

The Clinical Benefits of Powered Elevating Legrests (ELR'S)

What are ELR's?

"Elevating legrests (ELR's) allow individuals to change the angle of orientation of the legs and/or footrests relative to the seat, extending the knee. Some legrests are articulating, which means they lengthen while also extending the knee".
(RESNA 2015)



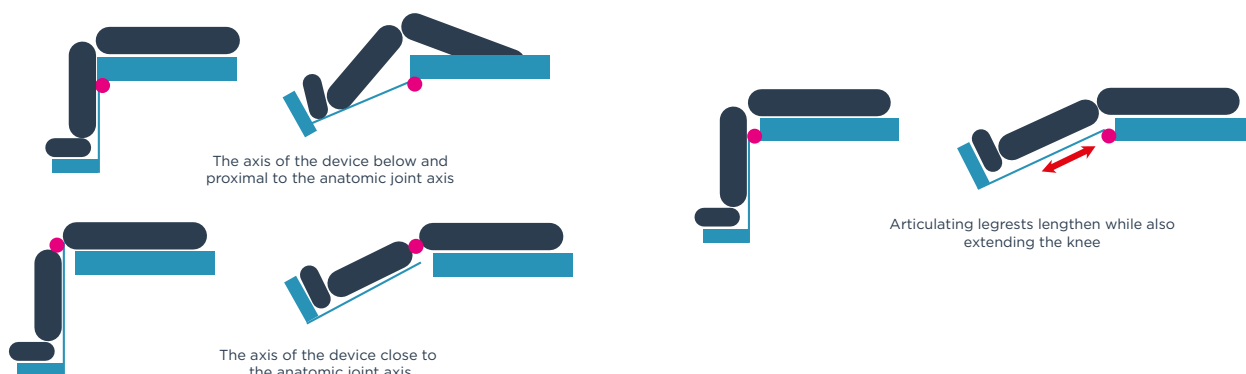
In order to provide clear movement at the knee joints, the pivot points of the ELR's should be positioned as close to the knee joints of the individual as possible. Some wheelchairs may be designed so that the pivot point of the ELR is below and/or proximal to the knee joint, however, with this type of design, the device will not only move the knee joint but it will also slowly lift the thigh from the seat. This can cause the pelvis to rotate posteriorly and affect the position of the hip joints, altering pressure at the Ischial Tuberosities (IT's) and cause shear and sliding to occur. It is likely to cause discomfort and even worse, pressure injury to develop, making it difficult for the user to maintain a seated posture.



LNX power centre mount foot platform

The Ultra Low Maxx is fitted with the LNX power centre mount foot platform. This articulating system allows automatic adjustment in length as the foot platform elevates, preventing unwanted pelvic movement which could affect the users overall seated position. The LNX system provide superior support throughout the entire range of movement, giving the user the independence to adjust the foot support as and when needed increasing comfort level throughout the day.

ELEVATING LEGREST CONSTRUCTIONS



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Important point to consider

The height of the cushion is an important factor as it may influence the position of the knee joint in the chair.

What are ELR's most commonly prescribed for?

- Management of lower limb oedema and/or pain associated with oedema
- Management of orthostatic hypotension
- Management of autonomic dysreflexia when used with tilt / recline
- Treatment and management of lower extremity pressure injuries
- Enhance sliding transfers when used in combination with recline in supine position
- Management of contractures or orthopaedic deformities
- Pressure redistribution (in combination with recline)
- Negotiate various environmental terrains

Benefits of ELR's explained

Management of lower limb oedema

For wheelchair users, the lower limbs may act as a reservoir for fluid accumulation for a number of reasons (Kinzer & Convertino, 1989). Elevating the legs above the level of the left atrium by approximately 300 mm is generally recommended as part of the management of oedema. This allows for a reduction in venous pressure and increases arterio-venous pressure and capillary flow. To achieve this position in the wheelchair, elevating legrests are usually used in combination with tilt, however, it is important to note that this may be inadequate due to possible issues relating to flexion at the hip joints. In this instance, recline may also be required in order to achieve an optimum position.

Recent research has shown that in a control group of individuals without disabilities, using elevating legrests and tilting more than 30° in combination with full recline, significantly improved lower limb haemodynamic states, as measured by near-infrared spectroscopy (Fujita, et al 2010). It is important to note, however, that additional research using individuals with disabilities is needed (RESNA 2015).



Management of orthostatic hypotension

Orthostatic hypotension, or postural hypotension as it is otherwise known, is a drop in blood pressure which can occur when the body changes position, usually from a position of lying/sitting to standing. During this change of position, it is important for the body to push blood upwards and supply the brain with oxygen. If the body fails to do this then blood pressure will fall and the person may feel lightheaded, dizzy or even pass out. Part of the management of acute symptoms, such as dizziness, includes assuming a recumbent (lying flat) or semi-recumbent position (Claydon, Steeves, & Krassioukov, 2006). Clinicians suggest that using a combination of tilt, recline, and power legrests can help to achieve such a position (Kreutz, 1997).

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Enhance sliding transfers

Recline may be used in combination with elevating legrests to enhance sliding transfers with a person in supine position. It can also enable the individual to be rolled more easily from side to side, to assist with dressing or adjusting garment on the lower body.

Management contractures and orthopaedic deformities

Elevating legrests enable passive movement of the knee joints (Lange, 2006). If contractures are present, the legrests should be adjusted to an appropriate angle to prevent undue tension on the hamstrings and hip joints. It is recommended to use elevating legrests in combination with recline when passive extension of the knee is limited due to hamstring tightness, as recline allows extension of the hip. Additional footplate extensions or angle changes might be necessary. Extending the knee too far can often elicit reflex spasticity in those with central nervous system disorders.



Pressure redistribution

A study by (Stinson, Porter-Armstrong, & Eakin, 2003) found that when the effects of elevating legrests on posture were studied in subjects without impairments, 120° of recline in combination with elevation of the legs significantly reduced seating interface pressure. Using ELR's alone can stretch the hamstring muscles which will result in posterior pelvic rotation, flattening of the lumbar spine and result in sliding, which will create shear forces. ELRs are, therefore, best used in combination with recline.

Elevating legrests may also help in alleviating ischial and foot support pressure (Aissaoui, Heydar, Dansereau, & Lacoste, 2000) and can help reduce shear along the entire seating surface in comparison to recline alone. (Carlson, Payette, & Vervena, 1995).

Negotiate environmental terrains

Elevating legrests allow the user to change the position of the legs regularly throughout the day in order to negotiate obstacles for clearance.



For more controls information in relation to powerchairs, take a look at our, 'Clinical Guide to Powechair Provision' document available at clubtherappy.com.

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