

## Guide to Seating Supports for Wheeled Mobility

Seating supports enable people to sit comfortably over prolonged periods of time. By promoting comfort and helping to maintain a good position, a correctly designed and fitted support will make it easier for the person to perform normal daily activities such as eating, working at a computer or simply watching television.

Sitting in one position for a long time can lead to problems associated with the pressure of sitting. Seating supports are designed to spread the sitting force over as wide an area as possible, thereby reducing the likelihood of discomfort when sitting. This should also reduce the probability of developing pressure-related problems such as pressure sores.

### *Seats and Pressure-Relieving Cushions*

When seated the largest proportion of the body weight is carried through the pelvic area onto the seat of the support system. A hard seat or seat with little 'stretch', such as the sling seat in a standard folding wheelchair, will support to the body in a way that results in high pressures.

### **Foam Cushions**



A foam seat cushion will allow the pelvis to sink down into it. As the pelvis sinks, more of it comes in contact with the foam and this reduces the contact pressure. This results in better pressure distribution and is likely to be more comfortable to sit on.

### Contoured Foam Cushion



Some specialist seats and cushions are contoured to the shape of the body in order to further increase the contact surface area. A contoured a cushion can also help the person to sit in a better position and prevent them from slipping out of this position.

### Polymer Gel Cushions



Slipping or sliding on a cushion can result in frictional and shear forces. These forces are not good for the skin and underlying tissues. For this reason, some cushions have a top layer of polymer gel or polymer fluid. These substances move with the skin and significantly reduce the generation of detrimental forces.

### Air Cushions



Where maximum pressure relief is required, sometimes it is necessary to use an air cushion. With air cushions the air will tend to move about inside the cushion until the air pressure is constant throughout. In theory, when sitting on an air cushion the contact surfaces of the user should be at equal

pressures. In practice this is not quite the case, but air cushions are still considered as being one of the most effective means of minimising sitting pressures.

### **Rigidisers and Drop Seats**



The standard sling seat provided with a wheelchair will often not provide sufficient support for comfortable sitting over prolonged periods of time. In such cases it may be necessary to place a rigidiser on top of the sling seat in order to provide a firm base onto which a cushion may be set. Alternatively, a drop seat may be used. When using a drop seat, the original wheelchair seat canvas is removed and a rigid seat board, mounted on four 'drop hooks' will be mounted directly onto the wheelchair frame. Virtually any choice of cushion may then be mounted onto the drop seat.

### **Custom Contoured Seats**



If intimate contouring of the seat is necessary to provide optimal support with maximum pressure-relief, a custom contoured seat may be used. With custom contouring an impression is taken of the person's body and this is then moulded or formed into a custom made seat.

### **Back Supports**

The back support on a chair provides support to the back and reduces the effort required to sit up. The choice of type of back support is a matter of personal preference and physical need.



### **Standard Back Supports and Tension Adjustable Back Supports**

The standard back support provided on a wheelchair is a sling back support. This is simply a nylon canvas material attached to the two back support upright posts and provides little support.

Increasingly, wheelchair manufacturers are offering the option of a tension-adjustable back support. This is similar to the sling back except that a number of horizontal straps may be used to tension the back support to different degrees at different levels. In this way the back support may be contoured in a corset-like manner to match the natural curves of the spine.

The back support may be high or low, depending on personal requirements. A high back will provide extra support, while a lower back will enable easier propulsion of a wheelchair.

### **Frame-mounted Back Supports**



Where sufficient support or padding is not provided by the canvas back support it may be necessary to remove the original back support on the wheelchair and replace it with a frame-mounted support. Frame mounted supports generally consist of contoured foam mounted onto a wooden or plastic base board which is in turn mounted onto the frame of the wheelchair using mounting bracketry.

### **Adjustable Back Supports**



A frame mounted back support can generally be mounted in a range of positions and set at a range of angles, but sometimes the level of support offered is still insufficient. When this is the case there are a range of multi-adjustable back supports available to try. These supports are mounted from the back support canes and are also generally angle and height adjustable. They are frequently segmented so as to provide support exactly where it is needed. They may be segmented along the vertical axis to provide additional support to the lumbar curve, or they may be horizontally segmented so as to provide extra thoracic support where needed.

### **Custom Contoured Back Supports**



If intimate contouring of the back support is necessary to provide optimal support with maximum pressure-relief, a custom contoured back support may be mounted onto the wheelchair frame. With custom contouring an impression is taken of the person's body and this is then moulded or formed into a back support.

### ***Positioning Belts***

Seating systems are designed to provide maximum comfort. Sometimes the rigid support surfaces such as seat base and back support do not provide sufficient support and additional flexible positioning belts are required.

*Note: The purpose of positioning belts is to lend extra support and NOT to act as restraints.*

## Hip Straps



Standard hip straps are supplied on most wheelchairs. The purpose of these straps is to prevent the person from accidentally tipping forwards out of their chair. In the event that the pelvis requires stabilisation over and above what is being provided by the seat and back support, a four-point hip strap may replace the standard hip strap.

## Harnesses



Harnesses are useful when a person has difficulty sitting in an upright position. They may be of several different types, but the principle is the same – they tend to hold the person back into the seating system. They are generally made of a stretchy material such as Neoprene, the material used to manufacture wetsuits. This material will act as a strapping material but will stretch for comfort.

## Shoulder Straps

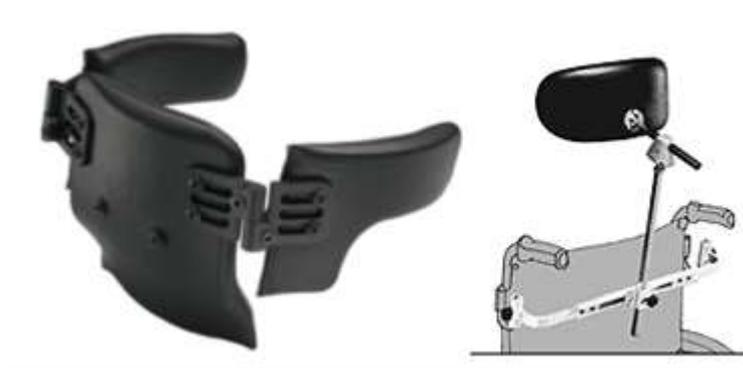


If a full harness is too invasive for an individual then shoulder straps may be a good alternative. Shoulder straps are discreet. They are anchored to the back support or frame and help hold the shoulders in position by applying a gentle force to the front of the shoulders. They click closed and may be tightened to a comfortable level by pulling on d-rings.

## Other Supports

The seat and back support alone may not be sufficient to provide the postural support required. Additional support, as outlined below, may be required.

## Head Supports



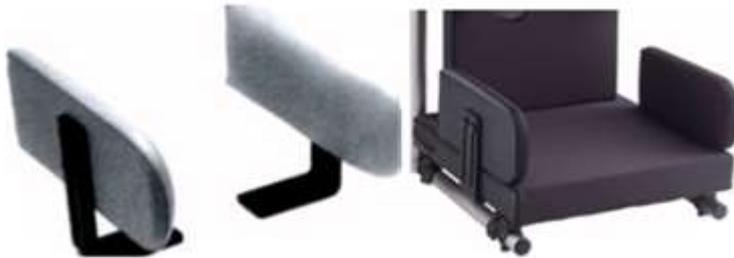
A head support generally does not offer support to the head so much as preventing the head from dropping back past the back support. This is of particular importance when being transported in a wheelchair-adapted car, taxi or bus. In these situations, it is strongly recommended that a head support be used. Numerous supports are available offering different features. The choice usually depends on the method of attachment of the head support to the wheelchair and the intended use of the head support.

## Lateral Thoracic Supports



In the event that there is a tendency to lean towards one side when sitting, there may be in danger of developing a scoliosis. Use of a lateral thoracic support can help to stabilise the trunk and maintain a midline position. Lateral thoracic supports may be fixed in position or they may be removable in the sense of being 'swingaway' so as to provide easier access to and from the chair.

## Lateral Upper Leg Supports



Use of a lateral thoracic support may tend to straighten the trunk, but as a result the pelvis may slip away from midline. Lateral upper leg supports are used to prevent this from happening. Lateral upper leg supports may also be used when a more 'snug' fit is required in the chair.

## Medial Knee Supports



A medial knee support may be required if there is a tendency to hold the knees very tightly together. This posture, if adopted over a prolonged period of time, can result in injury to one or both hips. Use of a medial knee support can promote good positioning of the knee and reduce the stresses experienced at the hips. Medial knee supports are also called abductors or pommels.

Medial Knee supports can be integrated into the seat cushion, may be mounted on bracketry which allows them to be removed for transfers, toileting etc., or may be mounted on bracketry which allows them to swing-away for the same purposes.

## Lateral Knee Supports



Lateral knee supports or adductors are used to help the person to hold their knees and thighs in a midline position when they have a tendency to fall outwards towards the edge of the seat.

As with medial knee supports, lateral knee supports are normally mounted by bracketry off the frame of the wheelchair and are normally removable or swing-away in design to facilitate transfer into and out of the seat.

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