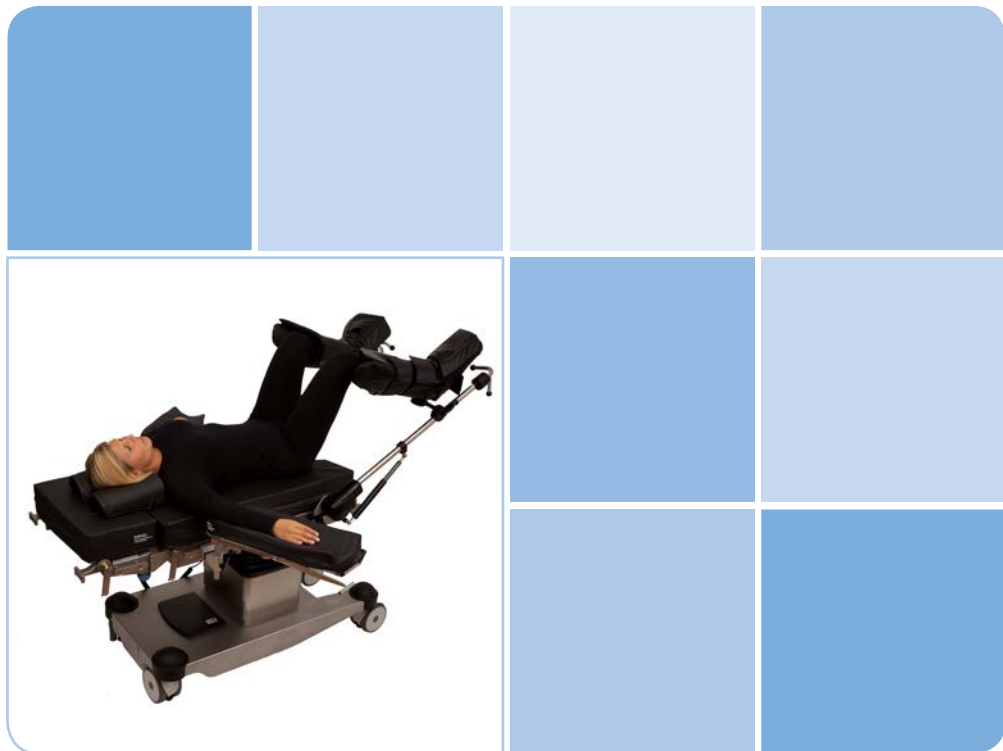


Positioning: The basic reader

It pays off to prevent pressure sores



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- a reliable partner through generations



Preface

Correct positioning is crucial for the wellbeing of patients. Expedient positioning increases the comfort of the patient during operation and minimizes the risk of forming nerve- and tissue injuries substantially. Correct positioning does not only provide more security and efficiency but also lightens the work of the care workers.

The present positioning guide is constructed on the basis of the new guidelines developed by the American National Pressure Ulcer Advisory Panel (NPUAP) and the European Pressure Ulcer Advisory Panel (EPUAP) in 2009.

The purpose of this positioning guide is to describe both the theoretical as well as the practical principles regarding expedient positioning of OR-patients. Especially the prevention and emergence of pressure sores, shear, and friction as well as nerve injuries are described in detail. In the guidelines of NPUAP and EPUAP friction is not part of the pressure sore definition. We have chosen to include friction in this guide as friction injuries can lead to unpleasant blisters and skin damage on the patient. In addition to this we include detailed explanations and illustrations of expedient positioning and positioning aids.

We wish to thank clinical senior nurse Anne Ørskov and clinical senior nurse Susan Bermark, who have shared their extensive positioning and pressure sore experiences with us. Their experiences have given us the opportunity to develop a guide constructed on the basis of problem situations arising in connection with positioning of patients at Danish hospitals. All pictures of pressure sores illustrated in this guide are kindly lent by Danish Wound Healing Society (Dansk Selskab for Sårheling).

It is our hope that this guide will contribute to spread knowledge about the importance of expedient positioning and also contribute to the enhancement of patient comfort contemporary with a decrease in positioning complications.

The guide primarily addresses OR-nurses, porters and care workers, but is also interesting reading for you, who want to know more about correct positioning, positioning injuries as well as pressure distributing mattresses and pads.

We recommend reading the whole guide, but it can also be used as a book of reference depending on area of interest.

Enjoy reading.
Simonsen & Weel

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Positioning injuries – pressure sores and economy



The price of pressure sores

The price of pressure sores is high in a both human and economical perspective.

Studies show that 20-25 % of hospitalized patients experience pressure sores. The price of pressure sore treatment (category 3 and 4) is on average 200.000 DKK per patient per year, of which 90 % of the expenses go to care workers.

A study on patients in 10 hospitals in Denmark has shockingly revealed, that almost 1/3 of the patients had had some kind of pressure sore. Many pressure sores are not discovered in time and develop into requiring treatment and therefore lead to longer hospitalization. A sore requiring treatment is often recognized as a category 2.

The secretariat of European Wound Management Association in Copenhagen concludes on the basis of the Danish study that between 25 and 43 % of hospitalized patients in Danish hospitals have pressure sores to some degree. The chairman of Danish Wound Healing Society, dr.med. Finn Gøttrup, finds the numbers alarming and call on to taking the problem more seriously. Therefore there is a need for all hospitals and care institutions to implement a pressure sore prevention system to stop this inexpedient development.

An Italian study shows that patients treated for simple, open sores are hospitalized for 14 days longer on average, while the more serious types of sores cause up to 20 extra days.

If estimated that a hospital bed in Denmark costs 2,800 DKK, this leads to additional expenditures of 40,000-50,000 DKK. This money could have been saved if prevention steps had been taken.

The experts have different views on the scale of additional expenditures in connection with treatment of pressure sores – but one thing is certain: For a long time studies have shown that the prevention of pressure sores is much more economical than treating them.

The price of pressure sores

A recent American study proves that the forming of pressure sores multiplies the mortality rate with 5 by weakened patients.

Sick, elderly and immobile persons are more exposed to pressure sores. Pressure sores by weaker patients can be life threatening or they may lead to the amputation of a foot or a leg if the sore is not relieved and treated correctly in time.

The human price is:

- pain
- obnoxious smells
- infection
- addiction
- limited activity
- social isolation
- at worst death

Risk screening of patient is therefore necessary – refer to the screening scheme in enclosure 1 and 2

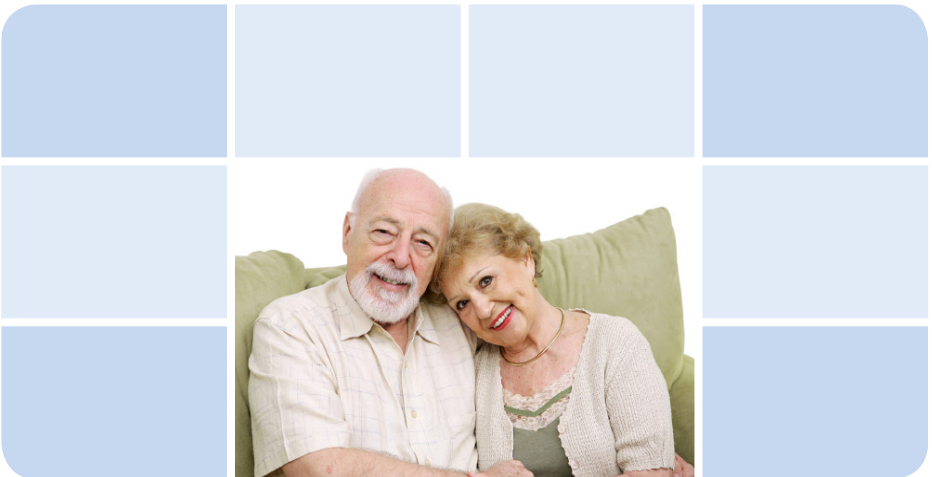
Definition of pressure sores

Pressure sores (decubitus) is local tissue damage in the skin caused by restriction of blood flow to the specific area. The damage is often caused by sustained pressure or shear or a combination of the two.

Pressure sores are thus a change in biological tissue formed by compression- and shear forces. These changes can develop already after 1½ hour bedding within vulnerable patient groups.

The tissue damage is the same whether the tissue pressure is high and persistent or low and short termed. By pressure is thought of force per areal. This way the pressure will be reduced if the force is distributed to a larger area.

The first sign of a pressure sore is red skin. This discoloration is caused by increased blood flow to the area because of recent blood flow restriction. If the skin is not relieved an inflammation of the tissue will develop because of skin loss, damage of the lymphatic and capillary vessels and a blue or red discoloration will form within hours or days. Later on necrosis, infection, abscesses and fistula may form in the pressure sore.



Formation of pressure sores

Pressure sores form when tissue is exposed to pressure between bone and mattress as a result of sustained pressure or shear. The tissue pressure leads to decreased blood flow in the specific area, as the blood vessels are either closed or ripped. This way the tissue gets no or poor nutrition. When the oxygen supply is reduced or stopped completely, waste products and carbon dioxide will accumulate and the tissue is damaged. The severity of the damage will increase with the duration and strength of the pressure to the skin. Some patients are more vulnerable to pressure sores than others.

Vulnerable areas

Pressure sores can develop on every part of the body but usually develop where a bone is close to the skin – presupposed exposure to pressure or shear between bone and mattress.

The vulnerable areas:

- Aures (ears) – vulnerable in side position
- Caput (head) – especially the back of the head is vulnerable when kids lie on their back
- Scapula (shoulder blades) – vulnerable when lying on the back
- Olecranon (elbows) - vulnerable in side position
- Os sacrum (sacrum) - vulnerable when lying on the back
- Calcaneus (heels) - vulnerable when lying on the back
- Digiti pedis (toes) - vulnerable when lying on the stomach
- Malleolone (malleolus) - vulnerable in side position
- Spina iliaca (hipbones) - vulnerable in side position
- Patella (knees) - vulnerable when lying on the stomach
- Tuber ischiadicum (tailbone) - vulnerable when sitting
- Nates (buttocks) - vulnerable when lying on the back

These areas should be monitored carefully by positioning.

Pressure sores in different stages

Pressure sores fall into one of four categories based on their severity:



Category 1 – redness (persistent area of red skin)

Pressure marks are a clear red, lightly swollen mark on the skin. This redness is persistent to finger touch and relief, as the blood flow has been cut off. Incipient tissue damage with aseptic inflammation reaction. The condition is reversible – the tissue can heal and aggravation can be prevented by immediate relief of pressure.

Category 2 – light skin loss or bullae formation (blisters)

A superficial red sore without necroses. The persistent pressure has caused blister formation and skin loss in epidermis that rarely affects dermis. If the blister breaks a painful and infection susceptible skin damage will occur. The sore will heal by relief.



Category 3 – skin loss

The tissue is dead. The sore has extended to dermis and to the subcutaneous tissue. There might be necroses, exudates, undermining and possibly cysts or fistulas. The fascia stops progression to lower layers. The sore needs treatment to heal.

Category 4 – Loss of all tissue layers

The sore has extended to fascia to the underlying muscle and possibly to the bone. There might be necroses, undermining, cysts or fistula formation. The sore, that is often infected, need intensive treatment to heal.



Relief is necessary to prevent the formation of a pressure sore and to secure healing. It might be necessary with plastic surgery by extensive sore formation.

Risk factors

People not able to change their body position themselves and secure pressure relieve in time have a risk of forming tissue damage. This means, that patients who are completely or partial paralyzed, suffer from severe diseases, are weak, suffer from consciousness disturbances or are under general anesthesia are especially vulnerable.

The risk of forming pressure sores also depends on the patient´s resistance to pressure.

The resistance is reduced by:

- Age over 70 years
- Reduced skin barrier (e.g. because of incontinence and perspiration or reduced elasticity by dehydration)
- Hypotension (e.g. peripheral ischemia or in connection with operations)
- Limited mobility (the patient´s ability to change and control body position)
- Limited activity (the patient´s level of physical activity)
- Reduced sensibility (e.g. paralysis, neuropathy)
- Poor nutrition condition
- Bone prominences (e.g. heels, malleolus, os sacrum and tuber ischii)
- Obesity or emaciation
- Dehydration
- Diabetes
- Infection
- Long termed steroid treatment

Prevention of pressure sores

Careful and intensive care are without a doubt the basic elements in preventing pressure sores.

The care workers should anytime be aware of:

- Pressure distributing mattresses and pads play a significant role in the prevention of pressure sores – as the pressure should be distributed to the largest area possible
- Good personal hygiene is an important factor in the prevention and healing of pressure sores; continued humidity from e.g. plastic coating or incontinence breaks down the skin which leads to easier formation of skin damage and sores. The skin of the patient should therefore be kept dry, whole, clean and elastic.
- Daily inspection of the patient's skin is essential; changes in the skin should be registered and closely monitored.
- Higher age is a risk factor of forming pressure sores. Around 70 % of all pressure sores are formed on patient more than 70 years old. The skin of elderly people has reduced elasticity compared with the skin of younger people. This influences the barrier function of the skin which therefore requires gentle care.
- The temperature of the skin plays a significant role in the formation of pressure sores. Increased temperature due to mattresses and pads that produce and detain warmth is a great disadvantage to the patient. Fever also involves increased temperature which can lead to a quicker ulcer formation. It is important to make sure, that the fever is not coming from the ulcer as this could be a sign of infection.
- Reduce the time in which an area is exposed to pressure. Pressure sores are often a result of long termed pressure in combination with limited mobility. People with reduced level of consciousness and / or reduced sense of touch are especially vulnerable to pressure and friction damage.
- Tissue areas pressed against cast, clips, drainage pipes and other hard material can cause pressure sores.
- Expedient positioning reduces the patient's risk of complications.

Positioning injuries - shear and friction injuries



Definition of shear and friction injuries

Friction occurs when tissue is exposed to frictional resistance. This happens when the body position of the patient is changed and the patient is not lifted from the mattress but is pulled across the bed and the skin is still in contact with the mattress (a shear arises in the tissue layers). The result is a scraping of epidermis which leads to superficial sores which makes the skin vulnerable to outer influence which again increases the risk of infection. Shear arises when tissue is exposed to friction in combination with pressure. This happens when e.g. the patient is sliding down in the bed and the skin is not following the position change.

The formation of shear and friction injuries

The formation of shear and friction injuries

The formation of shear and friction injuries by stagger of skin and mattress, e.g.:

- Raising the headboard of the patient
- Moving the patient from e.g. OR positioning to bed
- Inexpedient pulling or moving of the patient
- By wrong side position

Vulnerable areas

Long termed pressure and tissue stagger are the primary causes of pressure sore formation, but also friction of the tissue by movement is a risk factor. The places where the skin is close to the bone are especially vulnerable. (See under pressure sores p. 10)

Risk groups / risk situations

The patient is vulnerable to shear and friction injuries when:

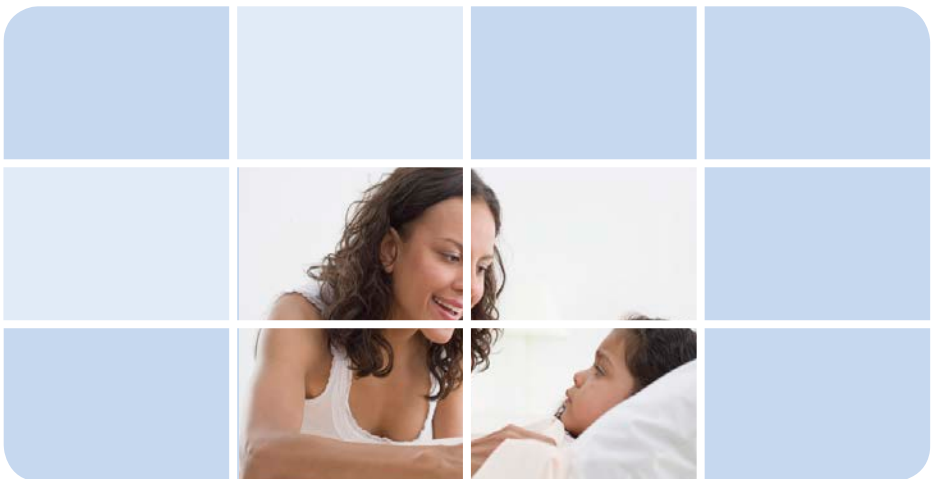
- The patient is moved
- The patient is repositioned. Use draw sheet, sliding sheet or poly bag
- The patient is placed in sitting position
- By turns
- By repositioning during OR (e.g. when the foundation area is changed)

Prevention of shear and friction injuries

To avoid shear and friction injuries the care workers should use draw sheets when positioning the patient.

Do not pull a person up in bed. Use a draw sheet to pull the patient in the right position.

The patient must lie secured and anti-slip on the positioning tools. Otherwise a dangerous shear and friction can occur because of the inexpedient weight distribution.



Positioning injuries – nerve injuries



Definition of nerve injuries

A nerve injury is per definition the material change or destruction of the complete – or part of the – anatomical structure of the nerve with following function disturbance.

The pathophysiology consequences of injury to the sensory nerves are:

1. Affected conduction ability, possibly complete or partly function loss that can be temporary or permanent (anaesthesia, hypaesthesia)
2. Neural disruption with discomfort symptoms (hypaesthesia, paraesthesia, dysaesthesia, allodynia).

Nerve injuries may occur as a result of isocheimal, thermal, chemical and mechanical trauma.

Formation of nerve injuries

Nerve injuries occur by pressure and/or traction:

Pressure: Compression of blood flow to the nerve cells caused by the bed, different holders, drip stands and similar

Traction: Reduces the diameter of the nerve, increases the interneuron pressure and compresses the blood flow.

Studies have shown that 8 % traction may affect the circulation and 15 % traction causes ischemia of the nerve. Occurs if the patient is positioned in abnormal anatomical positions.

Vulnerable areas

Vulnerable nerves:

- Ulnar nerve: May be pressed above or by the elbow. This may cause pain and sensory disturbances in the nerve as well as paralysation of the hand muscles.
- Prevention: Avoid that the medial humerusepicondyle is resting on the foundation and that the arms are flexed more than 90 degrees when back positioned. The arms should be placed in supination (hands facing upwards) if possible, to avoid pressure in the cubital tunnel.
- Nervus radialis: May be pressed by the outer side of the upper arm. This may cause pain and sensory disturbances in the nerve as well as paralysation of the arm and the extensor muscles of the hand wrist (straightening muscles) – causes drop hand.
- Prevention: Avoid pressure in the backside of and the middle of humerus. Level differences between armrest and OR bed must be avoided.
- Nervus peronæus: May be pressed against the outer side of the knee. This may cause pain and sensory disturbances in the lower leg in the nerve and possibly drop foot.
- Prevention: Avoid pressure on the lateral side of the knee joint.
- Nervus tibialis: A damage of the nerve may cause paralysation in musculus gastrocnemius (muscle of the calf) and paraesthesias under the foot and in the lateral toes.
- Prevention: Avoid long lasting positioning of the legs in GU-support as it causes increased pressure on the nerve in the hollow of the knee.
- Nervus peronæus: Damage may cause sensory disturbances in the upper side of the foot and the outer side of the calf as well as paralysation of the dorsal flexion of the feet and toes – drop foot.
- Prevention: Avoid pressure on the lateral side of the knee joint by e.g. GU-positioning. By side positioning you should be aware of the lower leg and knee resting on the mattress.

Classification of nerve injuries

Seddon's classification scheme can be used for describing nerve injuries:

1. Neurapraxis – temporary paralysis of a nerve caused by lack of blood flow or by pressure on the affected nerve – no loss of structural continuity.
2. Axonotmesis – neural tube intact, but axons are disrupted. These nerves are not likely to recover.
3. Neurotmesis – the neural tube is severed. These injuries are likely permanent without repair – at best the nerve function will only achieve partial recovery.

Risk factors

Factors influencing the development of nerve injuries:

- The duration of the positioning
- Alcoholism
- Poor general condition, over- or underweight
- Diabetes
- Peripheral vessel illnesses

Prevention of nerve injuries

Prevention of nerve injuries:

- Shortening of the positioning
- Previous knowledge – if the patient has any special neurological problems or tendency to a sleepy feeling in arms/legs
- Check pulse, vein abundance, pulsoxymetria in vulnerable extremities
- Use pressure distributing ESSELL mattresses and pads

Positioning injuries - other types of positioning injuries



Contracture and thrombosis

Even though the tissue and nerve injuries should have a high priority, the medical staff should also be aware of the following injuries caused by inexpedient positioning:

Contracture: decreased mobility in the joints because of changes in the joint, shrinking of the joint capsule or shortening of the surrounding tendons and muscles.

Prevention of contracture:

The patient's joint should be moved during long lasting immobility to prevent stiffness.

The medical staff should position with a view to maintaining the patient's muscle length to prevent the formation of deformity.

Thrombosis: occurs when the blood vessels are closed due to coagulation. Thrombosis can occur in all vessels of the body and may cause embolization to the lungs and post-thrombotic syndrome. Thromboses are common after long lasting stagnation or when a vein has been twisted (this may occur by inexpedient positioning). It is important to secure the blood flow from the legs to the heart. This can be done with elastic stockings. Especially the lower extremities and the veins of the pelvis are vulnerable to thrombosis caused by decreased blood flow, changes in the blood condition as well as damage of the vessel wall layers.

With age there is an increasing incidence of deep vein thrombosis (DVT). It is estimated that 1/3 of the cases occur spontaneously, the rest of the cases occur by patients with an increased risk. Increased risk is seen by patients after some surgical operations (one study found an increased DVT-risk up to 3 months after orthopaedic operations), after acute trauma, by some acute medical conditions, former DVT and by patients with anti-phospholipids antibodies.

Prevention of thrombosis:

- The lower extremities should be positioned high if possible
- Usage of elastic stockings and anti-embolism stockings
- Early mobilisation of the patient
- Vein pump exercises

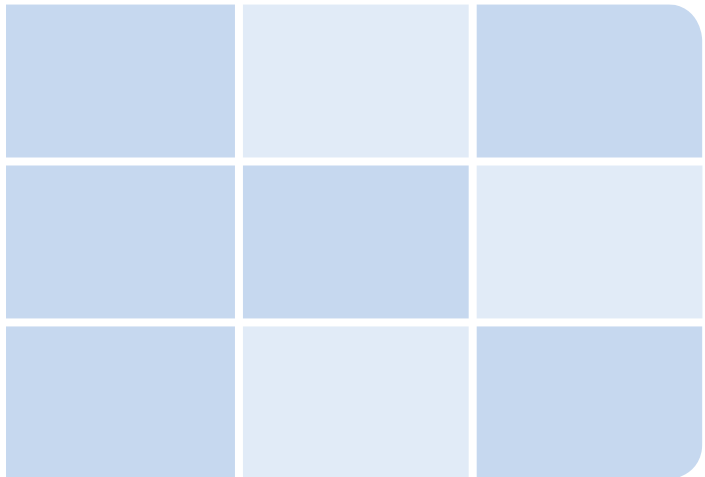
Anti-embolism stockings

In connection with hospitalization of patients it is important to offer an efficient thrombosis prophylaxis with anti-embolism stockings. Simonsen & Weel has developed a concept for this called mediven Trombexin and mediven Struva.

Mediven Trombexin and Struva are anatomical knitted and offers the patient the best comfort possible without comprising the functionality. The pressure is graded decreasingly from the ankle to the thigh and in that way increasing the blood flow speed.

The advantages are as follows:

1. Good adaptability
2. Comfortable to wear
3. The right compression
4. Pressure sore prophylaxis
5. Safety conscious



Anti-embolism stockings

The specially developed silicone top string makes it possible for the staff immediately to see if the stocking fits.



The colour coded, padded heel reduced the risk of forming pressure sores at the same time as it shows the correct position on the heel.



The inspection opening under the foot is used for controlling the blood flow at the same time as it prevents the patient from falling or sliding.



The antibacterial toe reduces the formation of bacteria, even after the stocking has been washed several times.



Simonsen & Weel transfer injuries



Transfer injuries

Transfer of patients

Many pressure sores develop when the patient is repositioned. It is therefore important to:

- Avoid pulling the patient by repositioning
- Use the positioning aids to reduce friction and shear
- Remove positioning aids after use
- Frequent examination of the patient's skin
- Place the patient on a smooth mattress
- Examine the patient for pressure traces after every repositioning
- Register and closely monitor every sign of pressure traces on the patient
- Place the patient in anatomical correct position and not to pull the mattress as it may cause friction on the patient's skin

Spare duvet covers and draw sheets under the patient's skin should be removed as they reduce the effect of the pressure relieving mattress. A transfer sheet has to be used as the standard transfer aid as the transfer sheet prevents pressure sores as well as spares the care workers for heavy lifting.

Transfer staff

Take care of yourself and your body when transferring a patient. Use the transfer aids to avoid unnecessary injuries. With the right aids a transfer takes no time at all.

Simonsen & Weel Correct transfer and positioning aids



The importance of correct positioning aids

Correct positioning aids are crucial to secure the best positioning of the patient. On the following pages we will present the positioning aids that create the best position of the patient. Simonsen & Weel has in cooperation with Danish hospitals developed the mattress products ESWELL that consist of pressure distributing mattresses and pads that give the patient optimal comfort while positioned and during hospital stays.

Different types of mattresses

Static pressure distributing mattresses: The principle of the static pressure distributing products is to create a larger weight bearing surface to distribute the user's body weight and thereby achieve a lower pressure. Static mattresses are ideal for patients with up to category 2 pressure ulcers, but can also be used for category 3 pressure ulcers if an effective turn schedule is used.

Dynamic pressure distributing mattresses: The principle of the dynamic pressure relieving products is that the pressure location on the body is moved periodically after predetermined time periods or individual setting. Dynamic mattresses are typically used for patients with pressure ulcers in category 3 and 4

ESWELL Foam

Description

The ESWELL mattresses and pads are built up as a 2-layer sandwich construction, typically comprising viscoelastic foam with a specific density of 80 kg/m³ and HE foam with a specific density of 40 kg/m³ for optimal pressure distribution. Owing to its pressure relieving effect the purpose of the mattress is to eliminate the risk of pressure sores, which can easily occur during long-lasting surgery.

Characteristics

- Prevents pressure sores
- More environmentally-friendly than other foam materials
- Meets requirements for fire resistance
- Maintains body temperature during surgery
- Guaranteed for 3 years

ESWELL Cover

Description

The cover comes in different colours and is made of waterproof and breathing Decu-Tex[®] material, which mainly consists of polyurethane. For optimal hygiene all covers are fully-welded. The covers are fitted with a plastic zipper which makes it easy to remove the cover for cleaning. The cover is folded over the zipper to avoid skin injury to skin of the patient or others before, during and after surgery.

Characteristics

- Easy to clean (can be washed at 95°C)
- Can be spin-dried or tumbled at temperatures up to 130°C
- Counteracts the formation of bacteria and fungus
- Fully-welded cover with non-slip bottom
- Latex-free
- 1 year guarantee on cover

ESWELL

Anti-bacterial material

As a quite unique feature, Simonsen & Weel can offer operation mattresses and pads made of anti-bacterial material, Dartex Silver 3, which kills more than 99,9 % of MRSA, the staphylococcus bacteria, which in Denmark is primarily found in hospitals and nursing homes.

The material has been tested according to international standards and its effect has been documented over a period of 48 months. After that the material loses its function and must be replaced.

The process works as follows: The material contains silver ions which are present in soluble chambers close to the surface. When the surface gets in contact with water the chambers slowly solute and the silver ions will be present directly on the surface. When the staphylococcus bacteria hits the surface it interacts with the silver ions and the bacteria is killed.

ESWELL

Coated material

To smaller items, such as face pads, it will often be advantageous to coat the foam instead of producing a suitable cover.

In the coating process the material is sprayed with a quick-drying substance forming a thin and waterproof coating.

The advantage of the coating is, among others, that the patient avoids bruises on body and face caused by seams and/or welds. Furthermore, the production is faster and cheaper and the material can be autoclaved.

ESWELL

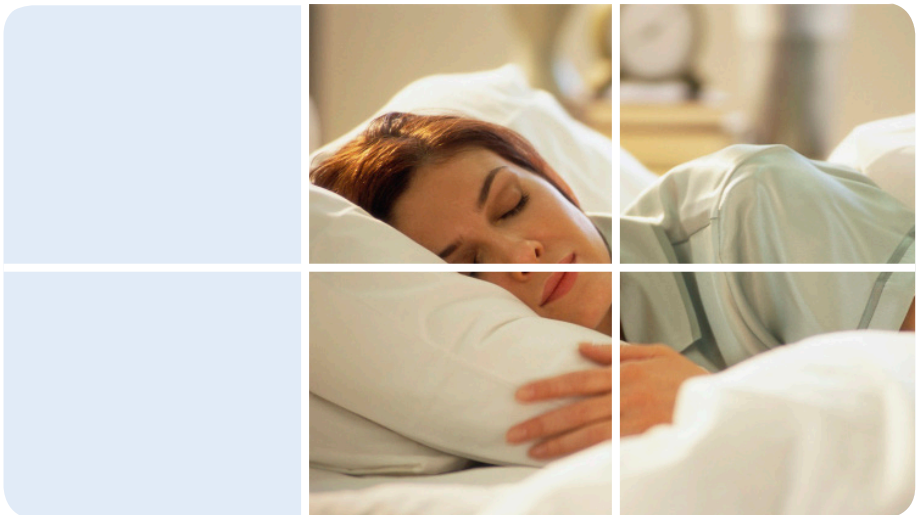
Cleaning and maintenance

The foam should not get in contact with water, as this can affect the pressure relieving effect of the material. The Decu-Tex® cover on the other hand can be wiped and has been tested with a series of cleansing agents. Superficial filth on the cover can be removed with a soft, wet cloth with a neutral cleansing agent. Other filth can be removed by first using methyl alcohol followed by hot water and a cleansing agent.

Cleaning and disinfection can be done with lukewarm water and a neutral cleansing agent or with a sodium hypochlorite dissolution (0,1 % or 1000 portion per million chlorine).

Own disinfection remedies can be used if the instructions of the producer are followed. By use of normal cleansing agents the cover can be washed at maximum 95 °C.

Prober drying is important in regards to maintenance. The material can be air-dried, spin-dried or tumbled at temperatures up to 130° C. The cover should not be mangled or wringed.



ESWELL

positioning pads

Simonsen & Weels positioning pads promotes and secures optimal positioning of the patient during surgery. Our wide selection of positioning pads gives the care workers numerous options to obtain the most expedient positioning of the patient.

The positioning pads relief pressure and increases the pressure distribution and secure the patient comfortable positioning even in awkward positions. Furthermore the pads provide help by re-positioning and care of the patient. The positioning pads are easy to use and work with.

ESWELL

Pressure distributing mattresses

We offer a wide range of standard mattresses for hospital beds, pads for chairs and wheel chairs as well as special mattresses for children and infants. All products include our unique Decu-TEX® cover.

Our standard mattresses come in eight different sizes and four different qualities. The qualities are: Patients with a weight up to 130 kg, patients with a weight up to 140 kg, patients with a weight up to 200 kg, patients with a weight more than 200 kg.

The sizes are as follows:

80 x 200 x 12/14 cm
85 x 200 x 12/14 cm
90 x 200 x 12/14 cm
85 x 205 x 12/14 cm
80 x 210 x 12/14 cm
85 x 210 x 12/14 cm
90 x 210 x 12/14 cm
95 x 210 x 14 cm

ESWELL

Pads for chairs and wheel chairs

We also offer pads for chairs and wheel chairs in four different sizes and two different qualities. The qualities are as follows: Patients with a weight up to 120 kg, patients with a weight more than 120 kg.

The sizes are as follows:

43 x 43 x 7.5 cm; 43 x 45 x 7.5 cm; 45 x 45 x 7.5 cm; 50 x 50 x 7.5 cm

ESWELL Made-to-measure pads and mattresses

If one of our many standard pads or mattresses does not fit your customer's needs, it is also possible to produce it according to your wishes. When you order a made-to-measure pad or mattress, it is important that you either provide us with the exact measures or indicate the size with a drawing.

In addition to the measures, we also need to know whether you want the product with or without zipper and if you want a non-slip cover on the bottom. The zipper is essential if you want the option to remove the cover to wash it separately. The non-slip cover is very useful if the pad is placed directly on an operation table or stretcher. Thereby, the use of Velcro is eliminated.



Transfer aids - Trans-Slide Tri-Clean

One of the most difficult tasks for care providers is the repositioning of bedridden patients, especially the patients who cannot move their body. In the future the transfer of patients will probably be an extensive problem due to an aging population as well as the increase of bariatric patients.

Simonsen & Weel offer a unique transfer sheet especially developed for solving the problems surrounding the transfer of patients in a bed. The transfer sheet, Trans-Slide Tri-Clean, is made of a very smooth material treated with a special coating. This characteristic combined with the 2-layer design gives an incredible smooth aid, which reduces friction significantly. This reduction of friction minimizes the patient's risk of forming transfer injuries. It also reduces the physical effort of the care providers by vertical and lateral transfers of patients.

All care providers working with transfers will benefit from using the Trans-Slide Tri-Clean.

The advantages of Trans-Slide Tri-Clean are:

- Reduces the physical weight surrounding the transfer – for the care provider and the patient
- Very durable and long life
- Can be washed by temperatures up to 95°C
- Suitable for cleansing
- Suitable for disinfection
- Easy to use
- Saves time and money
- Huge friction reduction

Simonsen & Weel Correct positioning



Correct positioning in general

A patient unable to move due to paralysis or anesthesia is vulnerable to form pressure sores and nerve injuries. The purpose of correct positioning is to avoid or reduce the risk of complications. Expedient positioning of the patient is partly preventive and partly part of the treatment if tissue damage has formed. The principle of correct positioning is the use of the antispastic pattern.

The expedient positioning should take the patient, the surgeon and care workers into consideration. An optimal positioning therefore often comes into place in cooperation between porters, operation and anaesthesia workers. The positioning should always be approved by the surgeon.

Always be aware of not moving pressure from one area to another. If the heel should be relieved, it is not ideal to place something under the ankle. This way the pressure is only moved to the Achilles' tendon instead of the heel and the pressure on the sacrum is increased. If the heel needs to be relieved, a positioning pad should be placed under the lower leg.

The precautions needed to be taken prior to the mostly used positions are illustrated and described on the following pages. These are: back positioning, abdominal positioning, side positioning, extension positioning and GU-positioning. Furthermore there are a wide range of special positions not illustrated in this guide as they often are based on the illustrated positions.

General positioning precautions

- The patient is involved in the positioning to the extent possible
- The patient is positioned for the shortest time possible
- Avoid hard foundations, sharp borders, different height levels and folded clothes and sheets
- The patient is positioned on a pressure distributing mattress and is padded in vulnerable areas
- Avoid the care workers leaning against the patient and avoid heavy and sharp instruments on the patient
- During long lasting surgery the positioning should be changed a bit if possible
- The positioning should be checked continuously during operation with a view to re-positioning

Back positioning

Aids:

- ESWELL pressure distributing mattresses
- ESWELL OR head pad
- ESWELL mattresses for arm support
- ESWELL leg pad and heel pad
- Possibly leg holder

Be aware that:

- That the patient is positioned on a smooth and even mattress
- That the patient is not positioned with crossed legs
- That the head pad is not in contact with the shoulders of the patient
- That the arm support has the right height and that the shoulders of the patients are not overstretched (no difference in height level)
- That the arms of the patient are max. flexed 90°
- That the arms of the patient are placed in supination (hands facing upwards) if possible to avoid pressure in the cubital tunnel
- That the elbows are not exposed to pressure where nervus ulnaris runs behind the elbow joint
- If one arm has to be strapped along the patient's body, this has to be done with an arm sling
- To place a leg holder around the legs a over the knees (the leg holder should not be tight)
- That the back positioning leaves a heavy pressure on shoulders, heels and sacrum

Illustration of correct back positioning



Abdominal positioning

Aids:

- ESWELL pressure distributing mattresses
- ESWELL face pad
- ESWELL pads for abdominal positioning
- ESWELL pads for arm rests. Arm rests especially for abdominal positioning in advantage to Stockholm armrests
- ESWELL cushion
- Possibly leg holder

Be aware that:

- That the head of the patient is not rotated more than 60 degrees (nervus occipitalis)
- That by udadrotation in the hip the lateral malleolus is exposed to pressure against the mattress
- That the arm rests are placed in the same height as the patient´s shoulders so they are not exposed to abnormal stretching (plexus brachialis)
- That the elbows of the patient are not exposed to pressure where nervus ulnaris runs behind the elbow joint
- That the patient is turned with both arms placed along the side and that the head is fixed in sagital level until the patient is turned
- That the thorax pads are not pressing against the neck of the patient
- That the toes of the patient are not in contact with the mattress (use a cushion)
- To place a leg holder around the legs over the knees

Illustration of correct abdominal positioning



Side positioning

Aids:

- ESWELL pressure distributing mattresses
- ESWELL side positioning mattress
- ESWELL mattress for arm rest
- ESWELL OR support pad
- ESWELL small side holder
- ESWELL large side holder
- Leg holder
- Possibly granulate pads between the patient´s knees
- Possibly goepfels holder with arm support

Be aware that:

- That the arm rest for the lower arm of the patient has the right height, that the shoulder is not pushed forward and that there is no pressure on the elbow where nervus ulnaris runs behind the elbow joint
- That the side support is not tightened too much and that the metal is not in contact with the patient´s skin
- That the prominence of the thigh bone is a great risk
- That is advantageous to place a granulate pad between the patient´s lower legs and knees so it covers the whole lower leg of the patient. This way it is possible to avoid pressure on the inside of the knees, medial malleolus and heels
- That the leg holder is placed around the patient´s lower leg
- That the arm placed in the goepfels holder should not be stretched. This is prevented by placing the goepfels holder at height with the shoulder
- That there might be a pressure on the outer side of the knee by underweight patients

Illustration of correct side positioning



Extension positioning

Aids:

- ESWELL pressure distributing mattresses
- ESWELL OR head pad
- ESWELL mattresses on arm rests
- ESWELL goepfels leg holder with arm/leg support
- Draw sheet

Be aware that:

- That the patient's leg is padded and fixed in the boot (avoid to tighten it too much)
- To place a knee cushion (if the leg is hanging to avoid stretching on nervus peroneus)
- That the leg holder is not pressuring the medial side and the lateral side of the healthy knee
- That there is no vein stasis in the patient's lower leg
- That the leg holder is not pushed too far from the body – it may cause a stretch/pressure on nervus femoralis and nervus obturatorius
- That the arm on the operated side is fixed in an arm support, no stretch on the shoulder (plexus brachialis) and no pressure on the elbow. Pad if the patient is very thin
- That the arm rest has the right height and that the shoulder is not overstretched and that there is no pressure on the elbow

Illustration of correct extension positioning



GU-positioning

Aids:

- ESWELL pressure distributing mattresses
- ESWELL OR head pad
- ESWELL mattresses on arm rests
- American leg holders or goepfels leg holders with leg/arm support

Be aware that:

- That there is no vein stasis in the patient´s lower leg (the foot should be at the same height or higher than the patient´s knee)
- That the leg support is not pressuring the lateral or medial side of the patient´s knee (nervus peroneus and saphenus)
- That the legs are correctly positioned in the leg supports. The feet and lower legs should not be twisted
- That heavy flexion of the thigh is avoided (not more than 90 °)
- That the leg support has the right height
- That the patient´s legs are not separated more than necessary. The stretch on the inside of the thigh should be reduced as much as possible
- That there is no pressure on the elbow, where nervus ulnaris runs behind the elbow joint
- That the leg supports are not pressuring the lateral side of the knees
- That the arm rests have the right height and that the patient´s shoulder joint is not overstretched

Tips for positioning in leg support:

Place the patient´s foot in the leg support so that the sole of the foot touches the boot bottom. With the aid of the black handles, the patient´s leg is positioned right (preferably symmetrical) – during this procedure the knee/lower leg should point at the opposite shoulder.

Illustration of correct GU-positioning



Simonsen & Weel Positioning courses



Positioning courses

The positioning experts from Simonsen & Weels give positioning courses in which different positioning techniques and positions are gone through. You and your colleagues will have the opportunity to ask questions regarding the specific positions causing trouble in the everyday work. You will also be updated on the most efficient transfer methods and positions as well as have the opportunity to test our unique selection of positioning pads and mattresses.

Our positioning courses normally have duration of 2-4 hours, but the course can be adjusted to your needs and time frame.



We hope that this folder has made the importance of correct positioning clear as well as given some methods in how to prevent positioning injuries like pressure sores, shear, friction and nerve injuries. If you have any questions regarding correct positioning or positioning aids or if a course in your ward could be of interest, please do not hesitate to contact our product manager: +45 21 71 00 87 or our product specialist: +45 21 71 00 70.

Simonsen & Weel contact information



Simonsen & Weel contact information

If you have any questions regarding our selection of positioning equipment, please do hesitate to contact our customer service. Our opening hours are Mondays-Thursdays 8am-4pm and Fridays 8am-3.30pm.

All orders on standard products received before 4pm (3.30pm on Fridays) are sent the same day. The delivery time on non-standard products is approx. 4 weeks.

You can order by phone, e-mail or fax:

Phone: +45 70 25 56 10

E-mail: ks@sw.dk

Fax: +45 70 25 56 20



Simonsen & Weel References & Enclosures



References

For further reading we refer to the following work and rapports in which we have found inspiration:

Pressure Ulcer Prevention (2009) af European Pressure Ulcer Advisory Panel (EPUAP) og National Pressure Ulcer Advisory Panel (NPUAP)

Evidensbaseret klinisk retningslinje for forebyggelse af trykskader hos patienter med hoftebrud (2009) by Forskningsssygeplejerske Anne-Birgitte Vogelsang

Sårjournal. Prævalensundersøgelse 2008 for trykspor og tryksår i somatiske afdelinger (2008) by Sårsygeplejerske Anne Ørskov

Lejring af operationspatienter (2007) by operationssygeplejerskerne: Birte Knudsen, Anne-Marie Nielsen, Henriette Vestergaard og Lisbeth Jensen

Hospitalssengen (2006) by Greta Randrup Olsson

Guidelines til forebyggelse af tryksår (2005) by Hjælpemiddelinstitutionen

Tryksårsforebyggelse i den siddende stilling (2003) by Helle Dreier

Forebyggelse og behandling af tryksår (2002) by Videncenter for sårheling

Lejring by Klinisk udviklingssygeplejerske Monica Kegel Dalsgaard

Vejledning i positionering by Etac

Medicinske patienter i skammekrogen in Dagens medicin



Enclosure 1 – Pressure sore screening

The purpose of the pressure sore screening is:

- To identify patients in risk of forming pressure sores to start preventive measures.
- To get a documentation tool that also secures systematism.
- To increase the ward´s focus on preventing pressure sores.

There are numerous approved screening tools and methods of which the Braden scale is very prevalent (see enclosure 2).

Clinical senior nurse, Anne Ørskovs, who is a wound expert has established support groups and teaches care workers, students and trainees about wounds.

Anne Ørskov has also developed the following very useful pressure sore screening system:

Pressure sore screening

Patient's name and social security no.:

Form no.:

Year:

Ward:

By hospitalization (answer yes / no):

1. Has the patient any pressure sores (if possible, what stage)
2. Is the patient walking / self-reliant
3. Does the patient suffer from diabetes

Complete the rest of the form if: 1 + 3 = Yes and/or 2 = no

Enclosure 1 – Pressure sore screening

Ad hoc screening tool

Date:

Signature:

Does the patient have trouble doing activities in general?

- 0 = No or insignificant activity limitations
- 1 = Slight or some activity limitations
- 2 = Moderate activity limitations
- 3 = Severe limitations
- 4 = No activity possible

Does the patient have the will and ability to mobility?

- 0 = Yes
- 1 = Yes, partly
- 2 = No

Has the patient been exposed to pressure in the same area more than 1½ successive hour during 24 hours?

- 0 = No
- 1 = Yes, one time during 24 hours
- 2 = Twice during 24 hours
- 3 = Yes, more than twice during 24 hours

Is the patient placed on friction reducing aid during repositioning and transfer?

- 0 = Yes, or not relevant
- 1 = Yes, every 2 times on average
- 2 = No

Total score:

Calculate Ad hoc score

- 0 point: No risk
- 1 - 4 point: Low risk
- 5 - 8 point: Middle risk
- 9 - 11 point: High risk

Patients who are not confined to bed and self-reliant are not to be screened. All other patients incl. patients with diabetes have to be screened.

Patients who are to have surgery of more than 1½ hour duration have to be screened.

Patients in the risk groups: low, middle and high as well as patients with dysregulated diabetes ($\text{hba1c} \geq 8$) have to be re-screened one time per week.

Enclosure 2 – The Braden scale

The Braden scale evaluates a patient's risk of forming pressure sores (it does not take the patient's age, BMI, any peripheral ischemia, any pressure sores and their stage into consideration).

It is therefore essential that the Braden scale, and any other screening tool, is used in combination with the medical experience of the care workers.

In the Braden scale a patient scores in the specific risk factors – the lower the score, the higher the risk of pressure sores.

No risk: 21-23 point

Low risk: 19-20 point

Middle risk: 12-18 point

High risk: 6-11 point

Make sure to re-position the patient. Frequent change the lying and sitting position to relieve or distribute the pressure and to increase the comfort.

Enclosure 2 – The Braden scale

The Braden scale for predicting pressure sore risk

<p>*Sensory perception: The ability to respond meaningfully to pressure related discomfort</p>	<p>1. Completely limited Unresponsive (does not react, flinch or groan) to painful stimuli, also to diminished level of consciousness or sedation, OR Limited ability to feel pain over most of body surface</p>	<p>2. Very limited Responds only to painful stimuli. Cannot communicate discomfort except by moaning or restlessness, OR Has a sensory impairment, which limits the ability to feel pain or discomfort over ½ of the body.</p>	<p>3. Slightly limited Responds to varied discomforts but cannot always communicate discomfort or need to be turned, OR Has some sensory impairment, which limits ability to feel pain or discomfort in 1 or 2 subdivisions</p>	<p>4. No impairment Responds to varied discomfort. Has no sensory deficit which would limit ability to feel or voice pain or discomfort.</p>
<p>*Moisture Degree to which skin is exposed to moisture</p>	<p>1. Constantly moist Perspiration, urine, etc keep skin moist almost constantly. Disposition is detected every time the patient is moved or turned.</p>	<p>2. Moist Skin is often but not always moist. Linen must be changed at least once a shift.</p>	<p>3. Occasionally moist Skin is occasionally moist, requiring an extra linen change approximately once a day.</p>	<p>4. Rarely moist Skin is usually dry; linen requires changing only at routine intervals.</p>
<p>*Activity Degree of physical activity</p>	<p>1. Bedfast Confined to bed</p>	<p>2. Chairfast Ability to walk severely limited or nonexistent. Cannot bear own weight unless seated in bed or wheel chair.</p>	<p>3. Walks occasionally Walks occasionally during day but for very short distances with or without assistance. Speaks negatively at such shift in bed or chair.</p>	<p>4. Walks frequently Walks outside the room at least twice a day and inside the room at least once every 2 hours during waking hours.</p>
<p>*Mobility Ability to change and control body position.</p>	<p>1. Completely immobile Does not make even slight changes in body or extremity positions without assistance</p>	<p>2. Very limited Makes occasional slight changes in body or extremity positions but unable to reposition frequently or significant changes independently.</p>	<p>3. Slightly limited Moves frequently through slight changes in body or extremity positions independently.</p>	<p>4. No limitations Makes major and frequent changes in position without assistance.</p>
<p>*Nutrition Usual food intake pattern.</p>	<p>1. Vary poor Never eats a complete meal. Rarely eats more than 1/3 of any food offered. Eats 2 servings or less of protein (meat or dairy products) per day. Takes fluids poorly. Does not take a liquid dietary supplement OR Is NPO and/or maintained on clear liquids or IV for more than 5 days.</p>	<p>2. Probably inadequate Rarely eats a complete meal and generally eats only about 1/4 of any food offered. Protein intake includes only 3 servings of meat or dairy products per day. Occasionally will take a dietary supplement OR Receives less than optimum amount of liquid diet or tube feeding.</p>	<p>3. Adequate Eats over half of meal served. Eats a total of 4 servings of protein (meat, dairy products) each day. Occasionally will refuse a meal, but will usually take supplement if offered OR Is on a tube feeding or TPN regimen, which probably meets most of nutritional needs.</p>	<p>4. Excellent Eats most of every meal. Never refuses a meal. Usually eats a total of 4 or more servings of meat and dairy products. Occasionally eats between meals. Does not require supplement.</p>
<p>*Friction and shear</p>	<p>1. Problem Requires assistance to overcome resistance in moving. Complete tilting without sliding against sheets is impossible. Frequently slides down in bed or chair, requiring frequent repositioning with maximum assistance. Squinting, restlessness, or agitation leads to almost constant friction.</p>	<p>2. Potential problem Moves freely or requires minimum assistance. During a move skin probably slides to some extent against sheets, chair, restraints, or other devices. Maintains relatively good position in chair or bed most of the time but occasionally slides down.</p>	<p>3. No apparent problem Moves in bed and in chair independently and has a sufficient muscle strength to lift up completely during moves. Maintains good position in bed or chair at all times.</p>	

Enclosure 3 - Nutrition

General recommendations regarding nutrition.

Make a nutrition screening of all persons in risk of forming pressure sores in the whole health care sector; and offer guidance in proper nutrition for all persons in risk of developing nutrition problems and forming pressure sores.

This should include:

- Nutrition valuation
- Valuation of nutritious needs
- Identification of feeding methods
- Measurement of the nutritious effect
- Re-evaluation of the nutritious status when changes in the person´s condition

Correct nutrition is essential, as it improves the general condition of the patient.

Simonsen & Weel offer a wide selection of nutrition products and our dieticians are always available for guidance within the nutritious area. Call us for further information: +45 70 25 56 10.

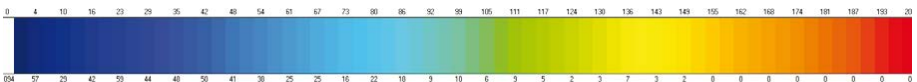
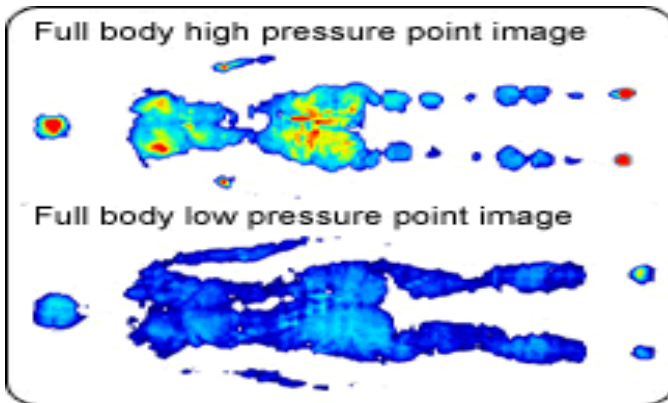


Enclosure 4 - Pressure Imaging System

Simonsen & Weel has a XSENSOR Pressure Imaging System that can measure the pressure which the user is exposed to on a given mattress.

Pressure Imaging Systems allow monitoring and comparison of pressure distributions over time. It dynamically measures the interface pressure between two surfaces (eg.: human body and mattress)

The colors illustrate the pressure which the user is exposed to. The light blue and blue color indicates areas of low pressure. Yellow, orange and red shows areas where the body is subjected to a high, uncomfortable pressure, which reduces blood circulation. The red color is extremely alarming - positioning cushion should be used to reduce pressure on on vulnerable areas.



Simonsen & Weel is Denmark's oldest supplier of equipment to the Danish health care sector, with a history back to 1817. We are distributing products from some of the world's leading manufacturers of medical equipment, compression stockings and medical nutrition.

Today, we are approx. 50 employees. Most of us operate from our main office just outside Copenhagen. Our product specialists cover the whole Denmark including the Faroe Islands and Greenland.

In addition to our product specialists, we have a very competent sales and after sales service as well as a technical service department with specialists within each of our key business units.

It is our philosophy that we only cooperate with leading manufacturers of products that fit in with our main business areas, which helps us strengthening our position as the Danish health care sector's preferred collaborator.



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