CONVENTIONAL DEADLIFT

Joint Actions - Concentric Phase (lifting bar up)

• Hip Extension
• Knee Extension
• Knee Stabilisation
• Ankle Planter Flexion
• Shoulder Girdle Stabilisation (scapula stabilized)

Concentric Phase

• Lifting the weight up from the floor (barbell moving against gravity)

Eccentric Phase

• Lowering the weight back down to the floor (barbell moving with the aid of gravity)

Speed of Movement

• Two seconds through concentric phase
• Two seconds through eccentric phase
• Three seconds in dead position (barbell positioned on the floor)

Breathing

• Exhale as the barbell is being taken through the concentric phase, reset breathing at the top and exhales through the eccentric phase as the (weight is lowered back to the floor).

MUSCULAR ANALYSIS

The Barbell Deadlift belongs to the bending to extending movement pattern group of exercises. It is very similar to the squat and recruits similar muscles. However the main difference is that the deadlift is a hip dominant exercise where the hip extension is the prime action and the knee extension is secondary. In addition to this the deadlift asks for more activation and involvement of the hamstrings. The deadlift also relies on the muscles of the shoulder girdle and forearms to support the load.
The hip extension is done by the gluteus maximus and adductor magnus.
Very important that the gluteus maximus is well activated and fully involved as the primary hip extensor. Its quite common in a deconditioned population learning the deadlift that the gluteus maximus isn't recruited or activated properly, therefore other muscles are required to fill the void. In a deadlift this can easily be referred to the lower back muscles such as the erector spinae group and quadratus lumborum. Over time the back will stress as the hips are normally tilted in the anterior with an over arched back action rather than a clean hip extension offered by a well fired and activated gluteus maximus. Very important attention and postural analysis is completed to ensure this muscle is the main muscle involved.
The hamstrings have a unique role in the conventional deadlift, for example they act as a dynamic stabilizer during the first half of the lift. In the first half of the lift they are heavily involved however there is little change in there length. In the upper half of the exercise the hamstrings assume the role of a synergist.
In the concentric phase of the lift the knees are extended by the four quadriceps, the

quadriceps aren't involved as much as they are in the squatting pattern as the hips are transferred more posterior, somewhat eliminating the knees full potential and capacity to be involved in the exercise. They do play an important role in the upper half of the lift, as they need to support the gluteus maximus by extending posterior, this assists the hips to extend fully in the anterior position.
The ankle is also involved as the soleus plantar flexes it, which allows the shin to be upright and positioned correctly. The gastrocnemius plays the role of a dynamic stabilizer, connecting with the knee and ankle with little change in length as the lift is performed. Ankle mobility is very important to increasing ones mobility and therefore depth of the deadlift. Its crucial the ankle can have good range of both plantar flexion, but what could be more important to mobility is that it can dorsi flex with good mobility. This allows the weight to be easily transferred on to the heels. In a deadlift the ankles act as a lever or fulcrum allowing movement for all the structures above, basically the more mobility permitted from the ankles the better the range of movement the deadlift has.
The trunk plays the role of a stabilizer, doing its job by holding the spine neutral and activating muscles around the shoulder girdle. The erector spinae group of muscles act as stabilisers from the back and the rectus abdominus and obliques act as antagonist stabilisers from the front. Very important that these muscles are all well activated and doing there job to stabilise here.
When performing heavy loads and maximal lifts the spine may tend to round or buckle slightly, typically it will be the thoracic spine that gives way first.
This is a common sight at powerlifting contests where competitors are striving and pushing their body to record best lifts. When the thoracic spine buckles slightly it doesn't mean that the position has been lost, it just changes the contribution of muscles slightly. At this stage, the flexed thoracic spine pushes and forces the shoulders forward. The flexed thoracic spine must be fixed and straightened again at some stage to finish the lift, this is accomplished by the erector spinae group becoming more involved and changing role of stabilizer to muscle synergist. The shoulder girdle muscles will then need to pull back into retraction to then assist the hips to fully extend.
Scapula muscles play an important role in holding the upper back upright and assisting the thoracic spine to maintain its correct position. In the beginning phase of the lift, the trunk is angled forward in a conventional deadlift set up. This forward angle recruits the rhomboids as the major stabilizer with the middle trapezius assisting this action. When the trunk becomes more upright, such as the upper half of the lift the upper trapezius and levator scapulae contribute more in scapula stabilization.
The latissimus dorsi and teres major become involved by keeping the barbell close to the body during the concentric and eccentric phase of the lift. These muscles play an important role in protecting the spine from losing neutral posture position by keeping the bar in the appropriate centered position.

MAIN TEACHING POINTS

• Hands should be positioned just outside the shins, the closer the better. If the grip width is too wide it means the bar will travel more distance to complete the lift.
• Optimal starting position is with the shins at 90 degrees to the ground and the shoulder blades directly over the barbell. This can be viewed from the side. This ensures the barbell can be pulled up in a straight line.
• Before the initial lift take a deep breath in and brace the abdominal wall. This will help protect the spine and generate more force.
• Also engage the lat dorsi in order to stabilise the shoulders but to also pull any slack out of the barbell. This will eliminate any jerky movements from the

beginning and decrease the chances of spinal injury. This will be extremely beneficial on heavy lifts, so it's very important that it is practiced on lighter loads also.
• Initiating the movement by trying to bend the bar will automatically engage the lats.
• Once abdominals and lats are activated its time to initiate the first lift. Do this by imagining pushing your feet through the floor. Similar to the plate on the leg press, but in a freestanding position. Instead of pressing the plate on the leg press away from you, imagine pressing the floor away in a similar manner.
• As soon as the barbell leaves the floor activate the glut max by squeezing it and driving your hips forward
• This will enable a straight barbell path and lock out more effectively
• Squeeze glut max and hips should be pushed fully through hip extension and should not drop down towards the floor towards the initial phase of the lift off.
• Just stand up straight with no hyper extension seen in the lower back at the conclusion of the lift
• Begin to lower the barbell by unlocking your gluts and pushing them back
• It should be lowered in a straight bar path, aim here is to make it identical to the path it came up in
• The barbell shouldn't be lowered too fast or dropped. It also shouldn't be lowered too slowly as it put a lot of forces and torque on the back
• The spine should be neutral from the neck to the sacrum. When in doubt, use a dowel or PVC pipe and place it along the spine so you have 3 points of contact (back of head, t-spine and tailbone).
• A straight bar path is recommended and the bar should travel up and down whilst in contact with the body
• Use straps to ease the stress on the finger and hands

ADDITIONAL CONSIDERATIONS

• Initiate the movement by pushing away from the floor by driving the hips forward. Think about leading with the chest.
• The spine should stay neutral throughout. At no point should the spine flex or extend beyond neutral.
• Keep the bar tight to the body throughout. It may help to think about dragging the bar up the shins.
• Keep pulling back, and finish by extending the hips at the top. Think about finishing tall.