

The Clinical Benefits of Powered Recline

What is recline?

“Recline systems provide a change in seat-to-back angle orientation, while maintaining a constant seat angle with respect to the ground.” RESNA (2008)

What is recline most commonly used for?

- Redistribute pressure
- Change of body position
- Increase comfort
- Increase sitting tolerance
- Accommodate for limited hip flexion
- Transfers
- Personal care
- Improved respiration

Contraindications of recline:

- Shear
- Sliding out of the chair
- Hip and knee range limitations
- Spasticity
- Contoured seating

Recline is not a new phenomenon, in fact, wheelchairs with manual recline systems date back as early as the 18th century. Recline was initially introduced to prevent tissue injury. Reclining the back support meant that pressure could be redistributed over a larger surface area, reducing the build up of pressure under the buttocks.

To date, recline is still considered one of the best means of pressure distribution, however, wheelchair prescribers need to acknowledge that certain contraindications exist in the use of recline along, which could warrant its use very dangerous if ignored.

The main risk in the use of recline is shear, so what exactly is shear?

Shear: Shear forces are parallel forces (forces acting in different directions to each other), sometimes described as stretching forces, caused by the effects of gravity. Static shear occurs when the pelvis has migrated down within the seat surface and is often associated with a posteriorly tilted position. Dynamic shear can occur during short range reciprocal movements, such as leaning, reaching and wheelchair propulsion. In these cases, movement of the skeleton against the inner layers of the skin and tissue creates excessive strain, causing the upper layers of the skin to be pulled away from the deeper layers. This is the reason tissue damage is often greater internally than externally. Sacral skin breakdown is often related to shear issues.



The Clinical Benefits of Powered Recline

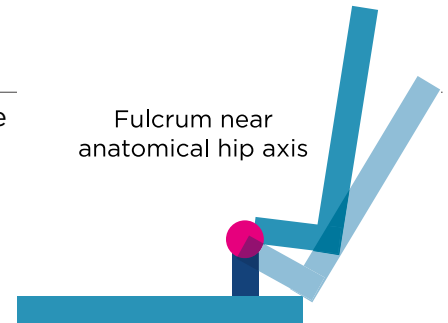
Why does shear occur?

Manual and power reclining wheelchairs use pivot points to open (recline) the back support and to close it (return it to an upright position). The amount of shear that occurs is directly related to the position of the pivot point of the seat back. For decades, pivot points were located low on the wheelchair, at the posterior end of the seat rail.

How to reduce shear?

The key to reducing shear is to keep the mechanical pivot point of the seat back as close to the hip joint of the user (the body's own pivot point).

Ideally the pivot point should be located at least 3"/76 mm above the seat rail (the average height of a seat cushion)

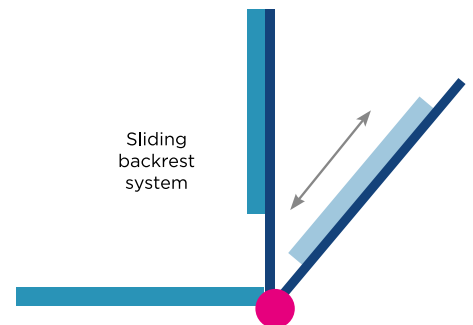


This image illustrates a low pivot recline with a cushion



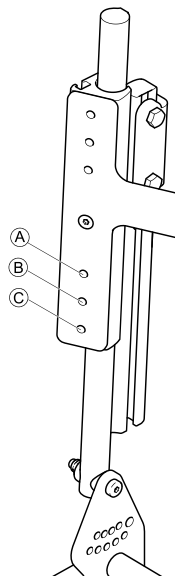
This image illustrates a raised pivot point approximately 3"/76 mm (the average height of a seat cushion)

Some power reclining systems have a back that "floats" or "tracks," allowing the user to remain interfaced with the back as it moves through its range, with minimal shearing. These are called low shear or zero shear reclining backs, especially useful when combined with a contoured back support.



Align bottom hole of backrest plate to hole of desired height on backrest tube:

- A** = 200mm gap
- B** = 175mm gap
- C** = 150mm gap

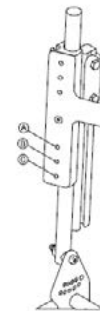


The Invacare Ultra Low Maxx Extended Shear Reduction (ESR) technology does just this. It can be adjusted dependent upon need, to increase or decrease the range of shear reduction, ensuring that the user remains in position as the chair is put through its recline cycle. This also ensures that lateral supports and head supports remain in position.

The Clinical Benefits of Powered Recline

One important point to remember when using recline is how seating products are interfaced with each other. Although high pivot points are becoming more and more the “industry norm”, positioning the back support too low and using a back cushion which is too thick can have detrimental effects for the user. It could result in the seat cushion sitting in front of the back support and when the chair is put into recline, the back support will push the seat cushion forward, causing it to move out of place, which in turn will create shear. If the back cushion is too thick, it will cause a shelf to occur between the back support and the seat cushion. This causes the lower edge of the back support to make contact with the pelvis, causing unwanted pressure.

On the Invacare Ultra Low Maxx seating system, both the standard High Back and the Matrx back supports can be adjusted in height on the frame. This ensures the pelvis is correctly supported at the level of Posterior Superior Iliac Spines (PSIS) and eliminates the risk of the cushion being pushed forward out of position.



Align bottom hole of backrest plate to hole of desired height on backrest tube.

- A = 200 mm gap
- B = 175 mm gap
- C = 150 mm gap

Clinicians will often recommend using tilt before recline when returning to an upright position in order to minimise shear. Please note, however, for the most effective pressure redistribution, tilt and recline should be used in combination as is supported within the literature.

It is important that recline be assessed on an individual basis and it is essential that the user has the comprehension skills to be able to use this system safely and independently, to achieve the best results.

Power reclining backs offer the wheelchair user the ability to change his or her position at will. This usually results in more frequent use of the back, which in turn can increase sitting tolerance and decrease the tendency toward pressure problems.

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

Invacare Australia Pty Ltd:
ABN 45 074 676 378
PO Box 5002, 1 Lenton Place,
North Rocks, NSW 2151,
Australia.
Freephone: 1800 460 460,
Fax: 02 8839 5353
Email: orders@invacare.com.au
Web: www.invacare.com.au

Invacare New Zealand:
PO Box 62-124, 4 Westfield
Place, Mt. Wellington,
Auckland, New Zealand.
Freephone 0800 468 222,
Freefax 0800 807 788
Email: sales@invacare.co.nz
Web: www.invacare.co.nz

Invacare Asia Ltd:
PO Box 5002, 1 Lenton Place,
North Rocks, NSW 2151,
Australia.
Phone: +61 2 8839 5330,
Fax: +61 2 8839 5331
Email: asiasales@invacare.com
Web: www.invacare.com.au

Making Life's
Experiences Possible

