

Sitting comfortably?

A user manual for wheelchair users

GLOSSARY

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| Armrests | On the wheelchair; can be used to distribute up to 10% of the body weight. Must support the arms when the arms are not in use; must not be in the way of you moving your arms and shoulders freely if you are driving your wheelchair by means of grip rings (drawing 11). |
| Body | Your body must function as a resource of pressure distribution. When the wheelchair seat and back are <i>perfectly</i> fitted to your body, the total amount of pressure on the exposed areas on your buttocks and your tailbone will be reduced. You will want to take advantage of this fact (drawings 5 & 8). |
| Buttock bones | The two rocker-shaped bones located under the buttocks. Those are the bones that you sit on and which, along with the 3rd support point located on the connection between the spine and the sacral spine, are supposed to make the stable seating position (drawings 1 & 4). |
| Clothing | Heavy seams on the clothing might add pressure to particularly exposed areas. You might want to remove the back pockets from your trousers or buy clothing designed especially for wheelchair users. The size and thickness of your outdoor clothing must not influence your choice of wheelchair width. You might want to look for outdoor clothing that is not bulky on the sides or on the back. Shoe soles might have different heights, which might influence the extent to which the wheelchair foot rests fit the length of your lower leg. You might want to buy shoes with the same sole height; if not, you will have to adjust the length of the foot rest whenever you change into shoes with a different sole height. |
| Cushion | An assistive device, which most people associate with pressure sore prevention. Unfortunately, the cushion on its own does not create sufficient pressure relief if the seating position is unstable. Therefore, cushions only make up a small part of the efforts needed to secure pressure sore prevention. The Danish market offers more than 100 different cushions, and your choice of cushion must be based on an analysis of your particular |

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| | wheelchair, your body as well as your everyday activities. |
| Everyday activities | <p>Along with stability and pressure distribution, everyday activities is one of the key words within this user manual.</p> <p>Everyday life is full of activities that make good sense to you. Most of these activities can be carried out in a variety of ways, but some of these ways might be risky in terms of developing pressure sores or tissue injuries. One such everyday activity is the transfer from one assistive device to another. Other activities might include cooking, leisure time activities, personal hygiene or work.</p> <p>Think about how you carry out your everyday activities. Perhaps you are able to identify other less risky ways of carrying out those activities.</p> |
| Foot rests | Used to distribute up to 10% of the body weight. Foot rests allowing the knees to remain at a 90 degree angle provide a better pressure distribution than other types such as elevatable foot rests (drawing 9). |
| Length of the lower leg | The length from the hollow of the knee to the sole of the foot; it is used to determine whether or not the thighs are utilised appropriately as a pressure distributing area. If the distance is too short, the knees will be elevated from the seat surface, and a high amount of pressure will build up underneath the buttock bones. If the distance is too long, there is a risk of clamping blood vessels and nerves within the hollow of the knee. |
| Lifting | A process requiring you as well as your assistants to be very careful. Your level of stability and pressure distribution in relation to your seating position depends on the quality of the lifting procedure. You and your assistants might want to practise the lifting procedures together in order to identify the best ones. If, for some reason, the lifting procedure fails, it is better to try again than to adjust the seating position once you are in the seat. |
| Lifts | Various lifts are available to suit any type of purpose and wish; however, a ceiling lift is usually the most appropriate type of lift in |

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| | cases involving pressure sores resulting from sitting. |
| Manual wheelchairs | The type of wheelchair, which is driven by means of grip rings on the wheels. Usually, it is most appropriate for such a wheelchair to be fitted with a strap back, a strap seat, foot rests and arm rests (drawing 10). A light chair is also most appropriate because this typically makes it easier for you to move the wheelchair forward without you sliding forward in the seat. |
| Pressure distribution | Along with stability and everyday activities, pressure distribution is one of the key words within this user manual. By distributing the body pressure across the largest area possible, we are able to reduce the amount of pressure on those areas, which are usually exposed to a high level of pressure, e.g. buttock bones and the tailbone. The contact surface between the wheelchair seat/back and the back of your body must be as large as possible. Amongst other things, this might be achieved by supporting the natural curve of the spine and by shaping the seat and back padding of the wheelchair crosswise to fit the body (drawings 5, 8 & 10). |
| Pressure sores | The traditional term for damages resulting from pressure – usually within particularly exposed areas. This user manual only covers damages related to sitting. |
| Seating assessment | A method of analysing the combination of body, assistive devices and activities in order to make this combination as stable, pressure relieving, non-harmful and meaningful to you as possible. This method requires a specific analysis of your everyday activities within your home, using your current assistive devices based on your specific functional abilities. |
| Shear | Displacement forces, which might lead to deformation and damage of the tissue located around protruding bones such as buttock bones and the tailbone (drawings 3 & 7). |
| Skeleton | Your skeleton is the most important resource within your body when it comes to your seating position. You need to utilise your skeleton to stabilise your upper body, and it contains the three support points: the two buttock bones as well as the 3rd support point, which make up the base of your seating position (drawings 4 & 6). |
| Slings | The fabric, which is supposed to carry the |

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| | <p>person who is being lifted. Many types of slings are available, and you should test various types at home before making a choice. Usually, you would need to select a sling, which is able to create a position that resembles your final seating position. At the same time, the sling must be as small as possible, and it must be easily removable in order to avoid having to move your body and change your seating position once you have been placed in the wheelchair.</p> |
| Spine | <p>Your spine must function as a resource with regards to your seating position. You need to use this part of your body to balance your head and your upper body. The natural curve of the spine is supported by means of the shape of the wheelchair. In this way, the spine becomes a self-supporting construction with the ability to prevent gravity from making your upper body collapse. You save energy, at the same time obtaining a high level of stability and pressure distribution (drawings 5 & 6).</p> |
| Stability | <p>Along with pressure distribution and everyday activities, stability is one of the key words within this user manual. We obtain a stable seating position when we utilise the innate ability of the spine to support itself, at the same time balancing the head and the upper body, by supporting the natural curve of the spine in the correct way (drawing 5).</p> |
| Tailbone | <p>Is located at the lowest part of the spine and is particularly sensitive towards pressure. (drawing 2). Therefore, it is a good idea not to sit on it. In order to avoid this, you will want to utilise the 3rd support point located at the lower part of the back as the last leg of the stable base needed when sitting (drawing 6).</p> |
| The 3rd support point | <p>Is an area located on your lower back. It is located where your spine and your sacral spine meet (drawing 5). Locate this area by following the highest point of your hip from your waist towards your back. Along with the two buttock bones inside the buttocks, this area is supposed to make up the stable base of your seating position (drawing 4).</p> <p>Within this area, support from the wheelchair is supposed to allow your spine to function as a self-supporting construction. From this position, the upper body and the head are</p> |

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| | maintained in a balanced position (drawing 6). |
| The neutral pelvic position | <p>Involves you sitting on the peak of your rocker-shaped buttock bones (drawing 6). You can only remain in this position as long as your body is supported by the 3rd support point. Think of this position as being similar to a 3-legged milking stool.</p> <p>You can only keep your pelvis in a neutral position by utilising the 3rd support point on your back, located where your spine and your sacral spine meet (drawing 5).</p> <p>If you end up sitting on your tailbone instead, the pelvis is no longer able to stay in a neutral position. Therefore, it will also not be possible to obtain stability in a seating position utilising the tailbone as the 3rd support point (drawing 7).</p> |
| The wheelchair back | <p>The part of the wheelchair, which is supposed to support the natural curve of the spine in order to create a stable seating position and maintain a balanced head. It must be adjustable by means of straps, or it must otherwise be possible to extend it by means of a pelvic support in the area of the 3rd support point (drawing 10).</p> <p>The wheelchair back can be used to distribute body pressure and remove it from the seat surface (drawing 8).</p> |
| The wheelchair recline function | <p>A function available on many comfort wheelchairs and electric wheelchairs. The function releases the wheelchair back, allowing the back to recline and the hip angle to be changed (drawing 13). Usually, this function should only be used in connection with the initial adjustment of the wheelchair. Afterwards, you might want to have this function dismantled so that you do not activate it unintentionally.</p> |
| The wheelchair seat | <p>The part of the wheelchair, which is supposed to match and support the shape of your bottom, at the same time providing sufficient space for the 3 cm of additional depth of your buttock bones compared to the rest of your seat surface (drawings 8 & 10).</p> <p>If you are using a manual wheelchair, it must be equipped with adjustable straps on the wheelchair seat in order to create the largest possible support surface for your bottom.</p> |
| The wheelchair tilt-in-space function | <p>A function available on many comfort wheelchairs and electric wheelchairs. This function releases the wheelchair seat and back</p> |

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| | <p>without changing the hip and knee angles (drawing 12). You may use this function as often as you like because it does not alter the stability of your seating position but only the effect of the force of gravity on your body.</p> |
| Tissue injuries | <p>Although tissue injuries is the same as pressure sores, this might be a more precise description of what pressure sores actually are. In principle, muscle tissue is more sensitive to the combination of pressure and shear than skin. The tissue is much more influenced by pressure and shear when you are sitting than when you are lying down. If the seating position is unstable, and if the pressure distribution is also not optimal, shear will work from the inside and lead to in-depth impacts on the tissue located close to particularly exposed bones. This explains underlying tissue injuries, which suddenly appear on the skin surface after having developed unnoticed over a long period of time.</p> |
| Transfer | <p>Is another word for moving. Whenever you transfer yourself to your wheelchair and intend to sit there for more than 15 minutes, you need to be careful. The transfer needs to take place in a controlled manner with or without assistive devices, and you must end up sitting on your bottom without having to pull the tissue across the seat surface.</p> <p>A transfer well-done is a big step towards ensuring a healthy seating position.</p> |
| Transfer devices | <p>There are many types of assistive devices that facilitate a transfer well-done.</p> <p>If you need to use assistive devices to transfer yourself, you need to find the best way to avoid pulling the tissue on your bottom across the seat surface.</p> |
| Wheelchairs allowing for seating position adjustment | <p>This category includes comfort wheelchairs and electric wheelchairs that allow mechanical or electric seating position adjustments. Usually, they offer tilting or recline functions as well (drawings 11, 12 & 13).</p> |