to maintain proper positioning when it may otherwise start to become compromised. By enforcing proper mechanics with lighter loads on paused deadlifts, you will be able to apply those mechanics to the sticking point when lifting the really heavy stuff.

## **II. BOX SQUATS**

While it may seem counterintuitive, box squats can be very helpful for improving deadlift power off the floor, especially when performed with a full sit onto the box rather than just a passive touch. To maximize carry-over to deadlifts, release tension in your quads and sit fully back so the squat starts the concentric from a dead stop, similar to how a deadlift does. For additional carry-over, attempt to replicate your deadlift stance when doing the box squat.

## **III. BLOCK PULLS**

As someone who personally struggles with the lockout more than breaking the floor, I’ve personally seen an enormous benefit from including low block pulls in my training. Simply put, block pulls are beneficial mostly because they allow you to safely lift significantly heavier loads than you’d be able to off the floor. This

can be excellent for strengthening grip and the end-range hip extensors (glutes and hamstrings) in that specific portion of the movement in which you struggle. Also, from a psychological perspective, getting used to feeling heavier weight in your hands can improve confidence and stability when pulling from the floor. Even though you're using very heavy weight with these, the injury risk is still low because the movement begins with the concentric. If you're not strong enough to lift the weight, it simply won't move, which is less daunting than doing a supermaximal set of squats or bench where you would need to dump the bar or have a spotter assist if you couldn't get the weight back up.

#### **IV. SUBMAXIMAL "TECHNIQUE" SETS**

Finally, simply doing more sets that are geared toward improving and refining your form while staying well away from failure can be great for locating and addressing your specific weak points in the lift. With relatively lighter loads, you're able to focus on each rep being as perfect as possible, which will ingrain new and improved lifting habits for when you lift the heavy stuff. During your warmup sets, and submaximal technique sets, still imagine yourself pulling your max for every rep. This will surely maximize technique transfer to higher effort and max effort sets.

#### **V. DEFICIT DEADLIFTS**

Deficit deadlifts increase the range of motion that the hip joint must go through and as such, force the glutes and hamstrings to work even harder to get the bar moving off the ground. A common mistake many lifters make during deficit deadlifts is to set up the deficit far too low, resulting in awkward mechanics and excessive back rounding. A modest, one or two inch deficit is perfect to create an extra hip flexion demand without excessive spinal flexion. You can set up this deficit by either standing on a sturdy 45 pound plate (or two plates if pulling



sumo) or by using shorter 35 pound plates to load. While deficit deadlifts are not programmed in this routine, if you find yourself very weak off the floor, you can optionally replace some of the paused deadlift work with deficit deadlifts for the same sets, reps and %1RM.

## COMMON DEADLIFT TECHNIQUE ERRORS

In this section, we will cover the most common deadlift mistakes in chronological order as they would be likely to happen during a set. For a visual description of most of the errors explained below, I'd recommend watching my video on [common deadlift errors](#).

### SET UP ERRORS

#### 1. SETTING UP WITH A POSTERIORLY TILTED PELVIS ("BUTT WINK")

The spine has a natural curvature to it, so if you're setting up with a "flat lower back," you're actually in some degree of lumbar spinal flexion. While this isn't an automatic death sentence for your spine, you do want to make an effort to be in a neutral lumbar spine position when deadlifting heavy loads. If you find yourself "squatting down" in order to get your hips down and reach the bar, you're likely putting your lower back into some degree of flexion during the setup. If you've ever noticed the "bikini pose" on Instagram or in bodybuilding competition, you have seen what extreme anterior pelvic tilt looks like. When setting up the deadlift, you should actually be doing a slightly more mild version of this. Rather than squatting down to grab the bar, focus on setting your hips back to create a stretch in your glutes and hamstrings while maintaining that anteriorly tilted pelvic position.

## 2. IMPROPER LAT BRACING

Before initiating the pull, it's critical to keep your lats and upper back tight to prevent the bar from drifting forward. If the bar drifts away from your shins, you're increasing the distance from the load to your hips, making the same weight more difficult. If you're having a tough time visualizing what the lats should be doing in the deadlift, I'd recommend trying [this drill](#) from Dean Somerset which will train your lats to keep the bar in tight to your shins.

## 3. NOT STACKING YOUR JOINTS (SUMO)

With the sumo deadlift, when viewed from the front, you should be able to draw a straight vertical line from your knees to your heels. If your heels are outside your knees, your stance is probably too wide and your knees may be caving in. The first solution here is to simply narrow your stance a bit. To keep your knees out, you may need to work on your hip mobility and inner thigh flexibility. If this seems to be the issue in your case, you can do some dynamic stretching and foam rolling for your inner thigh muscles before training and then after training, do some light static stretching for the same area.



*When the ankles and knees are stacked, the shins point up in a perfectly straight line. If your knees are caving inside your ankles, you may need to work on hip mobility or narrow your stance slightly to get the knees out.*

## EXECUTION ERRORS

### 1. LOWER BACK ROUNDING

There is a general consensus among strength and conditioning experts that moderate thoracic (upper back) rounding is acceptable and safe during the deadlift, but lumbar (lower back) rounding presents a much greater injury risk. If you do allow some degree of upper back rounding, you should make an effort to keep it consistent throughout the lift. If you set up with a slightly rounded upper back, try to prevent it from rounding further throughout the ROM.

However, if you are seeing substantial lower back rounding, it could stem from several different causes. As mentioned in the setup errors, this could simply be a result of not anteriorly tilting your pelvis during the setup phase. If your setup is appropriate but your lower back still rounds during the lift, you may simply be

lifting loads that are too heavy. In this case, lighten the weight and tighten up the form. It's also possible that you are incapable of maintaining an anteriorly tilted position during or after your setup due to immobile hamstrings. To fix this, do some hamstring foam rolling prior to lifting and after the workout, perform some light static stretching for the hamstrings.

The paused deadlifts included in this program can also remedy excessive lower back rounding, as the pause will force you to keep your positioning tight as soon as the plates leave the floor (which is when lower back positioning often starts breaking down).

## **2. HIPS SHOOTING UP EARLY**

If you find your hips shooting up as soon as you start to pull the weight, it's most likely that you're simply setting up the lift wrong. Many trainees have the temptation to set up the deadlift with their hips very low and then try to squat the weight up. This almost always results in the hips shooting up first, leaving your lower back to handle much of the load. If you set up the lift properly, then your hips shouldn't shoot up. Again, to get your hands down to the bar, think about doing a stiff leg deadlift, where you're pushing your hips back rather than just squatting down to grab the bar. Then, once you can't get your hips back any further without really stretching your hamstrings, allow your knees to come slightly forward until your shins just touch the bar (without moving it) and hold that relatively high hip position. If you do this correctly, when you initiate the pull, your hips shouldn't rise up, but rather drive forward as the chest rises up.

## **3. EXCESSIVELY LOCKING THE LIFT OUT**

This error is especially in male lifters who seem to get so excited about getting the lift up that they want to keep going with it and end up leaning too far back

and hyperextending their lower back. Remember, all you need to do to lock out the deadlift is flex your glutes to lock the hips out and lift your chest up to lock the shoulders out. There is no need to squeeze your shoulder blades together or shrug the weight up at the top which will waste energy, lose tightness and throw your positioning off. It's totally fine to get hyped up for a big lift and use explosive power throughout the concentric, but once you hit lockout, it's important to maintain control and avoid taking the lift past its intended range of motion.

## **ADDITIONAL TECHNIQUE RESOURCES**

For a complete list of demo videos for all the exercises included in the Powerbuilding Program, please see the main Powerbuilding Program Manual PDF.

For a complete list of exercise substitutions for all the exercises included in the Powerbuilding Program, please see the main Powerbuilding Program Manual PDF.



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**POWERBUILDING**

# TECHNIQUE HANDBOOK

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