

Exercise of the month: Stiff leg deadlift

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Leading on from the first 'exercise of the month' article, the focus for this article will remain in the lower extremities and shall concentrate on the stiff leg deadlift (SLDL).

The rationale for the inclusion of the stiff leg deadlift in an exercise programme is twofold. Firstly, it is a major developer of the legs, hips and spinal musculature and secondly, it can be used as a progression in the teaching of more advanced lifts such as the clean and snatch.

A commonly used term for the SLDL, particularly in the USA, is the Romanian deadlift (RDL). Occasionally the SLDL is referred to as a straight leg deadlift; however for the purpose of this article the SLDL will be more closely related to the RDL.

Overview

The SLDL is a hip extensor exercise.

The table below highlights the key muscles that are used in the correct execution of the SLDL and the muscle action.

MUSCLES	ACTION
Erector spinae	Keeps spine locked in a neutral position throughout exercise
Gluteus maximus	Extends hip
Hamstrings (biceps femoris, semitendinosus, semimembranosus)	Extends hip

Abdominal muscles will be activated during the SLDL, to aid in the stabilisation of the spinal column.

Exercise technique

POSITION	Description	Problems	Variations/ solutions
START (figure 1)	Hands evenly space just wider than shoulder width		Could adopt wide (snatch) grip
	Bar is held at arms length just below waist.		
	Stand in an erect position lumbar and thoracic spine extended	Athlete has thoracic kyphosis.	Assess ability to extend thoracic spine without bar. Possibly seek physiotherapy intervention
	Feet hip width apart		
	Toes forward or slightly angled out		
	Breath is taken in prior to descent and held		
DESCENT (figure 2)	Knees are slightly unlocked to approx 15-20°.		
	Hips are flexed and move back		
	Spine is locked and movement created through rotation about the hip	Inability to keep spine locked. Lumbar and thoracic spine flex (figure 3)	Assess ability to extend/flex spine (happy/angry cat). Assess hip flexor mobility (straight leg raise)
	Centre of mass moves to back of foot	Centre of mass moves to front of foot.	Practice with back facing wall about 1 foot length away and teach athlete to push hips back till rear touches wall and weight is through heels.
	Shoulders move in front of bar	Bar remains in line with bar	Check knees are not flexing on descent.
	Bar remains close to thighs	Bar drifts way from body	Check weight is through rear of foot and shoulders are in front of bar.
	Descent ends at point just prior to when lumbar spine flexes, normally just below knees (figure 4)	Hamstring flexibility	Descend where athlete's mobility allows and progress over time.
ASCENT	Described spinal posture remains intact	Spine flexes	Check load is not too heavy for athlete
	Hips are extended through driving hips forwards		
	Motion continues until bar is back to start position		
	Just below mid thigh breath is slowly released		

Figure 1. Start



Figure 2. Decent



Figure 3. End of Decent



Figure 4. Wrong posture



Figure. 5 Teaching



TECHNICAL ISSUES

Table 2 highlights the procedure for executing a safe and effective SLDL.

Through practical experience, the primary technical fault that arises, is the athlete's inability to maintain the correct spinal posture. The spine must remain locked ensuring that the neutral lumbar lordosis remains intact throughout the exercise. As a consequence the risk of disk herniation and ligamentous damage is eliminated. Correct technique will result in an increased muscle activation of the spinal extensors resulting in a posterior shear force. When the spine is flexed the spinal extensors lose their oblique line of action, therefore unable to resist the shear forces produced from the exercise, therefore, over time, the risk of injury to discs and spinal ligaments increases. (McGill, 2002)

In order to avoid spinal flexion correct instruction must be given. The most common method adopted in the gym is using a stick to align the spine and to give feedback to athlete (figure 5). The stick is aligned down the spine and contact must be maintained throughout.

It is important that the athlete focuses on their hip extensors to create the movement as this focus will facilitate their learning and the transfer to their sporting performance. The load should be adjusted so that this can be the focus and the spinal musculature remains as a spinal column stabiliser.

APPLICATION

From the previous sections it is clear that the SLDL can be used as an effective exercise to strengthen the hip extensor musculature. Hip extension has a major role in all dynamic activities and sports. The hamstrings cross the hip and the knee; however they are very often only strengthened through knee flexion exercises. This however does not replicate sporting activity, where the hamstring must exert forces to extend the hip particularly in jumping and running. This SLDL can therefore be an excellent exercise to strengthen the hip for dynamic sporting activities.

Other possible sporting situations that perhaps warrant the prescription of the SLDL during preparatory parts of year are as follows:

Hockey- The position a player adopts during a penalty corner requires strength through hip extensors to control position and allow effective power production to shot.

Judo/wrestling- Techniques that require hip power and strength through hip extension. Strength through hip and spinal extensors to maintain their desired posture prior to attack.

Swimming- Power through hips at start and turns.

Rugby- Front row forwards; must maintain neutral spine whilst exerting force through hip extensors while scrummaging.

Sailing- ability to extend around and flex around hip whilst maintain neutral spine.

The SLDL is also an excellent tool to us when teaching and strengthening a clean or snatch, as it teaches the correct back, hip, knee and shoulder alignment as the bar passes the knee.

Figures 6 and 7 demonstrate the mid point of the pull during the snatch. Notice the positions are the same as the end position for a SLDL.

Figure 6



Figure 7



CONCLUSION

This article has given an overview of the SLDL. The loads should be progressed and as with any lift, limited by the weakest link in the kinetic chain, very often the lumbar spine. Its correct implementation and execution is vital, if the desired training effects are to be observed, whether this is strength or technical development.

REFERENCES

McGill, S. **Low Back Disorders, Evidence-Based Prevention and Rehabilitation.** Human Kinetics, 2002.

Kendal, F et al. **Muscles, Testing and Function.** 4th Edition, Williams and Wilkins, 1993