



**My Top  
Muscular  
Training  
Exercises and  
Challenge  
Series**

**My List** is a program that highlights my favorite exercises—the ones I consistently incorporate into my training. It details how I program them, how to perform them correctly, and why they matter.

In addition to the exercises, the program features **My Challenge List**, where I set physical challenges based on these movements. There will be several challenges (Upper, Lower, and Mid Body etc). Participants can test themselves against age- and gender-based benchmarks. If you meet or surpass the challenge level, you'll earn a spot on **My Challenge List**, where your name, initials, or a chosen nickname (for anonymity) will be displayed.

This will be an **ongoing list**, meaning you can attempt challenges at any time and work toward securing your place on the list. It's all about pushing limits, improving performance, and recognizing those who rise to the challenge!

If you make **My Challenge List for any challenge**, you'll receive:

An **“I Am Fit” sticker** as a badge of achievement.

A **certificate from Chris** recognizing your success.

And if you want to commemorate your victory with a **trophy or a shirt**, you're welcome to purchase one yourself with our full blessing. Using our name/logo I am Fit—because you earned it! We do not profit from this.

**Note:** Your numbers will remain private, and this is based on the honor system. If you need help reaching these levels, feel free to make an appointment with Chris for personalized guidance and support. It's about doing your best and proving to yourself that you can push through!

## My Top Muscular Training Exercises

I approach my own training with a holistic focus on building a resilient, functional body. My routine blends mobility work to restore joint range and maintain tissue health, functional exercises like the suitcase carry and kettlebell swings to reinforce stability and power, and targeted core work for a strong foundation. I balance resistance training to build strength and durability with run training to develop cardiovascular endurance and mental grit.

To complement this, I integrate high-intensity conditioning on the elliptical and assault bike to push intensity while minimizing wear and tear from running four days per week. My training isn't just about working hard — it's about moving well, building capacity, and staying prepared for whatever life throws my way.

In this series of articles, I'll break down my favorite muscular gym-based exercises into upper, middle, and lower body categories. Not included in this gym-based list are my aerobic (moderate and high-intensity) training, my essential core and mobility routine that I do most days of the week, my warm-up routine, and some power exercises, which remain a crucial part of my overall program.

### Go-To Lower Body Exercises

For lower body exercises, I focus on building strength, stability, and muscle balance while addressing tendon capacity and hypertrophy. My go-to Mid Body Exercises exercises include:

- Single-Leg and Pistol Squats: For unilateral strength and balance.
- Split Squats: Performed with rear foot elevated (Bulgarian Split Squats) or with foot down, typically with dumbbells, for quad and glute development.
- Goblet/Front/Zercher Squats: Performed with dumbbells for core engagement and quad strength.
- Weighted Step-Ups: From both the front and the side to target the quads, glutes, and stabilizers.
- Barbell or Power Squats: For overall leg strength and development.
- Standing and Seated Calf Raises: To develop calf strength and endurance.
- Ball Leg Curls: For hamstring strength and knee stability.
- Nordic Leg Curls & Reverse Nordic Curls: Strengthen the hamstrings and quadriceps eccentrically, great for knee health.
- Copenhagen Planks: Targets the adductors and core for improved hip stability.
- Leg Extensions and Curls Machines: Primarily for tendon strength and muscular hypertrophy.
- Inner/Outer Thigh Machines: I include these because they are very time-efficient for targeting the adductors and abductors.
- Leg Press Machine: I include it because it is very time-efficient for targeting the quadriceps and glutes.
- Tibialis Raises: Helps strengthen the front of the shin, useful for knee health and running performance.

### Go-To Upper Body Exercises

- Pull-ups: With varied hand placements (neutral, overhand, underhand) and both weighted and unweighted variations.
- Dips: Performed both weighted and unweighted.
- Push-ups: A staple for bodyweight strength.
- Dumbbell Curl-to-Shoulder-to-Press: A compound movement for biceps, shoulders, and triceps. **or Basic Dumbbell Presses**
- Dumbbell Rows: My preferred choice is double-armed for back strength, but I do single arm as well.
- Dumbbell Flat or Incline Press: A versatile option for chest development.
- If time permits, I also add additional aesthetic exercises:
  - Cable Pushdowns: For isolating the triceps.
  - Varied Dumbbell or Barbell Curls: For targeting the biceps.
  - Dumbbell Upright Rows or Lateral Raises: For shoulder strength and definition.

### Go-To Mid Body Exercises: Posterior Chain & Core

For mid-body exercises, I emphasize strength and stability while maintaining strict form. I perform all of the exercises below, except for the Controlled Jefferson Curl, with my spine locked in neutral and my core braced. My go-to Mid Body Exercises include:

- Hex Bar Deadlifts: A powerful full-body movement with a mid-body emphasis.
- Dumbbell Deadlifts: I prefer dumbbells over barbell deadlifts for time efficiency, especially since I have dumbbells that go up to 100 lbs.
- Romanian Deadlifts (RDLs) with Dumbbells: A great exercise for the hamstrings, glutes, and lower back.
- Single-Leg Romanian Deadlifts with Dumbbells: To build unilateral strength and balance.
- Hyperextensions: Performed both as static holds and for repetitions, including traditional and side-lying variations for comprehensive spinal strength.
- Pallof Presses: Using a band or cable to build anti-rotational core stability.
- Jefferson Curls: While not a typical mid-body exercise, I include these for controlled spinal mobility and hamstring lengthening. I never use more than 50 lbs, do not bring this exercise to fatigue, and perform it in a slow, deliberate manner.

This training approach not only supports muscular strength, tendon capacity, and bone density, but it also contributes to overall aesthetics. Through this series, I'll explain how to perform each exercise, their benefits, and what a fit level looks like for both men and women."

# Other Important Components to Consider for My Training

## Warm-Up Routine

My warm-up typically consists of my **core routine** (Floor It), my **simple Primary Motion Exercises** (Build It), which include rotator cuff work, and some **mobility work** that also focuses on balance (Move It). This may include dynamic stretches, mobility drills, or activation exercises to prepare my body for the demands of the workout ahead.

## Progression Strategies

I typically perform three sets of each exercise, going to a couple of repetitions shy of failure (known as reps in reserve) on the final set. My progression strategy alternates between two approaches:

1. **Progressive Overload:** Gradually increasing weight on one training day.
2. **Volume Consistency:** Keeping the weight constant on the second training day to focus on volume and technique.

For recovery during sets, I often incorporate active recovery exercises. These may include an alternative movement that doesn't interfere with the paired exercise or a balance exercise, mobility work, calf raises, or a rotator cuff stabilizing movement using bands.

## Exercise Substitutions

I occasionally substitute exercises with variations that use barbells, dumbbells, kettlebells, or cables and machines for variety while staying true to the overall blueprint of my program. This variety helps to keep the training engaging while addressing the same movement patterns.

## Grip Strength Training

Grip strength is an essential component of overall strength, and I integrate exercises like farmer's carries, dead hangs, and wrist curls into my active recovery. These exercises not only improve grip strength but also complement many of my upper and lower body workouts.

## Loaded Carries

Loaded carries are a staple in my training. In addition to the suitcase carry, I also include variations such as farmer's carries, overhead carries, and rack carries. These exercises enhance full-body stability, strength, and endurance.

## Explosive Training (Plyometrics and Swings)

To develop power, I incorporate explosive movements like box jumps, mini jumps, and kettlebell swings at the end of my lower body training sessions. These exercises improve my ability to generate force quickly, benefiting overall athletic performance.

## Mobility for Lower Body

Mobility work for my lower body focuses on improving hip, ankle, and knee function. This includes dynamic stretches and mobility drills that enhance range of motion and stability, crucial for performing lower-body exercises safely and effectively.

## Recovery and Rest Days

I train four days a week, alternating between upper body and lower body sessions, with mid-body exercises distributed across both days. On my non-training days, I prioritize additional cardio and mobility work, as well as parts of my **IT Program**, to ensure I'm addressing every component of fitness while giving my muscles adequate recovery time.

## Training Frequency and Splits

My training format balances workload across upper and lower body days while ensuring that I'm addressing all major muscle groups. This upper body and lower body format balances workload and ensures I'm addressing all major muscle groups. For example:

- **Upper Body Days:** Focus on pressing, pulling, and accessory movements for the chest, back, shoulders, biceps, and triceps.
- **Lower Body Days:** Prioritize squats, deadlifts, single-leg movements, and calf work.
- **Mid-Body Exercises:** Integrated across both sessions to target the core, spine stabilizers, and posterior chain.'

My training week is split into upper body and lower body sessions, with mid-body exercises integrated across both. This super and lower body format balances workload and ensures I'm addressing all major muscle groups. I train four days a week, alternating between upper body and lower body days while splitting my mid-body exercises across the two sessions. For example, mid-body exercises like Pallof presses or Jefferson curls might be included with my upper body routine one day and others like the Hex bar Deadlift or Romanian Deadlift paired with lower body exercises the next. While my preferred split involves upper body and lower body four training days, I also recommend alternative splits, such as dividing the week into pull, push, and leg days over a 4-6 day a week training schedule. This flexibility ensures the program can adapt to different preferences or time constraints.

## Unilateral vs. Bilateral Emphasis

I intentionally include a mix of unilateral and bilateral movements in my program. Unilateral exercises like split squats, step-ups, and single-leg Romanian deadlifts help to correct imbalances and improve stability. Bilateral movements like squats and deadlifts build overall strength and power. This combination ensures balanced strength development across all planes of motion.

# My Training Program

4 Days Per Week

Cycle Lower Body and Upper Body Days : 2 Days Each (some Mid Body Exercises are done on either day), typically 3 sets per exercise for 3 sets

**Lower Body Workout: Typically working between 2 or 3 exercises**

**Warm Up: Floor It, Move It, and the Banded Shoulder Work**

- **Single-Leg or Pistol Squats:** One or the other
- **Split Squats:**
- **Front/Goblet Squats:**
- **Weighted Step-Ups:**
- **Barbell or Power Squats:** One or the other
- **Standing and Seated Calf Raises:** One or the other
- **Ball Leg Curls:**
- **Nordic Leg Curls & Reverse Nordic Curls:**
- **Copenhagen Planks:**
- **Leg Extensions and Leg Curls Machines:**
- **Inner/Outer Thigh Machines:**
- **Leg Press Machine:**
- **Single-Leg Romanian Deadlifts with Dumbbells:**

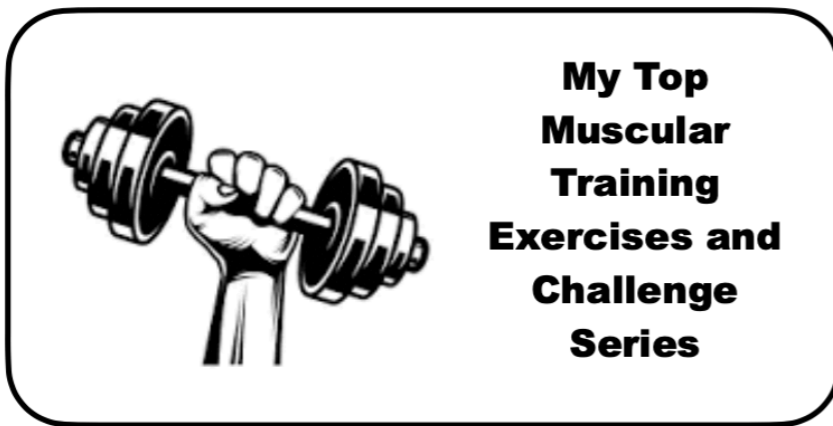
**Upper Body Workout (including mid body work) Typically working between 2 or 3 exercises**

**Warm Up: Floor It, Move It, and the Banded Shoulder Work**

- **Pull-ups:**
- **Dips:**
- **Push-ups:**
- **Dumbbell Curl-to-Shoulder-to-Press and Basic Dumbbell Shoulder Presses**
- **Dumbbell Rows:**
- **Dumbbell Flat or Incline Press**
  - **Cable Pushdowns:**
  - **Varied Dumbbell or Barbell Curls:**
  - **Dumbbell Upright Rows or Lateral Raises:**
- **Hyperextensions:**
- **Dumbbell or Bar or Hex Bar Deadlifts:.**
- **Romanian Deadlifts (RDLs) with Dumbbells:**
- **Pallof Presses:**

**Mobility Day: A lot of motions but I include light Jefferson Curls**

- **Jefferson Curls:** While not a typical mid-body exercise, I include these for controlled spinal mobility and hamstring lengthening. I never use more than 50 lbs, do not bring this exercise to fatigue, and perform it in a slow, deliberate manner.



# Single Leg Squats

Summary: This exercise is great at improving athletic and fitness capacity. It is used as both an exercise and as a test of functional ability. It not only works the lower leg complex but it works the upper core. Doing the unsupported version (not holding on) is a great balance challenge. It is a must to keep hip level and knee aligned with toes (knees not going in or out). This is part of my own training twice a week.



# Single Leg Squat Assessment

## Depth Standard for Assessment/Training

### Purpose:

To assess lower body strength, balance, and control on each leg. This version uses a partial squat depth (~60° of knee flexion), making it suitable for general fitness, older adults, or those with limited mobility.

### How to Perform:

1. Stand on one leg, with the other leg held in front of you.
2. Squat down **until your knee is bent to roughly 60 degrees** — about one-third to halfway down from standing.
3. Keep your **heel flat, knee aligned over your toes, and torso upright**.
4. Return to standing with control.
5. Perform **as many reps as possible up to 10**, using good form. Repeat on the other leg.

| <b>Reps per Leg</b> | <b>Movement Quality</b>                             | <b>Interpretation</b>                          |
|---------------------|---|--|
| 10                  | Full control, no form breakdown                     | <b>Strong and balanced</b>                     |
| 7–9                 | Minor wobbles or control loss                       | <b>Good, slight improvement needed</b>         |
| 5–6                 | Noticeable instability, asymmetry, or fatigue       | <b>Moderate — train for strength/stability</b> |
| <5                  | Loss of control, poor alignment, cannot reach depth | <b>Needs improvement</b>                       |

# Single Leg Squats

## Single-Leg Squat (Intermediate to Advanced)

This exercise ranges from intermediate to advanced depending on your squat depth, leg position, and whether you're using support. It's a great balance challenge when performed without holding onto anything.

### How to Do It:

- Stand tall on one leg. Lift the other leg either straight in front of you or bent at the knee—whichever feels more stable to start.
- Place your arms out in front, at your sides, or lightly hold onto something for support if you're new to the movement.
- Keep your core braced and torso upright.
- Initiate the squat by hinging at the hips—push your hips back as you lower down.
- Aim to lower until the thigh of your stance leg is between a 45° angle and parallel to the ground.
- Press through your heel and engage your glutes to return to standing.
- Keep your hips level and avoid letting the knee collapse inward or outward—maintain proper alignment.
- Try gripping the floor with your toes for added foot stability.
- Keep the non-stance leg elevated throughout the set without letting the hip drop.

**Reps:** 5–15 reps per leg for 1–3 sets.

[See video here.](#) [See video here.](#)



## The Single-Leg Squat: A Powerful Tool for Strength, Balance, and Assessment

The single-leg squat (SLS) is one of my favorite lower-body exercises. It powerfully targets the gluteal complex and quadriceps while simultaneously challenging balance and core control. I especially feel its effects through the lateral core muscles, which help stabilize the pelvis and prevent hip drop during the movement.

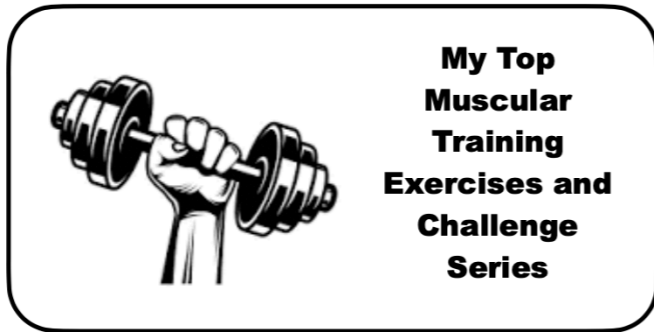
Beyond being a solid strength-builder, the SLS is highly functional. It mirrors the single-leg stance found in walking, running, and jumping—making it highly relevant for athletic performance and injury prevention.

Clinicians frequently use the single-leg squat as both an assessment and intervention tool. It provides a clear window into lower extremity alignment and can highlight faulty movement patterns involving the trunk, pelvis, and knees. Research has shown that individuals with conditions like patellofemoral pain (PFP), ACL injuries, or hip chondropathy often perform the SLS with compensatory patterns—such as ipsilateral trunk lean, contralateral pelvic drop, hip adduction, and knee valgus—compared to those without injury.

Given its diagnostic value, it makes sense to include the SLS in training not just for strength, but also for improving movement quality. One lesser-known but important variation involves altering the position of the non-stance leg. Changing where and how you hold the free leg can shift balance demands and challenge the neuromuscular system in different ways—something supported by recent research.

For individuals with low back pain or those recovering from sports injuries, single-leg squats may even offer advantages over traditional bilateral squats. Studies have found that SLS can achieve similar muscle activation in the hamstrings, calves, hips, and core, but with less load on the spine. Moreover, when matched for external load per leg, unilateral squats can generate greater peak vertical ground reaction forces and higher barbell velocities—metrics associated with greater strength and power development.

While bilateral squats remain essential for building maximal strength and muscle mass, I believe unilateral exercises like the SLS are often superior for functional strength, injury resilience, and performance enhancement. That said, more research is needed to determine which is best for specific outcomes like hypertrophy.



## Summary:

Lunges not only strengthen major lower-body muscles like the glutes, quads, and hamstrings but also engage core stabilizers, improving balance and joint stability—important for injury prevention. Studies show lunges activate the gluteus medius and maximus as effectively or better than squats and step-ups, making them excellent for hip strengthening and rehabilitation. Regular lunge training has been linked to improved functional movement patterns and posture, thanks to stronger hips and core muscles. They are also shown to enhance balance and reduce fall risk in older adults by boosting lower-body strength and body awareness. This is part of my own training twice a week.

# Lunges / Split Squats



# Lunge Assessment Table

| Test Type                        | What It Assesses                            | Instructions  | Scoring/Standards   | Notes  |
|----------------------------------|---|---|---|--|
| <b>Static Lunge Hold</b>         | Leg strength, endurance, knee stability     | Hold bottom lunge position (knee ~1 inch above floor) as long as possible | <30 sec: below avg<br>30–60 sec: avg<br>>60 sec: above avg                      | Perform both sides; note major asymmetries or knee wobble        |
| <b>Walking Lunge Test</b>        | Coordination, balance, mobility             | Perform 10 controlled walking lunges (5 each leg) across a 10–15 ft space | Smooth, upright, no loss of balance or trunk lean = pass                        | Count steps with loss of control or knee collapse                |
| <b>Repetition Test</b>           | Strength endurance, control                 | Max reps of bodyweight lunges in 60 seconds with good form                | <10: low<br>10–20: avg<br>20+: high   | Stop test if form breaks down (e.g., knees cave in, torso leans) |
| <b>Step-Through Lunge</b>        | Hip and ankle mobility, core control        | Perform alternating forward-to-reverse lunges (same leg, then switch)     | Fluid motion, upright torso, no stumbles = pass                                 | Great for revealing core and hip stability issues                |
| <b>Overhead Lunge</b>            | Thoracic and hip mobility, postural control | Perform forward lunges holding arms overhead (or a dowel)                 | Arms stay overhead, torso upright = pass<br>Arms fall/knee wobbles = needs work | Can highlight mobility restrictions in shoulders, hips, or core  |
| <b>Front Knee Tracking Check</b> | Knee alignment and neuromuscular control    | Observe knee during forward lunge: does it stay over 2nd/3rd toe?         | Consistent tracking = pass<br>Knee caves in = flag for risk                     | Film side and front views if possible for feedback               |

# Lunge and Split Squat Form

**Types (progression):** The Forward and Rear Lunges are two of my favorites. To make it harder hold onto weights. If just starting out do the [Split Squat](#), which is a lunge without a step forward or back and do not go deeply and it is ok to use a support. I do not recommend the Bulgarian Lunge for many, which is a highly popular exercise used by Strength and Conditioning Coaches ([see article](#)).

## Why I Don't Program Bulgarian Split Squats for many:

While Bulgarian split squats are a great single-leg strength builder, they place high demands on pelvic stability and hip mobility. For clients with SI joint sensitivity, poor balance, or limited hip extension, I often substitute forward or reverse lunges to build similar strength benefits in a more accessible way.”.

[SEE DETAILS ON HOW TO DO A FORWARD LUNGE.](#)

## Form: Lunge Form Essentials:

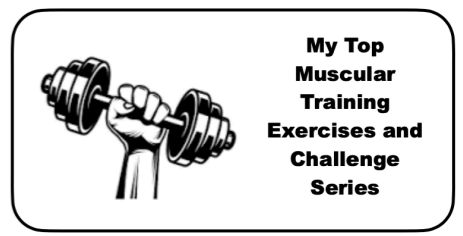
- **Breathe continuously** throughout the movement.
- **Keep a neutral spine**, especially in the lower back.
- **Engage your core** with a gentle (~20%) isometric abdominal contraction to stabilize your spine.
- **Start** standing tall with feet hip-width apart, hands on hips, and hips facing forward.
- **Step forward** (or backward for rear lunges) so your back heel lifts off the ground.
- **Lower your body slowly**, keeping your torso upright and spine vertical.
- Aim for **90-degree angles** in both knees: front knee stacked over the ankle, back knee aligned under the hip. Visualize a straight line from ear → shoulder → hip → back knee.
- **Press back up** through the front foot to return to standing. Repeat on the other side.

Maintain control and avoid rushing—proper alignment and balance are key.



The lunge is one of the best exercises for strengthening the lower body. It effectively targets the glutes, quadriceps, and core muscles while also improving balance and stability. Because lunges mimic **primary movement patterns**—like stepping and bending—they help correct muscle imbalances and promote better overall movement. In addition to building strength in the hips and knees, lunges support spinal stability, which is why I include them in nearly all my lower back conditioning programs. Some experts even suggest that regular lunging can contribute to improved posture. I consider the lunge a foundational exercise that belongs in everyone's basic fitness routine. It also works great as a warm-up for advanced exercisers and athletes. Since it's a unilateral movement, it's important to perform lunges on **both the right and left sides** to maintain balanced strength and coordination. Lunges require no equipment and can be done virtually anywhere. They're simple enough to be performed frequently—even daily if desired. I recommend doing lunges at least 3 times per week, completing 1 to 3 sets of 10–15 repetitions per leg. It only takes a few minutes, so there's really no excuse to skip them! **Did you know?** A study found that the forward lunge activates the hamstrings, gluteus maximus, and gluteus medius more effectively than body-weight squats, leg presses, and hip extensions. This makes it an especially valuable exercise for building strong, balanced lower-body muscles. A 2019 study in *Physical Therapy in Sport* showed that regular lunge training improved participants' functional movement patterns and posture, likely due to enhanced hip and core strength, supporting the idea that lunges contribute to better alignment.

# Goblet / Front / Zercher Squats



## 🏆 Why I Love the Goblet Squat — Summary

The Goblet Squat is a full-body, functional exercise that especially engages the core and mimics everyday movements of squatting with weight in front. It's similar to the Zercher squat but more comfortable because you hold a dumbbell or kettlebell at chest level instead of cradling a barbell in your elbows.

This exercise promotes total-body strength, encourages upright posture, and challenges core stability due to the forward load's torque on the spine. It's highly practical for daily activities like lifting boxes or groceries.

Research shows the front squat (and its variation, the goblet squat) is as effective as the back squat for muscle recruitment but with less joint stress, making it safer—especially for those with knee or spinal concerns.

**Consider the Zercher Squat** when you want to increase load and develop greater hip and core strength. The Zercher's bar placement provides a unique challenge to the upper back and core, making it a favorite among strength athletes and physical therapists focused on functional strength. According to many strength coaches and rehab experts, the Zercher squat can be the best choice when targeting specific strength gains and improving posture under heavier loads.



# Goblet / Front / Zercher Squats

## 🔄 Variations & Progressions

The Goblet Squat can be performed using different tools to match the lifter's ability, equipment access, or training goals:

- **Kettlebell** – Classic goblet style with a single weight held by the horns
- **Dumbbell** – Held vertically at the chest (by one end), or two dumbbells racked on the shoulders
- **Cable Machine** – Front-loaded resistance with constant tension
- **Resistance Band** – Great for beginners or mobility work
- **Barbell** – Front squat or Zercher squat variations for more advanced lifters



## ✅ Key Form Cues

### 1. Posture & Breathing

- Maintain a **neutral spine** throughout—especially the **lower back**.
- Brace the core with about **20% isometric contraction** to stabilize the spine.
- Breathe continuously—**don't hold your breath**.

### 2. Setup & Descent

- Stand with **feet shoulder-width apart**, feet gripping the floor.
- Keep your **chest tall**, **elbows close to your ribs**, and **head up**.
- Initiate the movement by **hinging slightly at the hips** and lowering into a squat.
- Descend with control, stopping when **hip mobility ends** (before the spine rounds).

### 3. Ascent

- Drive through **both feet evenly**, pressing into the floor.
- Keep the upper body upright as you return to a standing position.

⚠️ **Avoid “butt wink”** (posterior pelvic tilt or lumbar flexion at the bottom of the squat), which increases spinal stress. Never sacrifice spinal alignment for depth.

[SEE DETAILS ON HOW TO DO A GOBLET SQUAT.](#) [SEE FRONT SQUATS](#)



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[SEE DETAILS ON HOW TO DO A GOBLET SQUAT. SEE FRONT SQUATS](#)



## Goblet Squat Strength Test

### How to Test

1. **Warm up first** with bodyweight squats and mobility drills.
2. Select a **dumbbell or kettlebell** of appropriate weight.
3. Hold it in the goblet position at chest height.
4. Perform **10 controlled goblet squats**, maintaining:
  - Upright posture
  - Neutral spine
  - Depth as low as mobility allows without spinal flexion
5. Use a **mirror or coach** to ensure proper form throughout.

| Group   | Recommended Load   | Goal            |
|---------|--------------------|-----------------|
| Females | ~20% of bodyweight | 10 perfect reps |
| Males   | ~30% of bodyweight | 10 perfect reps |

- <10 reps = "Needs foundational strength and/or mobility work"
- 10 reps = "Meets functional strength standard"
- 10 reps = "Above-average strength and control"

### What's a Good Standard?

These benchmarks are based on general fitness levels for **uninjured, healthy adults**:

Example: A 150 lb female would use a 30 lb weight; a 180 lb male would use a 54 lb weight.

These loads are **challenging but safe** for those with solid movement mechanics and core control.

## Why I Love the Goblet Squat

The **Goblet Squat** is one of my favorite lower-body exercises because it works the **entire body**, especially the **core**, and mimics real-life movements. It's a highly **functional** motion—one that reflects how we often squat down with something in front of our body, whether held close or extended slightly forward.

### Similar to the Zercher Squat—But Less Painful

The goblet squat is very similar in movement to the **Zercher squat**, but it's often more comfortable to perform. Instead of cradling a barbell in the crooks of your elbows (as in the Zercher), you hold a **dumbbell or kettlebell at chest level**. This makes it more accessible and less painful, especially for those new to front-loaded squatting.

### Why It's So Effective

- **Total-Body Engagement:** While it targets the quads, glutes, and hamstrings, the **core works hard** to stabilize the torso against the forward pull of the weight.
- **Postural Benefits:** Holding the weight in front naturally encourages a **more upright posture**, making it easier to maintain a neutral spine throughout the squat.
- **Torque Challenge:** With the load in front, the exercise places significant torque on the spine, demanding strong core bracing and spinal alignment.
- **Real-World Application:** Whether lifting a box, picking up a child, or squatting with groceries, this type of movement is highly transferable to daily life.

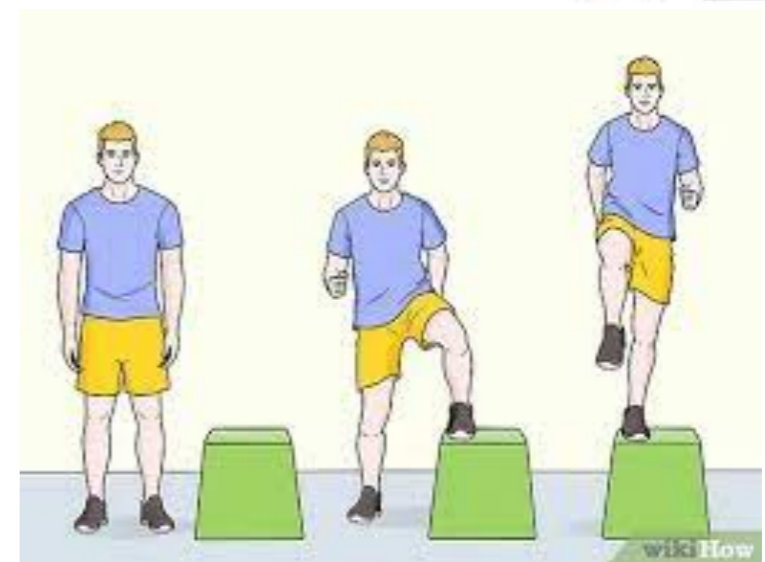
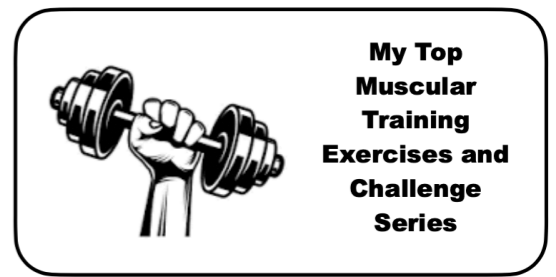
### What the Research Says

The Goblet Squat is a variation of the **front squat**, which has been shown in studies to be both safer and equally effective compared to the traditional **back squat**:

- One study found the **back squat produced significantly higher compressive forces and knee extensor moments** than the front squat.
- The **front squat** was just as effective for overall muscle recruitment, but with **less joint stress**.
- The authors suggest that **front squats are preferable for individuals with knee issues** (e.g., meniscus injuries) and those concerned with **long-term joint health**.
- Additional research shows that **back squats place more shear force on the lumbar spine**, further supporting the case for front-loaded options like goblet squats.

# Step Ups

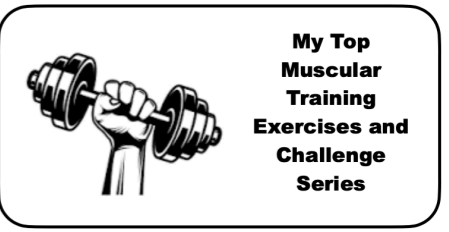
The step-up exercise is simple, safe, and adaptable for all fitness levels by adjusting step height. It's excellent for maintaining movement and sports ability. Step-ups strengthen the hip abductors and improve balance, with lateral step-ups activating the gluteus medius more than forward step-ups (Reid et al., 2016). The lateral step-up also serves as a functional strength test for lower limbs (Krause et al., 2020) and uniquely engages the quadratus lumborum, a core stabilizer (McGill, 2013). However, caution is advised with heavy loads or high steps during lateral step-ups due to potential knee injury risk



# Step-Up Assessment Chart

| Step Height                  | Repetitions | Performance Criteria                           | Interpretation                    | Notes                             |
|------------------------------|-------------|--|-----------------------------------|-----------------------------------|
| <b>6 inches<br/>(15 cm)</b>  | 10          | Smooth, controlled, knee tracks toe, no wobble | Foundational strength & balance   | For beginners or limited mobility |
| <b>8 inches<br/>(20 cm)</b>  | 10          | Maintains upright torso, controlled movement   | Low to moderate strength          | Early functional strength stage   |
| <b>10 inches<br/>(25 cm)</b> | 10          | Stable balance, minimal forward lean           | Functional strength baseline      | Common rehab and fitness target   |
| <b>12 inches<br/>(30 cm)</b> | 10          | Controlled ascent/descent, good knee alignment | Intermediate strength and balance | Typical for healthy adults        |
| <b>14 inches<br/>(35 cm)</b> | 10          | No knee valgus or torso compensation           | Advanced strength and control     | Athletes or high-function clients |
| <b>16 inches<br/>(40 cm)</b> | 10          | Excellent control, core engaged                | High level strength and stability | Elite or sport-specific training  |

# Step Ups



## Types (Progression):

The step-up can be performed either forward or laterally onto a step. A common progression is to step up using one leg only and maintain balance while standing on that single leg at the top before stepping back down. This avoids having both feet on the step simultaneously and increases the challenge to strength and stability.

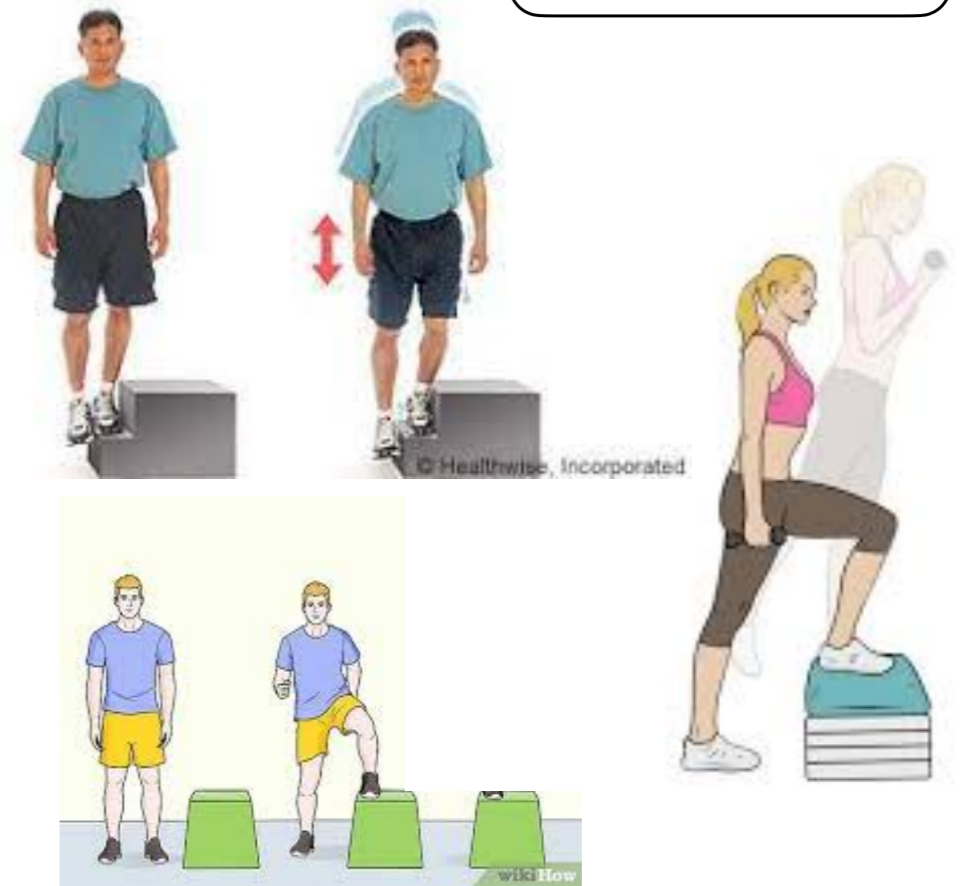
## Performance:

Typically, the exercise is done for 10 or more repetitions per leg, for 1–3 sets depending on fitness goals.

## Form – Upward Phase:

- Place your lead foot firmly on the step or platform, ensuring your torso stays upright.
- Align your lead knee over the second toe of that foot to protect the joint.
- Push off the trailing leg (e.g., left leg) to lift your body upward, bringing the trailing foot up to stand beside the lead foot on the platform.
- During the transition, expect your torso and lead shin (tibia) to move slightly forward past vertical. However, avoid excessive forward lean during a forward step-up or excessive lateral movement during a lateral step-up to maintain proper form and reduce injury risk.

[See Form](#)



This exercise is simple, safe, and excellent for sustaining your ability to move and play sports. It can be adapted for all ability levels by adjusting the step height. Step-up exercises are widely recommended to strengthen hip abductor muscles and improve balance in older adults and athletes.

Single-leg stepping is a highly functional movement performed daily. Step-ups effectively activate the gluteal muscles, with **lateral step-ups producing greater gluteus medius activation than forward step-ups** (Reid et al., 2016) The Lateral Step-Up is also used as a closed kinetic chain test to assess functional muscle strength of the lower limbs (Krause et al., 2020). As both a test and exercise, it develops concentric and eccentric strength, as well as balance and proprioception.

Uniquely, the lateral step-up engages the quadratus lumborum—a key core stabilizer—in a way not seen in many other lower-body exercises (McGill, 2013)

However, some strength professionals caution against heavy or high-step lateral step-ups due to potential knee injury risk, especially when performed with excessive load or step height (Hart et al., 2019).

# Back Squats / Leverage Squats

The back squat is one of the most fundamental lifts in strength and conditioning. Alongside the bench press and deadlift, it forms the trio of powerlifting exercises known as the “big three.” While the bench press primarily targets upper-body pushing strength and the deadlift emphasizes posterior chain power, the back squat is unmatched in its ability to develop total-body strength—particularly in the legs, hips, and core.

Athletes and fitness enthusiasts often use the back squat to build power, size, and overall athleticism. However, despite its value, it’s not a one-size-fits-all movement. There are important factors to consider before incorporating it into a training program.

First, a person must be physically prepared to squat properly. This means more than just muscular strength—it includes joint mobility, coordination, and awareness of how your body moves. Variables such as ankle mobility, tibial rotation, femur length, and spinal stability all influence how a person squats. Because of individual differences in anatomy and movement patterns, a squat that’s optimal for one person may not be suitable for another. That’s why individualized coaching and assessment are so important (see this [page]).

To ensure safety and effectiveness, I often incorporate machines like the **Hoist Power Squat** and other **leverage-type squat machines** into training. These machines are designed to guide the body through a natural squatting motion while reducing strain on the joints and spine. They provide support and stability, which can be especially helpful for beginners, those returning from injury, or individuals with mobility restrictions. By controlling the movement path and minimizing risk, these machines allow clients to build lower-body strength and confidence before progressing to more advanced barbell work.

In short, while the back squat is a cornerstone of strength training, it must be approached with care, and sometimes adapted, to meet the needs of each individual. Machines and variations are not shortcuts—they’re smart tools in a well-rounded strength program. See chart for levels and how to next pages.





## Estimated “Good” 10-Rep Squat Loads by Type (Men vs. Women)

| Squat Type                    | Men – Good Weight (10 Reps)             | Women – Good Weight (10 Reps)           | Example for 180 lb (82 kg) Man | Example for 140 lb (64 kg) Woman | Notes  |
|-------------------------------|---|---|--------------------------------|----------------------------------|--|
| <b>Barbell Back Squat</b>     | 1.2× – 1.5× bodyweight                  | 0.9× – 1.2× bodyweight                  | 215 – 270 lbs (98 – 122 kg)    | 125 – 170 lbs (57 – 77 kg)       | Classic compound lift; builds total-body strength                |
| <b>Front Squat</b>            | 0.9× – 1.2× bodyweight                  | 0.7× – 1.0× bodyweight                  | 160 – 215 lbs (73 – 98 kg)     | 100 – 140 lbs (45 – 64 kg)       | More quad and core focus; less spinal loading                    |
| <b>Leverage Squat Machine</b> | 1.0× – 1.3× bodyweight (machine weight) | 0.8× – 1.1× bodyweight (machine weight) | 180 – 235 lbs (82 – 107 kg)    | 110 – 155 lbs (50 – 70 kg)       | Stable platform; allows heavier loading with less balance demand |
| <b>Goblet Squat</b>           | 0.3× – 0.5× bodyweight                  | 0.2× – 0.4× bodyweight                  | 55 – 90 lbs (25 – 40 kg)       | 30 – 55 lbs (14 – 25 kg)         | Great for beginners, mobility work, and form practice            |

## ✓ How to Perform a Leverage Squat (Angled Shoulder Pad Style)

### 1. Set Up:

- Step onto the platform and position your shoulders under the angled pads.
- Stand tall with your feet roughly shoulder-width apart, toes slightly turned out.
- Grip the side handles for stability.
- Keep your chest up, core braced, and back neutral.

### 2. Unrack:

- Push up slightly to disengage the safety catch.
- Let the weight settle on your shoulders while staying tall and balanced.

### 3. Descend (Squat Down):

- Initiate the movement by sitting the hips back and bending the knees simultaneously.
- Keep your heels flat on the platform and allow your knees to track in line with your toes.
- Lower yourself in a controlled motion until your thighs are at least parallel to the platform—or lower if your mobility allows with good form.

### 4. Ascend (Stand Up):

- Press through your heels and midfoot to return to the starting position.
- Drive the movement with your glutes and quads, keeping your torso upright.
- Avoid locking out the knees at the top—maintain a slight bend.

### 5. Finish the Set:

- After completing your reps, slowly lower the machine and re-engage the safety catch or stopper.

## 🔍 Benefits of This Type of Leverage Squat Machine:

- **Natural Angle:** The angled shoulder pads mimic a more athletic squatting position and reduce spinal compression.
- **Freedom of Movement:** Unlike fixed-track machines (like a hack squat), this design allows more natural hip and knee movement.
- **Versatile for All Levels:** Safer than barbell squats for beginners or those with mobility limitations, but still great for advanced lifters to load heavily with confidence.
- **Joint-Friendly:** Less stress on the low back compared to barbell back squats. [VIDEO](#)

## ✓ How to Perform a Barbell Back Squat

### 1. Set Up:

- Step under the barbell in a rack and position it across your upper traps (high bar) or just below them (low bar).
- Stand tall with feet roughly shoulder-width apart, toes slightly turned out.
- Grip the bar evenly, squeeze your shoulder blades together, and brace your core.
- Unrack the bar by standing straight up, then take 1–2 controlled steps back.

### 2. Stance Adjustment:

- Set your feet firmly and find your natural squat stance—this may vary slightly based on your hip structure and femur length.
- Keep your spine neutral and core braced throughout the lift.

### 3. Descend (Squat Down):

- Initiate the movement by pushing your hips back and bending your knees at the same time.
- Keep your knees tracking in line with your toes—they may bow out slightly, which is normal and often necessary for hip space.
- Maintain an upright chest, heels down, and tension throughout the body.
- Lower under control until your thighs are at least parallel to the floor—or deeper if mobility allows.

### 4. Ascend (Stand Up):

- Drive through your heels and midfoot, engaging your glutes, hamstrings, and quads.
- Keep your torso strong and avoid collapsing forward.
- Finish tall but don't hyperextend—keep knees soft and core engaged.

### 5. Rack the Weight:

- After completing your reps, walk the bar forward under control and re-rack it on the hooks.
- Make sure the bar is secure before stepping away.

## 🔍 Benefits of the Barbell Back Squat:


- **Total Body Strength:** One of the best compound lifts for building full-body power, especially in the lower body and posterior chain.
- **Functional Transfer:** Excellent carryover to real-life movements and athletic performance.
- **Customizable:** Can be adjusted for different goals with bar position (high bar vs. low bar), tempo, and stance width.
- **Teaches Control:** Requires full-body tension, stability, and body awareness—especially under heavy load. [VIDEO](#)

# Why Everyone's Squat Looks Different

No two squats are exactly the same — and that's **not a flaw**, it's a **reflection of your body's unique structure**. While there are general movement principles that apply to all squats (like a braced spine, knees tracking over toes, and heels staying down), the details of your stance and mechanics depend on several individual factors:

## 1. Hip Anatomy (Depth & Orientation)

- **Hip sockets (acetabulum)** vary in depth and angle from person to person.
- Some people have hips that point more forward, while others have hips that angle outward.
- If your hips are more retroverted (angled outward), a wider and more turned-out squat stance will feel more natural.
- If they're more anteverted (angled forward), you may squat better with a narrower, more forward-facing stance.
- This is a major reason why some lifters “toes out” more than others, or need to go wide to hit depth comfortably.

 **Key Point:** Trying to force everyone into the same narrow, feet-forward squat can cause pain, impingement, or poor movement.

## 2. Femur Length vs. Torso Length

- Long femurs and short torsos often require a more forward lean to stay balanced.
- Short femurs and long torsos allow a more upright squat (common in Olympic lifters).
- This affects bar position too: high bar squats work well for more upright squatters, while those with long femurs may prefer low bar squats or variations like the box squat.

 **Key Point:** Your **leverages dictate your torso angle**, not your technique "discipline."


## 3. Ankle Mobility

- Limited dorsiflexion (ability to bend the ankle upward) can restrict squat depth and force compensation (like heels lifting or knees caving in).
- Good ankle mobility allows deeper, more upright squats.
- People with tight ankles may benefit from **heel wedges**, **weightlifting shoes**, or **elevated heel machine squats**.

 **Key Point:** If the ankle doesn't move, the body will find the movement elsewhere — often the spine or knees.

## 4. Tibial (Shin) and Femoral Torsion

- Some people have natural **external or internal rotation** of the tibia or femur — this changes how their knees track and what “neutral” looks like.
- Forcing the knees or feet to look perfectly straight may **go against your natural bone structure**.

 **Key Point:** Neutral is different for everyone. Let your knees and feet find their *natural line of movement*.

## 5. Spine Stability & Core Control

- Regardless of stance, you need to maintain a **braced, neutral spine** throughout the squat.
- Without adequate core control, other joints (hips, knees, low back) will compensate, leading to poor mechanics or injury risk.

## The Bottom Line:


A “textbook squat” should reflect **sound principles**, but the *exact form* will differ based on your anatomy. A coach or therapist forcing everyone into the same squat stance without considering structural differences is likely doing more harm than good.

 This is why **movement screens, joint assessments, and stance experimentation** are crucial — es

# Calf Raises Standing and Seated

Lack of mobility, strength, and stability in the lower leg—especially at the ankle—can lead to a chain reaction of problems throughout the body. If you can't properly bend at the ankle (due to stiffness or weakness), stress shifts to the knees and even the lower back. For example, during squats or running, limited ankle motion often causes the spine to flex earlier than it should, increasing the risk of injury.

That's why I consider calf raises a foundational movement. They're essential for beginners and still valuable for advanced exercisers and athletes. Calf raises are not only safe and simple—they're highly effective for improving ankle control, foot strength, and overall lower-limb resilience. For runners, they're especially important: strong calves contribute to propulsion, reduce Achilles strain, and improve neuromuscular control of the foot.

 Fun Fact: Tests like the calf lunge stretch and side hop have shown strong predictive value for injury risk in athletes—often more so than traditional flexibility screens (see Chris to be tested) See next pages for testing and how to,

**A good benchmark for single leg calf raises is around 25–30 unweighted reps in a slow, controlled tempo for both men and women, showing good muscular endurance; for weighted calf raises, being able to perform 10–15 reps with bodyweight loaded (e.g., holding dumbbells equal to your bodyweight) is a strong performance marker, especially when done with full range and no bouncing.**

# Calf Raises Standing and Seated

## ⚠️ Do You Need to Isolate Different Calf Muscles?

While standing calf raises emphasize the **gastrocnemius** and seated versions target the soleus, for most runners and general athletes, isolating these muscles individually isn't necessary. What matters more is that you:

- Strengthen the entire calf complex under different angles and loading conditions.
- Improve eccentric control, foot strength, and ankle stiffness.
- Build spring-like function in the lower leg for efficient propulsion.

👉 In other words, don't overthink the anatomy—focus on consistent calf strengthening from both straight-leg and bent-knee positions for comprehensive results.

## 🔍 Why Calf Raises Belong in Every Routine

- **Prevent Injury:** Improve ankle mobility and stability, reducing stress on knees and back.
- **Support Athletic Performance:** Boost jumping, sprinting, and change-of-direction movements.
- **Safe and Scalable:** Low impact, joint-friendly, and easy to load progressively.
- **Builds Foot Control:** Strengthens foot muscles and improves proprioception.
- **Aesthetic Bonus:** Helps shape and define the lower leg.

# Lower Leg (Calf & Ankle) Performance Chart

## Summary

- **Why Care?** Limited ankle mobility and weak calves cause compensations at knees and spine, increasing injury risk.
- **Key Movement:** Calf raises are foundational, safe, and effective for building ankle control and lower leg strength.
- **Target Numbers:** 25–30 slow single-leg reps unweighted; 10–15 reps weighted (bodyweight equivalent).
- **Additional Testing:** Use calf lunge stretch and side hop for injury risk screening.
- **Training Tip:** Emphasize full range of motion and controlled tempo to maximize benefit.

| Performance Aspect                   | Description / Importance   | Benchmark / Target   | Notes / Implications  |
|--------------------------------------|--|--|---|
| <b>Ankle Mobility</b>                | Ability to bend (dorsiflex) the ankle properly without stiffness or weakness.                                  | Full ankle dorsiflexion with ease.                                     | Limited ankle mobility shifts stress to knees and lower back, increasing injury risk during squats, running, etc. |
| <b>Calf Strength &amp; Endurance</b> | Ability to perform calf raises effectively improves ankle control, foot strength, and lower-limb resilience.   | 25–30 single-leg calf raises (unweighted), slow and controlled tempo.  | Good muscular endurance, foundational for all exercisers and athletes.  |
| <b>Weighted Calf Raise Strength</b>  | Strength when performing calf raises with added load equal to bodyweight (e.g., dumbbells).                    | 10–15 reps weighted calf raises, full range, no bouncing.              | Indicates strong calf muscle power and endurance, beneficial for runners and athletes.                            |
| <b>Injury Prediction Tests</b>       | Calf lunge stretch and side hop tests have strong predictive value for injury risk in athletes.                | Scores above risk thresholds in these tests.                           | More reliable than traditional flexibility screens; good screening tools for athletes.                            |
| <b>Functional Importance</b>         | Strong calves contribute to propulsion, reduce Achilles strain, and improve neuromuscular control of the foot. | Regular calf strengthening integrated into training.                   | Essential for injury prevention and enhanced performance in running and squatting.                                |
| <b>Balance &amp; Stability</b>       | Calf and ankle strength support overall lower limb stability and balance.                                      | Ability to maintain balance during calf raises and dynamic activities. | Deficits here can cause compensations and injury risk up the kinetic chain.                                       |

## ✓ How to Do Standing Calf Raises

**Targets:** Gastrocnemius and Soleus (primary calf muscles), intrinsic foot muscles, ankle stabilizers

### 1. Set Up:

- Stand tall with feet hip-width apart, using a wall, bar, or machine for balance.
- Position your feet so that your heels can dip below the platform (if using a step or machine), or flat on the ground if not elevated.
- Keep your knees straight but not locked. Brace your core and stand upright.

### 2. Lift:

- Press through the balls of your feet to raise your heels as high as possible.
- Pause at the top and squeeze your calves.

### 3. Lower:

- Slowly lower your heels back down under control.
- If elevated, let your heels drop slightly below parallel to stretch the calf muscles fully

### Tips:

- Go slow—avoid bouncing.
- For added challenge, use a dumbbell, barbell, or leverage squat machine with shoulder pads.
- A slight outward knee bow is fine—let your legs move naturally.



## ✓ How to Do Seated Calf Raises

**Targets:** Primarily the **soleus**, a deep calf muscle critical for endurance and joint stability

### 1. Set Up:

- Sit on a calf raise machine or bench with feet flat on the platform and knees bent at 90°.
- Place the padded lever or weight across your thighs, just above the knees.

### 2. Lift:

- Push through the balls of your feet, lifting your heels as high as possible.
- Squeeze at the top for a second.

### 3. Lower:

- Lower your heels back down slowly until you feel a stretch in your calves.

### Tips:

- Keep the motion smooth and controlled.
- Don't let your heels slam or bounce off the platform.
- If you don't have a machine, place a weight on your thighs and use a step under your toes.

# Ball Hamstring Curl

Stability ball leg curls are an excellent exercise for targeting the hamstrings, glutes, and lower back. This movement demands full-body stabilization alongside significant hamstring activation, mirroring the muscle engagement seen in many running and athletic activities. Because of this, it is one of my favorite hamstring exercises and a frequent inclusion in my running and athletic conditioning programs. [See video](#)

What sets the stability ball leg curl apart from many other lower-body exercises is its combination of hip extension and knee flexion—movements highly relevant to running sports. This dual action makes the exercise highly functional and valuable for athletes. It closely mimics the biomechanics of sprinting and deceleration, making it especially useful for sports requiring explosive leg power and hamstring control.

While there is limited research specifically on the stability ball leg curl, existing studies typically compare it to the traditional prone leg curl machine. One study found that although the stability ball curl offers similar benefits to the leg curl machine, it did not activate the hamstrings as strongly (Study). However, it is important to note that this exercise is not solely a hamstring movement; it effectively engages the entire posterior chain, including the lower back, glutes, hamstrings, and calves. This broader activation is why I favor it—not only for posterior chain development but also as a supplemental core exercise, given the substantial involvement of the glutes and lower back.

Another study reported higher EMG activity in the biceps femoris compared with the semitendinosus during the stability ball leg curl (Study). This could be particularly useful for prehabilitation or rehabilitation efforts focused on the biceps femoris muscle.

Some common mistakes with this exercise include allowing the hips to sag, which reduces effectiveness and can place undue stress on the lower back. It is best suited for individuals with adequate core and hip stability, as those with acute lower back issues should approach it cautiously.

Progressions and variations can increase its challenge and specificity. For example, performing single-leg curls or adding resistance bands may provide further strength and stability benefits.

Given the limited existing research, more studies are needed to understand the long-term effectiveness and injury prevention potential of stability ball leg curls compared to other hamstring exercises.



# Stability Ball Leg Curl Assessment Chart

## How to Use This Assessment:

- Start at the level that matches your current ability and focus on form.
- Once you can perform the Intermediate level criteria with ease, progress to Advanced.
- If you struggle to hold hips lifted steadily, remain at Beginner and work on core and glute activation.
- Use the chart regularly to track improvement and adjust training accordingly.

| Performance Level          | Repetitions (per set) | Sets | Assessment Criteria  | Interpretation / Next Steps  |
|----------------------------|-----------------------|------|--|--|
| <b>Beginner</b>            | 8–10                  | 2    | Performs movement with legs on ball but hips may stay on floor or lift briefly | Focus on developing basic hamstring strength and core activation to progress to hip lift |
| <b>Intermediate</b>        | 12–15                 | 3    | Hips lifted fully and held steadily; controlled movement; no sagging           | Solid posterior chain activation; progress reps and sets gradually                       |
| <b>Advanced</b>            | 15–20+                | 3–4  | Smooth, controlled reps with consistent form and sustained hip elevation       | Well-developed strength and stability; add volume or variations                          |
| <b>Single-Leg Advanced</b> | 8–12 per leg          | 3    | Maintains hip elevation and balance on one leg; no compensations               | Excellent core and hamstring control; ready for advanced progressions                    |

# How to Do Stability Ball Leg Curls

## 1. Starting Position: SEE VIDEO

- Lie flat on your back on a mat or the floor.
- Place your heels and calves on top of a stability ball, with legs fully extended.
- Keep your arms by your sides for balance.

## 2. Engage Core and Lift Hips:

- Tighten your core muscles.
- Lift your hips off the ground until your body forms a straight line (intermediate) from your shoulders to your heels. Your weight should be supported by your shoulders and your feet on the ball.

## 3. Curl the Ball:

- Slowly bend your knees and pull the ball toward your hips by rolling it with your heels and calves.
- Keep your hips elevated throughout the movement — do not let them sag.

## 4. Hold and Squeeze:

- At the end of the curl, when your knees are bent roughly 90 degrees, squeeze your hamstrings and glutes.

## 5. Return to Start:

- Slowly extend your legs, rolling the ball back to the starting position while keeping your hips lifted.

## 6. Repeat:

- Perform for the desired number of repetitions, maintaining control and steady breathing.

## Tips:

- Avoid letting your hips drop or sag at any point — keep your body in a straight line from shoulders to heels.
- Control the movement to prevent the ball from rolling too quickly.
- Keep your core tight to protect your lower back.



# Nordic Hamstring Exercise

## GREAT ATHLETIC TRAINING EXERCISE

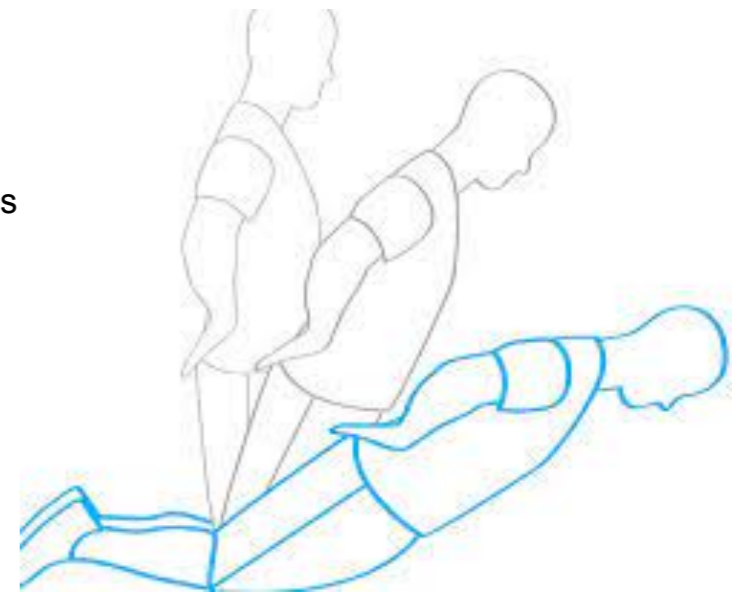
### The Nordic Hamstring Exercise

As a coach, I'm always looking for the most effective exercises to keep athletes injury-free and performing at their best. This is one of the most important: the **Nordic Hamstring Exercise (NHE)**.

This movement is personal for me. As a former sprinter who's dealt with more than a few hamstring strains, I've learned the hard way how important hamstring health is. Since I started incorporating the NHE 2–3 times per week, those nagging issues have all but disappeared. If you play any sport that involves sprinting or explosive running, this exercise should be in your program.

The **NHE is a bodyweight exercise** that requires no equipment and can be performed in several ways. Its greatest strength is how it targets the hamstrings **eccentrically**—that is, while the muscle is lengthening. This is key because most hamstring injuries occur during this phase, especially in high-speed running. By building strength in this vulnerable range, you're not just preventing injury—you're boosting resilience and potentially improving performance.

It also activates the **glutes** and **calves (gastrocnemius)** isometrically, making it a time-efficient lower-body exercise.



### What the Research Says

- Hamstring injuries are the most common and recurrent muscle injuries in soccer and other sports.
- Eccentric hamstring weakness is a key modifiable risk factor that the Nordic Hamstring Exercise (NHE) targets effectively.
- A meta-analysis of 15 studies (over 8,400 athletes) showed the NHE reduces hamstring injury risk by up to **51%**, cutting injury rates in half.
- NHE improves the hamstring-to-quadriceps (H/Q) strength ratio better than traditional leg curls, enhancing injury prevention and joint stability.

Recent findings add more depth:

- **Minimal volume is still effective:** Just 1 set of 3 reps per week can significantly increase eccentric strength and reduce injury risk—great for adherence.
- **Muscle structure adapts:** NHE increases hamstring fascicle length and adds sarcomeres in series, improving muscle resilience—but these gains require consistent training to maintain.
- **Evidence quality caution:** Some reviews suggest earlier studies had methodological limitations, so while promising, more rigorous research is needed.
- **Coaching precision matters:** Proper control of tempo, range, and progression is essential for maximizing benefits.



### How to Get Started

If you're new to the NHE, ease into it—it's demanding and may cause soreness early on.

Try this:

- **1–3 sets of 5–10 reps,**
- **2–3 times per week,**
- Use a partner or an anchored object to hold your ankles down,
- Control the lowering phase as far as you can, then catch yourself with your hands and push off lightly to return to start.

**Bonus Tip:** Even 3 reps per week has been shown to help. Start light and stay consistent.



### Final Thoughts

The Nordic Hamstring Exercise isn't just a tool for injury prevention—it's a performance booster backed by solid science and firsthand experience. Whether you're a coach, athlete, or educator, it deserves a place in your program.

Want to sprint faster, perform better, and avoid injury?

**Just do it.**

**How to Do the Nordic Hamstring Exercise (NHE)** [See videos on how to perform all variations here.](#)

[See other video here.](#)

### Setup:

- Kneel on a padded surface.
- Have a partner hold your ankles down firmly — or anchor them under something stable (like a loaded barbell or a padded bench).
- Keep your body tall from your knees to your shoulders — think of a straight line from head to hip to knee.

### Execution:

1. **Brace your core** and keep your hips extended (don't bend at the hips).
2. Slowly **lower your torso forward** by straightening at the knees — keep your body straight as you go down.
3. **Go as low as you can under control.** When you can't control the descent anymore, catch yourself with your hands.
4. **Push off the ground lightly** with your hands and use your hamstrings to pull yourself back to the starting position.

### ✓ Coaching Cues:

- Keep your hips **locked in** (no bending at the waist).
- Lower slowly — **control is key** for eccentric strength.
- Focus on **feeling the hamstrings working** the entire way down.
- Don't rush the movement; it's better to go slow and partial than to flop.

### 🔄 Beginner Modification:

- Loop a resistance band under your chest and anchor it above (like in a squat rack) to assist you on the way down and back up.
- Only go as far as you can control — build range gradually.

[See videos on how to perform all variations here.](#) [See other video here.](#)

# Nordic Hamstring Exercise (NHE) Fitness Level Chart

| Level   | Title      | Performance Criteria   | Training Notes   |
|---------|------------|--|--|
| Level 1 | Beginner   | <ul style="list-style-type: none"><li>• Cannot lower more than 15–20° without collapsing</li><li>• Immediate hand support needed</li><li>• High soreness risk</li></ul>  | Build basic eccentric control with assisted or band NHEs |
| Level 2 | Developing | <ul style="list-style-type: none"><li>• Lowers to ~30° under moderate control</li><li>• Requires early hand catch</li><li>• 5+ reps possible with effort</li></ul>       | Focus on consistent control, aim for 2–3 sets per week   |
| Level 3 | Functional | <ul style="list-style-type: none"><li>• Controls descent to 45°+</li><li>• Hands used late in descent</li><li>• 3 sets of 8–10 reps with clean form</li></ul>            | Maintain, refine tempo, and ensure consistent practice   |
| Level 4 | Advanced   | <ul style="list-style-type: none"><li>• Controls nearly full range (60°–70°)</li><li>• Minimal or no hand support</li><li>• Performs 3x10+ reps consistently</li></ul>   | Add eccentric pauses or slow tempos (3–5 sec down)       |
| Level 5 | Elite      | <ul style="list-style-type: none"><li>• Full-range control with slow tempo</li><li>• May return unaided</li><li>• In-season &amp; off-season performance ready</li></ul> |  |

# Reverse Nordic

## GREAT ATHLETIC TRAINING EXERCISE

### **Just Do It: The Reverse Nordic Curl** [See more here](#)

As a coach, I'm always on the lookout for exercises that protect against injury and improve athletic performance—especially those that target weak links in the kinetic chain. One of the most overlooked but powerful movements is the Reverse Nordic Curl (RNC). It's essentially the opposite of one of my other go-to moves: the Nordic Hamstring Curl. While the NHE strengthens the back of the thigh, the RNC zeroes in on the quadriceps and hip flexors, especially through a deep, controlled eccentric range.

What makes the Reverse Nordic special is that it trains both the quads and hip flexors simultaneously, which few bodyweight exercises do. This dual action mimics real sports movement—like sprinting, decelerating, and landing—where those muscle groups work together. Because the RNC is joint-friendly and driven by eccentric loading, it helps build tendon and muscle strength while protecting the knees and hips through increased time under tension.

I want to emphasize: this is a highly eccentric movement, meaning the muscle works as it lengthens. That's crucial because many lower-body injuries (like quad or hip flexor strains) happen during eccentric loading—think sprinting, kicking, or landing. By improving eccentric strength, you can reduce injury risk and improve control under real-game conditions.

There's also a structural benefit: research shows that the RNC can increase muscle fascicle length, pennation angle, thickness, and cross-sectional area of the quadriceps—especially the rectus femoris, which crosses both the hip and knee. Since most traditional leg exercises (like squats and lunges) don't hit the rectus femoris well, and because this muscle tends to get short and weak from prolonged sitting, the RNC offers a safe and effective way to target it. This has implications for both injury prevention and sprint performance, especially given the rectus femoris's role in hip flexion during high-speed running.

If you want a simple yet effective way to bulletproof your quads, hips, and knees—the Reverse Nordic Curl is worth your attention.



## ◆ How to Perform the Reverse Nordic Curl

### 1. Starting Position:

- Kneel on a padded surface with feet flat and hips fully extended.
- Keep your torso upright and arms crossed on your chest or at your sides.
- Engage your glutes and core to maintain a straight line from knees to shoulders.

### 2. Descent:

- Lean backward **from the knees**, keeping the hips **extended** (do not hinge at the hips).
- Lower your torso in one straight line toward the floor, as far as you can control.
- Keep your gaze neutral, avoid lumbar extension.

### 3. Ascent:

- Reverse the movement by using your quads to bring your body back to vertical.
- Keep the movement slow and controlled, especially on the way down.

### 4. Common Regressions:

- Use a resistance band anchored behind you for support.
- Partial range of motion.
- Arms reaching forward for counterbalance.

### 5. Progressions:

- Add a weight plate or vest.
- Slow down tempo.
- Add isometric holds at end range.

## ✓ Assessment Chart: Reverse Nordic Curl

- **High Level:** All “Good” — add resistance or tempo.
- **Moderate:** Mostly “Good” and “Needs Improvement” — practice consistently.
- **Low Level:** Any “Poor” — regress to band assistance or partial ROM.

| Category                  | Good   | Needs Improvement                                      | Poor   |
|---------------------------|--|--|--|
| <b>Form</b>               | Body forms a straight line from knees to shoulders, hips stay extended | Slight hip bend, minor arch in back                    | Hips break, torso bends or collapses, back overarches        |
| <b>Range of Motion</b>    | Leans back to 30–60° from vertical while maintaining alignment         | Leans back only 10–30° or breaks form at deeper angles | Cannot lean back more than 10° or loses alignment early      |
| <b>Control</b>            | Smooth and slow descent/ascent (2–3 seconds each direction)            | Slight tremor or rushing toward end range              | Falls into movement or cannot return without help            |
| <b>Reps (Bodyweight)</b>  | 6–10 full-range reps with control                                      | 3–5 reps with effort or mild form breakdown            | 1–2 reps, cannot complete descent or return to start         |
| <b>Quad Engagement</b>    | Strong, even quad tension throughout; glutes support hip extension     | Quad fatigue early, inconsistent tension               | Quads unable to support movement, uses momentum or hips      |
| <b>Knee Comfort</b>       | No discomfort with padding   | Mild anterior knee discomfort under control            | Sharp pain or persistent discomfort, even with modifications |
| <b>Progress Readiness</b> | Can add tempo, weight, or reps without form loss                       | Can increase reps but not ready for load               | Needs regression or mobility/stability work first            |

# Copenhagen Plank / Abduction Exercise

## Why the Copenhagen Adductor Exercise Belongs in Your Routine






The Copenhagen Adductor Exercise is one of my favorites—especially since I have a labral tear in my hip. Ever since I began doing it three times a week, the occasional inner thigh pain I used to experience has disappeared.

If you play sports that involve running, cutting, or kicking, this exercise is essential. Also known as the *Copenhagen plank* or *Copenhagen adduction exercise*, it's a powerful side plank variation that primarily targets the adductors (inner thigh and groin muscles) while also strengthening the lateral core.

That combination matters. Groin injuries are among the most common soft tissue injuries in sports, and there's a strong connection between low adductor strength and groin strains. In fact, research has consistently shown:

- **Greater hip adduction strength significantly lowers the risk of hip and groin injuries.**
- The **Copenhagen Adduction Exercise produces the highest activation of the adductor longus** compared to eight other common adductor exercises.
- It also stimulates high activation in the **external oblique and rectus abdominis**, making it excellent for building core stability—another factor linked to injury prevention.

## What the Latest Research Says (2024–2025)

-  **Widespread Use in Elite Sports:** A 2024 survey showed that **over 80% of professional soccer clubs** use the Copenhagen exercise—often with personalized variations—to reduce injury risk and maintain performance.
-  **Strength & Muscle Gains:** An 8-week program led to **~18% increases in adductor muscle thickness**, plus greater hip flexibility. However, these gains can **regress within 4 weeks** if the exercise is stopped—so consistency matters.
-  **Great for Rehab:** A 2024 trial among soccer players recovering from groin injuries found that adding the Copenhagen exercise to rehab significantly improved **eccentric strength**, reduced pain, and improved functional outcomes.
-  **Objective Testing:** New tools now allow for **reliable in-exercise measurement** of eccentric adductor strength using load cells, helping coaches and clinicians track progress more accurately.
-  **Prevention Evidence Is Mixed:** While one major study showed a **41% reduction in groin injuries** with Copenhagen training over 36 weeks, recent reviews note that not all trials replicate this success. Still, most show **clear gains in strength** and **lower reinjury risk**.

## Who Should Be Doing This?


This exercise isn't just for soccer players. It's valuable for:

- **Runners**
- **Skaters**
- **Martial artists**
- **Field and court athletes**
- **Anyone with hip, groin, or core demands in their training**

Even non-athletes can benefit—especially those with chronic groin discomfort, core weakness, or hip instability.

## Simple, Scalable, and Supported by Science

The Copenhagen Adductor Exercise is bodyweight-based, equipment-free, and easy to scale for intermediate to advanced exercisers or pros. Whether you're rehabbing an injury, trying to prevent one, or simply building a more resilient body, this exercise is worth your time.

 **Pro Tip:** Start with a modified version (knee-supported) if you're new, and build up to the full-length side plank variation. Just 2–3 sessions per week can lead to measurable strength gains in under two months.

# Copenhagen Plank / Abduction Exercise

## How to Progress the Copenhagen Adductor Exercise (Beginner to Advanced)

The Copenhagen Adductor Exercise can be scaled to match any fitness level — from rehab and general fitness to elite athletic training. Here's a step-by-step guide to help you progress safely and effectively.

### Level 1: Beginner – Knee-Supported Hold

**Setup:** Lie on your side next to a bench or box. Place the **top leg on the bench with the knee bent** at 90°, while your bottom leg stays straight on the floor. Support your upper body on your forearm.

**Movement:** Lift your hips off the ground into a side plank. Hold this position, keeping your body in a straight line from shoulder to knee.

**Goal:**

- 3 sets of 20–30 seconds per side
- Focus on **hip alignment**, **core tightness**, and building endurance in the adductors.

✓ **Best for:** Rehab, injury prevention, and first-time users developing base-level strength.

### Level 2: Intermediate – Mid-Shin Support

**Setup:** Move the support point farther from the body — now place your **mid-shin** or lower leg on the bench. The bottom leg hangs below.

**Movement:** Hold a side plank position or perform controlled **leg lifts**, where the bottom leg rises to touch the top leg, then slowly lowers.

**Goal:**

- Holds: 3 sets of 15–20 seconds
- Reps: 3 sets of 6–8 reps (lift + slow lower)

✓ **Best for:** Building eccentric control and progressing adductor strength without full bodyweight load.

### Level 3: Advanced – Full-Length Ankle Support

**Setup:** Extend the top leg fully and place the **ankle or foot** on the bench. Your bottom leg is fully unsupported.

**Movement:** From a strong side plank, **lift the bottom leg up** to touch the top leg, then lower slowly (3–5 seconds). This is the full version used in most research studies.

**Goal:**

- 3 sets of 4–6 reps per side
- Rest 60–90 seconds between sets

✓ **Best for:** Athletes and advanced users aiming for maximal adductor strength, core control, and injury prevention.

### Level 4: Elite – Add Load or Instability

Once you've mastered the full-length version, add challenge:

- **Weighted:** Place a dumbbell or plate on your top hip.
- **Instability:** Rest your foot on a foam pad or BOSU ball to engage stabilizers.
- **Tempo:** Emphasize **slow eccentrics (5–8 seconds down)** for greater strength adaptation.

**Goal:** 3 sets of 3–5 reps with perfect form.

✓ **Best for:** Competitive athletes or high-level rehab training. Increases core/adductor demands and neuromuscular control.

### 💡 Tips for Every Level:





- Keep your **hips high and stacked** — avoid letting them drop or rotate forward.
- Brace your **core fully** — don't let your back sag.
- Move up only when you can complete your current level with **good form and control**.



See videos on how to perform all variations [here](#).



# Copenhagen Adductor Strength Progression Chart

| Level  | Description                     | Test Type                                | Benchmark                   | Interpretation                                  |
|--|---------------------------------|--|-----------------------------|---|
|  <b>Level 1: Beginner</b>     | Knee-supported hold             | Side plank hold (knee on bench)          | ≥ 30 seconds per side       | Foundational adductor and core endurance        |
|  <b>Level 2: Intermediate</b> | Mid-shin support with leg lifts | Controlled leg lifts (3–5 sec eccentric) | 6+ reps per side            | Moderate adductor strength, eccentric control   |
|  <b>Level 3: Advanced</b>   | Full ankle-supported variation  | Controlled leg lifts (3–5 sec eccentric) | 5–6 reps per side           | Strong adductor/core strength, ready for sport  |
|  <b>Level 4: Elite</b>      | Weighted or unstable surface    | Weighted reps or unstable hold           | 4–6+ reps or 20–30 sec hold | High-level resilience and neuromuscular control |

Completing **5–6 slow, controlled reps** of the **Level 3 Copenhagen Plank** with **full ankle support** and **3–5 second eccentric leg lowers** indicates **advanced adductor and core strength**—a strong marker of readiness for high-level sport and injury resilience.

# Leg Extensions Machine

## Summary: Leg Extensions Are Safe, Effective, and Underrated

Despite long-standing criticism, **leg extensions are a safe and essential exercise**, especially when properly programmed. Research shows that ACL and patellofemoral joint stress during leg extensions is **well within safe limits**, often **no greater than walking or squatting**.

Recent studies and updated rehab guidelines now **recommend leg extensions after ACL reconstruction** and for conditions like **patellar tendinopathy**, especially when performed in a **controlled range of 40°–90°** of knee flexion.

Leg extensions offer unique benefits:

- Isolate and strengthen all quadriceps heads
- Target joint angles other exercises can't
- Minimize spinal load
- Aid recovery and improve function after injury

When applied thoughtfully, **leg extensions are not only safe—they're one of the best ways to restore and build knee strength.**



### ✓ What Is Considered a Good Level of Leg Extension Strength?

A **good** level of leg extension strength is the ability to perform **10 controlled repetitions** at approximately:

- **28–30% of bodyweight for women**
- **45–50% of bodyweight for men**

This range reflects solid quadriceps strength for most active, healthy individuals. It indicates that the person has built a functional base of lower-body strength that supports knee health, mobility, and daily performance. While not yet at the "excellent" benchmark, this level suggests well-developed muscular control and a reduced risk of injury, especially when combined with balanced training of the surrounding muscles.

# Leg Extensions Machine

The leg extension machine has earned a controversial reputation in the strength and rehab world. Critics often warn that it places dangerous stress on the knee, particularly the ACL and patellofemoral joint. But recent evidence strongly challenges this outdated view.

Today's research shows that leg extensions—when properly programmed—are not only safe, they're among the most effective ways to restore quadriceps strength, support knee function, and build muscle.

## **The Myth: Leg Extensions Are Bad for Your Knees**

One of the most common arguments against leg extensions is that they strain the anterior cruciate ligament (ACL). While it's true that open-chain exercises like leg extensions produce tension on the ACL, the forces are **modest**. Studies show that ACL strain during leg extensions typically ranges from **158 to 396 newtons**—well under 20% of the ligament's failure threshold of over **2,000 N**. In fact, these loads are similar to or even less than what the ACL experiences during **normal walking or jumping**.

Others argue that leg extensions overload the patellofemoral joint (PFJ), but again, the data doesn't support this in isolation. In fact, squats performed to 90 degrees often produce **greater PFJ stress** than electromyographically matched leg extensions, particularly at deeper knee angles.

Simply put: **leg extensions are not inherently dangerous**. Like any exercise, their safety depends on execution, loading, and context.

## **Rehabilitation: From Caution to Recommendation**

For years, leg extensions were avoided in knee rehabilitation—especially after **ACL reconstruction** or in cases of **patellar tendinopathy**. But recent research has reversed that trend.

✅ A 2022 meta-analysis found that **open kinetic chain (OKC) exercises** like the leg extension—either alone or in combination with closed-chain exercises—resulted in **greater improvements in quadriceps strength** than closed-chain training alone.

✅ Updated clinical guidelines now **recommend leg extensions** after ACL reconstruction, especially when used in a controlled range of motion and with appropriate loading.

Delaying or avoiding isolated quadriceps loading—such as leg extensions—may actually impair recovery. After ACL surgery, patients often have difficulty regaining strength near terminal knee extension, which is crucial for full function. The leg extension is one of the few exercises that can **target this range directly and effectively**.

## **Programming: Safe and Smart Use of Leg Extensions**

When dealing with injury or post-surgical rehab, **adjusting range of motion and load** makes leg extensions both effective and joint-friendly.

### 💡 **Guidelines for Rehab and Performance:**

- **Early ACL Rehab:** Start leg extensions in the **40°–90° knee flexion** range to reduce strain on the healing graft.
- **Avoid near-lockout (0°–30°)** initially, then progress gradually as tolerated.
- **Combine with CKC exercises** (like squats or leg press) to build comprehensive strength and stability.

This phased approach allows for **complete arc strengthening** of the quadriceps while controlling joint stress in sensitive ranges.

## **Why Leg Extensions Still Matter**

Leg extensions remain one of the most valuable tools for lower-body strength. Here's why:

- ✅ **Isolated Quadriceps Strength:** No other exercise so effectively targets all four heads of the quadriceps—especially the rectus femoris, which is often under-activated in compound lifts.
- ✅ **Joint Angle Specificity:** Leg extensions allow precise strengthening at individual angles, making them ideal for addressing strength deficits or sport-specific needs.
- ✅ **Minimal Spinal Load:** They allow intense quad work without loading the spine—useful for individuals with back pain or those fatigued from compound lifts.
- ✅ **Beginner and Rehab Friendly:** The fixed path of motion reduces coordination demands and ensures consistent loading, making them excellent for beginners or clients in recovery.
- ✅ **Hypertrophy Potential:** Because of their high time-under-tension and direct quad activation, leg extensions are a staple in bodybuilding programs for a reason—they work.

## **Conclusion**

The leg extension is not a dangerous or outdated exercise—it's a valuable, science-supported tool for building and restoring lower-body strength. Whether you're training for performance, recovering from injury, or simply looking to strengthen your knees, **leg extensions can and should play a central role** in a well-designed program.

With thoughtful range control, progressive loading, and intelligent integration, the leg extension machine remains one of the most effective ways to build powerful, resilient quadriceps.

# Leg Extension Assessment Chart (10 Reps – % Bodyweight Load)

## ✓ How to Use This

1. Multiply the person's body weight by the % for each level.
2. Test what weight they can perform **10 controlled reps** on the leg extension machine (full range, no momentum).
3. Compare against the chart to classify their strength level.

| Fitness Level        | Women (% BW for 10 Reps) | Men (% BW for 10 Reps) | Interpretation   |
|----------------------|--------------------------|------------------------|--|
| Level I – Low        | ≤15%                     | ≤25%                   | Below average strength; needs focused quad development |
| Level II – Basic     | 16–22%                   | 26–35%                 | Fair strength; beginner level or rehab starting point  |
| Level III – Moderate | 23–27%                   | 36–44%                 | Active individuals; moderate strength base             |
| Level IV – Good      | 28–30%                   | 45–50%                 | Strong, trained individuals; solid foundation          |
| Level V – Excellent  | 31%                      | 51%                    | High-level strength and muscular development           |

## How to Do Leg Extensions Correctly

To get the most out of leg extensions—and protect your knees—use proper form and settings on the machine. Here’s a step-by-step guide:

### ✓ Setup

#### Adjust the Back Pad

Sit with your back firmly against the pad.

Your knees should align with the machine’s pivot point (usually marked).

#### Adjust the Shin Pad (Ankle Pad)

The pad should rest just above your ankles—not on your shins or feet.

#### Set the Range of Motion (*if adjustable*)

**Standard:** Full range (bending to ~90° then straightening the leg).

**Rehab or post-injury:** Limit motion to **40°–90°** of knee flexion to reduce joint stress.

#### Choose the Right Weight

Start light, especially if you’re new or recovering from injury.

Aim for control—not momentum.

### ✓ Execution

#### Grip the Handles

Hold the side handles to stabilize your upper body.

#### Extend the Legs

Slowly straighten your legs by contracting your quadriceps.

Pause briefly at the top—don’t lock your knees or snap the legs straight.

#### Lower Under Control

Lower the weight back down smoothly to the starting position.

Don’t let the stack crash or use momentum.

### 🎯 Tips for Best Results

- **Tempo:** Use a 2–1–2 tempo (2 seconds up, 1 second pause, 2 seconds down) for muscle control.
- **Breathing:** Exhale as you extend, inhale as you lower.
- **Volume:**
  - **Strength:** 3–5 sets of 6–10 reps with heavier load
  - **Hypertrophy:** 3–4 sets of 10–15 reps
  - **Rehab:** Start with higher reps (15–20) and lower load
- **Form over ego:** Quality reps matter more than heavy weights.
-

# Leg Curl Machine

## Why Strong Hamstrings Matter for Athletic Performance and Injury Prevention

It is well-established that hamstring weakness and muscle imbalances significantly increase the risk of lower body injuries in athletes. For this reason, targeted hamstring-strengthening exercises should be considered *non-negotiable* in any well-designed injury prevention and athletic performance program.

**Strong hamstrings protect both your knees and your lower back.** Despite the misconception that isolation exercises are less functional, **hamstring isolation work—such as leg curls—is proven to enhance both performance and injury resilience.**

The hamstring group is bi-articular, meaning it crosses both the hip and knee joints. This allows it to work synergistically to extend the hip and flex the knee—key actions in sprinting, jumping, deceleration, and change-of-direction movements. Hamstrings are especially active during eccentric contractions (when the muscle lengthens under tension), such as during landing or slowing down—scenarios that often result in injury if the muscles aren't adequately trained.

Hamstring strains are among the most common injuries in sports like soccer, football, and track. In one study, athletes who incorporated specific hamstring isolation training using the **leg curl machine** experienced significantly fewer strains (only 3 of 15 athletes) compared to a control group that did not include this training (10 of 15 athletes). This shows that even a simple, targeted movement can play a powerful role in preventing injury.

During athletic movements such as sprinting, jumping, and cutting, the hamstrings operate at various joint angles, contracting both concentrically and eccentrically. This complexity supports the use of varied angles and modalities in training. The leg curl machine provides safe and focused overload across these ranges, making it an effective tool for developing resilient hamstrings.

**Research also shows that among leg curl variations, the seated leg curl often produces superior muscle activation and hypertrophy compared to lying or standing versions.** Because the hip is flexed during the seated position, the hamstrings are placed at a more optimal length for generating tension—particularly the semitendinosus and biceps femoris muscles. This positioning reduces compensation from other muscles and allows for a more focused, effective contraction, making the seated leg curl an excellent choice for both muscle growth and injury prevention.

**That's why I include isolation-based hamstring training in all my speed athletes' programs.** In addition to seated or lying leg curls, here are a few more excellent exercises that round out a comprehensive hamstring routine:

- **Nordic Hamstring Curl** – One of the most validated exercises for hamstring injury prevention and eccentric strength.
- **Stability Ball Hamstring Curl** – Excellent for integrating core stability and posterior chain engagement.
- **Golfer's Squat** – A dynamic variation that incorporates balance, hip hinging, and posterior chain coordination.
- **Romanian Deadlifts (RDLs)** – While not an isolation movement, RDLs train the hamstrings through hip extension and are essential for posterior chain strength.

### Final Thoughts:

If you're serious about reducing injury risk and improving speed and power, hamstring isolation exercises like the seated leg curl should be a staple—not an afterthought. Integrating a variety of hamstring exercises across joint angles and contraction types builds strength, enhances control, and helps keep athletes on the field and off the injured list.

**The leg curl machine is considered a Novice Exercise** ([see complete list](#)).

# Seated Leg Curl Strength Assessment Chart (10 Reps)

*Load based on percentage of body weight*

## Example (For clarity):

If a male athlete weighs 180 lbs:

- **Very Good** =  $180 \times 0.31 = \sim 56$  lbs for 10 reps

If a female athlete weighs 140 lbs:

- **Very Good** =  $140 \times 0.51 = \sim 71$  lbs for 10 reps

- 

If you can perform **10 controlled reps on the seated leg curl** with at least **0.31× your body weight (men)** or **0.51× your body weight (women)**, you have **very good hamstring strength**—a key factor in protecting your knees, improving performance, and reducing injury risk.

| Rating            | Men (% Body Weight) | Women (% Body Weight) | Notes  |
|-------------------|---------------------|-----------------------|--|
| <b>Needs Work</b> | < 0.20              | < 0.30                | Below average hamstring strength. Priority area.                             |
| <b>Fair</b>       | 0.20 – 0.25         | 0.30 – 0.40           | Some base strength. Needs development for injury resilience.                 |
| <b>Good</b>       | 0.26 – 0.30         | 0.41 – 0.50           | Solid hamstring strength. Supports performance and injury prevention.        |
| <b>Very Good</b>  | <b>0.51</b>         | <b>0.31</b>           | Excellent strength. Protective for knees and hips. Ideal range for athletes. |

# How to Perform the Seated Leg Curl

## Machine Types

There are three main types of hamstring curl machines:

- **Lying (Prone) Leg Curl**
- **Seated Leg Curl** (*shown in image*)
- **Standing Leg Curl**

All three isolate the hamstrings using a machine, and each can be valuable depending on your goals and equipment availability. The seated version is particularly effective for building hamstring size and strength due to the muscle's stretched position during movement.

## Performance Guidelines

- **Repetitions:** 10 or more per set
- **Sets:** 1–3 sets, depending on your training goal
- Focus on **controlled movement** and **full range of motion** to maximize benefit and prevent injury.

## Proper Setup and Form

1. **Adjust the machine** so your knees align with the machine's pivot point (axis of rotation).
2. **Position the leg pad** so it rests just above your heels, around the midpoint of your Achilles tendon.
3. **Ensure the back pad** is firmly pressed against your back, maintaining contact throughout the movement.
4. Sit tall with a **neutral spine** (a slight natural curve in your lower back), **shoulders back**, and **head in line with your spine**.
5. Grip the handles securely for stability.
6. **Point your toes up** (dorsiflex) to maintain tension on the hamstrings.

## Execution

- **Curl** the weight by driving your heels down and back, flexing at the knee until your legs are close to fully bent.
- **Avoid locking out** at the bottom—maintain tension.
- **Return** the weight slowly to the starting position without letting the weight stack touch—this keeps continuous tension on the muscle.
- **Control the entire movement**—avoid using momentum or letting your buttocks lift off the seat.
- Keep your **core engaged** and do not arch your back.

✓ *Key Tip: Muscle tension—not speed—should drive the movement. Focus on quality reps, not just quantity.*

# Inner (Adduction) and Outer (Abduction) Thigh Machines

## Why Inner and Outer Thigh Machines Deserve a Place in Your Program

The inner and outer thigh machines are often criticized as ineffective, non-functional, or even machines to avoid altogether (Paper, Paper 2). I disagree. I regularly recommend these machines, particularly the outer thigh (abduction) machine, to help individuals strengthen the lateral hip muscles—especially the gluteus medius. It's a valuable tool for targeting muscles that are otherwise difficult to isolate and engage.

While it's important to clarify that strengthening muscles won't necessarily make your thighs look slimmer—only overall fat loss through diet and weight management can do that—using the thigh machines builds strength, enhances joint stability, and supports better movement patterns.

## The Outer Thigh Machine: A Functional Approach

Strengthening the outer thigh and gluteus medius improves lateral stability, which plays a major role in core control and balance. The gluteus medius helps stabilize the pelvis during walking, running, and single-leg activities. If you find it difficult to balance on one leg or notice your hip drops, you likely have weak lateral hip and core muscles.

Hip abductor strength is also closely tied to knee health. Runners with iliotibial band syndrome or patellofemoral pain syndrome often show reduced hip abductor strength compared to uninjured peers. Leg abduction exercises—whether using a machine or resistance bands—are essential for runners and athletes. However, they're just as important for the general population, particularly after surgery. A study by Rasch et al. found that targeted abductor exercises significantly improved recovery following total hip replacement.

In short, weak hip abductors can compromise the function of the entire lower body—from your knees to your feet—and also impact core strength and stability. The outer thigh machine offers a simple, safe, and accessible way to strengthen these key muscles.

## The Inner Thigh Machine: Not Just for Aesthetics

The inner thigh (adductor) machine also gets dismissed too easily. I've used it successfully in rehab programs, especially for groin strains, and as part of general conditioning routines. As with the outer thigh, building inner thigh strength won't necessarily change how your legs look—but it will enhance your strength, stability, and injury resilience.

Adductor weakness is a known risk factor for groin injuries, especially in sports like soccer. A review by the National Strength and Conditioning Association highlighted that exercises directly targeting the adductors—like standing hip adductions with a band or cable, the Copenhagen adduction exercise, and the seated adductor machine—provide a range of motion and strength benefits that compound exercises like squats and lunges may not fully address.

Hölmich et al. demonstrated that an 8–12 week program combining adduction and abduction exercises, core training, balance work, and slide board movements effectively treated chronic groin strains. In contrast, passive modalities like stretching alone were not effective.

In soccer, players with groin injuries often show hip strength deficits compared to uninjured players. A similar 8-week adduction strength program significantly improved eccentric hip adduction strength and reduced injury risk.

## Final Thoughts

Both the inner and outer thigh machines are useful, evidence-supported tools—not just for aesthetics, but for real, functional strength and injury prevention. Whether you're an athlete, a runner, or simply someone working to stay strong and mobile, incorporating targeted thigh strengthening exercises into your routine can enhance your performance and protect your joints.

# Inner & Outer Thigh Machine Strength Standards by Ability Level (Based on % Body Weight)

**BW = Body Weight**

These targets assume a full range of motion, proper control, and 10–15 reps per set with good form.

 **Example for a 150 lb (68 kg) Person**

## Usage Notes

- **Adduction (Inner Thigh):** These muscles tend to be stronger but undertrained in most people. The machine allows a safe way to load them through a controlled range.
- **Abduction (Outer Thigh):** Targets smaller muscles (gluteus medius/minimus, TFL), which are often weaker but essential for hip and knee stability.
- **Elite-level resistance** often applies to trained athletes, advanced lifters, and post-rehab individuals who have built strong glute and hip control.

| Level    | Inner Thigh Adduction Resistance | Outer Thigh (Abduction Resistance) |
|----------|----------------------------------|------------------------------------|
| Average  | 45–75 lbs                        | 38–60 lbs                          |
| Advanced | 75–110 lbs                       | 60–90 lbs                          |
| Elite    | 110–150+ lbs                     | 90–120+ lbs                        |

| Level    | Inner Thigh (Adduction) Target % Body Weight | Outer Thigh (Abduction) Target % Body Weight |
|----------|--|--|
| Average  | 30–50% BW                                    | 25–40% BW                                    |
| Advanced | 50–75% BW                                    | 40–60% BW                                    |
| Elite    | 75–100%+ BW                                  | 60–80%+ BW                                   |

## Proper Form for Inner and Outer Thigh Machines

### Starting Position (Both Machines):

- Sit upright with your back flat against the pad, maintaining a natural curve in your spine.
- Brace your core gently to support your posture.
- Place your legs against the pads—either inner or outer thighs depending on the machine.
- Adjust the machine so there is mild tension in the target muscles at the starting position.
- Make sure your knees and toes are pointing in the *same direction* to avoid unnecessary stress on the joints.

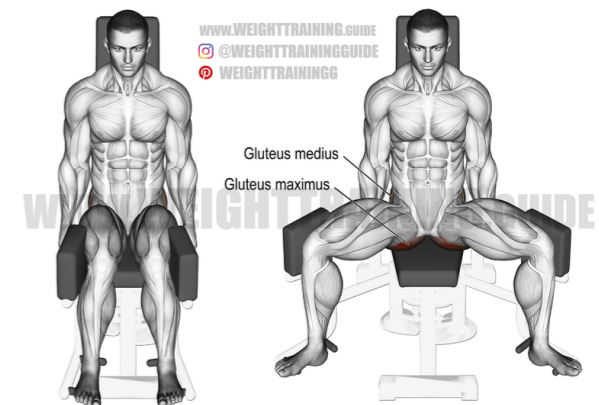
### Inner Thigh (Adductor) Machine:

- Slowly squeeze your legs inward against the machine's resistance.
- Pause briefly at the peak of the contraction.
- Return to the starting position in a slow and controlled manner.
- **Important:** *Do not use the machine's weight to force your legs into a wide stretch.* This can strain the groin and lead to injury.



### Outer Thigh (Abductor) Machine:

- Press your legs outward against the pads, focusing on activating the outer thighs and glutes.
- Pause at full abduction, then return slowly to the start position.
- Avoid using momentum—control the movement in both directions.



### Key Reminders:

- **Always keep toes and knees aligned.** Don't allow the knees to cave in or rotate outward independently.
- **Use a controlled pace.** Avoid jerking or bouncing the weights.
- **Focus on muscle activation, not just moving the weight.**

Let me know if you'd like a simplified version for a handout, graphic, or gym signage.

# Leg Press Machine

## Why the Leg Press Deserves a Place in Your Training—If Done Right

The leg press is often overlooked or criticized, but when performed correctly, it can be a **safe and effective exercise**, especially for novices. It's intuitive to set up, easy to use, and unlike some other machines (like the leg extension), the leg press involves **multiple muscle groups**, including the quadriceps, hamstrings, glutes, and even the calves.

### Muscle Building and Safety

One of the leg press's biggest advantages is that it allows you to train the lower body with substantial load—often more than you can squat—without placing excessive stress on the spine. That's why many bodybuilders favor it for hypertrophy.

The ongoing debate of machines versus free weights in muscle development continues, but recent research shows both can be effective. A study published in *Frontiers in Physiology* (2017) found no significant difference in muscle growth when comparing machine-based resistance training to free weights over an 8-week training period. However, free weights induced slightly higher increases in free testosterone in men, suggesting a potential hormonal edge (Schwanbeck et al., 2017).

### Functional Training and Athletic Performance

Critics often label the leg press as “non-functional” because it lacks the neuromuscular and balance demands of exercises like the barbell back squat. Research comparing leg press and squat training found that squats led to greater improvements in athletic performance, such as vertical jump and sprint speed (*Journal of Strength and Conditioning Research*, 2010).

However, this doesn't mean the leg press lacks merit—especially outside elite athletic training. In clinical populations, it has demonstrated impressive benefits. For example:

- In coronary artery disease patients, leg press training significantly improved walking mechanical efficiency, one-rep max strength, and rate of force development after just 24 sessions of 20 minutes each (*European Journal of Preventive Cardiology*, 2014).
- Another study found that leg strength training, including the leg press, improved walking economy by 9.7% and treadmill test performance by 13.6% in older adults (*Medicine & Science in Sports & Exercise*, 2010).
- Lower-body resistance machine use (including the leg press) was also shown to increase reactive balance recovery by 30%, which is critical in preventing falls among older adults (*Clinical Interventions in Aging*, 2015).

### Combining Machines and Free Weights

**Although the leg press may not transfer to athletic performance as effectively as squats, it's still a valuable tool for general strength, rehab, and hypertrophy. The evidence suggests that combining machine and free weight training may offer the best of both worlds. As *Healthline.com* puts it, mixing both modalities “may be just what you need to get a leg up on your fitness goals.”**

### Rehab and Clinical Use

In rehabilitation settings, the leg press offers a controlled and scalable way to rebuild lower-body strength. Professor Jill Cook, a leader in tendinopathy research, advocates for its use in rehab. She notes that exercises like the leg press can strengthen tissue without placing high elastic loads on tendons—ideal in the early stages of tendon rehab.

### Important Caution: Protect Your Spine

Despite its benefits, the leg press can pose risks if performed incorrectly. Dr. Stuart McGill, a renowned spine biomechanist, warns that allowing the pelvis to posteriorly tilt (come off the back pad) during the movement increases stress on the lumbar spine, heightening the risk of disc herniation. To avoid this, maintain a neutral spine and keep your pelvis firmly on the pad throughout the range of motion. Avoid lowering the sled too far.



But what is functional strength? It is the ability to display muscular strength in a basic human movement, such as walking, running, jumping, squatting, deadlifting, lunging, carrying, and dragging. The term “functional strength” comes from the field of gerontology, where researchers look to what helps elderly people become more mobile, more independent, and less likely to fall down.

The leg press is often overlooked or criticized, but when performed correctly, it can be a **safe and highly effective lower-body exercise**, especially for beginners. It's simple to set up and use, and unlike more isolated machines like the leg extension, the leg press targets **multiple muscle groups**—primarily the quadriceps, glutes, hamstrings, and calves.

## How to Perform the Leg Press Safely:

- 1. Set the Seat Angle and Sled Range:** Adjust the seat so your knees are slightly above your hips but not fully compressed. Your back and pelvis should be fully supported by the back pad.
- 2. Foot Placement:** Place your feet shoulder-width apart on the platform, toes slightly turned out. Keep your **heels flat and in contact** with the platform throughout the movement.
- 3. Neutral Spine:** Maintain a **neutral spine** at all times. Avoid rounding your lower back or letting your **pelvis lift off the pad**, which increases spinal stress and the risk of disc injury.
- 4. Controlled Range of Motion:** Lower the sled **only until your knees are at about a 90° angle**, or until your thighs are roughly parallel to the platform. Going too deep can cause the pelvis to tuck under (posterior pelvic tilt), stressing the lumbar spine.
- 5. Drive Through Heels:** Press the sled away by **driving through your heels**, not your toes. Fully extend your legs without locking your knees.
- 6. Don't Rush the Reps:** Use **slow, controlled movements**, especially during the lowering phase. Avoid bouncing at the bottom or slamming the sled at the top.
- 7. Breathing:** Inhale as you lower the weight; exhale as you press it up. Avoid holding your breath for too long, especially under heavy loads.

## Leg Press Strength Assessment Chart

Goal: 10 Repetitions at a Given Load Relative to Body Weight

### Example

For a woman weighing 150 lbs:

- High Fitness:** Leg press 218 lbs or more for 10 reps  
( $150 \times 1.45 = 217.5$ )

For a man weighing 180 lbs:

- High Fitness:** Leg press 342 lbs or more for 10 reps  
( $180 \times 1.9 = 342$ )

- 

| Fitness Level | Women (10 reps as % of body weight) | Men (10 reps as % of body weight) |
|---------------|-------------------------------------|-----------------------------------|
| Low           | Less than 1.0× body weight          | Less than 1.3× body weight        |
| Moderate      | 1.0× to 1.44× body weight           | 1.3× to 1.89× body weight         |
| High          | 1.45× or more                       | 1.9× or more                      |

A strong indicator of lower-body fitness on the leg press machine is the ability to perform **10 controlled repetitions at a load equal to 1.45 times body weight for women and 1.9 times body weight for men.**

# Tibialis Raises

## Tibialis Raise: What It Is, Why It Matters, What Research Says, and How to Do It

### 1. What Is a Tibialis Raise?

A **tibialis raise** is an exercise that strengthens the **tibialis anterior** — the long muscle running along the front of your shin, next to the tibia (shin bone). Its primary job is **dorsiflexion** — pulling the foot upward toward the shin.

Two highly effective versions are:

- **Against the wall** — for targeted strengthening with bodyweight resistance.
- **Heels on a step** — for a greater range of motion using a stretch at the bottom.

### 2. Why It's Important

The tibialis anterior plays a key role in:

- **Ankle stability** — controls your foot when walking, running, or landing.
- **Shock absorption** — slows your foot as it lowers to the ground, protecting joints.
- **Injury prevention** — helps reduce risk of:
  - Shin splints
  - Foot drop
  - Recurrent ankle sprains
- **Balance and fall prevention** — especially critical for older adults.
- **Athletic performance** — aids sprint starts, jump landings, and quick direction changes.

### 3. What Research Says

- **Fall risk:** Strong dorsiflexion strength correlates with improved balance and reduced falls in older populations.
- **Shin splints:** Tibialis anterior strengthening, combined with calf stretching, significantly reduces recurrence in runners.
- **Ankle stability:** EMG studies reveal high activation during abrupt stops, cutting movements, and downhill running.
- **Performance:** Athletes with stronger dorsiflexion often have better sprint acceleration, stability on landing, and agility.

### 4. How to Do Tibialis Raises

#### Version 1: Against the Wall

1. Stand with your back flat against a wall.
2. Walk your feet forward 12–18 inches, keeping heels planted.
3. Lift your toes and forefoot toward your shins as high as possible.
4. Lower slowly without letting them drop.
5. **Reps & sets:** 2–3 sets of 15–20 reps, 2–3× per week.

#### Version 2: Heels on a Step (Balls of Feet Hanging Off) You can also do this on a floor

1. Stand on a step with **heels resting on the step edge** and **balls of your feet hanging off** into space.
2. Let your toes point slightly downward for a light stretch at the start.
3. Pull toes and forefoot upward toward your shins as high as you can.
4. Lower slowly past neutral for maximum range.
5. **Reps & sets:** 2–3 sets of 12–20 reps, 2–3× per week.

#### Form Tips for Both

- Move slowly and control both the lift (concentric) and the lowering (eccentric).
- Avoid rolling your ankles outward.
- Focus on full range of motion — both above and below neutral.
- For extra resistance, hold a dumbbell or use a tib bar.



## Good & Advanced Strength Benchmarks Tibialis Raise

### 1. Reps with Bodyweight (Wall or Step Version)

- **Good:**
  - **Men:** 20–25 controlled reps
  - **Women:** 18–22 controlled reps
- **Advanced:**
  - **Men:** 30+ strict reps
  - **Women:** 26+ strict reps

*Strict* means: heels never leave the ground (wall version) or never rise above step edge (step version), full range of motion, slow 2–3 second lowering phase.

**Good & Advanced Strength Benchmarks:** For bodyweight tibialis raises (wall or step version), a good goal is **20–25 controlled reps for men and 18–22 for women, while an advanced standard is 30+ strict reps for men and 26+ for women.**

### 2. Weighted Tibialis Raise Strength

If you want to load the exercise with a **tib bar**, dumbbell, or kettlebell on the foot:

- **Good:** Lift **10–15% of bodyweight** for 12–15 reps.
- **Advanced:** Lift **20–25% of bodyweight** for 8–12 strict reps.

### 3. Athletic Performance Context

- **Recreational runner / general fitness:** Being able to do 20+ full-range reps bodyweight per leg significantly lowers shin splint risk and improves running comfort.
- **Field/court athletes** (basketball, soccer, etc.): Hitting 25–30+ reps bodyweight or 15–20% BW loaded is associated with better deceleration control and fewer ankle sprains.
- **Elite sprinters/jumpers:** Often train tibialis raises with heavy loads (20–30% BW) for low reps and high intent, in addition to high-rep endurance sets.

# Pull Ups

## The Pull-Up: A True Test of Muscular Ability

Pull-ups are one of the most effective and challenging exercises in fitness. They are not only a favorite of mine but also a benchmark I use with many clients as a goal for building functional upper-body strength. In my view, the ability to perform even a few pull-ups in men—or one or two in women—is a clear sign of good muscular ability.

### Why Pull-Ups Matter

The pull-up is a foundational movement pattern that has long been considered a gold-standard test of upper-body strength and muscular endurance. Unlike many exercises, it requires you to move the entirety of your own body weight against gravity, demanding not only strength but also coordination, grip strength, and trunk stability.

According to the ACE Integrated Fitness Training® (ACE IFT®) model, the pull-up is a prime example of the “pulling” motion—one of the five essential movement patterns (alongside bend-and-lift, single-leg, pushing, and rotation). Mastering these movements equips us to move more effectively and efficiently in both athletic training and daily life.

### Muscles Worked

Pull-ups are a compound, multi-joint exercise, recruiting multiple large and small muscles at once. The primary movers include the latissimus dorsi (lats), biceps brachii, and rhomboids, while stabilizing muscles such as the trapezius, rear deltoids, core, and forearm muscles play critical supporting roles. Because of this, pull-ups provide a level of muscular engagement and carryover to daily activities that few other exercises can match.

### Proper Technique: Packing the Shoulders

One of the most important aspects of proper pull-up technique is **scapular positioning**. ACE Fitness emphasizes the need to “pack the shoulders” before pulling:

- Begin by hanging from the bar with straight arms.
- Pull the shoulder blades down and together, as if tucking them into your back pockets.
- Maintain this scapular setting as you engage your back and arms to pull yourself upward.

This technique ensures the right muscles are activated, reduces risk of injury, and improves power output.

### Benefits Beyond Strength

Research highlights several additional benefits of pull-ups:

- **Functional Strength:** Pull-ups mimic natural human movements, like climbing or lifting, that require coordinated pulling power.
- **Grip Strength:** Grip endurance during pull-ups has been linked with overall health and longevity.
- **Postural Balance:** Strengthening the upper back through pull-ups can counteract forward-shoulder posture common in people who sit often.
- **Core Activation:** EMG studies show significant activation of abdominal and spinal stabilizers during pull-ups, making them an indirect core exercise.

### Building Pull-Up Ability

For many, performing a full pull-up may feel out of reach at first—but it’s an achievable goal with the right progression. Useful exercises to build strength and muscular balance include:

- **Lat Pulldown** (mimics the pulling motion with adjustable resistance)
- **Inverted Row / Suspension Row** (a horizontal pulling variation to develop back and grip strength)
- **Negative Pull-Ups** (jump up or use a step to the top position, then slowly lower down)
- **Assisted Pull-Ups** (using resistance bands or an assisted pull-up machine)

This combination builds both vertical and horizontal pulling strength, improving overall “pulling ability.”

### A True Marker of Fitness

Pull-ups are more than just an exercise—they are a **marker of muscular ability and resilience**. They demand strength, stability, and coordination, while engaging multiple movement patterns critical for daily function. Whether your goal is athletic performance, general fitness, or simply being strong and capable, the pull-up deserves a central place in your training.



## Pull-Up Performance Norms

While genetics, body composition, and training history all influence performance, general benchmarks can help assess upper-body strength.

*Note: Even being able to perform one strict pull-up is an excellent marker of muscular strength for women, while three or more is a sign of above-average ability. For men, completing double-digit pull-ups demonstrates strong muscular endurance and power relative to body weight.*

| Category      | Women | Men  |
|---------------|-------|------|
| Needs Work    | 0     | 0–2  |
| Basic Ability | 1–2   | 3–7  |
| Fit           | 3–6   | 8–11 |
| Highly Fit    | ≥7    | ≥12  |

The ability to do 7 or more pull-ups for women and 12 or more for men represents an exceptional level of upper-body strength, muscular endurance, and overall fitness.

### Pull-Up Progression

If you're not yet able to perform a full pull-up, start with **assisted variations**. You can use a resistance band, an assisted pull-up machine, or place one foot lightly on a chair for support. Focus on full range of motion and control.

Once you can perform **15 or more strict pull-ups**, begin adding resistance to continue progressing. This can be done by holding a dumbbell between your feet or using a **weighted belt or vest**.

### Proper Form

- **Grip:** Reach overhead with palms facing away (pronated grip) and wrap your thumbs around the bar for a secure hold.
- **Body Position:** Cross one leg over the other to minimize swinging. Brace your abdominal muscles to stabilize your spine.
- **Scapular Engagement:** Depress and retract the shoulder blades (pull them back and down) before initiating the pull. Keep them set throughout the exercise.
- **Pulling Motion:** Flex your elbows and drive them down toward your sides, keeping them roughly at the **3 and 9 o'clock position** (aligned with your trunk).
- **Avoid Momentum:** Do not kick or swing—your body should remain vertically aligned with the floor.
- **Range of Motion:** Pull until your chin clears the bar, pause briefly, then lower under control until arms are fully extended. Maintain trunk alignment throughout.

### Exercise Variations

- **Wide-Grip Pull-Up (palms forward):** Places more emphasis on the lats.
- **Close-Grip Pull-Up (palms forward):** Shifts some load into the upper back and forearms.
- **Chin-Up (palms facing you):** Involves the biceps more heavily while still targeting the back.
- **Neutral-Grip Pull-Up (palms facing each other):** A shoulder-friendly variation that balances load across the lats, biceps, and forearms.
-

# Dips

## Dips: The Ultimate Upper-Body Exercise

Dips are one of the most effective bodyweight exercises for building upper-body strength, muscular endurance, and functional fitness. Alongside pull-ups and push-ups, dips are a cornerstone of any upper-body routine, providing compound benefits that few other exercises can match.

### Benefits of Dips

**Compound Muscle Engagement:** Dips work multiple muscle groups simultaneously, including the triceps, chest, shoulders, core, and stabilizing muscles. This makes them a highly efficient exercise for overall upper-body development.

**Builds Upper-Body Strength and Power:** Dips are particularly effective at improving lockout strength in pressing movements such as the bench press, overhead press, and jerk, translating directly to performance in other strength exercises.

**Superior Muscle Mass & Definition:** Dips emphasize a long range of motion, making them excellent for developing triceps and lower chest.

**Functional & Transferable:** Beyond aesthetic benefits, dips enhance pressing power and improve performance in everyday activities and athletic movements.

**Versatile and Scalable:** You can adjust difficulty through grip width, body angle, or by adding external load such as a weighted vest, belt, or backpack.

**Minimal Equipment, Maximum Payoff:** Dips require only parallel bars or a sturdy substitute, making them easy to set up at home or in the gym.

**Enhances Stability & Coordination:** Performing dips on unstable setups, such as rings, improves core control, shoulder stability, and overall coordination.

**Encourages Mental Toughness:** Dips are challenging and require focus and discipline, offering benefits for both the mind and body.

### How to Perform Dips Correctly

#### Step-by-Step Breakdown

- 1. Setup:** Grip parallel bars with arms straight, shoulders down and back, chest lifted, and legs crossed slightly behind you.
- 2. Descent:** Lower yourself slowly until your elbows reach or slightly exceed 90°, depending on mobility, maintaining a controlled and even motion.
- 3. Ascent:** Press back up to full elbow extension, keeping elbows tucked (triceps focus) or slightly flared (chest focus) and avoiding shoulder shrugging.

#### Variations in Form

- **Chest-Focused:** Lean forward slightly, elbows flared.
- **Triceps-Focused:** Keep torso vertical, elbows tucked close to the body.

#### Safety Tips

- Warm up shoulders and triceps before attempting dips.
- Avoid dips if you cannot hold yourself locked out for ~30 seconds or have not achieved ~15–20 clean push-ups.
- Focus on technique to prevent shoulder injuries and avoid rushing reps.

| Progression Stage               | Description  |
|---------------------------------|--|
| <b>Support Hold</b>             | Lock out on bars, hold position while stabilizing body |
| <b>Negative Dip</b>             | Slowly lower from the top position to descent          |
| <b>Assisted Dip</b>             | Using resistance bands or feet for support             |
| <b>Partial Dip</b>              | Range-limited, less depth; gradually increase depth    |
| <b>Standard Dip</b>             | Full-bodyweight dip with controlled descent/ascent     |
| <b>Weighted Dip</b>             | Add load via belt, vest, or pack for added resistance  |
| <b>Ring Dip / Bulgarian Dip</b> | Increase complexity with unstable surfaces or angles   |

# Dips Performance Standards

Achieving certain dip numbers is an excellent measure of upper-body strength and endurance.

- **Women achieving 3 dips** → Intermediate to Advanced
- **Men achieving 10 dips** → Intermediate to Advanced
- **Women achieving 5 dips** → Elite
- **Men achieving 15 dips** → Elite

Dips, together with push-ups and pull-ups, form a powerful trio for upper-body development. By following proper form, progressing safely, and using performance benchmarks as milestones, you can build exceptional strength, muscular endurance, and functional fitness.

| <b>Gender</b> | <b>Beginner</b> | <b>Novice</b> | <b>Intermediate</b> | <b>Advanced</b> | <b>Elite</b> |
|---------------|-----------------|---------------|---------------------|-----------------|--------------|
| <b>Men</b>    | <1              | 1–5           | 6–9                 | 10–14           | 15           |
| <b>Women</b>  | <1              | 1–2           | 3–4                 | 5–9             | 5            |

**Women who can perform 3 dips and men who can perform 10 dips are considered Advanced placing them around the 70th percentile for upper-body strength and endurance.**

# Push Ups

## **The Push-Up: A Foundational Exercise for Strength and Health**

The push-up is one of the most effective exercises for the upper body and a cornerstone of functional fitness. It is considered a primary movement pattern because it involves the pressing motion, which is essential for everyday activities and athletic performance. Push-ups work the triceps, pectoral muscles, and parts of the shoulders while also engaging the core and lower back for stability.

One of the key benefits of push-ups is their versatility. They can be performed anywhere without equipment, making them accessible to almost everyone. While push-ups can be performed frequently, it is generally recommended to include them in your routine 2–3 times per week to allow for recovery and prevent overuse. They can serve as a foundation exercise for beginners or as a warm-up for more advanced exercisers.

### **Cardiovascular Health Connection**

Push-ups may also provide insight into cardiovascular fitness. Studies suggest that individuals who can perform higher numbers of push-ups in a set period tend to have a lower risk of heart disease over time, highlighting their value not just for strength but for overall health.

### **Knee Push-Ups: A Gateway to Progression**

Knee push-ups are an effective and underappreciated variation. They allow individuals to build strength safely and progressively, making them an ideal stepping stone toward full push-ups on the toes. They effectively engage the same muscle groups and can help improve endurance and form.

### **Stable vs. Unstable Surfaces**

While some training trends focus on performing push-ups on unstable surfaces to challenge stabilizing muscles, research shows that traditional push-ups on a stable surface provide similar improvements in strength and endurance. For most people, sticking to the basics is both effective and safe.

In summary, push-ups are a versatile, practical, and highly effective exercise. They strengthen the upper body, improve core stability, and may even reflect cardiovascular fitness. Whether performed on the knees or toes, push-ups are a foundational movement that deserves a place in almost any fitness routine.

## **How to Perform a Proper Push-Up**

1. **Starting Position:** Begin in a plank position with your hands placed slightly wider than shoulder-width apart. Ensure your body forms a straight line from head to heels, engaging your core and glutes.
2. **Descent:** Lower your body by bending your elbows at a 45-degree angle, keeping them close to your torso. Lower yourself until your chest nearly touches the ground.
3. **Ascent:** Push through your palms to extend your elbows, returning to the starting position while maintaining a straight body line.
4. **Breathing:** Inhale as you lower your body and exhale as you push back up.

## **Push-Up Progressions**

### **1. Wall Push-Ups**

- **Description:** Stand facing a wall, place your hands on the wall at shoulder height, and perform push-ups by bending your elbows and bringing your chest towards the wall.
- **Benefits:** Ideal for beginners to build initial strength and form.

### **2. Incline Push-Ups**

- **Description:** Place your hands on an elevated surface like a bench or step. Perform push-ups by lowering your chest towards the surface and pushing back up.
- **Benefits:** Reduces the amount of body weight lifted, making it easier than standard push-ups.

### **3. Knee Push-Ups**

- **Description:** Perform push-ups from your knees instead of your toes. Ensure your body forms a straight line from knees to shoulders.
- **Benefits:** Provides support while still engaging upper body muscles.

### **4. Standard Push-Ups**

- **Description:** Perform push-ups from your toes with a straight body line, engaging core and glute muscles.
- **Benefits:** Full-body engagement, building strength and endurance.

### **5. Decline Push-Ups**

- **Description:** Place your feet on an elevated surface, such as a bench, and perform push-ups.
- **Benefits:** Increases the intensity, targeting upper chest and shoulders.

### **6. Diamond Push-Ups**

- **Description:** Place your hands close together under your chest, forming a diamond shape with your fingers, and perform push-ups.
- **Benefits:** Emphasizes triceps and inner chest muscles.

### **7. Clapping Push-Ups**

- **Description:** Perform a push-up explosively, pushing off the ground with enough force to clap your hands before landing back into the push-up position.
- **Benefits:** Builds explosive power and upper body strength.

## **Tips for Effective Push-Up Training**

- **Form First:** Prioritize proper form over the number of repetitions to prevent injury and maximize effectiveness.
- **Consistency:** Incorporate push-ups into your routine 2–3 times per week, allowing adequate rest between sessions.
- **Progress Gradually:** Start with easier variations and progressively challenge yourself as strength and technique improve.
- **Rest and Recovery:** Ensure adequate rest and recovery to allow muscles to repair and grow stronger.

# Push-up performance chart

For push-ups, advanced performance is defined as completing 23–24 repetitions for women and 30–31 repetitions for men in a single set with proper form.

## How to Use This Chart:

- **Beginner:** Focus on building foundational strength and proper form. Wall or knee push-ups are ideal at this stage.
- **Intermediate:** You can perform standard push-ups on toes with solid form. Work on increasing repetitions gradually.
- **Advanced:** These numbers indicate strong upper body endurance and control. Consider adding variations or incline/decline push-ups to continue progressing.
- **Elite:** This level represents high-level strength and endurance. Push-ups at this range are excellent for overall conditioning and may indicate excellent cardiovascular health.

| Category            | Women (Push-Ups) | Men (Push-Ups) |
|---------------------|------------------|----------------|
| <b>Beginner</b>     | 0–12             | 0–17           |
| <b>Intermediate</b> | 13–22            | 18–29          |
| <b>Advanced</b>     | 23–24            | 30–31          |
| <b>Elite</b>        | 25               | 32             |

# Dumbbell Curl-to-Shoulder-to-Press

## Dumbbell Curl-to-Shoulder-to-Press: A Full Upper-Body Compound Exercise

The Dumbbell Curl-to-Shoulder-to-Press is a versatile, compound movement that targets the biceps, shoulders, and triceps in a single, fluid motion. By combining a biceps curl, shoulder raise, and overhead press, this exercise efficiently engages multiple muscle groups while improving coordination, stability, and overall upper-body strength. It is an excellent addition to both beginner and advanced routines, whether for strength training or functional fitness.

### Muscles Worked

- **Biceps brachii** – during the curl portion
- **Deltoids (shoulders)** – during the shoulder raise and press
- **Triceps brachii** – during the press
- **Core stabilizers** – to maintain posture and balance throughout the movement

### How to Perform the Exercise

#### 1. Starting Position:

- Stand with feet shoulder-width apart and hold a dumbbell in each hand at your sides, palms facing forward.
- Engage your core and keep your spine neutral.

#### 2. Biceps Curl:

- Curl the dumbbells up toward your shoulders while keeping your elbows close to your torso.
- Avoid swinging your arms; focus on controlled motion.

#### 3. Shoulder Raise (Optional Step for Compound Variation):

- Once the dumbbells reach shoulder height, slightly rotate your wrists so palms face forward, preparing for the press.

#### 4. Overhead Press:

- Press the dumbbells overhead until your arms are fully extended but not locked out.
- Exhale during the press and keep your core engaged to prevent arching your lower back.

#### 5. Return to Start:

- Lower the dumbbells back to shoulder height, then slowly lower them to your sides.
- Repeat for the desired number of repetitions.

#### 6. Breathing:

- Inhale during the lowering phases, exhale during the curl and press phases.

### Benefits

- **Time-efficient compound exercise:** Works multiple upper-body muscles in one movement.
- **Functional strength:** Improves coordination and strength for daily activities that involve lifting, pushing, or carrying objects.
- **Core stability:** Engages abdominal and lower back muscles to maintain balance during the press.
- **Progression-friendly:** Can be adapted with heavier weights, slower tempo, or more repetitions.

### Common Mistakes

- Using momentum instead of controlled motion.
- Arching the lower back during the press.
- Letting elbows flare excessively.
- Holding the breath; proper breathing is essential.



# Assessment and Performance Chart Dumbbell Curl-to-Shoulder-to-Press

This chart is based on repetitions completed with proper form using a moderate weight dumbbell (e.g., 8- lbs for women, 15 lbs for men), performed in a single set:

## How to Use This Chart:

- **Beginner:** Focus on proper technique with lighter weights, aiming for smooth control.
- **Intermediate:** Increase weight gradually and maintain a consistent tempo.
- **Advanced:** Use moderately heavy weights for higher repetitions with controlled movement.
- **Elite:** High repetitions with heavier dumbbells, excellent control, and minimal rest between sets.

For the Dumbbell Curl-to-Shoulder-to-Press, **advanced performance** is defined as completing **19–22 repetitions for women** using 8-pound dumbbells and **25–30 repetitions for men** using 15-pound dumbbells, in a single set with proper form. This level demonstrates strong upper-body strength, muscular endurance, and control, indicating readiness to progress to heavier weights or more challenging variations.

## Progressions and Variations

- **Seated Curl-to-Press:** Sit on a bench to reduce lower-back involvement and isolate upper-body muscles.
- **Alternating Arm Curl-to-Press:** Perform the curl and press with one arm at a time to focus on unilateral strength and balance.
- **Tempo Variation:** Slow down the lowering phase to increase time under tension for greater strength and hypertrophy gains.
- **Increase Weight Gradually:** As strength improves, increase dumbbell weight while maintaining proper form.

| Category            | Women (Reps) | Men (Reps) |
|---------------------|--------------|------------|
| <b>Beginner</b>     | 0–10         | 0–12       |
| <b>Intermediate</b> | 11–18        | 13–24      |
| <b>Advanced</b>     | 19–22        | 25–30      |
| <b>Elite</b>        | 23           | 31         |

# Dumbbell and Barbell Rows

## Dumbbell Row: My favorite is the Two Arm Dumbbell Row

Rows are one of the foundational strength-training exercises, targeting multiple large muscle groups while reinforcing posture and stability. Among the variations, the two-arm dumbbell row—sometimes called the double row—offers a balanced, effective way to build strength in the upper back and supporting muscles.

### Why Rows Matter

Rows are classified as **pulling exercises**, which balance out pressing movements like bench presses and push-ups. Consistently including rows in a strength program helps prevent muscular imbalances and supports overall structural integrity.

Key benefits of rows include:

- **Upper Back Strength:** Rows primarily train the latissimus dorsi, rhomboids, trapezius, and rear deltoids, all essential for pulling power and posture.
- **Core Engagement:** Maintaining spinal alignment during rows requires stabilization from the erector spinae, abdominals, and obliques.
- **Grip and Arm Strength:** Rows strengthen the forearms and biceps, improving performance in other lifts and daily tasks.
- **Postural Support:** Strengthening the muscles that retract the scapula counteracts the effects of sitting and rounded shoulders.

### The Two-Arm Dumbbell Row

The two-arm dumbbell row differs from the single-arm variation in that both arms pull simultaneously. Typically performed with the chest supported on an incline bench or in a bent-over position, this version emphasizes symmetry and coordination. In my opinion, the standing two-arm dumbbell row is superior for most lifters focused on mid-back strength and posture. Its setup is simple, the motion is more natural, and it allows for a deeper, more controlled scapular retraction than a barbell row, all while reducing stress on the lower back. This makes it ideal for building functional strength, correcting imbalances, and reinforcing good posture.

### Advantages of the Double Row

- **Balanced Development:** Training both arms together reduces the risk of side dominance and ensures more even strength gains.
- **Higher Loading Potential:** Because both arms share the work, you can often lift heavier overall loads compared to single-arm rows.
- **Time Efficiency:** Engaging both arms at once makes it a faster way to accumulate training volume.
- **Postural Reinforcement:** Performing the movement with strict form reinforces hip hinge mechanics and strengthens spinal stabilizers.

### Training Balance: Push vs. Pull

A common mistake in training is overemphasizing chest work while undertraining the back. Pressing movements (bench press, push-ups, overhead press) dominate many routines, but this can create rounded shoulders, poor posture, and increase the risk of shoulder impingement.

To offset this, many experienced lifters and strength coaches recommend performing about twice as much mid-back pulling work (rows, pulldowns, pull-ups) as pressing work. This 2:1 pull-to-push ratio is not arbitrary—it reflects how much more pulling strength and endurance the body often needs to counter daily habits like sitting, driving, and phone use, all of which reinforce forward shoulder posture. Extra pulling volume helps restore balance, protects the shoulders, and builds a stronger base for pressing lifts.

### Adding Bands for Deeper Muscle Recruitment

While dumbbells and barbells load the big movers, banded rows provide a unique benefit: constant tension throughout the range of motion. This not only strengthens the large muscles of the back but also recruits the deep stabilizing muscles around the scapula and spine that free weights may not fully activate.

Bands can:

- Improve scapular control and retraction.
- Strengthen smaller stabilizers like the lower trapezius and serratus anterior.
- Enhance joint health by challenging the muscles through variable resistance.
- Serve as a lower-impact alternative on recovery days or warm-ups.

Integrating both free-weight and banded rows ensures that you build not only raw pulling power but also the stability needed for long-term joint health and strength.

### The Bottom Line

Rows are essential for balanced strength, posture, and injury prevention. The **two-arm dumbbell row** provides efficient, symmetrical training for the back, arms, and core, making it a staple for athletes and fitness enthusiasts alike. When paired with pressing exercises, prioritizing extra pulling work ensures long-term strength, balance, and resilience. Adding **banded rows** into your training further engages the deep stabilizing muscles that keep your shoulders and spine healthy—rounding out one of the most important exercise categories in strength training.



# Double Arm Row strength/endurance performance based on reps out of 10:

## Notes:

- Percentages of body weight are per dumbbell. For a 200 lb man:  $0.38 \times 200 = 76$  lbs per dumbbell.
- For a 150 lb woman:  $0.21 \times 150 = 31.5$  lbs per dumbbell.
- The scale assumes proper form: neutral spine, full scapular retraction, controlled eccentric.
- Elite level indicates maximum strength/endurance combination for this load and rep range.

| Performance Level | Men (0.76% BW/dumbbell) | Women (0.38% BW/dumbbell) |
|-------------------|-------------------------|---------------------------|
| Novice            | 1–3 reps                | 1–3 reps                  |
| Intermediate      | 4–6 reps                | 4–6 reps                  |
| Advanced          | 7–9 reps                | 7–9 reps                  |
| Elite             | 10 reps                 | 10 reps                   |

Elite performance for the two-arm dumbbell row is completing 10 reps with a total load equal to 0.76% of bodyweight for men and 0.38% for women, divided evenly between the two dumbbells.

# Two-Arm Dumbbell Row (Bent-Over) – How to Do It

## • Setup:

- Hold a dumbbell in each hand with a neutral grip (palms facing each other).
- Stand with feet hip-width apart.
- Hinge at the hips until your torso is roughly parallel to the floor, keeping a neutral spine and a slight bend in the knees.

## • Starting Position:

- Let the dumbbells hang straight down from your shoulders.
- Keep your shoulder blades relaxed and avoid rounding your back.

## • The Row:

- Retract your shoulder blades and bend your elbows to pull the dumbbells toward your lower ribcage or waist.
- Keep elbows close to your body and avoid flaring them out.
- Focus on squeezing your mid-back muscles at the top of the movement.

## • Lowering the Weights:

- Slowly extend your arms back to the starting position under control.
- Do not let the dumbbells drop or use momentum.

## • Breathing:

- Exhale while pulling the dumbbells up.
- Inhale while lowering them down.

## Tips for Best Results:

- Keep the core tight to protect the lower back.
- Avoid jerking or swinging the dumbbells.
- Start with moderate weight to ensure proper form, then gradually increase.
- Optionally, perform on an incline bench for chest support to reduce lower back strain.

# Dumbbell Chest Press

## The Benefits of the Dumbbell Chest Press: Strength, Function, and Efficiency

The dumbbell press—whether performed on a flat or incline bench—remains one of the most effective upper-body strength builders. While the barbell bench press often steals the spotlight, dumbbells offer unique advantages for strength, muscle balance, and joint health.

### Why the Dumbbell Press Stands Out

#### 1. Improved Range of Motion

Unlike the barbell, which locks the hands in place, dumbbells allow a greater stretch at the bottom and a stronger contraction at the top. Research shows that this extended range of motion leads to greater chest activation and improved hypertrophy over time.

#### 2. Balanced Muscle Recruitment

Each arm works independently, reducing the risk of strength imbalances. This also means stabilizer muscles in the shoulders, triceps, and even the core are more engaged compared to barbell pressing.

#### 3. Joint-Friendly and Natural Motion

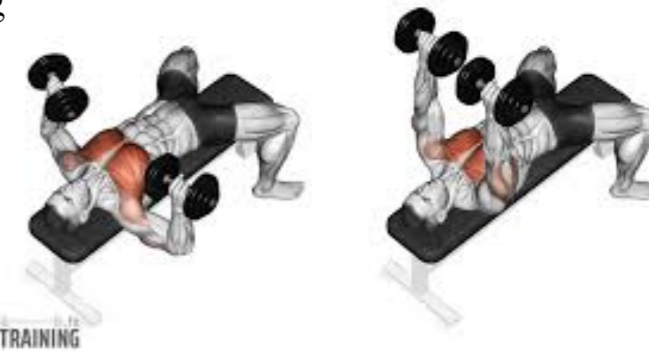
Dumbbells permit a more natural arc of movement for the shoulders and elbows, lowering stress on the joints. Lifters often find dumbbell pressing more comfortable, especially if they have a history of shoulder pain.

#### 4. Time Efficiency & Safety

Without the need for a spotter, dumbbells can be pressed safely—even to near failure—by simply dropping them to the side if necessary. They also require less time to set up compared to unracking and re-racking heavy barbells.

#### 5. Functional Carryover

Because dumbbells replicate pushing patterns used in daily life and sport, they provide more direct functional carryover to athletic performance and general strength needs.



### Why Some Trainers Favor Dumbbells Over Barbells

Many experienced lifters and coaches recommend prioritizing dumbbell pressing, especially for general strength and hypertrophy goals. While barbell pressing allows heavier total loading, dumbbells win in terms of natural biomechanics, joint safety, and independence of limb movement. For many, this makes them the more *sustainable* choice for long-term progress.

### How to Do It

1. Sit on a flat or incline bench holding a dumbbell in each hand at shoulder level.
2. Press the weights upward until arms are extended, avoiding lockout.
3. Lower slowly until the dumbbells are level with the chest (or slightly below on flat).
4. Maintain control and repeat for the desired reps.

# Dumbbell Press 10RM Performance Chart (per dumbbell)

## Ratios Used (per total bodyweight):

- **Men:** Beginner 0.35×, Intermediate 0.50×, Advanced 0.70×, Elite 0.85×
- **Women:** Beginner 0.20×, Intermediate 0.30×, Advanced 0.42×, Elite 0.55×
- **Each dumbbell = half the total load**

| Bodyweight    | Men Beginner | Men Intermediate | Men Advanced | Men Elite | Women Beginner | Women Intermediate | Women Advanced | Women Elite |
|---------------|--------------|------------------|--------------|-----------|----------------|--------------------|----------------|-------------|
| <b>120 lb</b> | 21 lb        | 30 lb            | 42 lb        | 51 lb     | 12 lb          | 18 lb              | 25 lb          | 33 lb       |
| <b>150 lb</b> | 26 lb        | 38 lb            | 53 lb        | 64 lb     | 15 lb          | 23 lb              | 32 lb          | 41 lb       |
| <b>180 lb</b> | 32 lb        | 45 lb            | 63 lb        | 77 lb     | 18 lb          | 27 lb              | 38 lb          | 50 lb       |
| <b>200 lb</b> | 35 lb        | 50 lb            | 70 lb        | 85 lb     | 20 lb          | 30 lb              | 42 lb          | 55 lb       |
| <b>220 lb</b> | 38 lb        | 55 lb            | 77 lb        | 94 lb     | 22 lb          | 33 lb              |                |             |

An advanced dumbbell chest press equals 0.70× bodyweight for men and 0.42× bodyweight for women, with each dumbbell representing half of the total load.

# Hex Bar Deadlift

## The Hex Bar Deadlift: A Smarter Way to Build Strength

### Why the Hex Bar Deadlift?

The **hex bar deadlift** (also known as the trap bar deadlift) is one of the most effective total-body strength exercises. Unlike the conventional barbell deadlift, the hexagonal design allows you to step inside the bar, keeping the load centered on your body rather than in front of it.

### Research Highlights

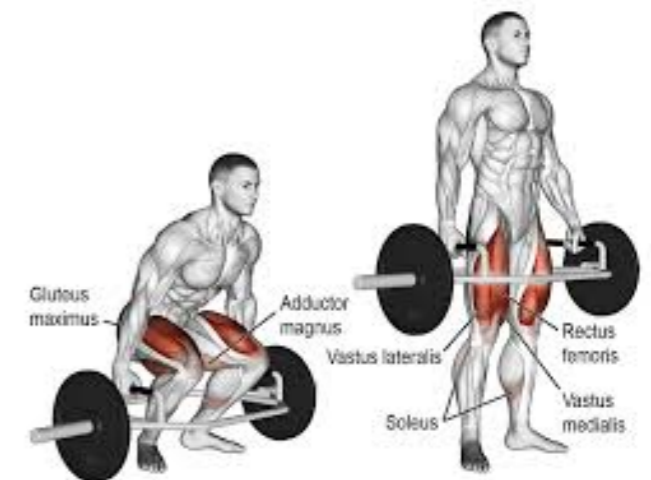
- **Reduced spinal stress:** Hex bar deadlifts significantly decrease shear forces on the lumbar spine compared to barbell deadlifts (Swinton et al., 2011).
- **Greater power and force production:** Peak force, velocity, and power are higher with a hex bar compared to a straight bar (Camara et al., 2016).
- **Higher load potential:** Lifters can typically use ~5–10% greater loads with a hex bar than with a conventional deadlift (Swinton et al., 2011).
- **Muscle activation differences:** While the hex bar deadlift is a total-body exercise, the more upright torso position shifts emphasis toward the **quadriceps**, whereas the conventional barbell deadlift activates the **hamstrings and lower back erectors** more. Understanding this subtle difference can help tailor training goals.
- **Neutral grip advantage:** The neutral hand position reduces shoulder stress and allows for more natural pulling mechanics (Comfort et al., 2011).
- **Crossover to athletics (with nuance):** Hex bar strength is often associated with better performance in jumps and sprints (Lake et al., 2017). However, athletes who need **specific posterior chain strength**—such as powerlifters—may still benefit from conventional deadlifts for targeted hamstring and spinal erector development.
- **Easier learning curve:** Novices and general fitness participants achieve safe technique more quickly with the hex bar compared to the barbell deadlift (Anderson et al., 2018).

### How to Perform the Hex Bar Deadlift

1. **Step inside the bar** so your feet are hip-width apart, toes pointing forward.
2. **Grip the handles** with palms facing inward (neutral grip).
3. **Set your posture:** chest tall, shoulders back, core braced, spine neutral.
4. **Hinge and squat down** until your thighs are about 45° to the floor.
5. **Drive through the heels and midfoot**, pushing the floor away as you stand tall.
6. **Finish strong:** stand fully upright, but don't lean back or overextend.
7. **Lower under control**, maintaining posture throughout.

### Takeaway

The hex bar deadlift is a safe, powerful, and efficient total-body lift. It emphasizes the quadriceps and is particularly useful for athletes needing explosive power, while also reducing spinal stress. However, those targeting posterior chain development or competitive powerlifting should still include conventional deadlifts in their programs.



# Performance Standards Hex Bar

## General Fitness Benchmarks

An advanced level of fitness is demonstrated by the ability to perform a hex bar deadlift at 1× bodyweight for women and 1.5× bodyweight for men.

| Category     | Women (5 reps)     | Men (5 reps)      |
|--------------|--------------------|-------------------|
| Beginner     | 0.5 × bodyweight   | 0.75 × bodyweight |
| Intermediate | 0.75 × bodyweight  | 1.0 × bodyweight  |
| Advanced     | 1.0 × bodyweight   | 1.5 × bodyweight  |
| Elite        | 1.25 × bodyweight+ | 2.0 × bodyweight+ |

### Military Standards (Army Fitness Test)

The U.S. Army assesses soldiers' strength using the **3-Repetition Maximum Deadlift (MDL)** event, which utilizes a 60-pound hex bar and weighted plates. The scoring is based on the maximum weight a soldier can lift three times.

- **Male Soldiers (Ages 17–21):**
  - Minimum: 150 lbs
  - Maximum: 340 lbs
- **Female Soldiers (Ages 17–21):**
  - Minimum: 90 lbs
  - Maximum: 210 lbs

These standards are part of the ArmyFitness Test (AFT) and are designed to evaluate soldiers' strength and readiness.

# Dumbbell Deadlift

## The Dumbbell Deadlift: A Time-Efficient, Powerful Alternative

### Why Dumbbell Deadlifts?

The **dumbbell deadlift** is often overlooked, but it's one of the most practical, joint-friendly, and efficient strength exercises. Unlike the barbell deadlift, which requires more setup, space, and often heavier loading, dumbbells offer a faster, simpler option without sacrificing effectiveness.

Here's why I prefer dumbbells over barbells:

- **Time efficiency:** No barbell setup, no loading/unloading plates — just grab your dumbbells and go.
- **Convenience:** Dumbbells are compact, versatile, and allow you to train anywhere. With a set that goes up to 100 lbs, you can achieve serious strength gains.
- **Natural movement:** Holding dumbbells at your sides keeps the weight close to your body, similar to a hex bar deadlift, reducing stress on the lower back.
- **Improved mobility:** Dumbbells allow for a greater range of motion and more freedom of movement compared to a barbell, making the lift friendlier on the hips and shoulders.
- **Balanced strength:** Each side works independently, addressing imbalances and preventing one side from dominating.
- **Accessibility:** Easier to learn than the barbell deadlift, making it great for all levels of lifters.

### Research Highlights

- **Joint loading:** Dumbbell deadlifts mimic the neutral grip mechanics of the hex bar, reducing lumbar spine stress compared to conventional barbell deadlifts (Swinton et al., 2011).
- **Muscle activation:** EMG studies suggest similar activation of the glutes, quads, and hamstrings when dumbbells are used at sufficient loads, with greater stabilizer engagement due to independent handles.
- **Strength carryover:** Like the hex bar deadlift, dumbbell deadlifts transfer well to functional strength and athletic performance, especially in movements involving hip hinge mechanics.
- **Learning curve:** Dumbbell deadlifts are easier for beginners to master compared to barbell deadlifts (Anderson et al., 2018).

### How to Perform the Dumbbell Deadlift

1. **Stand tall** with a dumbbell in each hand, arms at your sides, feet hip-width apart.
2. **Set your posture:** shoulders back, chest up, core braced.
3. **Hinge at the hips:** push your hips back while keeping a soft bend in your knees.
4. **Lower the dumbbells** toward the floor, keeping them close to your body.
5. **Go as low as mobility allows** (usually mid-shin without rounding your back).
6. **Drive through your heels and hips** to return to standing.
7. **Squeeze the glutes** at the top without overextending your spine.

### Takeaway

Dumbbell deadlifts may not look as impressive as barbell pulls, but they are **efficient, joint-friendly, and highly functional**. With dumbbells up to 100 lbs, you can build serious strength without ever needing to load a barbell. For lifters who value **time efficiency, simplicity, and convenience**, the dumbbell deadlift deserves a permanent place in the training routine.

# Dumbbell Deadlift Performance Standards

Since most people don't have dumbbells as heavy as barbells, standards for dumbbell deadlifts are lower but still meaningful. Using the same **advanced fitness anchor**:

- **Women:** 1× bodyweight (combined dumbbells) for 5 reps
- **Men:** 1.5× bodyweight (combined dumbbells) for 5 reps

*(Example: If a 180 lb man can dumbbell deadlift a total of 270 lbs — 135 lbs per hand — for 5 reps, that's advanced.)*

| Category     | Women (5 reps)     | Men (5 reps)      |
|--------------|--------------------|-------------------|
| Beginner     | 0.25 × bodyweight  | 0.5 × bodyweight  |
| Intermediate | 0.5 × bodyweight   | 1.0 × bodyweight  |
| Advanced     | 1.0 × bodyweight   | 1.5 × bodyweight  |
| Elite        | 1.25 × bodyweight+ | 2.0 × bodyweight+ |

# Romanian Deadlift

## Romanian Deadlifts with Dumbbells: Why They Matter and How to Do Them

The **Romanian Deadlift (RDL)** is one of the most effective exercises for developing posterior chain strength—particularly the hamstrings, glutes, and lower back. While barbells are commonly used, **dumbbells** offer unique advantages, including greater range of motion, improved stability, and easier adaptation for beginners or those with mobility restrictions.

### Why RDLs Are Important

**Posterior Chain Strength:** The posterior chain—hamstrings, glutes, and spinal erectors—is critical for posture, athletic performance, and injury prevention. Weakness in this area is linked to lower back pain and reduced sprinting and jumping ability.

**Hip Hinge Mastery:** RDLs reinforce the hip hinge pattern, which is fundamental to many daily activities and athletic movements like lifting, jumping, and running.

**Hamstring Development and Injury Prevention:** Research shows that eccentric hamstring exercises, like the RDL, are highly effective for preventing hamstring strains—one of the most common athletic injuries. [1]

**Lower Back Health:** Strengthening the spinal erectors helps protect the lower back from injury, especially during lifting and sports movements.

**Functional Strength:** Dumbbell RDLs improve unilateral stability and allow each limb to work independently, which can correct imbalances.

### How to Do Dumbbell Romanian Deadlifts

#### Step-by-Step Guide:

##### Starting Position

Stand with feet hip-width apart, holding a dumbbell in each hand in front of your thighs, palms facing your body.

Keep a slight bend in your knees and maintain a neutral spine.

##### The Descent

Push your hips back while lowering the dumbbells along the front of your legs.

Keep your chest lifted and shoulders back.

Lower until you feel a stretch in your hamstrings (usually mid-shin level).

##### The Ascent

Engage your glutes and hamstrings to drive your hips forward and return to standing.

Keep the dumbbells close to your body throughout the movement.

##### Breathing and Tempo

Inhale as you lower the dumbbells.

Exhale as you lift back up.

Perform slow, controlled reps—especially on the eccentric (lowering) phase.

##### Key Tips:

- Avoid rounding your back—keep a neutral spine.
- Focus on hip hinge, not knee bend.
- Start with lighter dumbbells to perfect form before progressing.
- Keep your shoulders down and relaxed.

### Research and Evidence

- **Hamstring Eccentric Strength:** Studies show that eccentric-focused RDLs improve hamstring length and strength, reducing injury risk in athletes.
- **Glute Activation:** EMG studies indicate RDLs recruit glute muscles effectively, contributing to improved hip extension power.
- **Lower Back Strength:** Research confirms RDLs strengthen spinal erectors and promote safer lifting mechanics, particularly for those lifting heavy weights. [

### Normative Chart for Dumbbell RDLs

While individual strength varies, the following **general guidelines** can help gauge performance. These numbers represent **dumbbell weight held in each hand for 8–12 reps**:

#### Notes:

- Start at the lower end if you are new or focusing on perfect form.
- Increase weight gradually as your hip hinge control and hamstring strength improve.
- Range of motion, control, and correct technique are more important than lifting heavier weights.

### Conclusion

Dumbbell Romanian Deadlifts are a **fundamental exercise for posterior chain strength, hip hinge mastery, and injury prevention**. They are accessible for beginners and scalable for advanced lifters. By emphasizing controlled movement, proper technique, and gradual progression, RDLs with dumbbells can improve your athletic performance, posture, and overall functional strength.

| Training Level | Women (per dumbbell) | Men (per dumbbell) |
|----------------|----------------------|--------------------|
| Beginner       | 10–20 lbs            | 20–35 lbs          |
| Intermediate   | 20–35 lbs            | 35–50 lbs          |
| Advanced       | 35–50 lbs            | 50–70+ lbs         |

# Single Leg Romanian Dumbbell Deadlift

## Single-Leg Romanian Deadlifts with Dumbbells: Strength, Balance, and Stability

The **Single-Leg Romanian Deadlift (SL RDL)** is a highly effective exercise that builds posterior chain strength while simultaneously improving balance, coordination, and unilateral stability. Using dumbbells adds versatility and makes the movement accessible for a wide range of lifters.

### Why Single-Leg RDLs Are Important

#### Unilateral Strength and Balance

Performing RDLs on one leg challenges each side independently, helping correct muscle imbalances that can affect athletic performance and injury risk.

#### Posterior Chain Development

Like the traditional RDL, SL RDLs target hamstrings, glutes, and spinal erectors, strengthening the muscles that support hip extension and lower back stability.

#### Hip and Core Stability

Single-leg variations require significant core engagement to maintain balance and control, improving stability for everyday movements and sports.

#### Injury Prevention

Research shows unilateral, eccentric-focused exercises like the SL RDL reduce risk of hamstring strains and lower back injuries. [1,2]

#### Functional Strength

Single-leg movements mimic real-life and athletic patterns, such as walking, running, and pivoting, making this exercise highly functional.

“An advanced lifter performing single-leg RDLs would typically use 25–35 lbs per dumbbell for women and 40–60 lbs or more per dumbbell for men for 8–12 controlled reps. At this stage, the focus is on maintaining perfect balance, full range of motion, and maximal posterior chain activation rather than simply increasing weight.”

### How to Do Single-Leg Dumbbell Romanian Deadlifts

#### Step-by-Step Guide:

##### Starting Position

- Stand tall with a dumbbell in each hand, arms at your sides.
- Shift your weight onto your right leg, keeping a slight bend in the knee.

##### The Descent

- Hinge at the hips while lifting your left leg straight behind you.
- Lower the dumbbells toward the floor, keeping them close to your standing leg.
- Keep your back neutral, chest lifted, and shoulders down.

##### The Ascent

- Engage your glutes and hamstrings of the standing leg to return to upright.
- Maintain balance and control throughout the movement.

##### Breathing and Tempo

- Inhale as you lower.
- Exhale as you rise.
- Perform slow, controlled reps—especially on the lowering (eccentric) phase.

##### Key Tips:

- Focus on the hip hinge, not the knee bend.
- Keep the lifted leg extended behind you without collapsing the hip.
- Start with lighter dumbbells to master balance and form.
- Use a wall or chair for support if needed when starting out.

### Normative Chart for Single-Leg Dumbbell RDLs

This chart represents **dumbbell weight per hand for 8–12 controlled reps:**

| Training Level | Women (per dumbbell) | Men (per dumbbell) |
|----------------|----------------------|--------------------|
| Beginner       | 5–15 lbs             | 10–25 lbs          |
| Intermediate   | 15–25 lbs            | 25–40 lbs          |
| Advanced       | 25–35 lbs            | 40–60 lbs          |

### Research and Evidence

**Unilateral Strength and Injury Prevention:** Studies indicate that single-leg, eccentric hamstring exercises reduce risk of strains and improve muscular balance. [1]

**Core Activation:** EMG studies show that single-leg RDLs increase activation of the glutes and core stabilizers compared to bilateral RDLs. [2]

**Balance and Functional Performance:** SL RDLs enhance proprioception and balance, which are key for athletic performance and fall prevention in older adults. [3]

### Conclusion

Single-Leg Romanian Deadlifts with dumbbells are a **powerful exercise for strength, stability, and functional performance**. They target the posterior chain, improve balance, correct asymmetries, and strengthen the core. By prioritizing controlled movement, perfect form, and gradual progression, SL RDLs can significantly enhance athletic performance and reduce injury risk.

For lifters who value **time efficiency, simplicity, and convenience**, the dumbbell deadlift deserves a permanent place in the training routine.

# 45 Degree Hyperextensions

## 45-Degree Hyperextensions: Strengthening the Foundation of the Posterior Chain

The **45-degree hyperextension** (also known as the **back extension**) is a highly effective exercise for developing strength and endurance in the **lower back, glutes, and hamstrings**. Performed on a 45-degree hyperextension bench, this movement trains the body's ability to extend the hips and stabilize the spine — key functions for posture, lifting, and athletic performance.

### Why 45-Degree Hyperextensions Are Important

#### Posterior Chain Strength

The exercise targets the spinal erectors, gluteus maximus, and hamstrings — the muscles responsible for hip extension and spinal stability. Strength in these areas supports proper lifting technique and helps protect against lower back injuries.

#### Lower Back Health

Research shows that endurance and strength of the spinal erectors are critical in preventing low back pain. The hyperextension provides a safe, controlled way to strengthen these muscles without heavy spinal loading.

#### Glute Activation

By adjusting range of motion and intent, you can emphasize glute contraction at the top of the movement, which improves hip stability and power for running, jumping, and squatting.

#### Posture and Core Stability

The exercise strengthens the muscles that help maintain upright posture, reducing rounding of the spine and pelvic tilt caused by prolonged sitting or weak hip extensors.

## How to Do 45-Degree Hyperextensions

### Step-by-Step Guide:

#### Setup

Adjust the pad of the 45-degree hyperextension bench so it rests just below your hip bones.  
Cross your arms over your chest or hold a light dumbbell or weight plate against your chest for added resistance.  
Keep your feet anchored under the footpads with toes turned slightly outward.

#### The Descent

Begin with a straight spine and hinge forward at the hips.  
Lower your torso until it forms roughly a 90-degree angle with your legs (or slightly below if mobility allows).  
Maintain a neutral spine — do not round your back.

#### The Ascent

Engage your glutes and hamstrings to raise your torso until your body forms a straight line from head to heel.  
Avoid hyperextending or arching your back at the top.  
Pause briefly at the top to contract the glutes.

#### Breathing and Tempo

Inhale on the way down.  
Exhale as you raise your torso.  
◦ Move in a slow, controlled manner — avoid using momentum.

#### Key Tips:

- Keep your chin tucked and spine neutral throughout.
- Focus on squeezing your glutes at the top.
- Beginners can start with body weight; advanced lifters can hold a dumbbell or plate for resistance.
- Perform 2–3 sets of 10–15 reps with good control.

## Research and Evidence

- **Back Extension Strength and Injury Prevention:** Studies show that back extension exercises strengthen spinal stabilizers, reducing the likelihood of lower back injuries.
- **Glute and Hamstring Activation:** EMG research demonstrates significant recruitment of gluteus maximus and hamstring muscles during 45-degree hyperextensions, especially when performed with a hip-dominant focus.
- **Functional Carryover:** Increased posterior chain strength from hyperextensions improves performance in squats, deadlifts, sprinting, and jumping.

## Conclusion

The **45-degree hyperextension** is one of the most underrated exercises for building a strong, resilient posterior chain. By targeting the glutes, hamstrings, and spinal erectors, it helps improve posture, reduce injury risk, and enhance performance in nearly all athletic and functional movements. Whether you're training for strength, rehabilitation, or longevity, this exercise deserves a permanent place in your program.

## Normative Chart for 45-Degree Hyperextensions

These ranges represent the **number of controlled repetitions** that can typically be performed with **good form and full range of motion**.

| Training Level | Repetitions (Body Weight or Light Resistance) |
|----------------|---|
| Beginner       | 8–12 reps                                     |
| Intermediate   | 13–20 reps                                    |
| Advanced       | 21–30+ reps                                   |

**An Advanced level is 20 or more strict repetitions with excellent control, maintaining a neutral spine, full hip extension, and strong glute engagement throughout the movement. At this level, the focus is on endurance, stability, and precise movement control rather than added resistance.**

# Pallof Presses

## Pallof Press: The Ultimate Anti-Rotation Mid-Body Exercise

The Pallof Press is one of the most effective and underrated exercises for developing mid-body strength and stability. Unlike traditional core movements that involve flexion or rotation, the Pallof Press challenges the body to resist movement — specifically rotation — making it a true “anti-rotation” exercise.

This is a key component of functional core training: not just moving weight, but controlling and stabilizing it under load. Whether you’re an athlete, a lifter, or simply trying to build a more resilient midsection, the Pallof Press should be a regular part of your program.

### Why the Pallof Press Matters

#### Anti-Rotation Strength

The exercise strengthens the obliques, transverse abdominis, and deep stabilizers by forcing them to resist twisting forces.

This enhances trunk stability during activities like running, lifting, and throwing, where unwanted rotation can lead to inefficiency or injury.

#### Spinal and Pelvic Stability

By resisting movement at the torso, the Pallof Press trains the core to stabilize the spine and pelvis — critical for maintaining posture and protecting the lower back.

#### Functional Core Control

The Pallof Press directly carries over to real-life movements. In sports and daily life, the ability to resist unwanted motion often matters more than generating motion.

#### Versatility and Accessibility

It can be performed with bands or cables, standing, kneeling, or half-kneeling, allowing for progression and variation across fitness levels.

### How to Do the Pallof Press

#### Step-by-Step Guide:

##### Setup

Attach a resistance band or cable at chest height.

Stand perpendicular to the anchor point with feet shoulder-width apart.

Hold the handle with both hands at your chest, keeping elbows tucked in.

##### Execution

Engage your core and slowly press the handle straight out in front of you until your arms are fully extended.

Pause for 2–3 seconds — this is the most challenging point where your core resists rotation.

Slowly return your hands to the chest.

Complete the desired reps and switch sides.

##### Form Tips

Keep shoulders relaxed and hips square throughout the movement.

Avoid twisting, leaning, or rotating toward the band.

Maintain a neutral spine and steady breathing — exhale during the press, inhale on return.

### Coaching Notes

#### Progression Options:

Move farther from the anchor point or increase band tension for greater challenge.

Try different stances (split stance, tall kneeling, or half kneeling) to change stability demands.

#### Common Mistakes:

Rotating or leaning toward the anchor point.

Flaring ribs or arching the back.

Using too much resistance and losing form.



### Research and Evidence

**Core Activation:** EMG studies show the Pallof Press activates the obliques and transverse abdominis significantly while minimizing spinal compression, making it safer than many loaded rotation exercises.

**Functional Stability:** Research highlights that anti-rotation exercises like the Pallof Press improve balance, coordination, and power transfer in athletes.

**Low Back Health:** Strengthening the anti-rotation function of the core supports lumbar stability and helps prevent overuse injuries in the lower back.

### Performance Standards: Fit and XFit Levels

To meet **Fit** or **XFit** standards, you should demonstrate strong posture, controlled breathing, and no visible rotation or sway under resistance.

**Fit Level** = Excellent control and stability with moderate load.

**XFit Level** = Exceptional resistance to rotation with high tension, precise posture, and steady breathing throughout.

### Conclusion

The **Pallof Press** is more than a core exercise — it’s a test of true **mid-body integrity**. By resisting rotation, it develops strength that transfers directly to athletic movement, lifting, and everyday tasks. Add it to your mid-body training routine alongside movements like the **Static Flexion Hold**, **45-Degree Hyperextension**, and **Side Bridge** for complete, functional trunk stability.

# Jefferson Curl: Mobility with Caution and Control

# Jefferson Curls

The Jefferson Curl is a slow, weighted spinal flexion exercise often used to improve hamstring flexibility, spinal mobility, and strength through controlled range of motion. It can be valuable when performed correctly — but it also carries risk if done excessively or improperly, especially for those with a history of back issues.

Both Squat University and Dr. Stuart McGill have emphasized that while controlled spinal flexion can be trained safely in some contexts, it should never be performed under heavy load or without adequate preparation and spinal awareness. The key is to understand why you're doing it and how to do it correctly.

## Why the Jefferson Curl Matters

### Improves Hamstring and Posterior Chain Flexibility

The slow descent builds flexibility through the hamstrings and calves while engaging the spinal stabilizers under controlled tension.

### Develops Eccentric Control

The exercise challenges the posterior chain to control spinal flexion and extension through its full range, promoting strength in positions often neglected by traditional lifts.

### Enhances Body Awareness

Moving segment by segment through the spine improves proprioception and teaches control — essential for maintaining a healthy, resilient back.

### Builds Resilience When Approached Progressively

When trained conservatively, it can enhance the spine's tolerance to everyday flexion demands such as bending, lifting, or tying shoes.

## Caution and Context

According to principles supported by both **Squat University** and **Dr. Stuart McGill**:

Spinal flexion under load **should not be a regular strength movement** for most lifters, particularly those with prior disc injury or chronic back pain.

The Jefferson Curl is best used as a **mobility or movement control drill**, not a max-strength exercise.

A neutral spine remains the foundation for heavy lifts — the Jefferson Curl is the **exception**, not the rule, and should be approached with that mindset.

**This movement should only be done with very light weight, with a strict focus on form, control, and safety. I personally perform it and prescribe it only to select individuals for whom it is appropriate — those who have solid movement control, no history of back injury, and can perform it without pain.**

## How to Perform the Jefferson Curl

### Step-by-Step Technique:

#### Setup

Stand tall on a low platform with a light barbell or dumbbells in your hands, feet hip-width apart.

#### Segmental Flexion

Begin by tucking your chin to your chest and slowly rounding the spine one vertebra at a time, allowing the weight to pull you into flexion.

Keep the motion controlled — your goal is to feel length and tension, not to reach maximum depth.

#### Pause and Return

At the bottom of your comfortable range, pause briefly, then reverse the motion by slowly unrolling the spine back to standing, one segment at a time.

#### Breathing and Control

Breathe steadily, maintaining abdominal tension and avoiding jerking or bouncing.

#### Common Mistakes:

Using too much weight.

Rounding quickly or “dropping” into the bottom position.

Treating it as a hamstring stretch rather than a controlled spinal movement.



## Recommended Guidelines

### Coaching Notes

Warm up thoroughly before performing.

Never push into pain or excessive rounding.

Focus on movement quality and spinal awareness rather than load.

If you have a history of back injury, consider other posterior chain exercises like **45° hyperextensions** or **hip hinges** that maintain a neutral spine.

## Conclusion

The Jefferson Curl can be a valuable tool for developing mobility and control through the posterior chain when performed with precision and purpose. However, it is not a lift for everyone. The goal is not to lift heavy, but to explore controlled spinal movement safely.

Approach it with the same discipline you bring to your 45° Hyperextensions, Static Flexion Holds, or Side Bridges — exercises that build mid-body strength and resilience through intelligent, purposeful movement.

| Fitness Level | Reps | Load                  | Notes                                       |
|---------------|------|-----------------------|---|
| Beginner      | 6–8  | Bodyweight or 5–10 lb | Focus on slow, segmental control            |
| Intermediate  | 6–8  | 10–25 lb              | Slightly increase range and control         |
| Advanced      | 6–10 | 25–40 lb              | Only if pain-free, strong, and well-trained |

# Dead Hangs: Upper Body Strength, Mobility, and Spinal Health

**Dead Hangs** are a simple yet highly effective bodyweight exercise that provides numerous **muscular, skeletal, and functional benefits**. By hanging from a bar, this exercise strengthens the upper body, improves grip, enhances posture, and can support shoulder and spinal health.

## Dead Hangs



### Why Dead Hangs Matter

#### Muscular Benefits

- Strengthens the upper body:** Dead hangs engage the shoulders, back, forearms, and grip muscles.
- Improves grip strength:** Holding your body weight develops forearm and hand muscles.
- Stretches the lats:** The downward hanging position elongates the latissimus dorsi and surrounding muscles.

#### Skeletal and Mobility Benefits

- Spinal decompression:** Hanging reduces pressure on the spine, potentially helping with back pain or posture issues.
- Improves shoulder mobility:** Dead hangs can increase range of motion in the shoulders and improve scapular mechanics.
- May aid in shoulder impingement:** Gentle hanging can create space in the shoulder joint and relieve pressure in the subacromial area, promoting better alignment and movement — provided it is pain-free.
- Corrects postural imbalances:** Proper hanging can help realign the upper body and counteract rounded shoulders.

#### Other Functional Benefits

- Enhances flexibility:** The stretch promotes flexibility in the shoulders, lats, and upper back.
- Reduces stress:** Hanging can be a relaxing way to release tension in the upper body.
- Improves coordination and control:** Maintaining a stable hang requires full-body engagement.
- Builds endurance:** Gradually increasing hang duration improves upper body muscular endurance.

### How to Perform Dead Hangs

#### Step-by-Step Technique:

- Setup**
  - Find a stable pull-up or hanging bar.
  - Grip the bar with hands shoulder-width apart, using either overhand (pronated) or neutral grip.

- Execution**
  - Hang with arms fully extended and shoulders slightly engaged (do not let them completely relax).
  - Keep the core tight and legs either straight down or slightly bent at the knees.
  - Maintain neutral head and spine alignment.

- Duration and Control**
  - Beginners: 10–20 seconds per hang.
  - Intermediate: 30–45 seconds.
  - Advanced: 60+ seconds while maintaining full-body tension.

- Key Tips:**
  - Avoid shrugging the shoulders excessively or letting the body swing.
  - Keep breathing steady and controlled.
  - Progress gradually to avoid overloading the shoulders or elbows.
  - If you have shoulder pain, hang only **pain-free** and consider starting with a **neutral grip** or slightly bent elbows.

### Safety Considerations

- Perform dead hangs only on secure, stable bars.
- Avoid forcing your shoulders into pain or extreme ranges of motion.
- Individuals with shoulder impingement or rotator cuff injuries should consult a healthcare professional or certified trainer before including dead hangs in their program.

### Conclusion

Dead Hangs are a **low-equipment exercise** that strengthens the upper body, improves grip, enhances shoulder mobility, and supports spinal decompression. When performed correctly, they may **help alleviate shoulder impingement** by creating space in the joint and improving scapular mechanics. Incorporating dead hangs into a mid-body or upper-body routine can improve **posture, functional strength, and endurance**, making it an essential tool for upper-body health and performance.

### Performance Guidelines: Advanced-Level Statement.

An advanced practitioner can maintain a dead hang for 60+ seconds with proper shoulder engagement, core tension, and full-body control, demonstrating strong upper-body endurance and spinal stability.

| Level        | Hang Duration | Notes  |
|--------------|---------------|--|
| Beginner     | 10–20 seconds | Focus on proper form and shoulder engagement     |
| Intermediate | 30–45 seconds | Maintain tension, avoid swinging                 |
| Advanced     | 60+ seconds   | Full control, stable shoulders and neutral spine |

# Carries

## Farmer Carries & Suitcase Carries: Mid-Body Strength, Stability, and Functional Control

**Farmer Carries** and **Suitcase Carries** are loaded carry exercises that train the mid-body, grip, and posture while developing **core stability, shoulder control, and total-body tension**. These functional movements build strength, endurance, and coordination, making them highly effective for both daily activities and athletic performance.

### Why Farmer and Suitcase Carries Matter

#### Core Stabilization and Anti-Lateral Flexion

Both exercises challenge the trunk to resist unwanted motion.

**Farmer Carries:** With weight in both hands, the mid-body resists forward lean and rotation.

**Suitcase Carries:** With weight in one hand, the mid-body resists lateral flexion toward the load, strengthening the obliques and spinal stabilizers.

#### Grip and Forearm Strength

Holding weight develops grip endurance and forearm musculature, supporting other lifts and everyday tasks.

#### Shoulder and Scapular Stability

Maintaining proper shoulder position under load strengthens scapular stabilizers and improves posture.

#### Functional Strength and Coordination

Loaded carries mimic real-world movements like carrying groceries or luggage, enhancing full-body coordination and strength.

#### Postural and Spinal Health

Encourages upright posture and spinal alignment under load, counteracting slouching or rounded shoulders.

### Advanced-Level Statement

An advanced practitioner can carry 50% of body weight total for males (40% for females) over 30 yards while maintaining upright posture, spinal alignment, and mid-body control, demonstrating excellent core, grip, and full-body stability.

## How to Perform Farmer Carries

### Step-by-Step Technique:

#### Setup

Grab a pair of dumbbells, kettlebells, or Farmer Carry handles.

Stand tall with feet hip-width apart, shoulders back, chest lifted.

#### Execution

Walk forward slowly and deliberately, keeping the core tight and spine neutral.

Avoid leaning forward, backward, or side to side.

Maintain a firm grip and controlled breathing.

#### Distance

Start with shorter distances and progress gradually while maintaining control.

## How to Perform Suitcase Carries

### Step-by-Step Technique:

#### Setup

Hold a dumbbell or kettlebell in one hand at your side.

Stand tall, shoulders level, core engaged, feet hip-width apart.

#### Execution

Walk forward slowly, resisting the tendency to lean toward the weighted side.

Keep the spine neutral and the shoulders square.

#### Distance

Start shorter and progress gradually as control and endurance improve.

#### Key Tips:

Avoid tilting toward the load during Suitcase Carries.

Keep arms relaxed but controlled.

Focus on smooth, stable walking with full-body tension.

## Coaching Notes

Start light and progress gradually.

Prioritize **posture and mid-body control** over distance or load.

Include in warm-ups, circuits, or strength routines for functional mid-body development.

Farmer Carries build symmetrical stability, while Suitcase

Carries target **anti-lateral flexion strength** for obliques and spinal stabilizers.

Ensure smooth gait, controlled breathing, and no leaning toward the load.

## Conclusion

**Farmer Carries and Suitcase Carries** are foundational mid-body exercises that combine **core stability, grip strength, shoulder control, and functional endurance**. Incorporating them into a program improves **posture, full-body tension, and real-world movement resilience**, making them essential tools for mid-body strength and functional performance.

| Level        | Farmer Carry   | Suitcase Carry   | Notes   |
|--------------|--|--|---|
| Beginner     | 20–30% body weight total, 10–20 yards                      | 15–25% body weight total, 10–15 yards per side                           | Focus on upright posture, core engagement, and grip                   |
| Intermediate | 30–40% body weight total, 20–25 yards                      | 25–35% body weight total, 15–20 yards per side                           | Maintain mid-body tension under moderate load                         |
| Advanced     | 50% body weight total (male), 40% total (female), 30 yards | 40–45% body weight total (male), 30 total (female), 25–30 yards per side | Full control, perfect posture, spinal alignment, smooth gait, no lean |

# Side Bridges

## Side Bridges (Side Planks): The Ultimate Core Strength and Stability Exercise

**Quick take:** the side bridge (side plank) is an isometric, anti-lateral-flexion core exercise that loads the obliques, quadratus lumborum (QL), glutes, and deep stabilizers. Stuart McGill includes it in his “Big Three” for low-back resilience, and research shows it’s highly effective for improving lateral trunk endurance and core stability.

### Why They Matter (Benefits)

- **Builds lateral core endurance and stability.** Side bridges train the obliques and QL to resist lateral flexion, which transfers to better load tolerance for the spine and improved movement economy.
- **Injury prevention and back health.** As part of a balanced core program, the side bridge helps distribute loads away from end-range lumbar flexion and rotation — a reason McGill includes it in his low-back resilience recommendations.
- **Functional carryover.** Lateral stability matters for running, carrying, single-leg tasks, and change of direction. Side bridges are low-cost, easy to scale, and carry directly to those activities.

### How to Do a Proper (Full) Side Bridge — Step by Step

1. **Start position:** Lie on your side. Stack feet (or place top foot slightly in front for balance). Prop on the lower forearm with the elbow under the shoulder (or on the hand with straight arm for an advanced variation).
2. **Set position:** Press the forearm into the floor, push hips up so the body forms a straight line from head to heels. Top arm can rest on the ribcage, reach up, or be placed on the hip. Neck neutral.
3. **Breathe and brace:** Inhale to set the diaphragm, gently brace the core (“tight but not breath-holding”). Keep hips high — avoid sagging.
4. **Hold with quality:** Maintain a rigid line and controlled breathing; stop the set when form breaks (hips drop, rotation appears, shoulder slumps).
5. **Progressions:** Forearm → straight-arm → top leg lift → weighted hip → elevated surface for feet or arm. Regressions include knee-bent side plank (knees stacked, hips lifted) or short holds with more support.

### How I Prefer to Train Side Bridges (My Coaching Approach)

While long, continuous holds are useful for testing, I break the side bridge into **15–20 second holds for 3 or more sets per side**, performed with perfect form. Shorter, high-quality sets let you maintain ideal alignment — hips high, spine neutral, ribs stacked, glutes engaged, no rotation. This approach **accumulates time under tension** without reinforcing sloppy form, gradually building the capacity to reach **advanced (60s) and elite (90s) holds** on both sides.

### Common Mistakes

- Letting hips drop (loses tension in obliques/QL).
- Rotating torso forward/back instead of staying stacked.
- Elbow too far from shoulder — shoulder instability and poor load distribution.
- Breath-holding — loses endurance and raises blood pressure unnecessarily.

### Programming Tips

- General fitness: 2–4 sets per side of 20–45 seconds with perfect form.
- Strength-endurance: accumulate 90–180 seconds per side via multiple sets.
- Athletes: include loaded/progressive variations and contralateral movements (bird-dog, anti-rotation chops).
- Assess both sides — asymmetry often reveals side-specific weakness or fatigue.

### Research Highlights

- Side-plank variations increase lateral trunk muscle thickness/activation and improve core stability when used in targeted programs.
- Frequently used as an endurance test in sport and rehab, showing reasonable reliability for lateral trunk endurance assessment.

### Final Take

Stuart McGill lists the side bridge (side plank) as one of his “Big Three” core exercises alongside the curl-up and bird-dog. He emphasizes **controlled endurance, progressive loading**, and the role of the side bridge in building a resilient, pain-resistant trunk. Quality matters more than duration — hold perfect form first, then chase time.

I consider the side bridge **one of the most important core exercises**. It’s simple, exposes side-to-side imbalances, and directly trains the muscles that stop the torso from folding when you run, carry, or get pushed. Short, perfect sets build a strong foundation — the long holds for testing and bragging rights come later.

| Category      | Men & Women<br>(hold both sides) |
|---------------|----------------------------------|
| Poor          | < 20 s                           |
| Below average | 20–39 s                          |
| Average       | 40–59 s                          |
| Advanced      | 60–89 s                          |
| Elite         | 90+ s                            |



**An advanced level for the side bridge is holding a full side plank for 60 seconds on each side, while an elite level is holding it for 90 seconds on each side with perfect form.**

# Planks: The Foundation of Core Stability — Benefits, How to Do Them, Research, and Performance Standards

**Quick take:** The front plank is one of the most reliable ways to build anterior core endurance. It trains the rectus abdominis, transverse abdominis, obliques, diaphragm, glutes, and deep spinal stabilizers in a single, simple position. Research consistently shows that trunk endurance — not high-rep flexion exercises — is strongly linked to reduced back pain and better functional movement. Planks remain one of the most “bang for your buck” core exercises ever created.

## Planks

### Why Planks Matter (Benefits)

#### 1. Builds rock-solid core endurance

Planks strengthen the anterior chain — especially the deep stabilizers — which translates directly to better posture, stronger lifting mechanics, and a more stable trunk under load.

#### 2. Supports spine health

Like the side bridge, planks are recommended in spine-stability programs because they build endurance without compressive flexion or twisting. They teach you to brace, breathe, and stabilise — essential skills for preventing low-back irritation.

#### 3. High functional carryover

The ability to maintain a neutral spine under tension is fundamental to running, squatting, pushing, pulling, carrying, and even sitting. Planks teach your body to stay rigid when it matters.

#### 4. Safe for most people

No equipment, no movement complexity, and easy to scale up or down. Perfect for beginners through elite athletes.

### How to Do a Proper Plank — Step by Step

#### Start position:

Lie prone and prop yourself on your forearms. Elbows directly under shoulders. Feet hip-width apart.

#### Set position:

Press forearms into the floor and lift the body. Create a straight line from head to heels.

#### Brace and breathe:

Tighten core gently (think “brace as if someone will poke your ribs”).

Squeeze glutes. Keep ribs down. Neck neutral. Pull elbows to knees.

#### Hold perfect alignment:

No sagging hips, no piked hips, no shrugging.

Breathe slowly and controlled.

#### Progressions:

Forearm plank → straight-arm plank → weighted plank → long-lever plank → RKC plank → stir-the-pot → plank reach.

#### Regressions:

Knee plank → short-hold clusters → incline plank (hands on bench).

### How I Prefer to Train Planks (My Coaching Method)

Just like with side bridges, I favor **shorter, perfect sets** rather than grinding out long, sloppy planks.

I typically break planks into **15–20 second holds**, performed for **3 or more sets**, with form absolutely perfect.

This approach:

- Builds better tension and alignment
- Builds more total quality time under tension
- Avoids the form breakdown that happens in long holds
- Gradually prepares someone for the 60–90 second performance standards

Short, high-quality work > long, compromised work.

### Performance Standards — Plank Normative Chart

#### In simple terms:

- **Advanced:** Hold a full forearm plank for **60 seconds** with perfect form.
- **Elite:** Hold a full forearm plank for **90 seconds** with perfect form.

These match the side-bridge chart so your testing standards are uniform across your core program

### Research Highlights (Simplified)

- Plank variations activate the anterior core, transverse abdominis, and obliques extremely efficiently.
- Endurance-based core work (planks, side bridges, bird-dog) is strongly associated with better low-back outcomes.
- The plank is one of the most commonly used tests for anterior core endurance in both sport and rehab.
- Adding progressive loading (e.g., long-lever planks or RKC planks) increases activation without adding spine compression.



### Common Mistakes

- Hips sag toward the floor
- Hips too high (“tenting”)
- Holding breath
- Shoulders shrug up to the ears
- Overly arched lower back
- Cranking neck upward instead of keeping it neutral

### My Take (Direct and Simple)

Planks are one of the most important anterior core exercises you can do. When done with intention — not as a long, shaky endurance grind — they teach you how to brace, breathe, and stabilize in the exact pattern needed for real-life movement.

Short, crisp sets build the strength. Perfect alignment builds the skill. 60–90 seconds builds the standard.

| Category        | Hold Time (Men & Women) |
|-----------------|-------------------------|
| Poor            | < 20 s                  |
| Below Average   | 20–39 s                 |
| Average         | 40–59 s                 |
| <b>Advanced</b> | <b>60–89 s</b>          |
| <b>Elite</b>    | <b>90+ s</b>            |

# The Dead Hang: A Simple Test of Functional Fitness

The Dead Hang — simply hanging from a bar with your arms fully extended — is more than a test of grip strength. According to longevity expert Peter Attia, it reflects several key elements of functional fitness:

- **Grip Strength & Endurance:** A strong predictor of overall health and longevity.
- **Shoulder Stability & Mobility:** Hanging decompresses the shoulder joints and helps maintain healthy range of motion.
- **Core Engagement:** Even though it looks passive, your core, lats, and scapular stabilizers all work to keep you aligned.
- **Spinal Decompression:** It can reduce tension through the spine, especially after long periods of sitting or loading.

If you can support your body weight from a bar for a decent length of time, it's a sign your upper body is strong, your connective tissues are resilient, and your nervous system can sustain muscular endurance — all hallmarks of functional fitness.

## How to Do It:

1. **Grip a Pull-Up Bar:** Use an overhand (pronated) grip, hands shoulder-width apart.
2. **Hang Freely:** Lift your feet off the ground so your body is fully extended.
3. **Engage the Core:** Keep ribs down, avoid swinging, and lightly pull your shoulder blades down and back.
4. **Breathe Steadily:** Inhale through the nose, exhale through the mouth.
5. **Time Yourself:** Use a timer or have someone time how long you can hold before grip or form fails.

✓ **Tip:** Beginners can start with a scapular hang (slight shoulder engagement) or active hang (shoulder blades pulled down).

✗ **Avoid:** Shrugging your shoulders up, arching your back, or holding your breath. Do not over do it.

## Good Dead Hang Times:

- Men under 45: 60+ seconds
- Women under 45: 45+ seconds
- Men over 45: 45+ seconds
- Women over 45: 30+ seconds

These times aren't just fitness benchmarks — they correlate with practical abilities like carrying groceries, opening jars, and preventing shoulder injuries.

## How to Improve:

- **Farmer's Carries:** Build grip and shoulder endurance.
- **Scapular Pull-Ups:** Strengthen shoulder stabilizers.
- **Deadlifts and Rows:** Improve overall pulling strength.
- **Progressive Hangs:** Add time gradually, or use a resistance band to assist at first.

## Good Dead Hang Times

These times aren't just fitness benchmarks — they correlate with practical abilities like carrying groceries, opening jars, and preventing shoulder injuries.

| Category             | Men < 45      | Women < 45    | Men 45+       | Women 45+     |
|----------------------|---------------|---------------|---------------|---------------|
| <b>Excellent</b>     | 90+ seconds   | 70+ seconds   | 75+ seconds   | 60+ seconds   |
| <b>Good</b>          | 60–89 seconds | 45–69 seconds | 45–74 seconds | 40–59 seconds |
| <b>Average</b>       | 30–59 seconds | 25–44 seconds | 20–44 seconds | 15–39 seconds |
| <b>Below Average</b> | <30 seconds   | <25 seconds   | <20 seconds   | <15 seconds   |