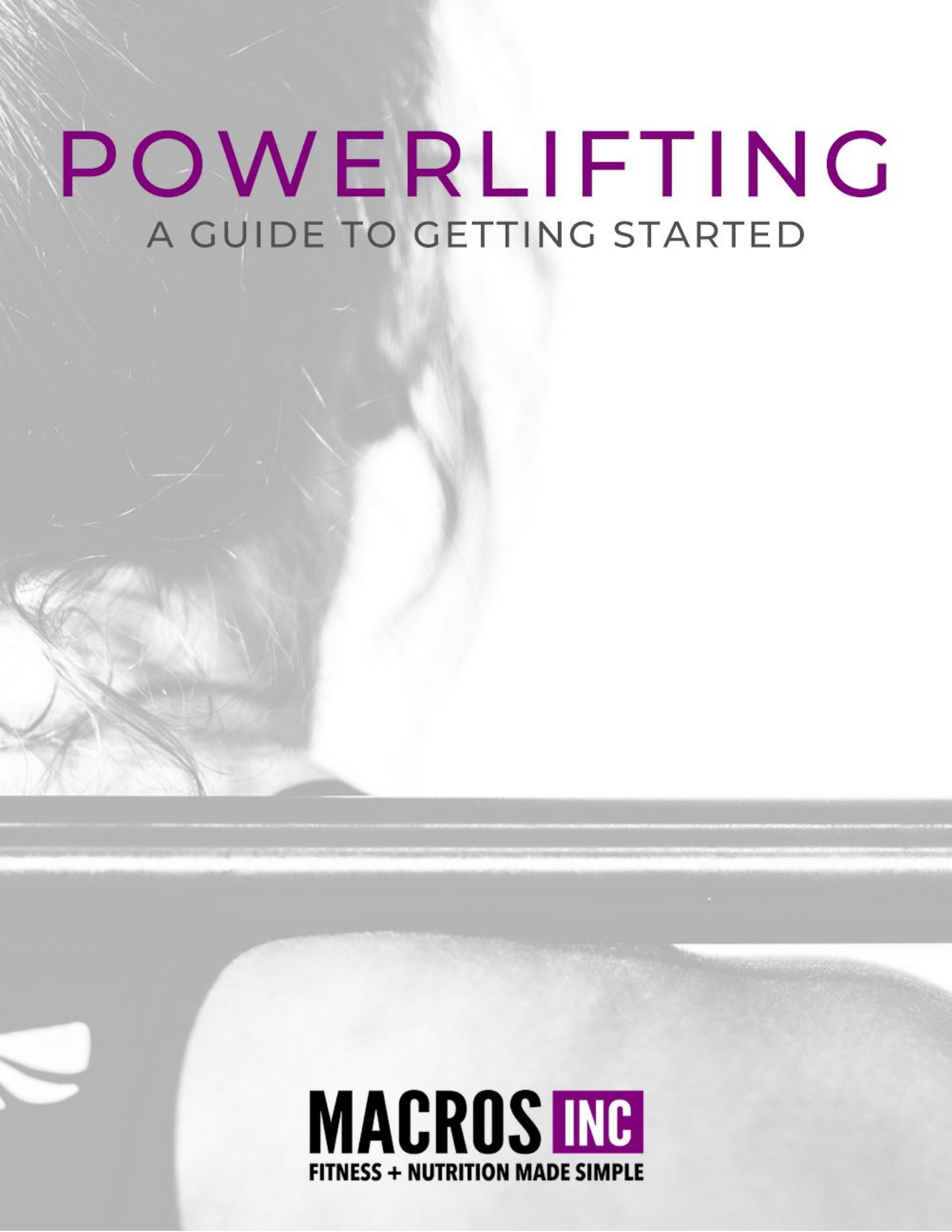

POWERLIFTING

A GUIDE TO GETTING STARTED

MACROS INC

FITNESS + NUTRITION MADE SIMPLE

Published by Macros Inc
Macrosinc.net

Authors: Matt Gary, Kade Gilbert
Editor: Brad Dieter

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WHAT IS POWERLIFTING

Powerlifting is the squat, bench press, and deadlift. In competition, competitors are given three attempts per exercise and their heaviest successful lift in each discipline are added together to comprise a total. The lifter with the highest total in their respective gender, age, and bodyweight category wins.

The powerlifts (aka The Big Three) are foundational compound, multi-joint exercises utilizing much of the body's musculature. When performed correctly and safely, these building-block movements provide the biggest "bang for your buck" regardless of your fitness goals.

Movements not muscles

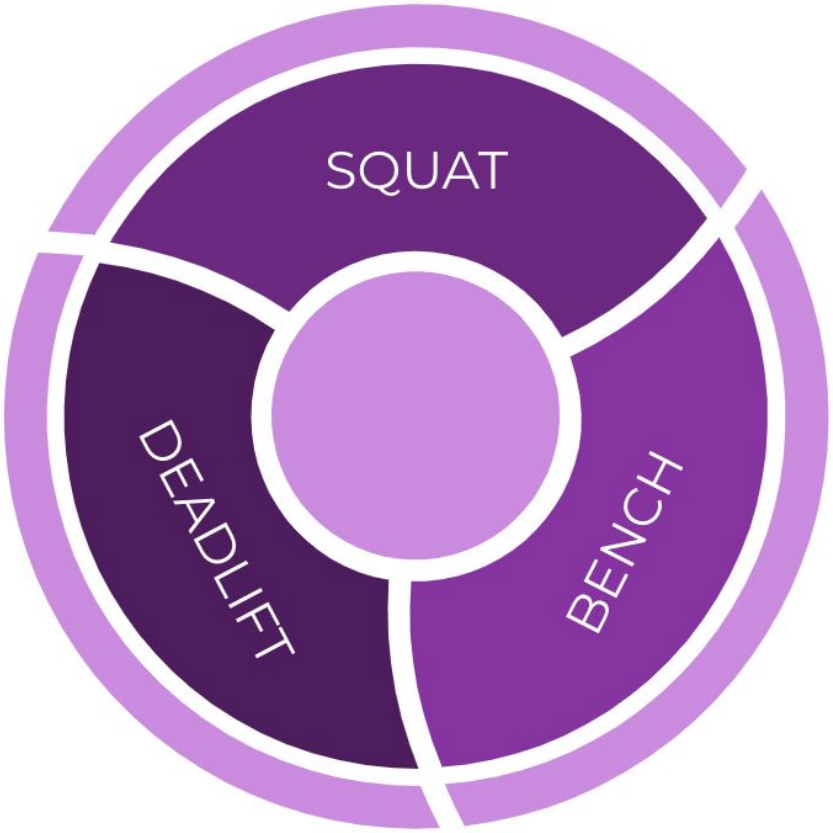
Working out (exercising) is fundamentally different from training. Exercise is only concerned with the current moment. It's inducing fatigue via increased heart rate, respiration, and getting sweaty today because exercise doesn't consider the future. Alternatively, training is systematically and repeatedly imposing stress on the body triggering an adaptation that satisfies a performance objective. Training is concerned with tomorrow and requires planning. Therefore, the best way to begin training the powerlifts is to think of them as movements rather than muscles.

Movements require a skill component. Skills are refined through deliberate and extensive practice. Consistent, quality, and repetitious practice leads to enhanced technique. As technique improves, you'll add more pounds to the bar.

The best way to become more skilled at performing the powerlifts is by

creating and practicing a specific process for each discipline. A rigid adherence to a concise and simple process increases the probability of it being repeatable every time. Think of your process as a ritual or routine performed every time you train each movement.

Much of your physical aptitude is determined by your genetic traits specifically anthropometry, bodyweight, muscle attachments, and fiber type. These individual characteristics largely influence leverage. Although a lifter's genetics are fixed, how he or she approaches the powerlifts may aid in increasing leverage and thereby enhancing movement performance. A lifter's body position including grip and stance, bar placement, and movement execution all affect one's leverage when performing the squat, bench press, and deadlift.




SQUAT

SQUAT

The squat (SQ) is the first lift contested in powerlifting competition. It's often hailed as the king of all strength training exercises and rightfully so as it utilizes as many joints and muscles as nearly any other movement. The squat is a full-body movement that primarily taxes the legs and tests lower body strength. The back held in rigid extension, throughout the lift, assists the legs. The squat is the single most valuable strength training exercise and the driving force behind nearly every athletic movement. Build the squat and the other two powerlifts usually follow.

Anatomical considerations

The best squatters are typically those who possess the best leverages. The most optimal structure for the squat is a short torso, short/thick thighs, and wide hips. A shorter torso creates a more compact frame and allows the barbell to be placed closer to the hip joint. Short thighs afford a shorter range of motion to break parallel while wide hips serve to support load and transfer force into the barbell.

Set-up and execution

Grip/hand placement

The first step in performing a squat is setting your grip. Lifters should start by gripping and squeezing the barbell as hard as possible. A tight grip not only helps ensure safety but it ignites the central nervous system (CNS) signaling full-body tension. The tighter a lifter can get, the greater their capacity to handle heavy loads. Grip width is determined by the size and mobility of the lifter. Wrist, shoulder, and elbow flexibility all influence grip width and subsequent bar placement. Lifters should generally strive to achieve the narrowest grip possible. A

narrow grip enables the lifter to contract the trapezius, rhomboids, and rear deltoids thus creating a protective shelf for the barbell to rest on the upper back. Furthermore, a narrow grip allows the lifter to effectively retract and depress the shoulder blades (scapulae), which help force the chest out and up. This creates a more favorable torso position for the lifter which helps counteract excessive forward lean during performance of the squat. Larger, thicker lifters will naturally have to take a wider grip, as they won't be able to bring their hands as close together as smaller lifters. *(Photo 1 – various grip widths)*

Some trainees may not have the wrist, shoulder, or elbow flexibility to wrap their thumbs around the bar. This is known as a "thumbless grip" and often looks like the hands are over the bar.

Bar placement

While bar placement is individual, it should allow you to stand vertical with minimal forward lean. Lower bar positions typically allow for greater weights to be lifted because of a reduction in the lever arm. However, this position may not be optimal for everyone and lifters should experiment to find their most suitable position. *(Photo 1 – high vs. low bar positions)* Upon setting the grip and positioning the bar on the upper back, the lifter should move their feet into a position inside their shoulders while placing their hips directly under the bar. This reduces stress on the lower back upon unracking the bar. Just before standing up and unracking the bar, the lifter should simultaneously inhale a big breath while tightening the entire body.

Walkout and stance

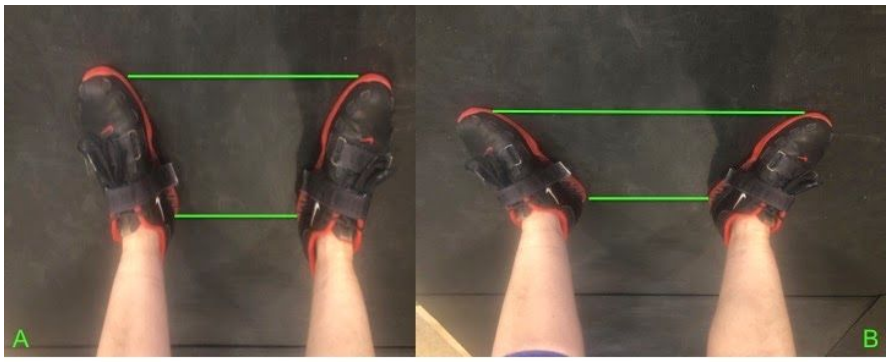
The lifter then stands up and unracks the barbell. Immediately upon standing up, the lifter should momentarily stop and remain motionless allowing the barbell and body to settle. This momentary pause allows the lifter to establish control of their body and the barbell. After allowing the weight to settle, the lifter may then direct their eyes toward their feet and begin to step back using a minimum of two steps but no more than three. A three-step approach is favorable as it affords the lifter precision and stability. The initial step should be straight back and approximately the length of the foot. Lifters may use whichever foot they feel most comfortable with. The sole purpose of the first step is to move backward, away from the rack. The second step is with the

opposite foot and begins to set the stance. This step should be directed back and outward by externally rotating and abducting at the hip. The third and final step should mirror the second step and complete the stance. After the lifter takes their third step, they should try to make their feet as symmetrical as possible.

A symmetrical stance helps increase the probability of a smooth and uniform descent. Stance refers to the foot placement at two key locations; the distance between the heels and toe angle. Lifters should find the most suitable stance for their anthropometry and mobility. A good place to begin is by using the "athletic position" or a slightly wider than hips approach. The heels are generally placed just beneath the shoulders, which places the feet and legs under the body and allows for maximum transfer of force through the body, feet, and into the ground. While wider stances reduce the distance of bar travel, it often makes it more difficult to assume the below parallel position required in competition. More narrow stances may allow for easier depth but will often be less optimal for taller lifters. Additionally, heavier lifters may opt against the narrow stance as the thighs may impede the torso on the descent. The toe angle should also be adjusted to meet the needs of the individual. Most toe angles should be approximately 30-degrees. Using the analogy that a lifter is standing on the face of a clock, the toe angle should be approximately at or around 10 to 11 o'clock for the left foot and 1 to 2 o'clock for the right. *(Photo 2 - stance width & toe angle)*

Once the stance is set, the lifter should once again

redirect their eyes forward. A neutral head and eyes down position, while anatomically correct, may cause the lifter to lean forward excessively. As the body follows the head, it's important to push the neck and trapezius muscles back into the bar while maintaining a slightly upward gaze. Finally the lifter should prepare to take one final large breath while tightening every muscle in the body and building tension. The lifter's goal should literally be to make the barbell seem as if it's part of the body.



Stance (aka foot position) refers to the distance between the heels and the toe angle. While lifters may have the same stance width, their toe angles can be quite different.

Photo A features an 11 and 1 o'clock toe angle while B features a 10 and 2 o'clock toe angle.

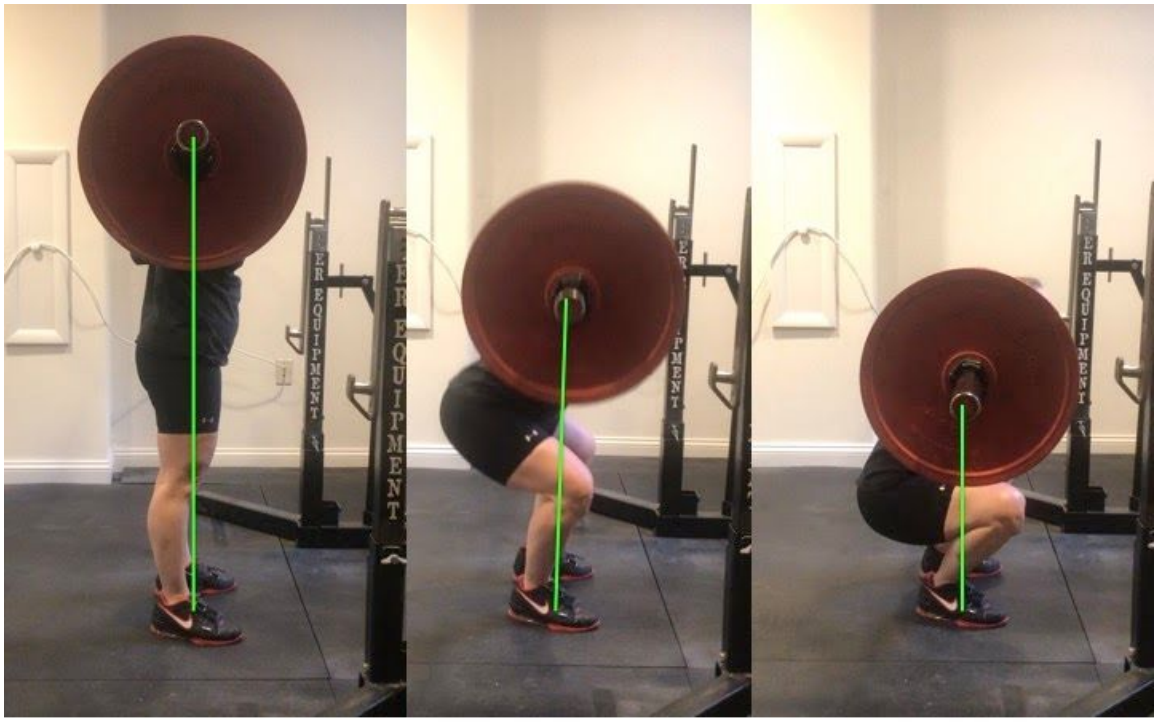
Descent

Once the squat position is achieved, the lifter initiates the descent by releasing their glutes and simultaneously "breaking" at the hips and knees. The actions may be similar to sitting into a chair. The descent should be done in a controlled manner that is neither too slow nor too fast. Descending too slowly places the lifter under tension longer than necessary while descending too rapidly may be dangerous and make the recovery more difficult. The speed of descent should be controlled and performed at a medium pace while keeping the torso as rigid and upright as possible. The torso functions as the lifter's column of support and must be held in an arched or flat position during both the descent and ascent. Additionally, the lifter should be forcing the knees out and opening their groin. This action allows the knees to track over the feet while recruiting the adductor and hamstring muscles. The descent is complete once the lifter squats below parallel. The below parallel

position is achieved when the top surface of the thigh, at the crease of the hip joint, descends below the top of the knees. Once this depth has been achieved, the lifter is now ready to begin the ascent.

Recovery and ascent

The ascent begins by driving upward explosively with the hips and thighs. Once again, the knees must be pushed out to allow the hips to come back under the bar. Throughout the descent, recovery, and ascent the lifter should be holding their breath and keeping their entire body, particularly the torso, as tight as possible. Once the lifter passes through the sticking point about two thirds of the way up, he or she may begin to expel their air and a slight deceleration of the bar may occur to avoid bouncing and an abrupt finish. Ideally, the barbell should be aligned over the middle of the foot throughout the lift. This optimizes the center of gravity of the lifter and barbell. (Photo 3 – showing bar over mid-foot)



The goal should be keeping the barbell over the middle of the foot at every position during the squat (top, middle, bottom).

Every repetition should follow this sequence. Breathing should take place at the completion or top of every rep before the descent of the next repetition. Movement quality is enhanced when each repetition is viewed as its own separate set rather than one in a series of reps. This increases the lifter's focus and repetition quality. When lifters rush through a set, each repetition degrades and negatively affects successive reps. For example, when a lifter performs a set of five repetitions, it should appear that the lifter has done five single repetitions without replacing the bar. This is true for all powerlifts and can increase skill acquisition and improve technique.

BENCH

BENCH PRESS

The bench press (BP) is the second lift performed in a powerlifting competition. The BP is undoubtedly the most popular exercise and one of the most incorrectly performed movements. The BP is an upper-body movement that primarily uses the shoulders, arms, upper back, and chest to test upper body pressing strength.

Anatomical considerations

The best bench pressers are typically those who possess the best leverages. The most optimal structure for the bench press is short arms and a thick torso. Shorter arms and a thicker torso decrease the distance of bar travel from the chest to lockout. In general, heavier/larger lifters also have a distinct advantage as they literally have more physical mass under the bar, which creates a larger foundation from which to press.

Set-up and execution

As the bench press is the only lift requiring the lifter to place much of their body in contact with an apparatus (bench), it's imperative to situate the body into an optimal pressing position. The optimal pressing position for most lifters is one in which the lifter maintains an arched torso with their legs pulled back under them. This position creates maximum full-body tension thus creating a solid pressing platform. Additionally, the arched torso shortens the distance of bar travel, which reduces the amount of work performed.

The first step in performing the bench press is achieving the optimal pressing position on the bench. Lifters have two primary options: 1) set

their feet first or 2) lay down on the bench and assume their grip on the bar. Setting the feet first enables lifters to ensure a more even and symmetrical position on the bench. In this case, one's orientation flows upstream. If a lifter positions themselves on the bench first and then sets their feet, there is a good chance their stance will be asymmetrical. While an uneven stance isn't catastrophic, a more even stance is preferred because the feet are the only thing connecting the lifter to the ground and it's where the initial force transfer begins (from the lifter's feet into the floor). An even foot position will likely lead to a more uniform body position and grip. If the feet are uneven, there's a good chance the hips and body will be misaligned. One advantage to lying down on the bench first is less flexibility is required to initially manipulate the body around the confines of the bench and barbell. In either case, lifters must experiment with the process that affords them the highest probability of achieving their best start position.

Using the edge of the bench as a reference point, most lifters will straddle the end of the bench and assume a stance similar to the squat. Once the feet are set evenly, the lifter will lie back onto the bench and prepare to set their grip. Upon lying down, lifters may look up to find their head positioned behind the bar with the bar located over their throat. This is unsafe and an unfavorable starting position. Therefore, the lifter will then need to use their legs to help set their arch and move themselves into a more optimal pressing position. Lifters should place their hands gripping the bar no more than 81cm (32") between the forefingers with thumbs wrapped around the barbell. A thumbless "suicide" grip is not permitted in some powerlifting federations and is dangerous, particularly for novice trainees. Lifters should strive for as wide of a grip as possible to reduce the distance of bar travel. However, optimal grip width is specific to each individual and should be experimented with in order to obtain the strongest position possible. Novice lifters should begin with a more conservative, medium grip width before attempting a wider grip, as their musculature may be less developed and susceptible to strain. Regardless of grip width, lifters should squeeze the bar as tightly as possible. A firm grip creates tension throughout the hands, arms, and entire body thus increasing central nervous system (CNS) activation, muscle recruitment, and greater force development.

After setting the grip, the lifter should begin setting their arch. The goal of arching the torso is bringing the chest/torso up higher and closer to the barbell thereby shortening bar path. This is best achieved by pushing the hips (buttocks) toward the shoulders. The shoulder blades are pulled together (retraction) and down (depression) while the hips are forced up into extension and pulled back toward the shoulders. Once the lifter assumes a tight and arched pressing position, they are now ready to remove the bar from the racks. This can be done by the lifter or with assistance from a spotter.

The lifter should take a full breath of air just before they receive the lift-off. After receiving the lift-off, the lifter may choose to "top off" their air to increase stability and inflate the chest as much as possible. The lifter's elbows should be locked with head, shoulders, and buttocks in contact with the bench. The lifter will now lower the bar and touch their torso, typically on or around the sternum. In powerlifting competition, lifters are required to pause on the chest. Accordingly, the bar must be held motionless before a command is given to press. The lifter then drives the bar forcefully upward to the locked-out position. This should be the same as the previously noted elected position.

When training, breathing should take place at the completion or top of every rep before the descent of the next repetition. Repetition quality and focus are enhanced when each repetition is viewed as its own separate set rather than one in a series of reps. When lifters rush through a set, each repetition degrades and negatively affects successive reps. For example, when a lifter performs a set of five repetitions, it should appear that the lifter has done five single repetitions without replacing the bar. As previously stated, this is true for all powerlifts and increases the likelihood of achieving technical mastery.

Grip/hand placement

When gripping the bar at lift-off and during the lift, the angle of the back of the hand should remain as vertical as possible. Grip width may vary as determined by a lifter's comfort. Eventually as a lifter becomes more experienced, they may strive for a grip as wide as possible to decrease the distance of bar travel and thus reduce the amount of work performed.

Arch/torso position

Lifters have been successful with an array of torso positions. However, most elite bench pressers utilize the arched-back position. As noted above, the arched position can be defined by shortening the distance between the shoulders and buttocks, which decreases the distance component and reduces work performed. If trainees have a history of back pain or injury, they may favor a flatter torso position while pressing.

Foot Position

For an arched lifter the feet should be placed as far back toward the head as flexibility allows. Widening the stance and placing the feet back allows for greater leg drive without raising the buttocks off the bench. The lifter may require heeled shoes to optimize their rearward foot position.

Finer Points of Lift Execution:

Bar Path

The bar position at lift-off should be approximately over the base of the neck when not using a spotter. The descent bar path may vary depending on the contact point the lifter chooses. At whatever contact point is chosen, most arched lifters will attempt to touch at the highest point; the elbow location should be in line with the bar. Ideally, the elbow will be directly under the forearm while the forearm and wrist will remain in one line. The barbell should sit in the middle of the hand completing a vertical line between the elbow, forearm, wrist, hand, and finally the bar. Once the bar is pressed, the lifter should attempt to return in a similar path.

Descent Speed

The descent should be done in a controlled manner that is neither too slow nor too fast. Descending too slowly places the lifter under tension longer than necessary while descending too rapidly may be dangerous, more difficult to pause, and make the recovery more difficult. The speed of descent should be controlled and performed at a medium pace while keeping the entire body as tight as possible.

Press Speed

The press should be executed in an explosive manner. When maximum weight lifted is the goal, there is no benefit to pressing

slowly. An explosive press can lead to compensatory acceleration, which can aid pressing the bar through the sticking point of the lift. The explosive speed off the chest is aided by a simultaneous leg drive through the heels. The leg drive should not cause the buttocks to lose contact with the bench.

DEADLIFT

DEADLIFT

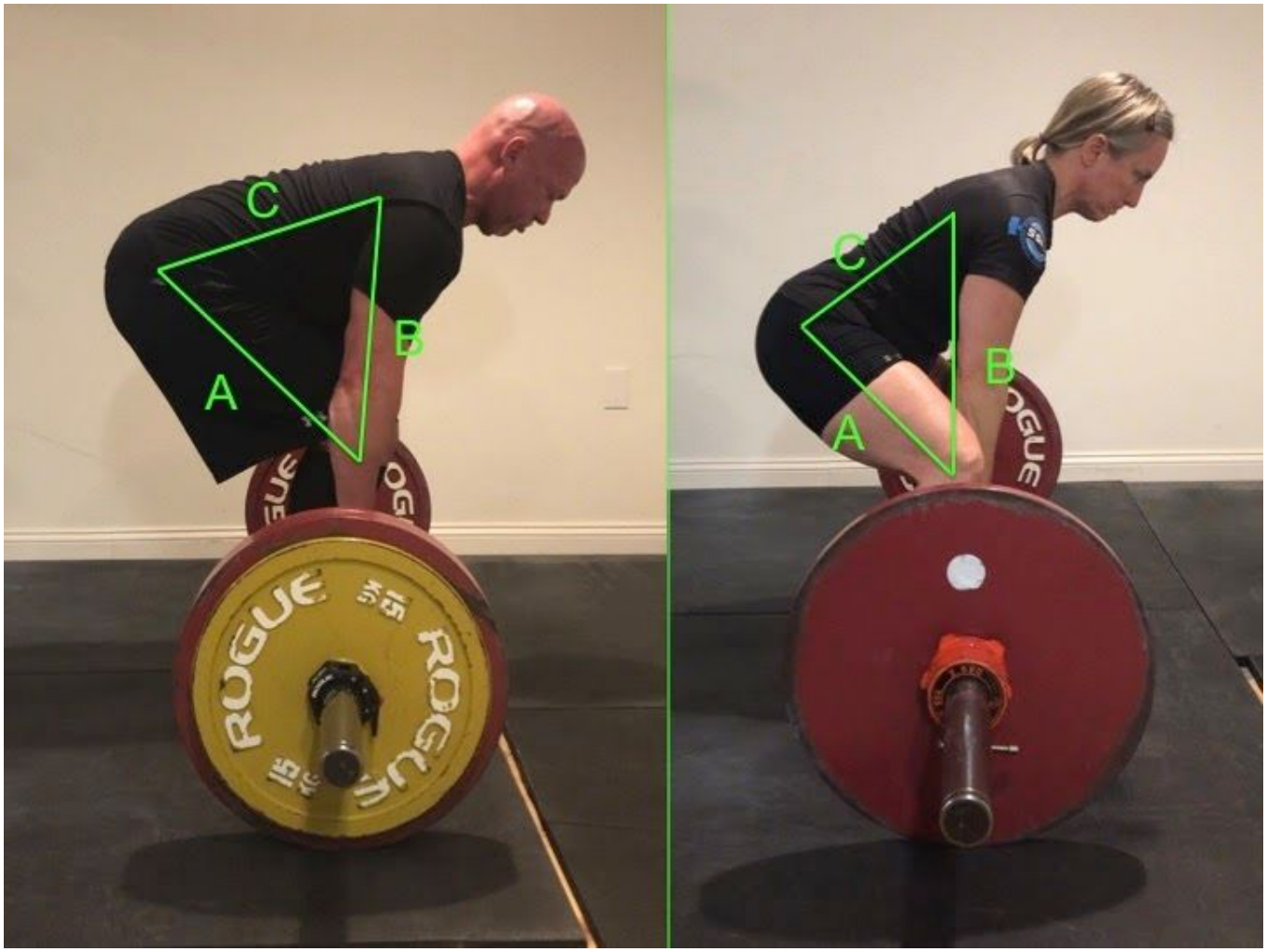
The deadlift (DL) is the third and final lift of powerlifting competition. It completes a lifter's total and often determines the winner. It has been called the truest test of strength as one literally picks up the barbell from the floor to waist level. The deadlift is another full-body movement that primarily taxes the back and hips while testing overall body strength. The legs and hips assist the back. Deadlift execution should not be confused with the squat. Lifters are advised against trying to squat the weight up. Oppositely, the deadlift employs a "hip-hinge" movement. The deadlift is also unique because it begins by lifting the barbell rather than lowering. This essentially eliminates momentum and the stretch reflex.

The deadlift is intended to be a vertical-only lift free of any horizontal bar travel. Horizontal displacement leads to a more difficult lift due to the bar moving away from the body and reducing center of gravity management. This makes the bar feel heavier and the lift is harder to complete.

Anatomical considerations

The best deadlifters are often those who possess the best leverages. The most optimal structure for the deadlift is a short torso coupled with long arms and legs. The torso acts as the primary lever moving about the hip joint, which is the fulcrum. A shorter torso makes for a shorter moment arm while longer thighs creates a higher pivot point at the hips. Long arms simply decrease the distance of bar travel from the floor to lockout. When examining anthropometry, one notices that the torso (spine) [C], arms (humerus, ulna, radius) [B], and thighs (femurs) [A] form a triangle (see conventional vs. sumo photo). Everyone's triangle looks different according to his or her torso and limb lengths. While angles change according to body-types, preferred stance, and

grip, one constant remains true for everyone – the shoulder blades (scapulae) must be directly above the bar at the start (see vertical bar path photo). If they aren't properly aligned at the beginning of the deadlift, the body will align itself and the shoulders will come forward over the bar before it breaks from the floor. This is often seen with lifters who incorrectly try to sit back behind the bar. This technical inefficiency is known as a "hook" or a horizontal component, which causes wasted energy.



Regular stance deadlift aka conventional stance deadlift

Lifters should begin by assuming a stance approximately hip width with toes turned slightly out. This stance should resemble where one

would stand if they were required to test their vertical jump. A vertical jump stance affords the lifter the maximum amount of force transfer from their legs into the ground. The shins should be about one to two inches from the bar. This places the bar over the middle of the whole foot, not the mid-instep. Bend over at the waist while keeping the legs as straight as possible but without lowering the hips. Take your grip on the bar with your hands just outside your thighs. Squeeze the bar as hard possible while leaving your hips up. Lower your hips slowly and allow the knees to come forward until your shins touch the bar. Once the shins contact the bar, stop and pull your chest up as hard as you can. This maneuver arches and flattens the back. The scapulae should be pulled back together and down as if trying to put them in your back pocket. This places the entire back into rigid extension. A most crucial aspect of this process is to lift the chest up and "pack" the lats (latissimus dorsi) muscles to set the back angle.

Drive the bar off the floor, while pushing your feet through the floor, and drag it up your legs in contact with your skin. As soon as the bar reaches the knees, squeeze the glutes as hard as possible. This will bring the hips forward to meet the bar. Continue to drag the bar up against the thighs. Stand fully erect with shoulders back, chest out and up, hips through, and knees locked.

Adhering to this sequence helps ensure a vertical bar path. Lifters often perceive the hips being too high but if you complete the steps correctly, the scapulae, bar, and mid-foot will be in vertical alignment. The bar path will be vertical and seem shorter.

As in the squat, an initial breath should be taken before producing force through the floor and held throughout the movement until the bar comes to lockout. In order to maximize skill acquisition, multiple sets of single repetitions are often preferable than multiple-rep sets.

Wide stance aka sumo deadlift

By widening the distance between the feet, a shorter range of motion is created and may be favorable to lifters with stronger hips and longer torsos. Start by setting the stance with toes pointed out and shins touching or one to two inches from the bar. This will vary depending upon the lifter's flexibility. Taller and less flexible lifters should set-up with their shins further away from the barbell. After setting the feet, bend over at the waist while keeping the legs as straight as possible but without lowering the hips. Take your grip on the bar with your hands just inside your thighs. Squeeze the bar as hard possible while leaving your hips up. Lower your hips slowly and allow the knees to come forward until your shins touch the bar if they haven't already. Once the shins contact the bar, stop and pull your chest up as hard as you can. Similar to the conventional deadlift, this maneuver arches the back and sets the torso angle. Just before initiating the pull, tighten every muscle in the body and simultaneously drive the feet down into the floor. Keep the head up and squeeze glutes to bring the hips toward the bar while dragging the bar up the legs. Stand fully erect with shoulders back, chest out and up, hips through, and knees locked.

Additional Considerations

Personal Attire

Fortunately, you don't need a lot of fancy attire to perform the powerlifts. Typically loose-fitting clothing like shorts and a t-shirt are

preferred to allow for maximum range of motion. Some may prefer leggings or tights with minor compression while allowing free movement. Baggy shorts or sweatpants should be avoided as they may inhibit movement and can make it difficult to determine depth in the squat.

Footwear is the most critical piece of lifting attire. Your feet connect you to the ground and are where most of your force transfer begins. Therefore, your feet should remain flat and stable at all times. Avoid any shoe that offers a lot of cushion. Some trainees may opt for a weightlifting shoe with an elevated heel. The elevated heel makes it easier to achieve depth in the squat and helps in overall stability. Wide stance squatters may opt for a flatter, hard sole shoe without an elevated heel.

Belts, wrist wraps, and knee sleeves are optional and offer varying degrees of support. Novices may want to begin training the powerlifts without the use of additional aids to help strengthen connective tissue and joints before adding them later as loads get heavier.

Training Frequency

Depending upon the trainee's goals, training the powerlifts one to two times weekly is typically sufficient. Increased frequency affords additional practice on the movements but personal tolerance should be assessed before making larger increases in overall workload.

Gym & Safety Considerations

Most commercial gyms are adequately equipped to perform the powerlifts. A squat rack or cage is needed for the squat. A bench press or rack and a bench are required for the bench press and you simply need an open area on the floor to deadlift.

Safety should always be your priority. When training alone, squats and bench presses should be done inside a cage or power rack with safety pins. When bench pressing heavy on an actual bench, ask for a spotter.

It's always a good idea to be respectful of your training environment. Be mindful of your gym's rules and ask the staff if they allow deadlifts, the use of chalk, and where might be a good place to deadlift if a designated area or platform isn't already provided. The golden rule and a little common sense go a long way.

To compete or not compete

Each fitness journey is unique and we all approach it with a different context or goal in mind. Some may simply want to reap the vast physiological and mental rewards that training the powerlifts offer. For others, competition may provide purpose to your training or be a fun way to connect with a community of like-minded people. Regardless of your destination, strength is always an asset and including the powerlifts into your journey can add a lot of value to your life.

Credits and Acknowledgements

This book utilized content, with explicit permission, from the USA Powerlifting Club, Senior National and Senior International Coaching Curriculum. Specifically, this book utilized direct quotes from the curriculum and paraphrased and summarized synopses from pages 11-23 of the course content.

Macros Inc thanks USA Powerlifting for their generosity of intellectual property and for allowing us to educate while standing on the shoulders of the giants who have come before us.