NEO-FLEX

POSTURE CORRECTION AND SUPPORT SYSTEM

CE

VERMEIREN

NEO-FLEX
TRUNK STABILIZATION

Good body posture is the one which ensures optimal stability, requires minimal muscle effort to hold the body upright and promotes optimal arrangement of internal organs.

Good posture is characterized by:

- straight position of head,
- physiological curvatures of sagittal plane and straight spine in coronal plane,
- well-formed chest,
- shoulders slightly backward in relation to pelvis,
- symmetrical alignment of pelvis.

Sitting puts the most stress and strain on the spine. Thus it is very important that a person sitting in a wheelchair has proper back support. There are three primary support surfaces: buttocks, back, and lower extremities.

PREVENTION METHODS

- Wheelchair fitted to the individual user.
- Solid backrest and seat.
- Correct backrest height depends on the desired amount of trunk support.
- Seat depth – allows up to 2,5 cm from back of knee to front of seat.
- Seat width – allows 1.3 cm from the outside line of thigh and armrest on either side.
- Correct lateral support for the trunk.
- Correct armrest height to allow for 30° shoulder flexion and 60° elbow flexion.
- Footplate position – allows 5 cm clearance from footplate to floor, feet positioned parallel to seat.
- Stable cushion.
- Achieve balance between support and function.
- Use correct support belts.

Kyphosis

Uncorrected posture

Corrected posture – harness **U79** type "H" or shoulder belts **U78.** Must be used with a two-point hip belt **U76.**

ASSESSMENT

- forward flexion of thoracic spine,
- lumbar flexion most often with posterior pelvic tilt,
- little contact with backrest,
- hyperextended neck to see straight ahead.
- incorrect breathing.

CAUSES

Wheelchair: seat to backrest angle too small and inadequate trunk support to prevent trunk collapse.

Causes related to physical conditions: fixed pathological kyphosis of spine, posterior pelvic tilt, tendon tension, tight hip flexor, low trunk muscle tone, weak and deteriorated muscles.

WHY TO USE THE BELT

- extended trunk and retracted shoulder blades,
- reduced kyphosis,
- natural trunk alignment over pelvis,
- improved respiratory capacity,
- increased head control,
- better line of sight.

"H" harness **U79.**

U78 "Reins" type harness Crisscross fastening does not restrict arm movement.

Independent fastening for each shoulder encourages shoulder retraction and promotes respiration.

Lordosis

Uncorrected position

Corrected position – a vest **U74** without zipper or **U73** with zipper. Must be used with a four point hip belt **U75**.

ASSESSMENT

- concave curvature of spine,
- hyper-extended lumbar spine,
- anterior pelvic tilt,
- retracted shoulder blades,
- limited contact with backrest.

CAUSES

Wheelchair: seat to backrest angle to small and inadequate trunk support to prevent trunk collapse.

Causes related to physical conditions: fixed pathological lordosis of spine, anterior pelvic tilt, tendon tension, tight hip flexor, low trunk muscle tone, weak and deteriorated muscles.

WHY TO USE THE VEST

- primary support of sternum,
- reduced lordosis and anterior pelvic tilt,
- natural alignment of trunk over pelvis and reduced shoulder blades retraction,
- improved respiratory volume,
- for users capable of active trunk flexion, a neoprene vest may allow more freedom of movement, while providing posture stabilization and correction,
- some users will require additional support at lower ribs and abdomen to reduce lordosis.

Vest is made from high quality LYCRA coated neoprene. It ensures proper flexibility and stabilization.

Middle part of the vest is made from CORDURA®. It's makes that part strong what improve the stability of the trunk, breathing l and control of movement as well.

Swivel buckles ensure free pivoting and smooth adjustment of an angle between attachment straps and the vest, straps do not twist or chafe.

Normally upper stabilization vests are delivered with rear pull when is not recommended that the patient may adjust the pull, vests may be also delivered with front pull which allows a seated person to adjust the pull.

U74- vest without zipper. Vest available in two versions, wide and narrow designed especially for

U73- vest with zipper. Vest available in two versions, wide and narrow designed especially

Skoliosis

Uncorrected posture.

Corrected posture – shoulder belts **U78**. Use together with a two-point hip belt **U76.**

ASSESSMENT

- lateral flexion of spine, usually in thoracic area to the right,
- one shoulder protruding forward and upward,
- one hip upward and forward – pelvic obliquity,
- one side of chest protruding backward (a rib hump); seen especially when bending forward, shoulders not level.

CAUSES

Wheelchair: inadequate trunk support, in particular lateral support. Uneven seating surface, seat too wide for the user.
Causes related to physical conditions: flexible or fixed pathological scoliosis of spine, pelvic obliquity, asymmetrical muscle tone shortening one side of trunk, hip joint contracture.

WHY TO USE THE BELT

Appropriate trunk support which in conjunction with hip belt and lateral support will promote an upright position of the trunk and correct alignment of the head.

Sometimes only one wide neoprene chest belt is needed to stabilize a person as it perfectly holds the trunk in a midline position and ensures greater freedom of movement for active persons.

U80 wide neoprene chest belt

Longitudinal axis rotation of vertebrae , i.e. trunk rotation

ASSESSMENT

- lateral flexion of spine in the horizontal plane,
- forward ribs on one side - a rib hump,
- forward shoulder blade,
- one shoulder is forward, often in conjunction with pelvic rotation.

CAUSES

Wheelchair: inadequate stabilization to prevent pelvic rotation,
Causes related to physical conditions: pelvic rotation, increased and asymmetrical muscle tone shortening one side of trunk.

WHY TO USE THE BELT

to pull the forward shoulder back to backrest to align the trunk in the sagittal plane.

Uncorrected posture

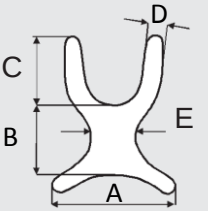
Corrected posture – shoulder belts **U78**. Must be used with a two-point hip belt **U76**.

Very often only one belt is required to pull the forward shoulder back.

Vests and shoulder belts – Selection Guide

How to select a vest and shoulder belts:
Measure shoulder width, consider also weight changes, height, and clothing.

XS	(24cm–28cm)
S	(28cm–33cm)
M	(33cm–41cm)
L	(41cm–48cm)
XL	(48cm–56cm)



Technical specification of vests with and without zipper:

Wide version U74.W and U73.W

	A	B	C	D	E
XS	22 cm	13 cm	13 cm	4 cm	9 cm
S	23 cm	14 cm	16 cm	4 cm	12 cm
M	30 cm	18 cm	20 cm	4 cm	13 cm
L	38 cm	21 cm	23 cm	6 cm	13 cm
XL	46 cm	25 cm	27 cm	6cm	16 cm

Narrow version U74.N and U73.N

	A	B	C	D	E
M	30,5 cm	18 cm	20,5 cm	4 cm	9 cm
L	38 cm	21,5 cm	23 cm	6 cm	10 cm
XL	46 cm	**25,5 cm**	27 cm	6 cm	10 cm

Technical specification of shoulder belts.

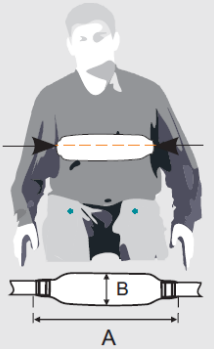
"H" Belts U79

Neoprene length	
S	31cm
M	34cm
L	41cm
XL	47cm

Shoulder belts U78

Neoprene length	
S	24 cm
M	29 cm
L	34 cm

How to select a proper size of a chest belt
Measure the length around the trunk from the front where the belt will be used.



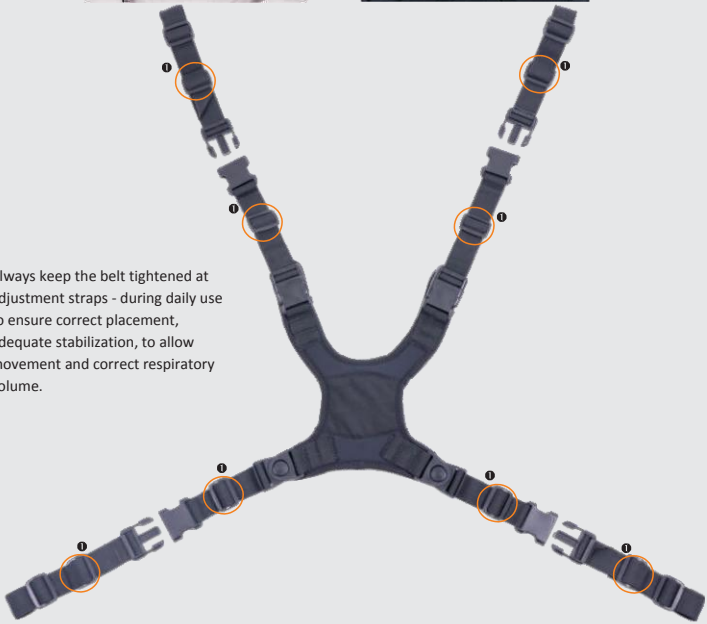
Length of the trunk	
XS	36 - 45 cm
S	46 - 55 cm
M	56 - 65 cm
L	66 - 75 cm
XL	76 - 85 cm

Technical specification of chest belts U80.

	A	B
XS	31,8 cm	7,6 cm
S	39,7 cm	8,9 cm
M	47,6 cm	10,3 cm
L	55,6 cm	11,4 cm
XL	63,5 cm	12,7 cm

Tightening the straps

Normally upper stabilization belts are delivered with front pull which allows a seated person to adjust the pull. Belts may be also delivered with rear pull when is not recommended that the patient may adjust the pull.



Always keep the belt tightened at adjustment straps - during daily use to ensure correct placement, adequate stabilization, to allow movement and correct respiratory volume.

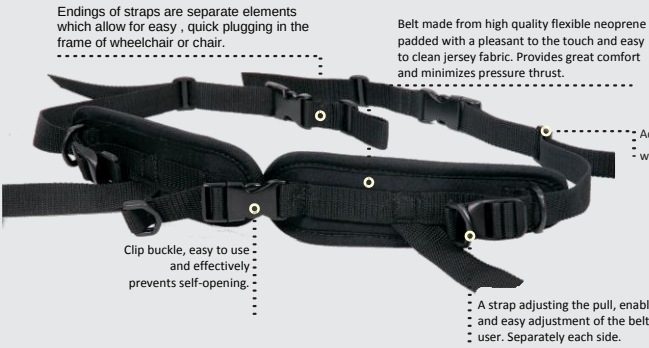
Attaching to the frame

An easy fastening system allows fitting and adjustment of strap in length. Clip buckles on each end of the strap - allows quick and easy attachment and removal of belts and vests. It also allows precise positioning of anchoring points on the frame. This system does not require readjustment of the pull after taking the straps off and fastening them again as attachment ends always stay in the chair.

Ends of the straps are mounted to the frame like it is showed on the picture.

Special buckle. Makes much easier to adjust the belt tension in the case of rear pull version. It's apply to the backrests based on wood and ERGO type. Just screw in to the base of backrest.

NEO-FLEX
PELVIC STABILIZATION



Most common posture deformations caused by improper position of the pelvis

Anterior pelvic tilt

Uncorrected posture

ASSESSMENT

- reduced or reversed thoracic kyphosis,
- ASIS (anterior superior iliac spine) lower than PISI (posterior superior iliac spine),
- increased lumbar lordosis,
- hyperextended trunk,
- retracted shoulder blades.

CAUSES

Wheelchair: seat to backrest angle too small.
Physical conditions: tight hip flexor, weak abdomen muscles, and lordosis.

HOW TO USE THE BELT

Position the belt above the ASIS and attach at 30–45 to the back. Anchor the secondary strap at 60° to 90° to the seat to prevent the belt from lifting up into the abdomen.

WHY TO USE THE BELT

The belt is designed to prevent the pelvis from tilting forward.

corrected posture – a 4-point belt **U75.**

4-point belt **U75.**

Posterior pelvic tilt

Uncorrected posture

ASSESSMENT

- sitting on the sacral bone - most common case,
- ASIS* (an anterior superior iliac spine) higher than PISI* (a posterior superior iliac spine),
- a tendency to slide out the wheelchair,
- extended lumbar spine,
- thoracic kyphosis,
- protracted shoulder blades,
- C-shaped posture.

CAUSES

Wheelchair: seat too deep, backrest too short, footplate too low or too far forward.
Physical conditions: contractures, weak muscles, kyphosis.

HOW TO USE THE BELT

Position the belt anterior and inferior to the ASIS* and attach at 90° to the seat.

WHY TO USE THE BELT

The belt is designed to prevent sliding.

Corrected posture - a two-point belt **U76.**

2-point belt **U76.**

Obliquity of the pelvis

ASSESSMENT

- One side of the pelvis is usually higher than the other one.
- Usually involves rotation.
- Shoulder on the low side of the pelvis tends to be elevated.

CAUSES

Wheelchair: wheelchair too wide, seat too short
Physical conditions: irregular trunk muscle tone, muscle imbalance, scoliosis.

PURPOSE OF THE BELT AND HOW TO USE IT

Position the belt over the ASIS* and attach at 60° to the seat. When using a four-point belt, anchor the secondary straps to the seat at 45° to 90°.

NOTE

Obliquity and rotation of the pelvis usually seen as increased pressure during active movement can often be reduced by an asymmetrical attachment of the belt to the wheelchair. Adjust the position of each anchor point to optimize the pull against each side of the pelvis.

WHY TO USE THE BELT

The belt is designed to bring the pelvis down to the seat and back to the backrest

Uncorrected posture

Corrected posture - a 2-point belt U76.

Rotation

Uncorrected posture

Corrected posture - a 4-point belt U75.

.

2-point belt U76.

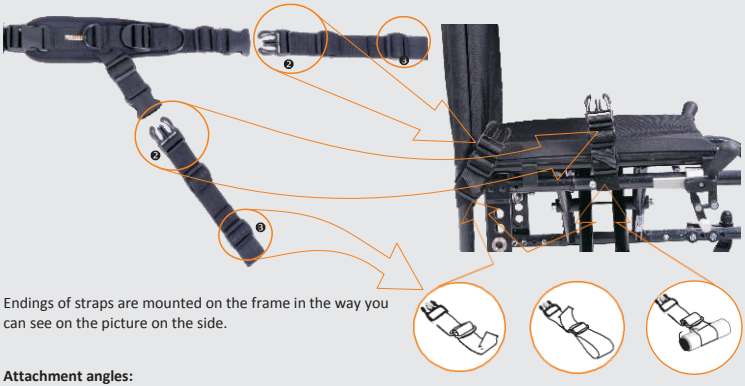
4-point belt U75.

Tightening the straps

Always keep the belt tightened properly at adjustment straps - during daily use to ensure correct placement.

Attaching to the frame

A simple system allows attachment and adjustment. Readjustment is required after removal and reattachment of the straps. Quick release buckle system on each end of strap enables to quick and easy plugging in the strap into the frame of wheelchair in right place. (see picture below with 4-point belt U75).



Endings of straps are mounted on the frame in the way you can see on the picture on the side.

Attachment angles:

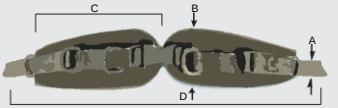
The angle at which the belt is attached to the chair frame has a direct effect on the angle of pull on the pelvis. The general principle is to imagine the therapist standing in front of the seated person using his/her hands to support or correct the position of the user. The belt should extend the therapist's arms and should be anchored to the chair frame at the same angle as the therapist's arms. The belt shall pull into the point where the therapist would push with his/her hands. This principle works as well with pelvis obliquity, rotation, and other asymmetrical postures.

NOTE

- A 60° angle of attachment – the belt positioned interior to the ASIS* – effectively prevents the user with a posterior pelvic tilt from slipping underneath the belt.
- A higher attachment on the backrest assists in positioning the user with an anterior pelvic tilt.
- A 30° angle of attachment pulls the back against the top of the pelvis, but is problematic for users with a neutral or posterior pelvic tilt.
- The secondary straps of a four-point belt are attached to the frame between 45° and 90° to hold the primary strap in place and to prevent the belt from riding into the abdomen or twisting.

Hip belt - how to select.

Measure hip width across the greater trochanters with the person seated. Then select a size according to the table below, consider also weight changes and clothing.



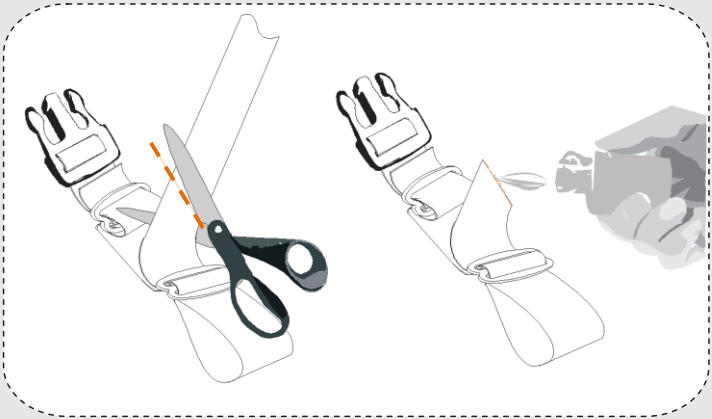
S	(18cm–28cm)
M	(23cm–38cm)
L	(33cm–48cm)

Technical specification of a hip belt

	A	B	C	D
S	(38mm)	(57mm)	(18cm)	(127cm)
M	(38mm)	(64mm)	(23cm)	(142cm)
L	(50mm)	(76mm)	(28cm)	(152cm)

* Medical terminology used in specification

Vests and chest straps are supplied with the strips longer than required by individual patients. Please adjust the proper tension and cat all protruding ends with scissors and melt edge of strap with for example lighter as shown in the picture below.



Wash and disinfect products.
Vests and straps are made of neoprene that is covered with a pure nylon cloth. This design allows for easy cleaning. It can be washed under running water or a shower using washing-up liquid or spirit and non-spirit based disinfectants commonly used in hospitals. After drying with paper towels, for example, the surface is almost dry and ready for use.

Other forms of stabilization of the upper and lower extremities.

Pelvic harness.

Pelvic harness is used for people who have a tendency to slide of the seat , also function as abduction of the limb. The harness also perfectly stabilizes the pelvic, firmly limiting the obliquity and rotation of the pelvis without any pressure on the bladder.

U01 Pelvic harness

Selection of the proper size

When selecting a pelvic harness, measure from the Anterior Superior Iliac Spine (ASIS) to the point where the inner thigh touches the seat.

XS	**(–20cm)**
S	**(20cm–28cm)**
M	**(28cm–36cm)**
L	**(36cm–41cm)**

Feet stabilization

Proper stabilization of feet directly affects the position of the pelvis, balance and upper body mobility.

U77 ankle straps

volume of the leg above the ankle

XS	**(14cm–17cm)**
S	**(17cm–20cm)**
M	**(19cm–23cm)**
L	**(22cm–29cm)**
XL	**(28cm–33cm)**

B19 feet strapsy

The forearm stabilization

The most common problem that appears after a brain stroke is a partial paralysis of the body. Depending on the location of stroke, the left or right side is paralyzed.

SYMPTOMS of the brain stroke:

1. Paresis (hemiparesis) - characterized by limited possibilities of mobility of the limbs. That may occur limpness (muscle weakness) or spasticity (muscle tightness), which, without the intense process of rehabilitation leads to abnormal, pathological permanent placement of the upper limb, which leads to contracture.

2. Permanent immobilization of the limbs (hemiplegic).

contracture in the wrist

contractures at the elbow

SOLUTION of the problem:
Ad1. In addition to the basic process of rehabilitation, which is used to restore adequate function there is also a need to keep limbs in the most natural position, which ensures the correct, stable arm support, has a direct impact on the correct positioning of the spine and protects against the formation of uncontrolled reflex reactions, which have strengthened when unattenuated.

Ad2. With a permanent paralysis, there is need to ensure proper stabilization of the upper limb on the armrest of the wheelchair.

B66 S is a professional solution for persons requiring proper stabilization of the arm. Made in vacuum technology allows perfectly match itself to arm's shape, to its size and shape of palm.

Armrest cushion is attached to the base with a wide VELCRO strap. This allows to change the depth position of the cushion and the optimum angle of the forearm (60 °) to ensure correct positioning of the spine. The armrest can also be tilted lateral. While using the system together with the high adjustable armrests you obtain a complete control over the arm.

Two sizes are available:

M	**(25cmx35cm)**
L	**(25cmx45cm)**

Belgium
N.V. Vermeiren N.V.
Vermeirenplein 1 / 15
B-2920 Kalmthout
Tel: +32(0)3 620 20 20
Fax: +32(0)3 666 48 94
website: www.vermeiren.be
e-mail: info@vermeiren.be

France
Vermeiren France S.A.
Z. I., 5, Rue d´Ennevelin
F-59710 Avelin
Tel: +33(0)3 28 55 07 98
Fax: +33(0)3 20 90 28 89
website: www.vermeiren.fr
e-mail: info@vermeiren.fr

Germany
Vermeiren Deutschland GmbH
Wahlerstr aße 12 a
D-40472 Düsseldorf
Tel: +49(0)211 94 27 90
Fax: +49(0)211 65 36 00
website: www.vermeiren.de
e-mail: info@vermeiren.de

Italy
Vermeiren Italia
Viale delle Industrie 5
I-20020 Arese MI
Tel: +39 02 99 77 07
Fax: +39 02 93 58 56 17
website: www.reatime.it
e-mail: info@reatime.it

Spain / Portugal
Vermeiren Iberica, S.L.
Carratera de Cartellà, Km 0,5
Sant Gregori Parc Industrial
Edifici A
17150 Sant Gregori (Girona)
Tel: +34 972 42 84 33
Fax: +34 972 40 50 54
website: www.vermeiren.es
e-mail: info@vermeiren.es

Poland
Vermeiren Polska Sp.z o.o
ul. Łączna 1
PL-55-100 Trzebnica
Tel: +48(0)71 387 42 00
Fax: +48(0)71 387 05 74
website: www.vermeiren.pl
e-mail: info@vermeiren.pl

Austria
Vermeiren Austria GmbH
Schärdinger Strasse 4
A-4061 Pasching
Tel: +43(0)722 96 49 00
Fax: +43(0)722 96 49 00-90
website: www.vermeiren.at
e-mail: info@vermeiren.at

Switzerland
Vermeiren Suisse S.A.
Eisenbahnstrasse 62
3645 Gwatt (Thun)
Tel: +41(0)33 335 14 75
Fax: +41(0)33 335 14 67
website: www.vermeiren.ch
e-mail: info@vermeiren.ch

Czech Republic
Vermeiren CR S.R.O.
Nádražní 132
702 00 Ostrava 1
Tel: +420 596 133 923
Fax: +420 596 133 277
website: www.vermeiren.cz
e-mail: info@vermeiren.cz

Manufacturer
Vermeiren GROUP
Vermeirenplein 1 / 15
B-2920 Kalmthout
Tel: +32(0)3 620 20 20
Fax: +32(0)3 666 48 94
website: www.vermeiren.be
e-mail: info@vermeiren.be

VERMEIREN

NEO-FLEX
POSTURE CORRECTION AND SUPPORT SYSTEM