

Squat, Bench, Deadlift – Theory Presentation

Introduction about me

- Hello everyone and welcome! My name is Greg Elkington, I am a Personal Trainer at GoodLife Fitness in Regina, Saskatchewan. I also work for GoodLife Fitness Head Office as the Personal Training Specialist for the Club Opening team. I have travelled around the country and opened a GoodLife in every province except for Quebec, and helped hundreds of trainers to set up their businesses and become better trainers. I have a Bachelor of Science in Mathematics/Physics from the University of Regina and as such love the biomechanics and technical aspects of why the powerlifts are such an integral part of the training programs I provide for my clients and myself.

Why Squat Bench and Deadlift are considered the big 3 lifts

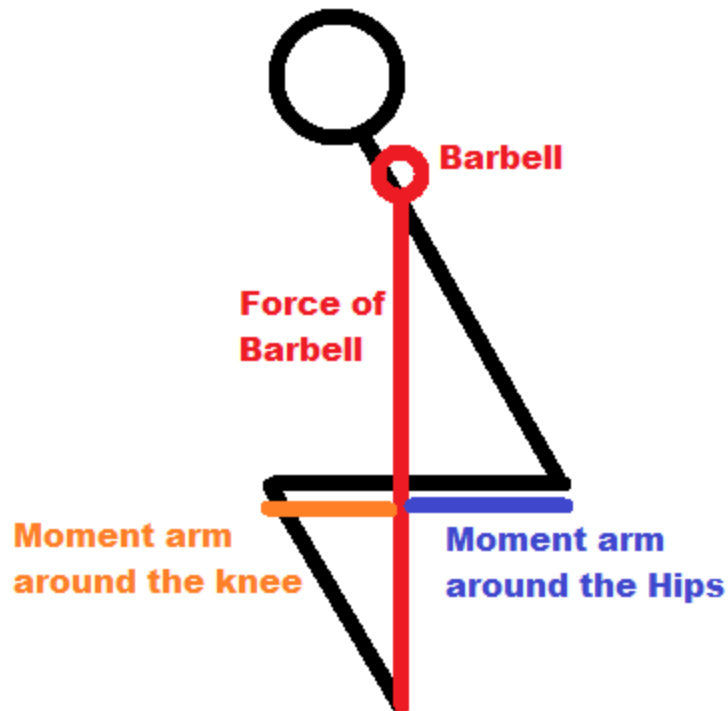
- The answer lies in the physics of the lifts
 - Maximal Load
 - Motor Units -A **motor unit** is made up of a **motor** neuron and the skeletal muscle fibers innervated by that **motor** neuron's axonal terminals. Groups of **motor units** often work together to coordinate the contractions of a single muscle; all of the **motor units** within a muscle are considered a **motor** pool.
 - Work Energy Theorem – The work-energy theorem states that the work done by all forces acting on a particle equals the change in the particle's kinetic energy. This can be derived from Newton's 2nd Law. The simplest form of the equation looks like $W = Fd$ where W is the work done, F is the Force applied and d is the distance.
 - What the crap does that mean and how does that apply to us as trainers?!
 - Free body diagrams
 - Center of Mass
 - Moment Arm
- Positioning should be determined based on the goal

Start from the Spine

- Translational motion what is it
- What risks are involved
- Fixed flexion/extension
- CNS and force generation

The Squat

- Where you load, determines the mechanics of the movement

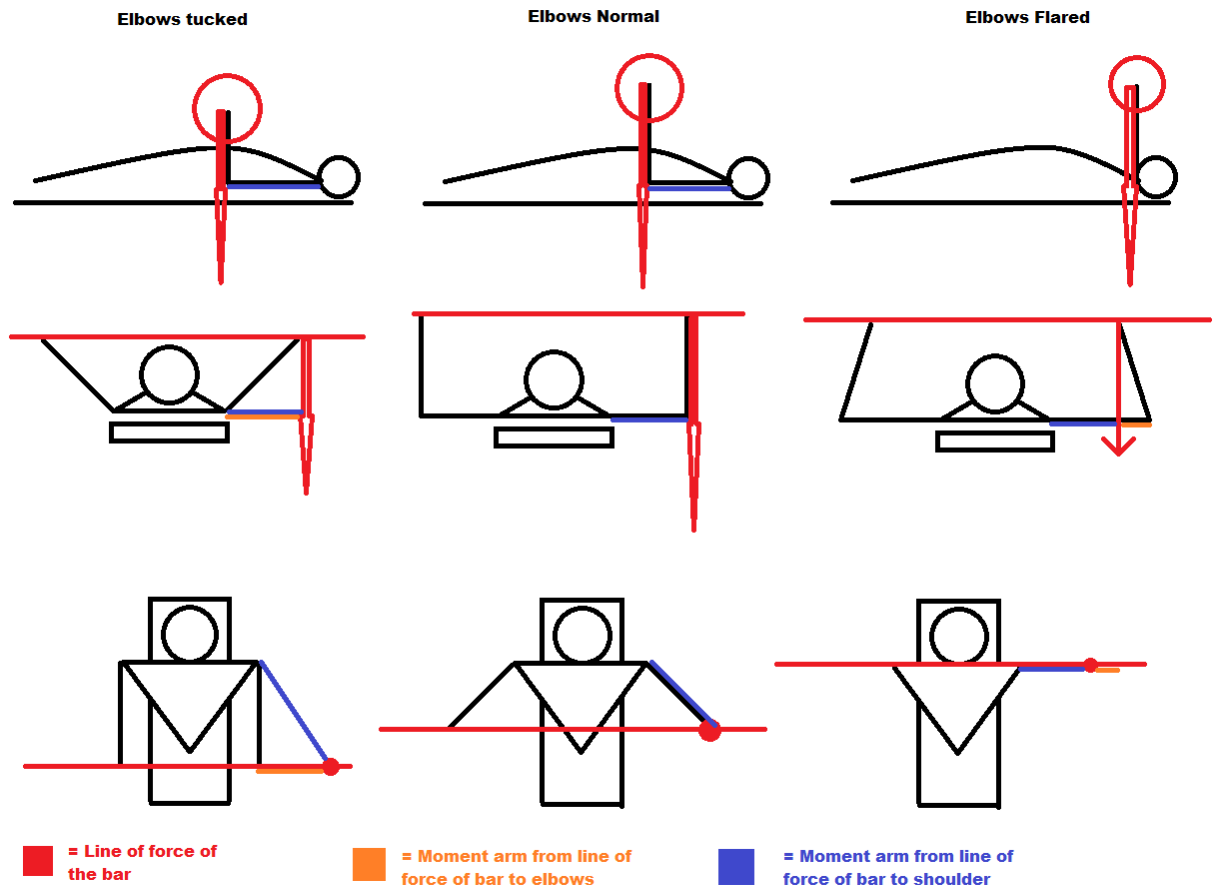


- 3 Barbell positions
 - High
 - Low
 - Front(not what we are working on today)
- Foot Position
 - Q Angle(hip)
 - Foot Angle
 - Determining what is best for a client based on their specific body type(this may change throughout training them)
- 3 Keys to a great squat
 - No translational motion of spinal position
 - Knees track over 2nd/3rd Toe
 - Hip crease breaks the knee plane without a posterior hip tilt
- Biggest Faults
 - Ankle inversion
 - Probable causes
 - Poor dorsi flexion
 - Collapsed arch
 - Tight calves
 - How this effects the mechanics/force
 - Correctives

- Knee Caving in(hip adduction)
 - Probable causes
 - Weak VMO/Glute Medius
 - Tight adductors
 - How this effects the mechanics/force
 - Correctives
- Leaning Forward(generally accompanied by back flexion)
 - Probable causes
 - Weak core
 - Tight hip flexors
 - How this effects the mechanics/force
 - Correctives
- Posterior Pelvic Tilt(Butt Wink)
 - Probable causes
 - Weak core
 - Tight posterior lower body chain
 - How this effects the mechanics/force
 - Correctives
- Lateral Shifts in the hip
 - Probable causes
 - Injury
 - Imbalance
 - How this effects the mechanics/force
 - Correctives

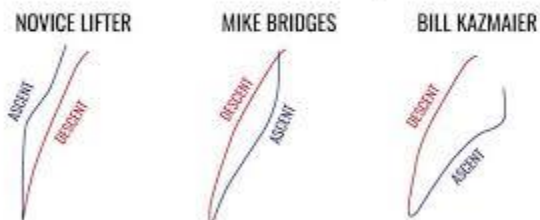
The Bench Press

- Where you load and how you position your body, determines the mechanics of the movement



- Barbell Path in a Bench Press
 - Why is it an arc?
 - LEVERS and the fulcrum(shoulder) and the Moment Arm

Difference in bar path



- Position on the Bench
 - Importance of your feet
 - Creating a table(scapula)
 - Lumbar Extension
 - Hand Position(understanding where to put them and why)
 - Happy medium on force generation and distance travelled(refer to work energy theorem)

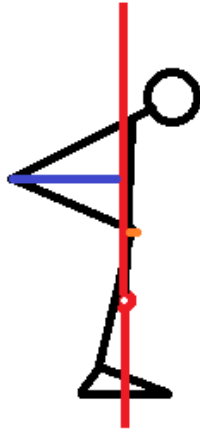
- 3 Keys to a great bench
 - Start and finish with stacked joints(Bar path)
 - Stable core and spine throughout the motion(push through the floor)
 - Scapula flush with the bench the entire time
- Biggest Faults
 - Elevated Shoulders
 - Probable causes
 - Upper trap dominance
 - Weak lats
 - How this effects the mechanics/force
 - Correctives
 - Scapula Protraction/Anterior Shoulder Rotation
 - Probable causes
 - Upper trap dominance
 - Weak lats
 - Weak mid back
 - How this effects the mechanics/force
 - Correctives
 - Translational Extension through the lumbar
 - Probable causes
 - Weak core
 - Poor setup/pushing through the floor
 - How this effects the mechanics/force
 - Correctives

The Deadlift

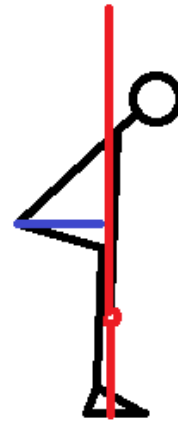
- Body type/lever length will determine position

SAGGITAL PLANE

CONVENTIONAL

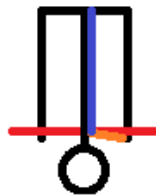


SUMO

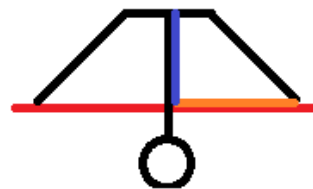


TRANSVERSE PLANE

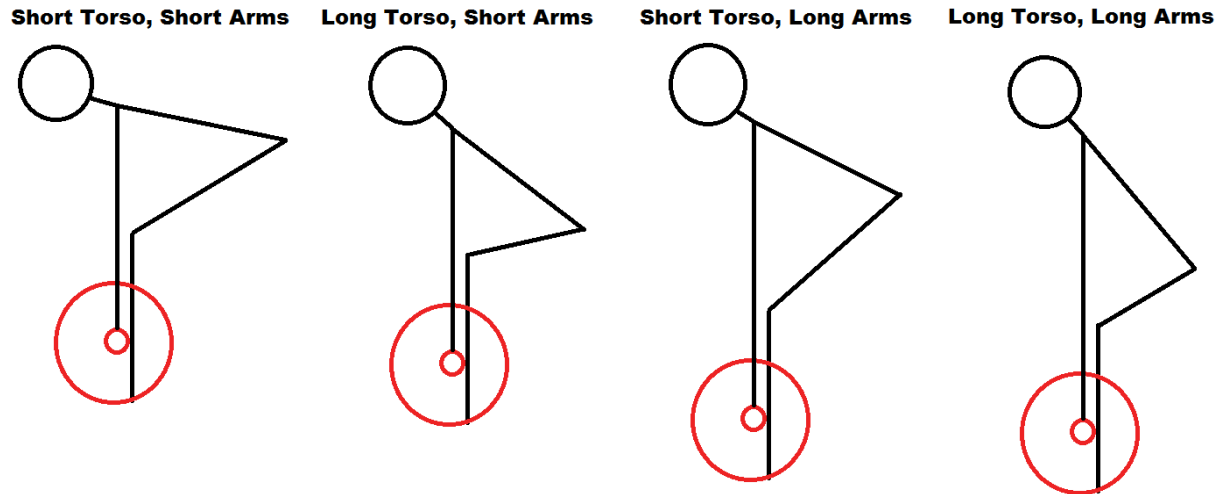
CONVENTIONAL



SUMO



■ = Bar + Line of Action of Bar ■ = Hip Moment Arm ■ = Knee Moment Arm



- The Great Debate: Conventional vs Sumo
 - Differences(biomechanics)
 - Moment Arm → erectors/back
 - Quad demands
 - Distance travelled(work energy)
- Foot Position
- Hand Position
- Head Position
- 3 Keys to a great deadlift
 - Pull the bar into you
 - Get set from the top down(core tension)
 - Push through the floor as you drive your hips forward
- Biggest Faults
 - Thoracic Flexion and scapular protraction
 - Probable causes
 - Weak lats
 - Weak upper back
 - Weak core
 - How this effects the mechanics/force
 - Correctives
 - Lumbar Extension
 - Probable causes
 - Weak core
 - Weak glutes/poor activation
 - How this effects the mechanics/force
 - Correctives
 - Knees Caving in
 - Probable causes
 - Weak glute med
 - Poor glute activation

- Not pushing through the floor
- How this effects the mechanics/force
- Correctives