Mattress
Clinical Cases

Academy Replacement Mattress

December 1997
This report contains the results of a 12 months clinical evaluation of the Vicair Academy mattress which represents a new concept in pressure relief. The patients involved in this study all have different needs with regard to their support surface. The advantage that the Vicair mattress offers is the simple and reliable, non-powered high performance pressure relief. The contents of this report clearly demonstrates the Vicair mattress to be useful as a replacement of high performance powered pressure relief support surfaces.

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Patient:
A 48-year old man, normal shape with a length of 173 cm and a body weight of 71 kg.

Main Diagnosis:
Traumatic spinal cord lesion with a vertebra fracture at L2 in 1970
Loss of motor function: L1 right side incomplete, L3 complete and L3 left side complete
Loss of sensation: L1 incomplete, L2 complete
Incontinence for urine and faeces
AIS Scale: A

Medical history:
- Decubitus grade III at the os sacrum in December 1995
- Bricker bladder
- Neurogenic Heterotopic Ossification in right knee

Sensitivity for the development of pressure ulcers:
Recurrent decubitus in 1975, plastic reconstruction
Increasing risk over the years.

Indication for Vicair mattress:
This patient suffered from increasing sleep difficulties due to the inability to sleep on his back because of redness at the sacrum after two hours of sleep. Patient used a block foam mattress. Taking away foam blocks at the sacral area caused a redness around the sacrum after the same two hours (Pressure annulus). During sleeping on the foam mattress, usually on the left side, decubitus grade I developed on the big toe and the left trochanter.  
The position of the stoma (Bricker) made it difficult to sleep on the right side. Since January 10th 1997, patient is using the Vicair Academy mattress in his home environment, with a low friction cover. The mattress lies on a normal bed frame with fixed bottom

Conclusion:
Patient can sleep again on his back without occurring redness in the sacral area. Also sleeping on the right or left side is no problem. In general, his sleep comfort improved considerably. The very vulnerable parts of the feet like the heel are adequately supported by this mattress. During the last clinical check-up in July 1997 his skin condition in the sacral area was excellent!

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No Figures available
Patient:
A 65-year, obese man with a body weight of 88 kg. Admission to hospital for bladder/bowel training and to make a choice for different anti-decubitus aids and training transfers.

Main Diagnosis:
AIS Scale: C

Medical history:
Gallbladder removal, Dotter procedure with stent implantation, aortabifurcation prosthesis.

Sensitivity for the development of pressure ulcers:
Increased risk.

Indication for Vicair mattress:
During his stay in hospital the patient was nursed on self regulating air overlay mattress. For practical reasons it was decided to look for a suitable mattress for the home situation. Primary goal was to diminish the pain during sleep with the possibility of an independent transfer from bed to wheelchair. An other factor that was of importance was the place of the mattress in a two double bed frame with the wish to have as little as possible a difference in height compared to a normal mattress. The mattress had to be able to adjust to different body postures and provide sufficient pressure relief. The Vicair Academy Dry Air mattress with a low-friction cover was used for four weeks.

Conclusion:
The Vicair mattress offers optimal protection with regard to decubitus prevention during the different body positions. Also it offers a stable base for making transfers from bed to wheelchair. The personal choice of the patient for the Vicair mattress was based on the comfort, the least pain in the low back region he experienced on this mattress.

Figures: next page(s):  
Figure 1: patient in half upright position
Figure 1: patient in half upright position
Patient:
A 35-year-old man, obese, with a length of 174 cm and a weight of 85 kg. Admission to the RCA (- Rehabilitation Center Amsterdam) for recovery from severe decubitus at the trochanter on both sides.

Main Diagnosis:
Traumatic spinal cord lesion T6 in 1982
Motor and sensory loss: T6 complete
Incontinence for urine and faeces.
AIS Scale: A

Medical history:
Uptake in hospital after serious self neglecting due to a severe mental depression. Decubitus Grade IV at left and right trochanter with involvement of both hip joints (see figure). Also combined with psoas abscess and necrosis at both palmar planes and several abscesses in the abdominal wall. Altogether, a life threatening situation. In the hospital both femurs heads were removed and a colostoma installed.

Sensitivity for the development of pressure ulcers:
Highly sensitive to decubitus.
Recurrent decubitus in the past. In 1988 patient suffered from decubitus on the right tuber with fistulation to the left groin and scrotum. This defect was repaired by plastic surgery using a V-Y advancement gluteal inferior plasty.

Indication for Vicair mattress:
Also in this case the aim was to look for a mattress that was most suitable for use in the home situation. Directly after take up in the rehabilitation clinic, patient was nursed at a Low Air Loss bed. After consolidation of several of the wounds, patient was nursed for two months on a Vicair mattress with a low friction cover.
The patient was nursed on his back for twenty four hours per day without being turned. Three times a week, the patient was out of his bed for one hour taking a shower. After further consolidation of the wounds patient was re-operated for further correction of the defects around his right hip joint. Postoperative patient was again nursed on a Vicair mattress for five weeks.
After this, the patient was again transferred to hospital for the next surgical procedure, this time at his left hip joint.

Conclusion:
The level of pressure relief of the Vicair mattress in this case was remarkable considering that the patient was not turned and therefore slept on his back for twenty four hours a day. Because of the non-powered nature of the mattress patient could easily be transported through the clinic which increased his mobility (see picture at balcony). The patient judged the mattress to be warmer as opposed to a Low Air Loss bed. Because of wound infection no definitive choice for a mattress in the home situation has been made.
Figures: next page(s):

Figure 2: X-ray of patient’s right hip

Figure 3: X-ray of patient’s left hip

Figure 4: Wound at left trochanter at the time he was nursed on the Vicair mattress

Figure 5: Wound at right trochanter at the time he was nursed on a Vicair mattress

Figure 6: Wound at right hip after secondary closure

Figure 7: Patient at balcony: easy mobility of bed due to non powered nature of mattress
Figure 2: X-ray of left hip

Figure 3: X-ray of right hip
Figure 4: Wound on left trochanter when nursed on a Vicair Mattress

Figure 5: Wound on right trochanter when nursed on a Vicair mattress
Figure 6: Wound on right hip after secondary closure

Figure 7: Patient on balcony on his non-powered mattress
Patient:
A 50-year old, obese man with a length of 184 cm and a body weight of 96 kg. Admission to the RCA for severe recurrent pressure sore at the left ischial tuberosity.

Main Diagnosis:
Status after traumatic spinal cord lesion at C6 after dislocation at C5-C6 in 1986
Loss of motor and sensory function: C6 complete
Autonomic function loss: C6 complete
Incontinence for urine and faeces
AIS Scale: A

Medical history:
Supra-pubic bladdereatheter
Neurogenic Heterotopic Ossification around the hip joints

Sensitivity for the development of pressure ulcers:
Patient is very sensitive for the development of pressure sores on the basis of his psychological condition. Recurrent decubitus on the left and right tuber with several plastic surgical corrections.
Re-admission to hospital for a pressure sore on the left tuber with a fistula to the urethra. Urine was leaking through the fistula through the wound.

Indication for Vicair mattress:
His current high performance air mattress was worn out and no longer available on the market (a so-called Schell bed). He needed a suitable new solution for the home situation. Important in making a selection was the ability to spent the night without turning giving him. Patient prefers to sleep on his left side.
During the admission period several mattresses were tried. On a low air loss bed the patient was sufficiently protected. On an alternating pressure relief mattress bed the patient developed red discoloration's in the trochanter area which made turning every 4 hours necessary. After this, the patient was nursed for two and a half weeks on a Vicair Academy mattress, 90x200 with a low friction cover.

Conclusion:
On the Vicair mattress the patient was sufficiently protected without the need for turning. Patient experiences less pain on the Vicair mattress, lies stable and has no complaints about perspiration. In the meantime patient has gone home where he sleeps on a Vicair mattress.

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Figures: next page(s):
Figure 8: wound on left ischial tuberosity with fistula
Figure 9. patients back after 8 hours on Vicair mattress without rotation
Figure 8: wound on left ischial tuberosity with fistula

Figure 9: patients back after 8 hours on Vicair mattress without rotation
Patient:
A 2,5 year old boy with a length of 70 cm and a weight of 23 kg.

Main Diagnosis:
Chondroplasia Punctata: this is a rare genetic defect causing severe growth disturbances with joint stiffness especially in the spinal trunk. Due to the limited movement of the chest, this disease is often complicated with recurrent bronchitis.

Sensitivity for the development of pressure ulcers:
Very limited

Indication for Vicair mattress:
The little boy has great difficulty in sleeping. His sleep is interrupted a couple of times each night. He sweats and gets thirsty. Due to his impaired chest mobility and subsequent bronchitis problems he sleeps in a slightly upright position. This is difficult on a normal mattress because he slides down. Since one year he sleeps on a Vicair paediatric mattress.

Conclusion:
The desired body position on the mattress could be realised because of the ability to change the contents of the different compartments of the Vicair mattress. After some experiments with the filling grade of the different compartments during the first week this resulted in a considerable reduction of complaints. The boy sleeps more at ease and for longer periods. The sweating and thirst has greatly diminished. After one year of use, the parents are still very happy with the mattress. Because the little boy is now fed through a catheter, the improved stability is even more appreciated.

Figures: next page(s):
Figure 10: Little boy on Vicair mattress in slightly upright position
Figure 11: Little boy from the side on the Vicair Mattress
Figure 10: Little boy on Vicair mattress in slightly upright position

Figure 11: Little boy from the side on the Vicair Mattress
Patient:
A 33-year old pregnant female.

Main Diagnosis:
Traumatic spinal cord lesion with a vertebra fracture at L1 and conus cauda lesion since 1993
Loss of motor function: L3 complete
Loss of sensation: L3 complete, L4 complete
Vegetative: complete
Incontinence for urine and faeces
AIS Scale: A

Sensitivity for the development of pressure ulcers:
Increasing risk over the years

Indication for Vicair mattress:
Patient is pregnant since three months and suffers since many years form pain in both legs, so-called deafferentiation pain (electrical pains) especially on the side where she lays on. The medication she normally takes for these pains is contradicted during pregnancy. Her normal mattress consists of a foam with a sheepskin on top. With the aim to lower the pains she tried a Vicair Academy Dry Air mattress with low friction cover during three weeks in the home situation.

Conclusion:
Sleeping on a Vicair mattress reduced the pain considerably. Patient can sleep longer on her back and prefers sometimes a stable side position. The patient has the impression that the moulding effect of the mattress makes less muscle activity necessary. The decubitus protection is sufficient. Another advantage she experiences is the normal outlook and size of the mattress which makes it fit into a normal double bed.

Figures: next page(s):
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**VICAIR MATTRESS: CLINICAL CASE 7**

**Patient:**
A 27 year old male with a weight of 72 kg and a length of 192 cm. Admission to the RCA for clinical rehabilitation after an acute spinal cord lesion.

**Main Diagnosis:**
- Traumatic spinal cord lesion C4 in December 1995
- Luxation fracture C3-C4, stabilisation by an anterior spondylodesis with internal fixation
- Loss of motor function: C4 complete
- Loss of sensation: C4 incomplete, T4 complete
- Vegetative: complete
- Incontinence for urine and faeces
- AIS Scale: A

**Sensitivity for the development of pressure ulcers:**
Highly sensitive.

**Indication for Vicair mattress:**
The patient was during his rehabilitation process nursed on different alternating pressure relief mattresses overlay and replacement systems.
As a result of failures in handling of the powered mattresses patient developed a decubitus grade I/II in the sacral region. Because of the intention of the patient to live completely independent it was his wish to have a non-powered mattress like a Vicair Replacement Mattress or an air flotation overlay.
Because of occurring spasm during sleep patient slept with foam blocks on his legs and a tension sheet over his knees. Patient slept for several weeks on a Vicair Academy Mattress with low friction cover.

**Conclusion:**
Patient experienced the Vicair Mattress as a reliable mattress with a high performance preventive action. Both with sleeping on his back or with sleeping on his side no redness occurred. This was important with regard to his wish to remain independent without the need to be turned during night. The application of a tension sheet did not cause any problems. The mattress had no negative or positive influence on the occurrence of spasm. After testing different mattresses patient choose a Vicair mattress because of the independence from electricity and reliable performance. In the meantime the patient has gone home and received a Vicair mattress from his health insurance company.

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*Figures: next page(s):*

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Patient:
A 60 year old, skinny man with a weight of 56 kg and a length of 181 cm. Admission to the RCA for rehabilitation 5 months after having suffered from the Guillain Barré Syndrome.

Main Diagnosis:
Status after very severe Guillain Barré Syndrome in April 1997 with a very serious tetraparesis after which admission with long term bed rest and artificial lung ventilation due to aspiration pneumonia. Excessive sweating and immense faeces incontinence.

Medical History:
Depressive syndrome in 1988
Disease of Waldenström, 1994
Inguinal Hernia repair in 1996

Sensitivity for the development of pressure ulcers:
Due to the loss of weight as a result of chronic diarrhoea and a very weak general condition there is an increased risk for pressure sores. During stay in hospital a small decubitus ulcer grade IV developed at the sacrum and os coccygis. In January 1997 a necrectomy of the wound was performed with removal of a loose piece of the os coccygis.

Indication for Vicair mattress:
After partial recovery, one year after admission to hospital, it was time to start to think about a mattress for use in the home situation. Patient started to be more mobile and independent. He could make an independent transfer from bed to wheelchair and could walk small distances with his walking aid. Patient was nursed for most of the time in hospital on a low air loss bed. After partial recovery patient was nursed for two months on a Vicair Academy mattress with a low friction cover. Patient was mobilised sitting on a Vicair Academy Twin 10 cushion.

Conclusion:
Initially the patient needed help in order to rotate on the mattress due to his very weak general condition. Over time he could rotate and make transfers independently. The pressure sore prevention level of the mattress was sufficient.

Figures: next page(s):
Figure 12: Fresh wound after necrectomy of os coccygis
Figure 12: fresh wound after neurectomy of os coccygis
Patient:
A thin 22-year old man with a length of 175 cm and a weight of 52 kg. Admission to the RCA for rehabilitation after a traumatic spinal cord lesion.

Main Diagnosis:
Traumatic spinal cord lesion C5 in June 1996
Loss of motor function: Right: C5 complete; Left C6 complete
Loss of sensation: Right T2 complete; Left T3 complete
Vegetative: complete
Incontinence for urine and faeces
AIS Scale: A

Sensitivity for the development of pressure ulcers:
Highly increased risk.

Indication for Vicair mattress:
During the rehabilitation process patient developed a scapula alatum on his right side. The right shoulder blade was protruding for at least 5 cm. The increased sensitivity of the skin in combination with occurring spasm caused a pressure ulcer grade III. See picture. Patient was nursed on an alternating pressure overlay mattress at that time. For this reason it was decided to try the Vicair Academy mattress as a support surface that would enable him to lay on his back. For further relief it was decided to remove a few cells from the compartment under the right scapula.

Conclusion:
The patient was nursed on the Vicair Academy replacement mattress for two periods. During the first period of ten days the wound on the scapula slowly improved while being nursed on the back. Patient liked the stability of the mattress but commented that it was feeling hard. In order to increase the speed of wound healing it was decided to change the support surface to a low air loss bed with a decreased mobilisation in the wheelchair. This resulted after a long period and various episodes in the wound healing process in the decision to perform a surgical resection of the tip of the right scapula.

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Figures: next page(s):
Figure 13: pressure at right scapulum alatum
Figure 13: pressure at right scapulum allatum
Patient:
A 32-year old man, slim figure, length 185 cm and a weight of 75 kg, admission to the RCA following a pressure sore grade IV on the left ischial tuberosity and right greater trochanter.

Main Diagnosis:
Traumatic spinal cord lesion with a vertebra fracture at T11 in February 1994
Loss of motor function: T10 complete
Loss of sensation: T10 complete
Vegetative: T10 complete
Incontinence for urine and faeces
AIS Scale: A

Sensitivity for the development of pressure ulcers:
Very sensitive.

Indication for Vicair mattress:
Patient was sleeping at home on a block foam mattress and developed a minor pressure sore on the left trochanter. He was advised to sleep more on his right side. As a consequence he developed a more serious pressure sore on his right trochanter. As an extra complication patient was seated for four days on a leaking multi-compartment air flotation cushion. The situation was further aggravated by an increased lumbar lordosis and flexion contracture of both hipjoints
At the time of admission patient was having a severe pressure sore grade IV (6x6 cm) with pocket formation on the left ischial tuberosity and a pressure sore grade IV (4x4 cm) on the right trochanter. After initial conservative treatment it was decided to perform plastic surgery on both wounds. The right trochanter was treated with a transposition of the musculus vastus lateralis and covered with a split skin transplant from the right upper leg. Part of the further rehabilitation procedure was the choice of a pressure relief surface for the home situation. Patient slept for three weeks on a Vicair Academy Dry-Air Replacement Mattress.

Conclusion:
Patient slept on the Vicair mattress in many different body postures. He never developed any redness, even not on his knees when sleeping on his abdomen, despite a flexion contracture of 45 degrees in both hip joints. The patient experienced the Vicair mattress as a stable and comfortable mattress. Patient can easily make the transfer from bed to the chair. He has a strong personal preference for the Vicair mattress above the block foam or multi-compartment air flotation overlay surface.
Recently, patient has been allowed by his health insurance company to purchase the Vicair mattress for his home situation.

Figures: next page(s):
Figure 14: wound at right trochanter after plastic surgery
Figure 15: close up of figure 14
Figure 14: wound at right trochanter after plastic surgery

Figure 15: close up of figure 14
Patient:
A 50 year old man with a length of 183 and a weight of 88 kg. Admission to the RCA for clinical rehabilitation after a traumatic spinal cord lesion.

Main Diagnosis:
Traumatic spinal cord lesion C4 in April 1996
Loss of motor function: C4 complete
Loss of sensation: C4 complete
Vegetative: complete
Incontinence for urine and faeces
AIS Scale: A

Sensitivity for the development of pressure ulcers:
Increasing risk.

Indication for Vicair mattress:
As part of the rehabilitation process a choice for a mattress in the home environment has to be made. In this context patient slept for one week on a Vicair Academy replacement mattress with an incontinence cover.

Conclusion:
Sleeping on a Vicair mattress was experience as comfortable. The pressure sore prevention was adequate, no rotation was applied at night. The nursing staff found the Vicair mattress to be less ideal because it was more difficult to move the patient in the bed. This in particular in relation with the fact that his wife was supposed to take care of him in the home situation.

Figures: next page(s):
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Patient:
An 83-year old man, normal shape with a length of 178 cm and a weight of 85 kg.
Re-admission to the RCA because of a pressure sore grade IV b at the right trochanter.

Main Diagnosis:
Traumatic spinal cord lesion L3 in 1963
Loss of motor function: L3 complete
Loss of sensation: L2 incomplete, L3 complete
Vegetative: complete
Incontinence for urine and faeces
AIS Scale: A

Sensitivity for the development of pressure ulcers:
Highly sensitive for skin break down.
Recurrent decubitus with surgical reconstruction in 1969, 1982 and 1990
In the beginning of 1997 donorskin transplantation was performed on the right ankle.
In the end of August 1997 plastic surgery was performed on the right trochanter with transposition of the vastus lateralis and skin transplantation.

Indication for Vicair mattress:
Because of the quick deterioration of the patient in the home situation it was obvious that a better protection was needed. At home the patient was using a so-called neoprene para-care mattress.
After being nursed for two weeks postoperatively on a low air loss bed, patient was nursed for four weeks on a Vicair Academy replacement mattress with an incontinence cover.

Conclusion:
Sleeping on a Vicair mattress was experienced as very comfortable. The protection by the mattress was sufficient without the need of any additional support aids to relief heels and feet. The patient could move independently. Due to the good stability patient could lie in a comfortable half side posture. The transfer from bed to chair was without difficulty. Citation from the nursery staff: “patient is better of on the Vicair compared to an alternating pressure relief mattress”.

Figures: next page(s):
Figure 16: Right trochanter two weeks postoperatively at the start on Vicair Mattress
Figure 17: Right trochanter after four weeks on Vicair mattress
Figure 16: Right trochanter two weeks postoperatively at the start on Vicair Mattress

Figure 17: Right trochanter after four weeks on Vicair mattress
Patient:
A 37-year old man, normal build with a length of 165 cm and a weight of 67 kg.
Admission to the RCA for clinical rehabilitation after an acute functional spinal cord lesion T4.

Main Diagnosis:
Functional spinal cord lesion T4 after an acute meningo-encephalitis (1996)
Loss of motor function: T4 complete
Loss of sensation: T4 complete
Vegetative: complete
Incontinence for urine and faeces
AIS Scale: A

Side Diagnosis:
Neurogenic Heterotopic Ossification around both shoulders and hips

Sensitivity for the development of pressure ulcers:
Very sensitive to skin break down. Recurrent pressure sores on the sacrum and os coccygis because of pronounced bony parts. Plastic reconstruction in April 1996.

Indication for Vicair mattress:
One of the main goal during the rehabilitation process is to offer the patient a mattress suitable for use in the home situation. Patient was offered a Vicair Academy replacement mattress with Low Friction cover during four weeks. Patient was encouraged to sleep on his abdomen in order to relief the wound area.

Conclusion:
Because of the changing condition of the patient he was nursed on a number of different support surfaces over time. He was nursed on high to mid range support systems. The change from Low Air Loss to a Vicair mattress was experienced as very positive. He slept in the beginning alternately on his back and belly. After that stable side posture without rotation. After a few days of increasing mobility the condition of the os coccygis deteriorated due to a bad body posture in the wheelchair.

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Figures: next page(s):
Figure 18: pronounced sacral area after surgical reconstruction
Figure 19: close-up of reconstructed area
Figure 18: pronounced sacral area after surgical reconstruction

Figure 19: close-up of reconstructed area
Patient:
A 35-year old man, normal build, a length of 185 cm and a weight of 95 kg. Admission to the RCA for clinical rehabilitation. Chronic pain syndrome in combination with incomplete spinal cord lesion.

Main Diagnosis:
Incomplete spinal cord lesion C6/C7 after laminectomy in 1993
Loss of motor function: C7/C8 incomplete
Loss of sensation: C8 complete
Vegetative: complete
AIS Scale: C

Medical History:
1972: surgical removal of a eosinophilic granuloma at high thoracic level through laminectomy at T1 and radiotherapy.
1994: several surgical corrections of the vertebral column following kyphosis of the low cervical, high thoracic vertebral column.

Sensitivity for the development of pressure ulcers:
Sensitive for skin breakdown.
Flap surgery at the left ischial in the beginning of 1997

Indication for Vicair mattress:
Patient slept at home on a fibre mattress. This mattress is considered to be no longer sufficient for the protection against skin breakdown. The Vicair Academy mattress with incontinence cover was tested for 6 weeks until now. Important for the patient is that the mattress could be installed in the normal bedframe alongside the mattress of his wife.

Conclusion:
Patient found the Vicair mattress to be comfortable. Especially the stability at the side made a independent transfer more easily. He slept on the mattress on his back for 12 hours in a row without being turned.

Figures: next page(s):
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Patient:
A 27-year old man, normal build with a length of 172 cm and a weight of 68 kg. Admission to the RCA for clinical rehabilitation after a recurrent pressure sore grade IV b on both trochanters and sacrum.

Main Diagnosis:
Complete spinal cord lesion L2, vascular lesion, traumatic aneuryisma aorta 1991
Loss of motor function: L2 complete
Loss of sensation: L2 complete
Vegetative: complete
Incontinence for urine and faeces
AIS Scale: A

Sensitivity for the development of pressure ulcers:
Very sensitive for skin break down. Recurrent pressure sores at the sacrum and os coccygis in 1994 due to a leaking air cushion. Flap surgery at the sacrum in 1997. Strong body asymmetry with pelvic asymmetry and a lordosis at low thoracic level. Thoraco-lumbar scoliosis.

Indication for Vicair mattress:
Admission to the RCA in February 1997 because of pressure sores grade IV b at the sacrum, os coccygis, both trochanters and right heel. These pressure sores were caused by the negligence of the patient to use a pressure relieving surface to sleep on. During hospital admission the patient was mainly nursed on his belly in order to relief the wounds to the maximum.
In the process of looking for a suitable mattress for the home situation, the patient was nursed on a Vicair Academy replacement mattress with low friction cover.

Conclusion:
The Vicair mattress offered in all body postures a sufficient and reliable protection. In order to protect the very vulnerable wound on the sacrum the patient slept a lot on his sides and on his abdomen. Patient could dress and undress himself very easily on the mattress (see pictures). After testing another motorised air mattress he preferred the Vicair. Currently he is waiting for the approval by his health insurance company to purchase a Vicair mattress.

figures: next page(s):
Figure 20: wounds on sacrum and both trochanters. Note body asymmetry.
Figure 20: wounds on sacrum and both trochanters. Note body asymmetry.
Patient:
A 72-year-old female with a length of 176 cm and a weight of 63 kg.
Admission to the RCA in October 1997 for clinical rehabilitation after a traumatic spinal cord lesion.

Main Diagnosis:
- Traumatic spinal cord lesion C7
- Loss of motor function: C5-C6 complete
- Loss of sensation: C6 complete
- Vegetative: complete
- Incontinence for urine and faeces
- AIS Scale: A

Sensitivity for the development of pressure ulcers:
Very sensitive.

Indication for Vicair mattress:
Patient is on the basis of her age and medical condition at increased risk of developing pressure sores. As a recent spinal cord lesion victim she has to be nursed on a high end pressure relief surface. For that reason it was decided to nurse her on a Vicair Academy replacement mattress with an incontinence cover.

Conclusion:
Patient could not be mobilised due to severe dizziness. She was very heavily incontinent for urine and faeces. She was initially rotated every three hours. After one week she could sleep through the night on her side without being turned. The pressure sore prevention can be judged good especially in conjunction with her severe incontinence problems that created very moisture conditions during the first month of hospitalisation.

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Figures: next page(s):

Figure 21: patient's back after sleeping on a Vicair mattress without being turned
Figure 21: patient’s back after sleeping on a Vicair mattress without being turned
Patient:
A 34 year old man with a length of 165 cm and a weight of 63 kg.
Admission to the RCA for clinical rehabilitation after a spinal cord lesion due to a vascular disorder.

Main Diagnosis:
Spinal cord lesion at T6 in 1997 due to vascular disturbance due to a severe kyphoscoliosis.
Loss of motor function: T6 complete
Loss of sensation: T6 complete
Vegetative: complete
Incontinence for urine and faeces
AIS Scale: A

Medical History:
Patient is known with a congenital hydrocephalus based on the Arnold Chiari Syndrome for which a ventriculo-peritoneal drain is installed.
In 1976 a Harrington rod was placed to correct his scoliosis.

Sensitivity for the development of pressure ulcers:
Increased risk also because of his depressive periods

Indication for Vicair mattress:
An important goal is to diminish his pain complaints during sleep. Patient has a strong preference for sleeping on his right side during the whole night. Complicating factors are the severe scoliosis (see picture) and his depressive disposition. The mattress is expected to offer a high quality pressure relief action. Since two months, the patient sleeps on a Vicair Academy replacement mattress with Low Friction cover.

Conclusion:
Patient finds the Vicair mattress to be comfortable and enjoys the stable side posture that he entertains during the whole night. His pain complaints are greatly diminished as compared to the foam block mattress he slept on before. The pressure sore prevention action is sufficient. Patient needs assistance from the nurse to make a transfer from bed to chair.

Figures: next page(s):
Figure 22: severe scoliosis
Figure 22: severe scoliosis
Mattresses used in comparison with the Vicair Academy mattress in the context of this study:

Nimbus 11, automatt: Manufacturer: Huntleigh Healthcare
Alternating pressure replacement air mattress

Aeros: Manufacturer: Redactron
Alternating pressure replacement air mattress

Decube: Manufacturer: Comfortex
Foam with removable foam block inserts

Rik mattress: Manufacturer: KCI/RIK medical
Fluid gel / foam combination
**Statistics on Vicair Mattress Clinical Cases:**

*Overview on relationship between indication for use of the Vicair Academy Dry-Air replacement mattress and the (number of) clinical cases involved.*

<table>
<thead>
<tr>
<th>Indication for use of the Vicair Mattress</th>
<th>Applicable for Clinical Case No</th>
<th>Total</th>
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<tbody>
<tr>
<td>Recurrent pressure sore prevented</td>
<td>1/3/4/7/8/9/10/12/15</td>
<td>9</td>
</tr>
<tr>
<td>No rotation needed</td>
<td>1/3/4/7/10/11/14/16</td>
<td>8</td>
</tr>
<tr>
<td>Over 8 hours in one position</td>
<td>3/4/7/11/13/14/16</td>
<td>7</td>
</tr>
<tr>
<td>Freedom of body positioning</td>
<td>1/6/8/10/12/13/15/17</td>
<td>8</td>
</tr>
<tr>
<td>Preference on the basis of being non-powered</td>
<td>1/3/4/7/10/15</td>
<td>6</td>
</tr>
<tr>
<td>Stable positioning</td>
<td>2/5/9/12/13</td>
<td>5</td>
</tr>
<tr>
<td>Reduction of pain</td>
<td>1/2/4/6/9/17</td>
<td>6</td>
</tr>
<tr>
<td>Conformation to extreme body contours</td>
<td>5/9/10/15/17</td>
<td>5</td>
</tr>
<tr>
<td>Easy transfer ability</td>
<td>1/2/6/8/10/12/14/15</td>
<td>8</td>
</tr>
<tr>
<td>Personal preference after comparison with other mattresses</td>
<td>1/2/4/7/10/12/15/17</td>
<td>8</td>
</tr>
<tr>
<td>Reimbursed by health care provider (Applied for reimbursement)</td>
<td>1/4/5/7/10/(15)</td>
<td>6</td>
</tr>
<tr>
<td>Also using a Vicair pressure relief cushion</td>
<td>1/3/7/9/11/17</td>
<td>6</td>
</tr>
</tbody>
</table>
**Explanation AIS Score** (modified Frankel Scale)

<table>
<thead>
<tr>
<th>ASIA IMPAIRMENT SCALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ A = Complete: No motor or sensory function is preserved in the sacral segments S4-S5.</td>
</tr>
<tr>
<td>□ B = Incomplete: Sensory but not motor function is preserved below the neurological level and extends through the sacral segments S4-S5.</td>
</tr>
<tr>
<td>□ C = Incomplete: Motor function is preserved below the neurological level, and the majority of key muscles below the neurological level have a muscle grade less than 3.</td>
</tr>
<tr>
<td>□ D = Incomplete: Motor function is preserved below the neurological level, and the majority of key muscles below the neurological level have a muscle grade greater than or equal to 3.</td>
</tr>
<tr>
<td>□ E = Normal: Motor and sensory function is normal.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CLINICAL SYNDROMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Central Cord</td>
</tr>
<tr>
<td>□ Brown-Sequard</td>
</tr>
<tr>
<td>□ Anterior Cord</td>
</tr>
<tr>
<td>□ Conus Medullaris</td>
</tr>
<tr>
<td>□ Cauda Equina</td>
</tr>
</tbody>
</table>