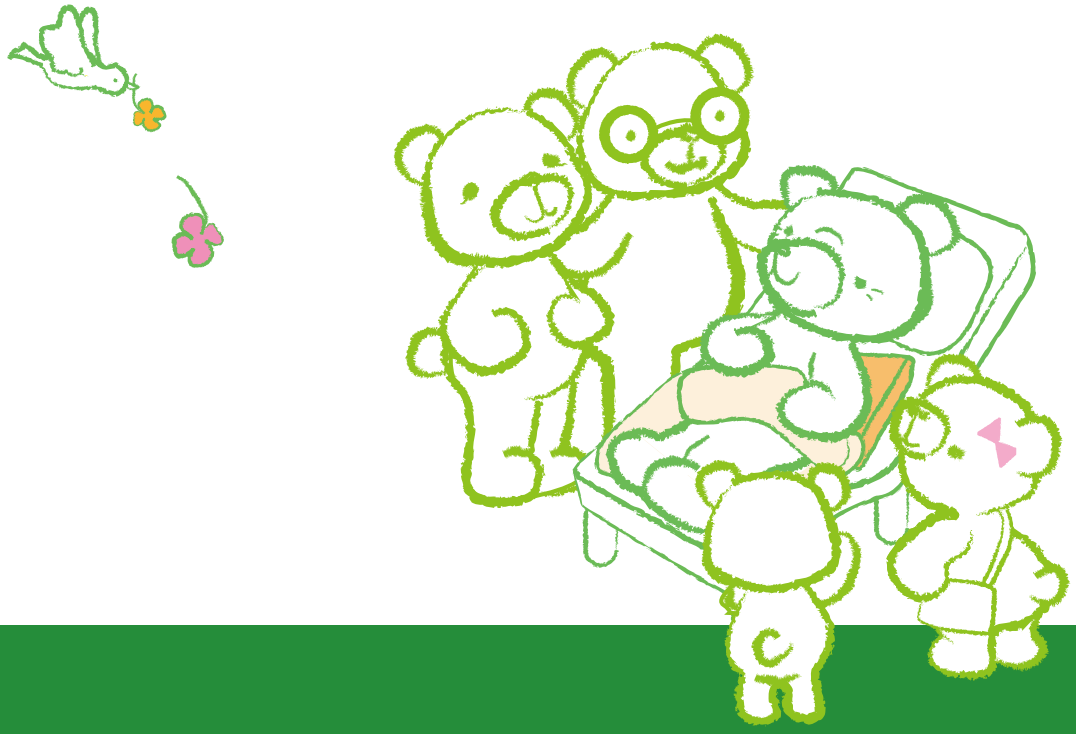
Helpful guide for care to implement from tomorrow

# Positioning Practice Handbook



Let's live in comfort.

Supervisor: Yoshinori Kitade

I Sonex Co., Ltd.

# Why is positioning necessary?

## Positioning, the cornerstone of care

Recently we often hear the word “positioning.”
“Positioning” refers to care of posture and activities in order to prevent bedsores,prevent and improve arthrogryposis,promote safe ingestion/swallow and breathing,while enhancing comfort and ability of activities, for the people requiring nursing care.

If people engaged in caregiving and nursing learn about positioning and incorporate it into daily care, they can pay more attention to the function of the people they care such as posture, breathing and muscle tension,and also they can monitor and adjust the personal and physical environment of the people requiring nursing care .
Furthermore, positioning is useful for not only comforts and pleasant feeling of the people in need of care, but also bringing out their residual function and preventing advancement in severity.
We hope this pamphlet will be beside nursing care professionals and families who provide nursing care, helpful for daily care.


**Yoshinori Kitade**

**Representative and sponsor for posture/activities healthcare research association, Manager of Rehabilitation Dept., Seiyu Memorial Hospital**

**Physical therapist, assistance planner, Bengt Engstrom concept certified master**

After working in the emergency room of the hospital, He transferred to current position in home rehabilitation and daycare, engaged in research of the effect of position and wheelchair seating on human posture. He has been active in a wide range of roles including seminar instructor and part-time instructor at medical/assistance related schools. He has written a number of manuscripts including “Care of Bedsores for Cancer Patients” (published by Japanese Nursing Association) and “Illustrated Nurses’ Handbook of Positioning and Dietary Care to Prevent Accidental Swallowing” (Miwa Shoten).

**Misako Funaki**

**CEO, I Sonex Co., Ltd.**
**Director, Funaki-Gishi Co., Ltd.**

**Occupational therapist, prosthetist, nursing care support specialist**

After graduating from Kyushu Rehabilitation University, she worked in the Tokyo Metropolitan Disability Welfare Center and involved in rental and sale of assistive equipment at Funaki-Gishi, and later established a home repair business.
She founded assistive equipment manufacturing company I Sonex Co. in 2005, patented and developed a large number of products including Nasent Pad, Nasent Toilet, FC Cushion and Sky Lift.



**design by Natsuko Katayama (I Sonex Co., Ltd.)**

# CONTENTS

## Basics of Positioning
Learning basic Knowledge of positioning



## Practice Positioning
Learning from practice examples of positioning



# Basics of Positioning

## Learning basic Knowledge of positioning

This part provides fundamental knowledge and abilities of observation required for positioning. Fundamental knowledge of “pressure/shearing force”, “observation of posture”, “contracture and muscle tension” is essential for accurate understanding of conditions that occur in a person you care. Analyzing the causes responsible for the conditions requires ability to observe and assess human factors such as caregivers and the way care is provided, and physical environment such as beds, mattresses and wheelchairs; in other words, it requires an “ability to recognize.”

Let’s take a first step toward learning the art of positioning.

# What is positioning?

## Objectives of positioning

By providing comfortable and stable posture that facilitates activities, preventing problems related to long-term bedridden people such as :

- Preventing bedsores
- Maintaining and facilitating swallowing function
- Maintaining and facilitating respiratory and circulatory function
- Relaxing muscle tone and preventing deformation/ contracture of joints
- Providing relaxed posture

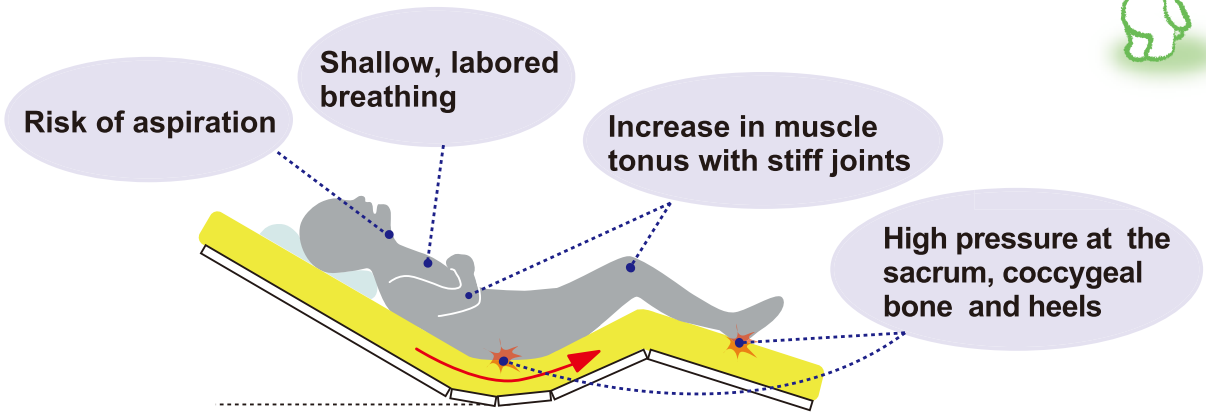
## Definition of positioning

Setting relative positions of body parts for a person with motor impairments in order to maintain comfortable and safe posture (position) that suits the objectives of care by utilizing cushions etc.

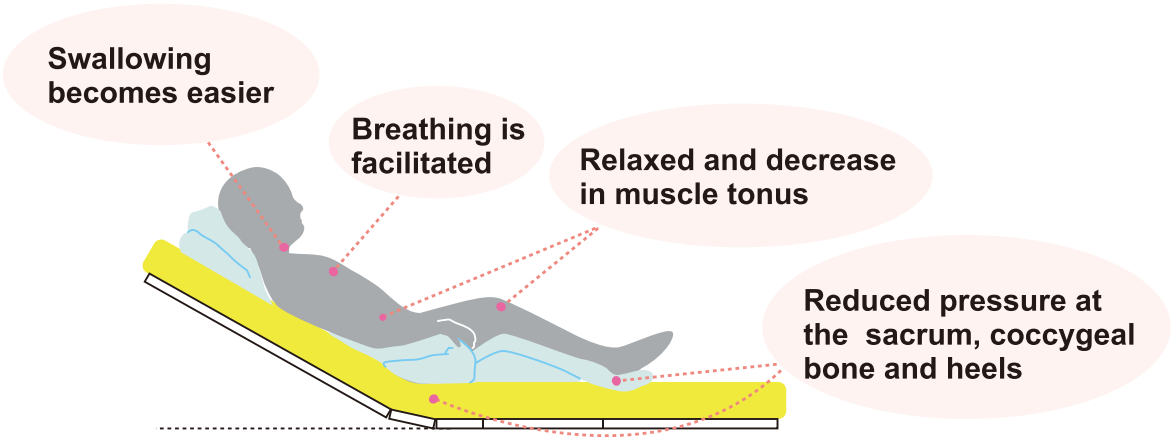
■Taken from website of Japanese Society of Pressure Ulcers (JSPU)

## Benefits of positioning


Before positioning




After positioning




## Correlation of postural change and positioning

**Postural change**
Turning direction of the body towards the direction to which gravity works


**Positioning**
Aligning body parts such as pelvis, spinal column, cervix, head, upper limbs and lower limbs, based on objective of care.

# Assessment of posture and environment

Carefully observe "what is happening" prior to positioning; assess and analyze the causes by carefully looking, listening and feeling.

## Assessment of the case

☐ **General condition**
Diagnosis /anamnesis, bedsores, height/weight, BMI, blood pressure, pulse, respiration ($SPO_2$), edema, pain

☐ **Disability condition and characteristics of posture**
Paralysis, range of motion (ROM), consciousness / cognition ability, muscle tone, alignment of posture and body pressure assessment

☐ **Ability of movement**
Ability of moving body, maintaining sitting position, transferring, the degree of independence in daily living for the elderly

☐ **Communication**
Conscious level, linguistic ability, facial expressions (pleasure, discomfort), motion, complain of pain, the degree of independence in daily living for the elderly with dementia

☐ **ADL**
Dietary method (ordinary eating / nutrient infusion), excretion method (diapers, catheter), Bathing/cleaning Method, transfer method

☐ **Living habits and preferred posture**
Posture required for daily living and medical treatment,posture to avoid pain, favorite posture

## Assessment of environment / assistive technology

☐ **Bed / mattress**
Bed structure and function (electric/ manual operation, back raising / knee raising / height adjustment)
Mattress material and hardness (foam, polyester cotton, gel), structure (1 to 3 layers), thickness

☐ **Body pressure dispersion bedding**
Static mattress, dynamic mattress (over lay type / high function type)

☐ **Type of sheets and pajamas**
Sheets (cotton / elastic material), waterproof sheets, bath towel wrinkling, bed clothes wrinkling

☐ **Positioning products / assistive technology**
Fixed shape type (primarily foam), type that adjusts to shape (primarily beans), gliding sheets, glide gloves for releasing pressure

☐ **Assistive technology being used**
Wheelchair, wheelchair cushions, transfer equipment (lifters and hoist,transfer board)

## Assessment of assistance method

☐ **Positioning method**
Type of postural change, daily postural change schedule, Habits to release pressure

☐ **Main caregivers**
Family (single / plural member[s]), nurse (hospital, nursing home , home visit), care givers(hospital, nursing home , home visit)

☐ **Efforts for positioning**
Capability to provide nursing care (physical strength, number of nurses, mental aspect, time allotment), positioning skill/understanding, ability to cooperate with others

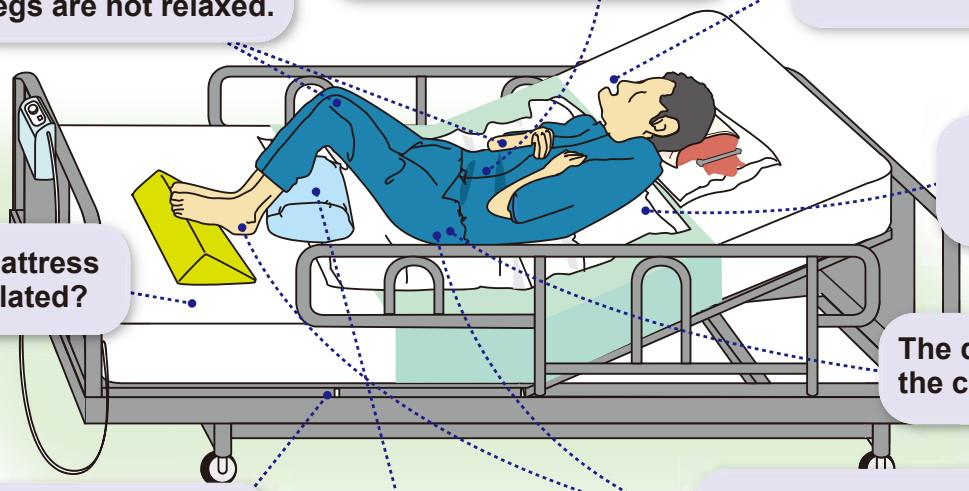
☐ **Consideration of shear and friction that occurs during assistance**
Method and frequency of correcting lying position, transfer method (number of caregivers / use of equipment), adjusting wheelchair posture

# Enhance awareness needed for positioning

For clues to enhance your awareness, see page ___!

## Awareness in back raising posture

P, 7· 8· 11· 12· 13



The stomach and the chest are squeezed making it hard to breathe.

The arms and the legs are not relaxed.

The mouth is dry.

Wrinkles in the towel and/or the pajama.

The air mattress looks deflated?

The diaper is not in the correct position.

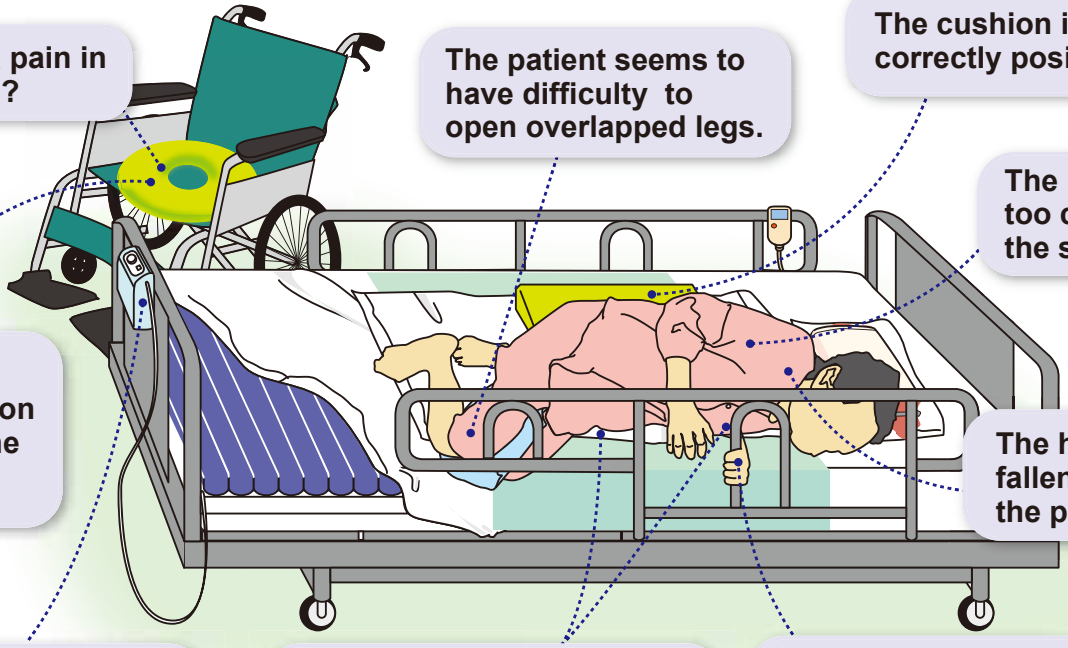
Is there any reason not to use a knee raising mechanism?

Is the pillow positioned correctly?

The bottom and/or the heels seem sore.

## Awareness in side lying posture

P, 7· 8· 9· 10



Is it for a pain in buttocks?

The patient seems to have difficulty to open overlapped legs.

The cushion is not correctly positioned.

The body is too close to the side rail.

Is the use of a donut cushion suitable for the patient?

The head has fallen off from the pillow.

Is the body weight setting of the air mattress set correctly?

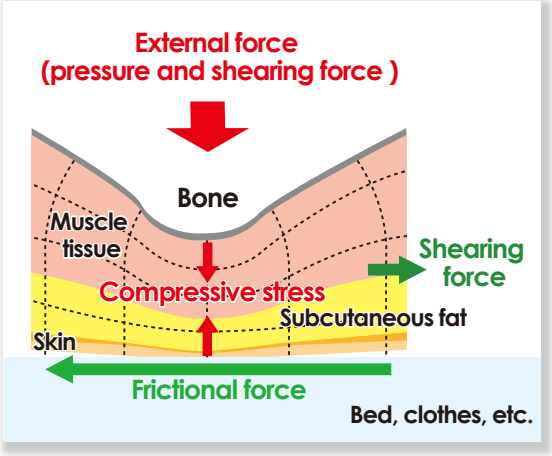
It seems the pressure on the lower side of the shoulder, arm or hip is high.

Why is the patient gripping the side rail?

# Positioning to prevent bedsores

## What is bedsore?

Bedsore is a lesion that causes necrosis of skin and soft tissue caused by limits of blood flow to the skin and nearby tissues due to continuous external force (pressure + shearing force) on body parts in contact with a bed or a wheelchairs for a over a period of time.




## What are the causes?

The direct cause is sustained pressure on the same area (particularly bony prominences). Indirect causes include shear or friction that occurs when a body slips during back raising or transfer, malnutrition or edema, underweight, unclean skin, etc.

## Pressure dispersion by using body pressure dispersion mattress

For people who have a higher risk of bedsores, use body pressure dispersion equipment to distribute body weight effectively.
It is important to set correct body weight with air mattress. If the mattress is too soft, the body sinks into the mattress and it negatively affects posture; if it is too hard, body pressure is not effectively distributed.

### For people who are able to turn over on the bed without assistance

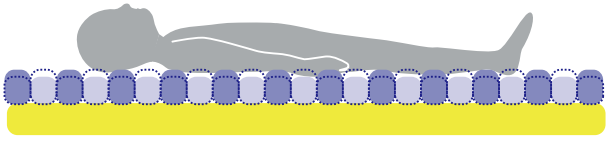
■Static mattress
(multilayered urethane laminated mattress)

### For people who are unable to turn over on the bed without assistance

■dynamic mattress(air mattress)

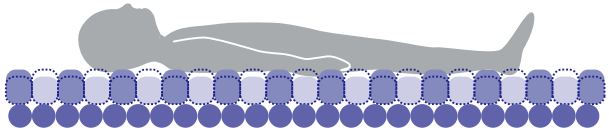
***over lay type***

For those with moderately moderately evident bony prominences and already have bedsores.



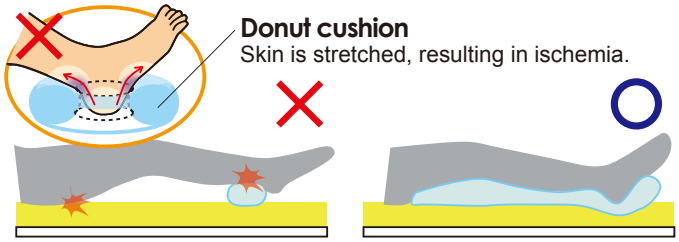
***High function type***

For those with multiple bedsores or bedsores of depth classification stage III/IV or more.



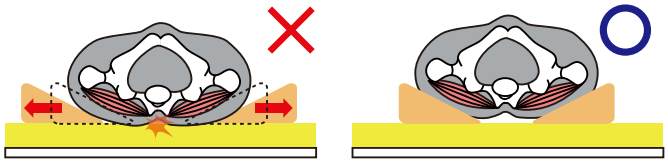
## Body pressure dispersion using positioning equipment

### Weight is supported by a wide surface rather than points




Heels are supported by rolled up towels or donut cushion.

Whole lower limbs.



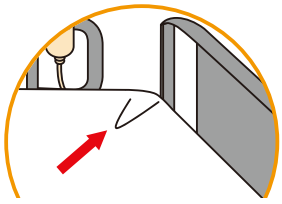
The cushions have come off resulting in excessive load on the sacrum.

Gluteal muscles support the load firmly.

### Frequency of Postural change

| Ordinary mattress | Body pressure dispersion matress |
|---|---|
| Position should be changed every 2 hours. | Position should not remain unchanged for more than 4 hours. |

Select elastic sheets for air mattresses. In case of cotton sheets, set the sheet on the mattress loosely.

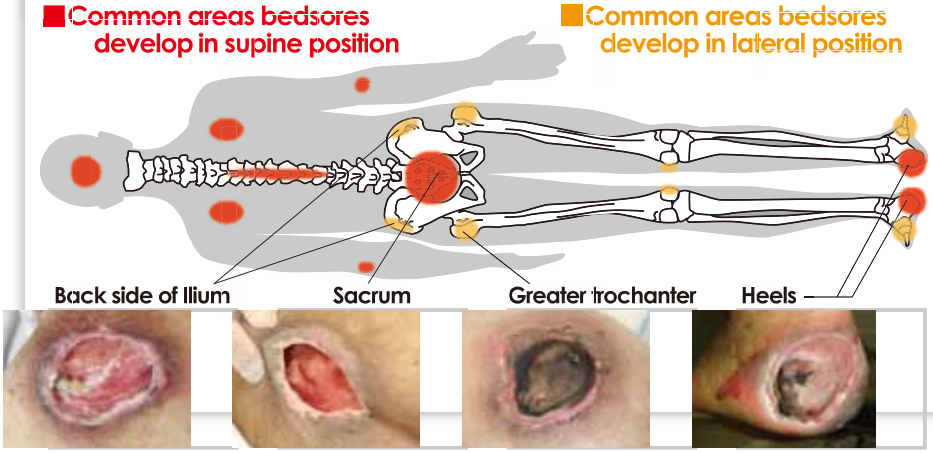


In case of cotton sheets, do not set it tightly.

## Common areas bedsores develop

■Common areas bedsores develop in supine position

■Common areas bedsores develop in lateral position




## Areas of bedsores classified by facility types

### General hospitals

No. 1: Sacrum (49.6%)
No. 2: Heel bone (15.2%)
No. 3: Greater trochanter (9.4%)

### Nursing homes

No. 1: Sacrum (49.2%)
No. 2: Heel bone (9.8%)
No. 3: Back side of Ilium (8.5%)

Japanese Society of Pressure Ulcers (JSPU) Edition: Taken from page 3 of Bedsores Prevention and Management Guidelines, 2009 Shorinsha

## Situations in which shear or friction occur

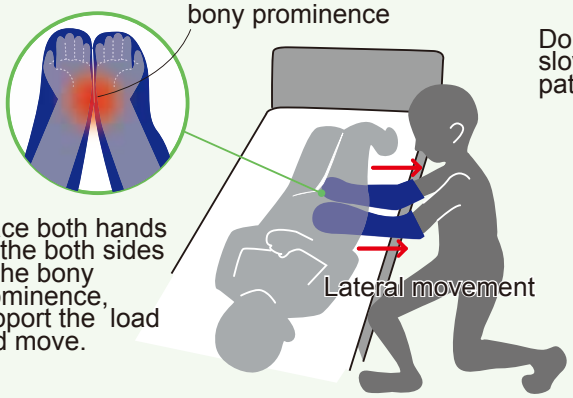
### When adjusting sleeping position and changing position

- Sliding up the body by pulling
- Pulling the body to the side

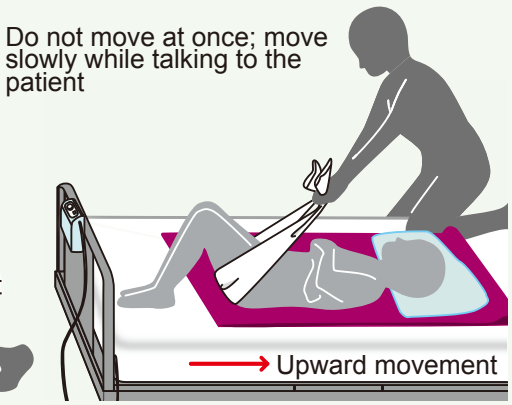
⇒ Pressure and shear occur at bony prominences

## Method to provide assistance without causing shear and/or friction

### Use of glide gloves



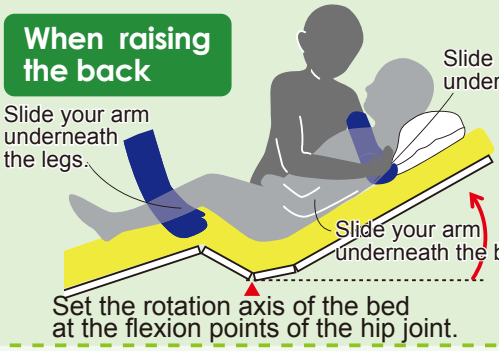

### Use of gliding sheets



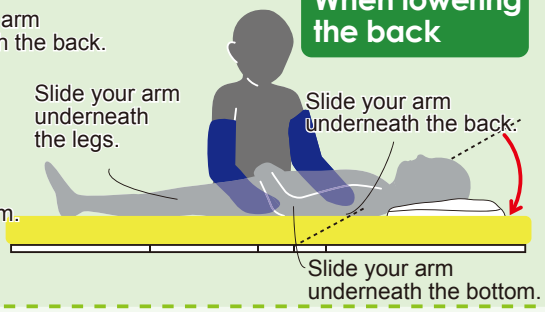

### When raising or lowering the back of a bed

- Pressure or shear occur between a mattress and a body
- Pressure and/or shear tend to be increased when sitting slipped forward

### When raising the back



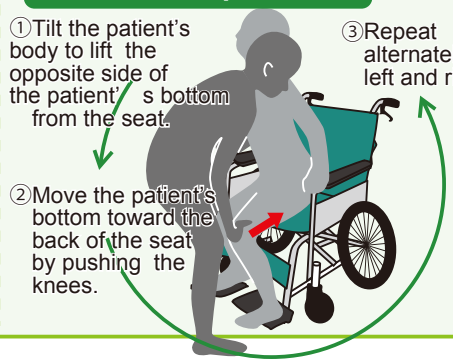

### When lowering the back




### When transferring or adjusting posture on a wheelchair

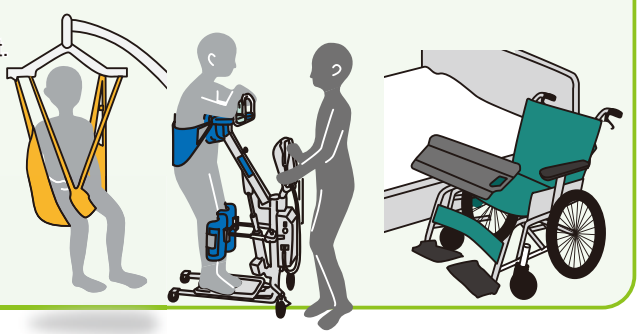
- Transferring by sliding a bottom
- Turning and lifting a body all at once.
- Lifting a body while shifting a bottom into a wheel chair seat

### Method of adjusting wheelchair posture




### Use of assistive technology

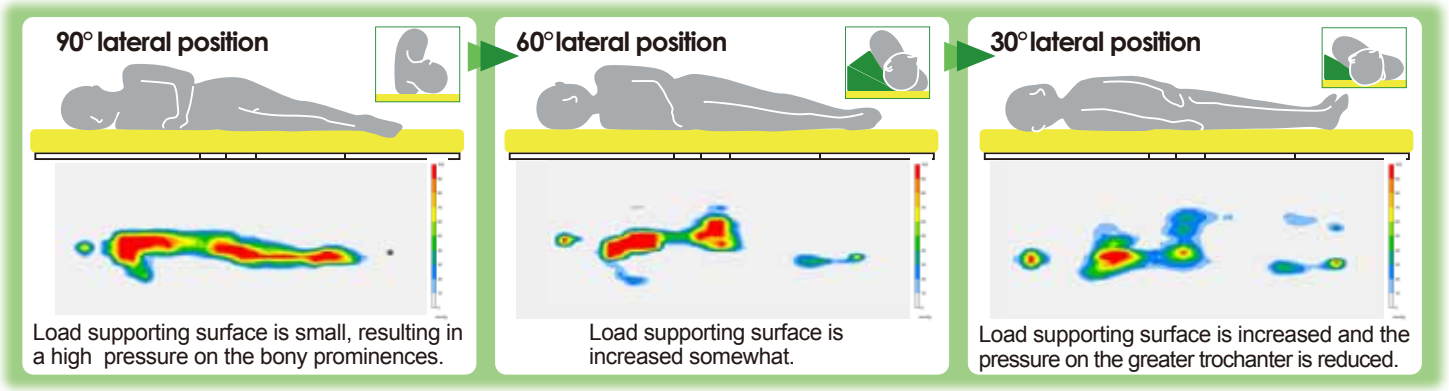
●lifters and hoist ●Transfer board



# Positioning patient in lateral position

## Load supporting surface and pressure

When positioning a patient in lateral position, because of the small load supporting surface, the load is concentrated on bony prominences (shoulder, greater trochanter, ilium, heels). It is important to set the patient' s back at an angle that reduces pressure on the bony prominences while widening the load supporting area.

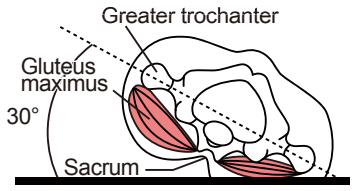



Load supporting surface is small, resulting in a high pressure on the bony prominences.

Load supporting surface is increased somewhat.

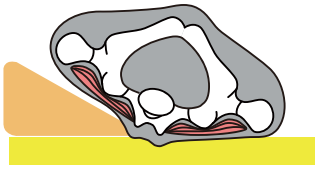
Load supporting surface is increased and the pressure on the greater trochanter is reduced.

## Lateral position 30° rules




Lateral position under 30 ° enables avoiding putting pressure on the ilium and the greater trochanter, as well as enabling the body to be supported by the buttocks where bones are covered by muscles and fat .

### Patients for whom lateral position 30° is not applicable

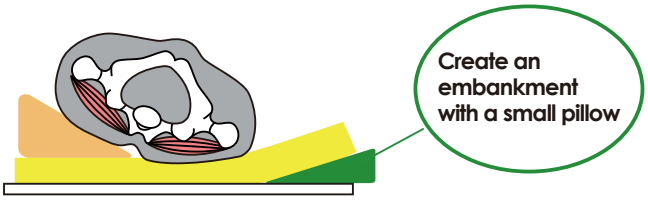


Lower inflation pressure air mattress is an option for emaciated patients and those for which lateral position 30° is not comfortable, as well as those who return to their favorite or preferred position.

## How to make lateral position comfortable

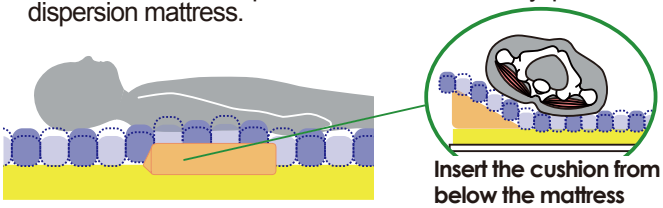
### Make an embankment on the opposite side (embankment method)

Place a small pillow or a cushion underneath the opposite side of the mattress to reduce a gap and an unstable feeling caused by the inclined surface.



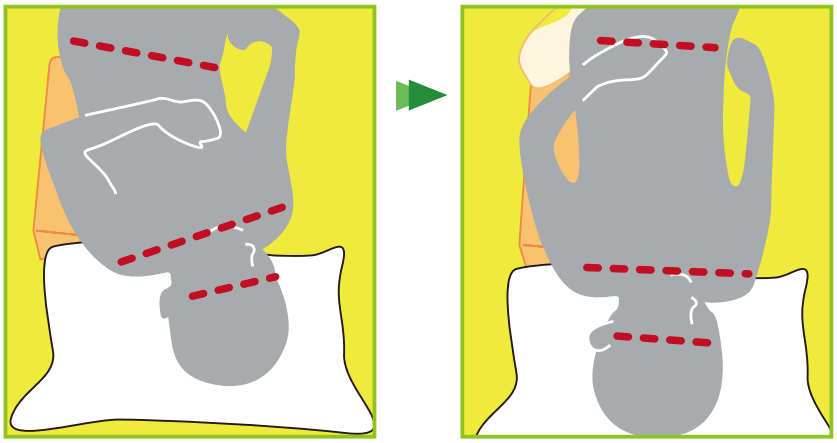

### Performing postural change from below a body pressure dispersion mattress

For people who feel discomfort or pain when directly being touched, insert a cushion underneath the mattress and make use of the performance of a body pressure dispersion mattress.




## Correct posture alignment

It is important to correct entire body alignment at the final stage of positioning. Especially, attention to upper limbs (head, chest, pelvis, upper limbs) is required as improper alignments may increase muscle tone, causing discomfort and breathing difficulties.



The lines that connect ears, shoulders on both sides and top/front iliac spine are twisting

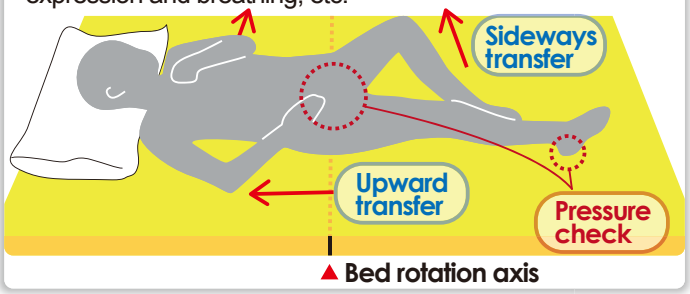
Adjust the lines that connect ears, shoulders on both sides and top/front iliac spine so that the lines parallel each other.

This part is important!

## Lateral position process

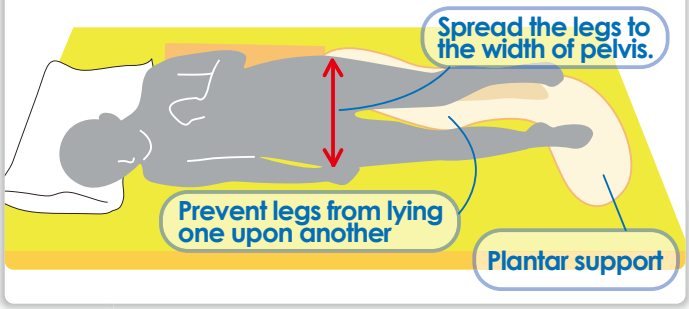
### 1 Preparation stage: Correcting the lying position and checking pressure

Put on a pair of glide gloves. Adjust lying position and check pressure at bony prominences, muscle tone, facial expression and breathing, etc.



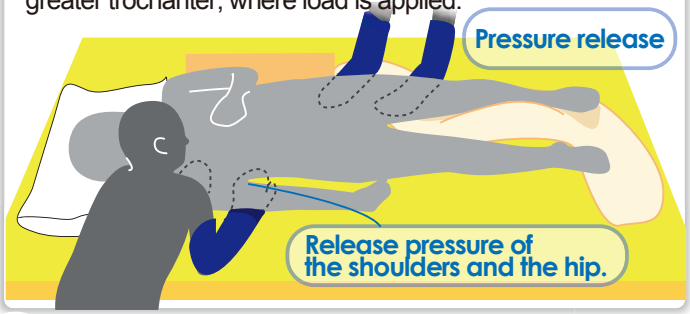

### 2 Performing postural change and supporting load

Place cushions or pillows beneath the upper and lower body to ensure the load is supported properly.



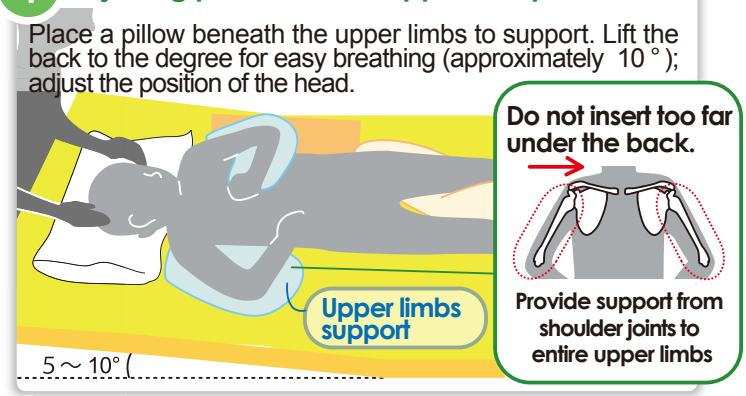

### 3 Releasing pressure and adjusting posture

Release pressure of the entire body, especially make sure to release the pressure on the lower shoulders, pelvis, greater trochanter, where load is applied.



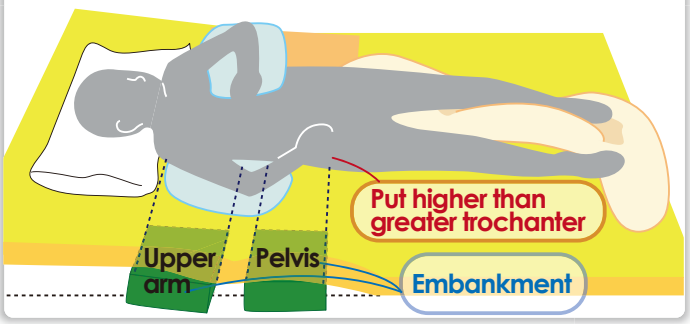

### 4 Adjusting posture of the upper body

Place a pillow beneath the upper limbs to support. Lift the back to the degree for easy breathing (approximately 10 ° ); adjust the position of the head.



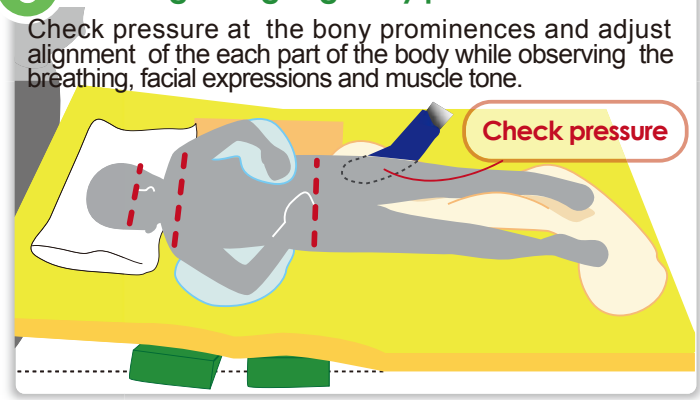

### 5 Enhancing comfort

In order to relieve instability, hold the upper arms and pelvis and create an embankment.



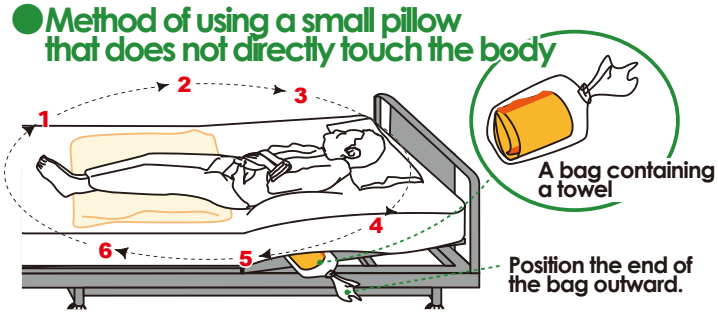

### 6 Final stage : Aligning body posture

Check pressure at the bony prominences and adjust alignment of the each part of the body while observing the breathing, facial expressions and muscle tone.



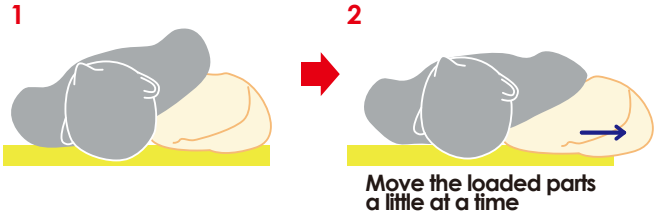

## Small shift without significant postural change

### ●Method of using a small pillow that does not directly touch the body




Place a small pillow underneath the mattress and move each body part in sequence to avoid a risk of fracture or intensifying pain.

### ●Small shift to move loaded parts a little at a time

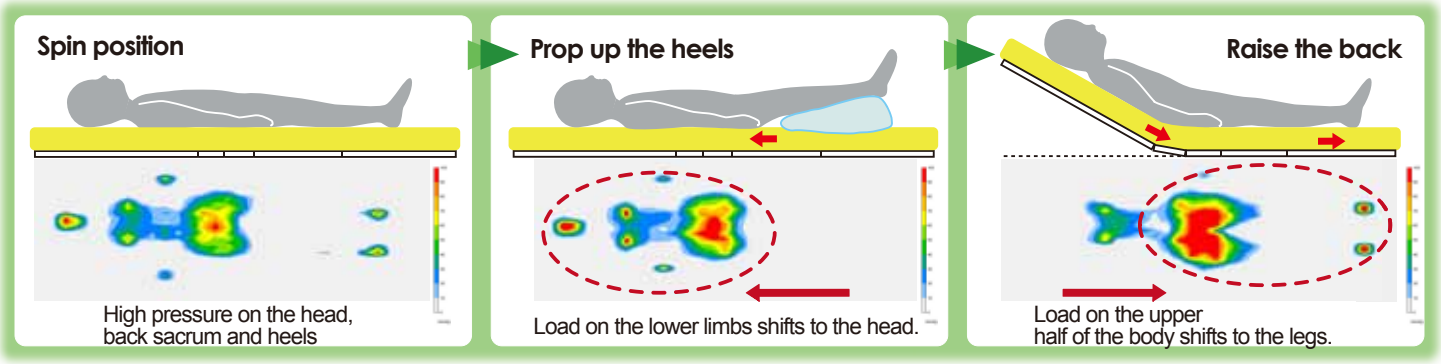



To ensure a good sleep at night and reduce burden on caregivers, change loaded parts by moving the positioning pillow a little at a time.

# Positioning for back raising posture

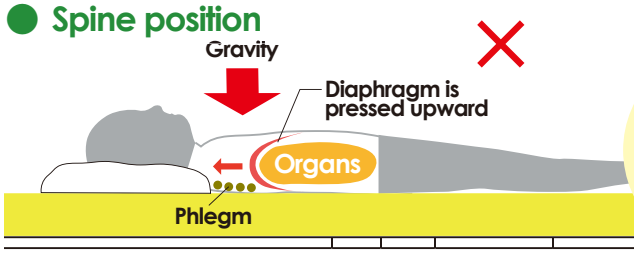
## shift of pressure points

When you relieve pressure from one point, it always moves to another point. Pressure points shift when raising or lowering a back of a nursing bed and performing positioning. Observe changes in pressure on the sacrum, coccygeal bone and heels when positioning a patient.



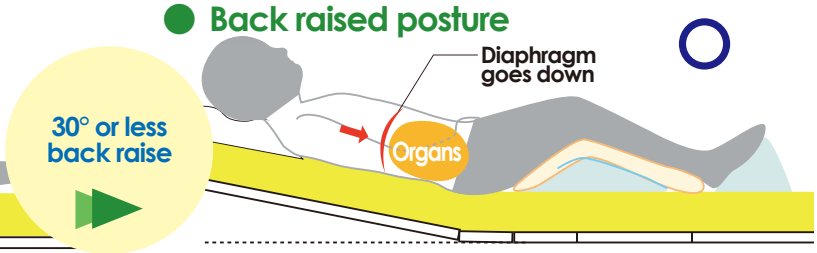

## How to help patients respire more easily

### Spine position




①Organs press the diaphragm upward thereby restricting movement of the lungs.
②The back is immobilized by gravity,making it difficult to expand the thorax.
③Phlegm builds up in the back of the chest and becomes difficult to expel.

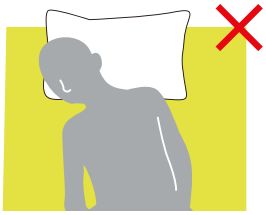
### Back raised posture



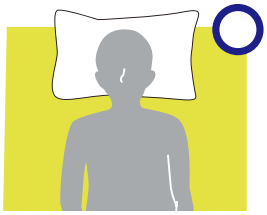

①Organs go down thereby allowing movement of the diaphragm
②Thorax expands making it easier to breathe.
③Back is raised making it easier to expel phlegm.

## How to help patients swallow more easily

### Place head and body trunk in neutral position.

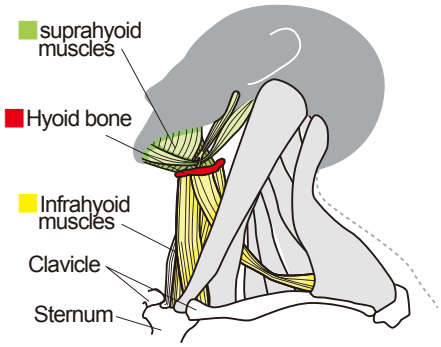


If the head and/or trunk are laid downward, the infrahyoid muscles are pulled,making it harder to swallow.



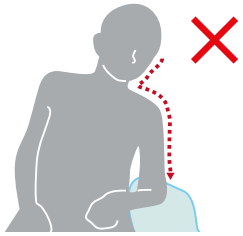
The head and trunk are kept in neutral position, thereby making it easier to swallow.

### Muscles used for swallowing




The muscles used for swallowing (infrahyoid muscles, etc.) are anatomically connected to the clavicle, sternum and shoulder blades, so they are easily affected by relative positions of the head, trunk and upper limbs.

### Support weight of the arms with cushions.

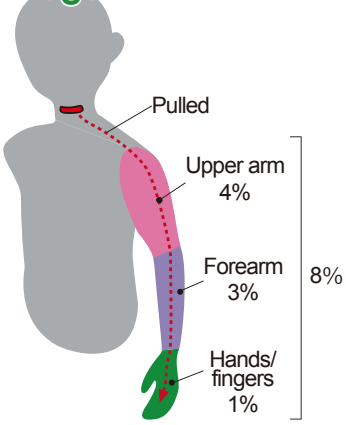


The head and trunk are pulled backward by the weight of the upper limbs, thereby making it difficult to swallow.

Weight of the upper limbs is supported by cushions, thereby making it easier to swallow.

### Arm weight by percentage

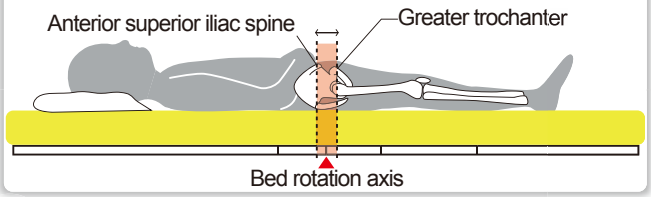
Weight of an upper arm, forearm and hand accounts for approximately 8% of the body weight. If not supported, the infrahyoid muscles are pulled upward via the shoulder blades and clavicle, thereby inhibiting movement of the larynx, impedes swallowing.



## Back raised posture process

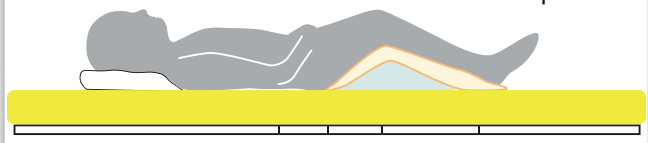
### 1 Preparation stage: Checking environment and adjusting lying position

Check a bed mechanism and a type of mattress; correct patient's lying position and adjust bed rotation axis with flexion points of the hip joint.



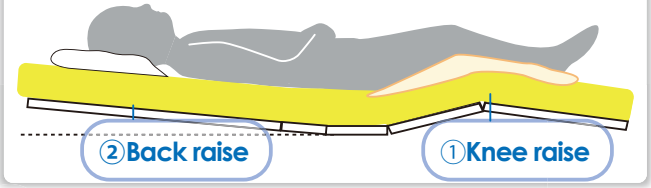

### 2 When bed does not match the points knees flex

If the rotational axis of the bed does not match the knee joints of small patients or those with deformation/contracture of lower limbs, place a cushion under the lower limbs to match the knee flexion points.



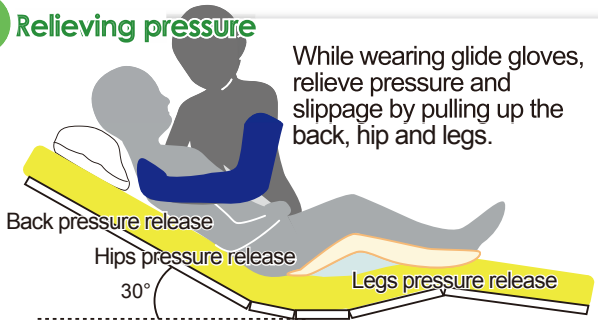
### 3 Raising the back

In order to avoid slipping of the buttocks, raise the knees before raising the back and lower the knees so as not to put pressure on the abdomen.



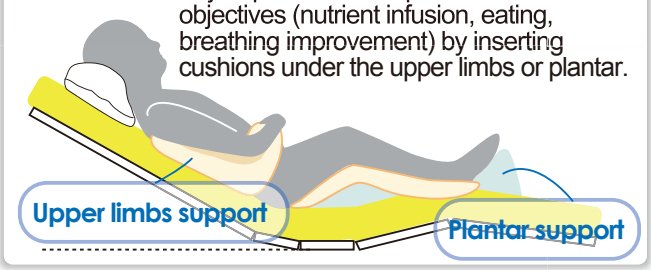

### 4 Relieving pressure

While wearing glide gloves, relieve pressure and slippage by pulling up the back, hip and legs.



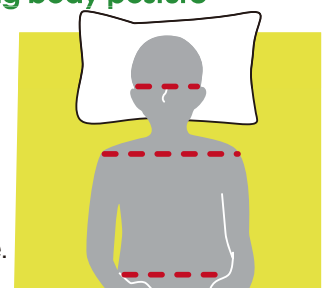

### 5 Enhancing comfort

Adjust posture of the patient based on the objectives (nutrient infusion, eating, breathing improvement) by inserting cushions under the upper limbs or plantar.



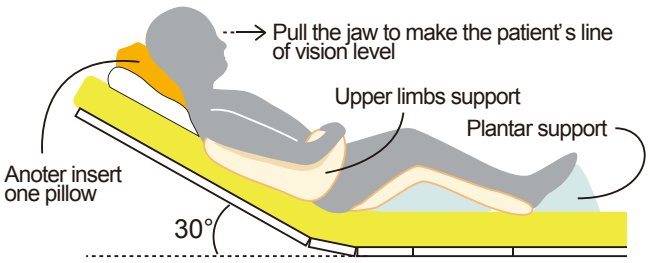

### 6 Final stage: Aligning body posture

Check pressure at the bony prominences and adjust alignment of the each part of the body while observing the breathing, facial expressions and muscle tone to complete adjustment of the posture.

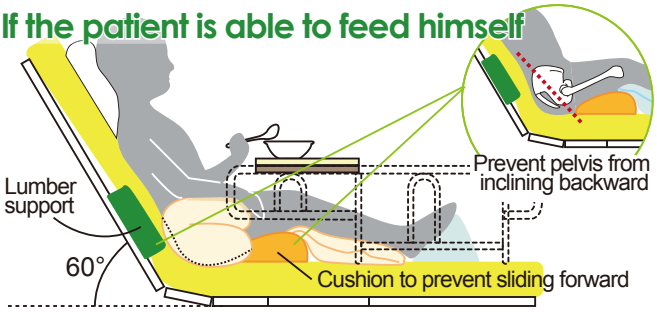


## Back raising posture for eating/swallowing

### If the patient has swallowing disorders



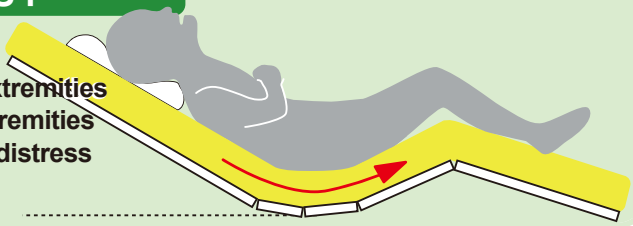

### If the patient is able to feed himself




① In the case of patients with swallowing disability, start from 30 degrees back raising position.
② Gently pull out the jaw so the head tilts slightly forward; adjust by stacking pillows till the patient's eye level becomes horizontal.
③ Raise the back of the bed to 40 to 60 degrees, depending on the severity of the swallowing disorder and the patient's motor ability to eat.

## Harmful effect of slipped forward sitting position

**① Local increase in pressure and shear**
**② Decrease in the mobility of head, trunk and joints of extremities**
**③ Excessive muscle tone of head, trunk and joints of extremities**
**④ Increase in accidental deglutition risk and respiratory distress**
**⑤ Increase burden for caregivers**

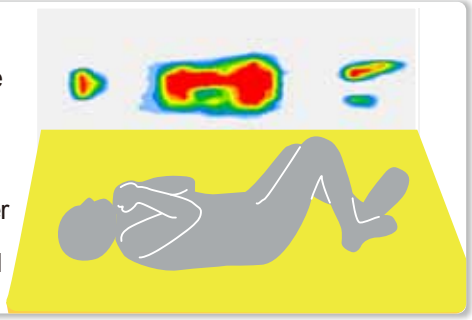


# Positioning for patients with higher muscle tone and arthrogryposis

In the case of patients with higher muscle tone and arthrogryposis (joint contractures), muscle tone is aggravated by pain and uncomfortable stimulation when you try to force the patient's arms and/or legs to correct the posture; it makes positioning more difficult against your intention. It is important to understand the process to avoid increasing muscle tone before trying to position the patient.

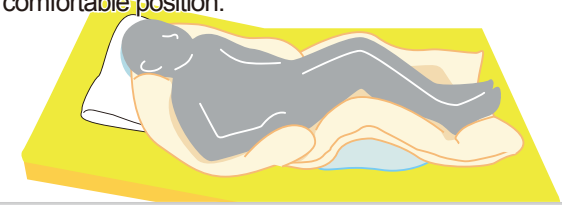
## Muscle tone relaxation process

1 The load supporting surface contacting the mattress is small and the mattress supports the load at a limited number of body parts such as head, back and buttocks.

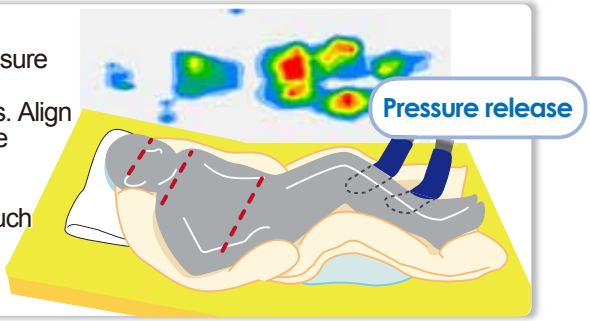


2 To reduce muscle tone, insert a cushion to support the weight with the mattress; raise the back (no more than 30 °) to shift the weight from the upper half to the lower half of the body (Especially thigh and plantar).

3 Watch the patient's facial expressions for signs f. pain or discomfort while reducing muscle tone; move the joins slowly to adjust the posture to a comfortable position.



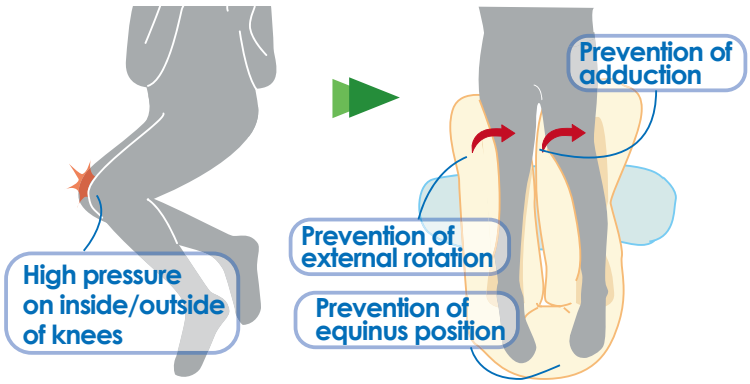
4 Relieve pressure from bony prominences. Align posture while observing patient's conditions such as breathing and muscle tone.



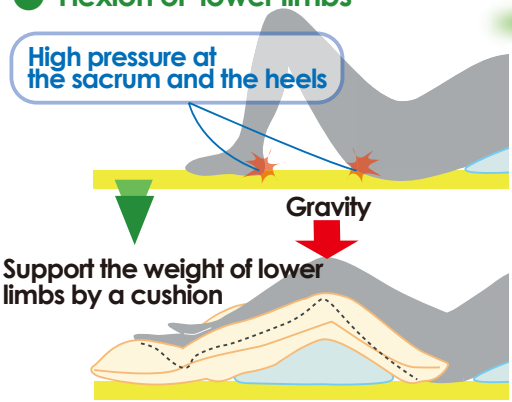

## How to adjust cushions for deformation/contracture of lower limbs

Relax muscle tone first!

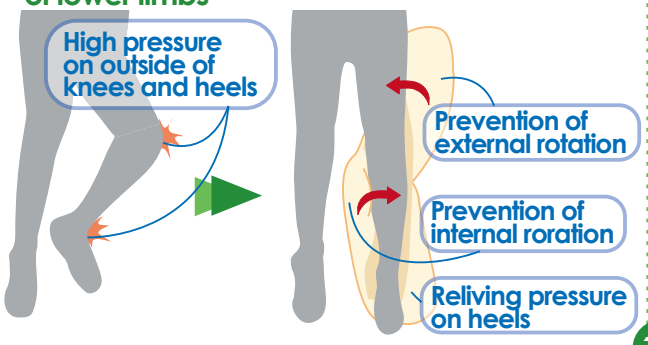
### A sideways fall and flexion of lower limbs



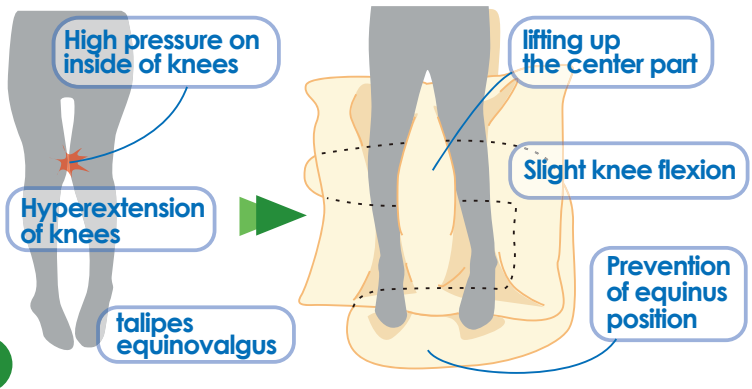

### Flexion of lower limbs




### Abduction and external rotation of lower limbs



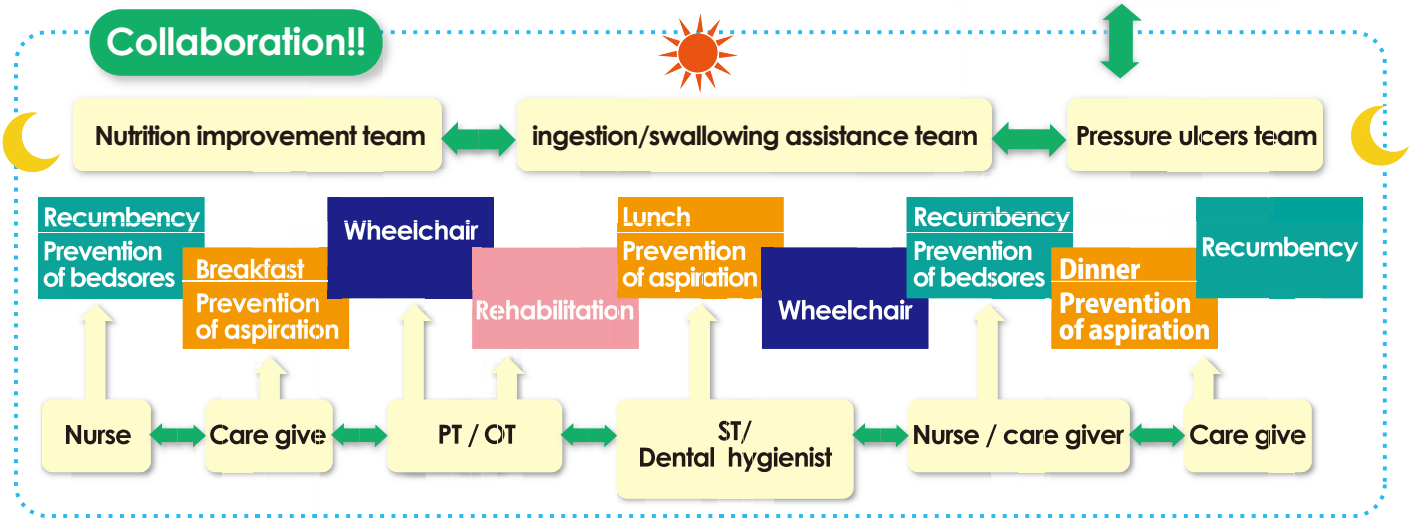

### Adduction / internal rotation of lower limbs



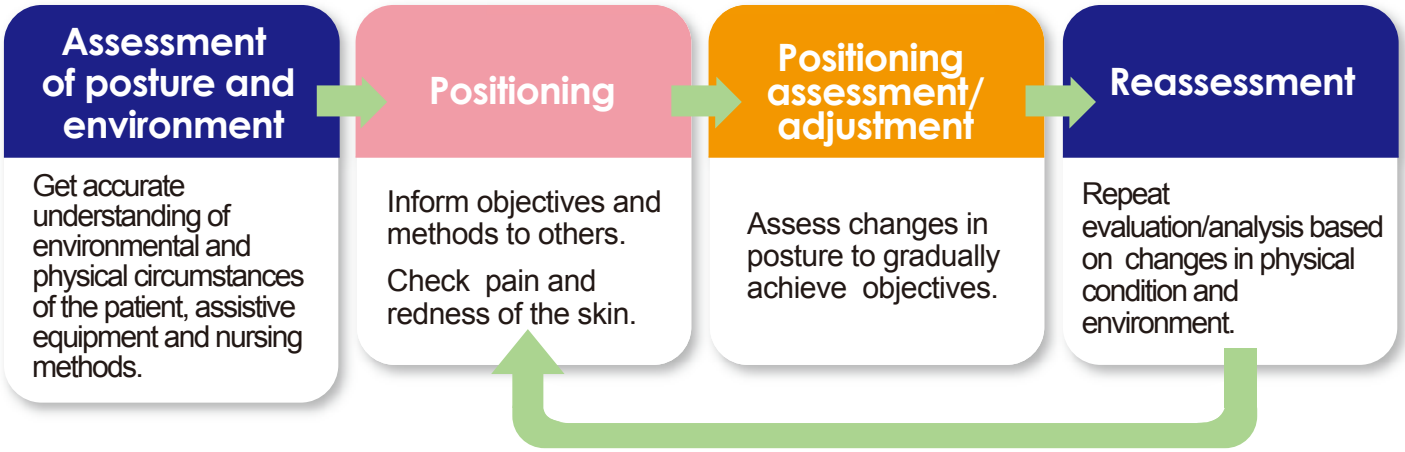
# Enhancing results of positioning

## Collaborate with other professionals

Positioning not only involves raising a bed, but rather requires considering what sort of posture is used for activities such as transfer,locomotion,eating,rehabilitation and so on.If objectives and/or methods of positioning vary, it is important to determin priority and share objectives with other professionals in a team.


## Review based on changes in posture or lifestyle



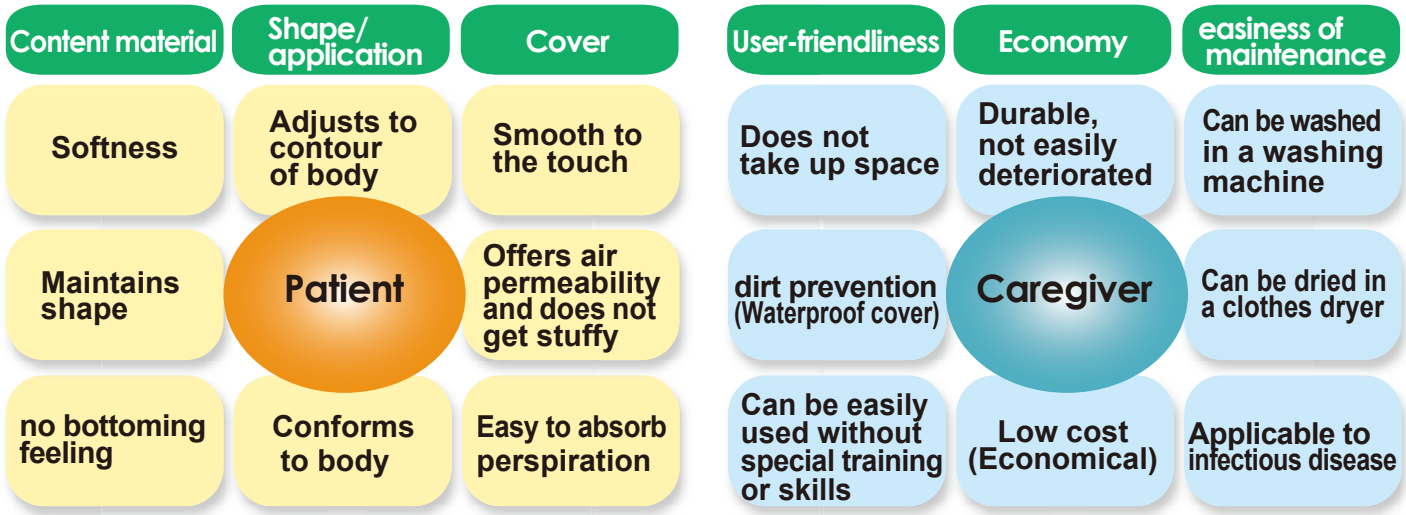

## Sharing experiences is the best way to understanding positioning

It is difficult to understand and practice positioning by just reading textbooks.
Long term bed ridden patients understand the position of their body, pain and pressure applied to body parts using deep sensation and skin sensation with a lack of visual information.
By actually experience of a role as a patient being positioned, you can experience the pain, discomfort, muscle tone and uneasiness from the standpoint of the patient receiving care. Learning in a group with other professionals is strongly recommended.

# Tips for choosing positioning products

## Views to choose positioning products

When selecting positioning products, it is important to consider mental and physical impacts of the equipment on mental, physical, physiological functions and choose products that makes a patient feel “comfortable” and “relaxed.” Look, feel and experience to select the best products to provide comforatable life as much as possible when positioning.




What are the features of positioning equipment?

| | | Shape/ application | Content material / characteristics | Cover | User-friendliness | Ease of maintenance |
|---|---|---|---|---|---|---|
| Can be formed freely |  | ▪ Can be adjusted to conform to body shape<br>▪ Multipurpose | **Polyester cotton chips (Soft)**<br>Can be shaped by moving chips | ▪ Has a pleasant feel | ▪ Takes space to some extent<br>▪ There is a need to learn how to use | ▪ Can be washed in a washing machine ; can be a dried in a cloths dryer<br>▪ Can withstand high temperatures up to 135°C |
| Fixed shape |  | Primarily lateral position | **Special medium density, low resilience foam (Soft)**<br>Shape is predetermined so it can be used in the same manner by anyone. | ▪ Polyester front surface with laminated waterproof rear surface | ▪ Compact<br>▪ Easy to use; doesn’ t require special training or skills | ▪ Cover can be washed in a washing machine or dried in a cloths dryer<br>▪ Equipment and cover can be washed together in hot water in excess of 100°C |
| |  | Relief of pressure at bone prominences | | | | |
| |  | Prevention of slipping forward when raising back | | | | |
| |  | Primarily spinal position / lateral position | **Special high density, low resilience foam (Somewhat hard)**<br>Shape is predetermined so it can be used in the same manner by anyone. | ▪ Polyester material offering superior ventilation and perspiration absorption | | ▪ Cover can be washed in a washing machine.<br>▪ Wash equipment with a neutral detergent. After spin drying, dry in the shadow. |
| |  | Multipurpose equipment applicable to spinal position / lateral position/semi sitting (back raised) position | | | | |
| |  | For adjustment of lying and sitting posture | | | | |

# Practice of Positioning

## Learning from practice examples of positioning

This part contains case studies to help to apply the knowledge and the skills of positioning you learned in the basic part to nursing and care practice. In order to put a positioning plan into action in your practice, we should take into account restrictions in medical management, burden on caregivers, provision of positioning and assistive equipment, and impact on other ADL, while obtaining understanding of other professionals.


**Cooperators who provided the cases**

**Hakuai Okayama Social Welfare Corp., Okayama Hakuai Hospital**
Dr. Mutsumi Satake, Nursing Supervisor

**Head of Rehabilitation Dept., Tomita Hospital Medical Corp.**
Hiroshi Tsuji, Physical Therapist

**Hiroshima Prefecture Posture/ Activities Healthcare Research Association**
Yosuke Sato, Occupational Therapist
Koji Takamoto, Occupational Therapist
Yohei Tsuchiya, Assistive Equipment Consultant


# Case Study I :
# Case of hemiplegia

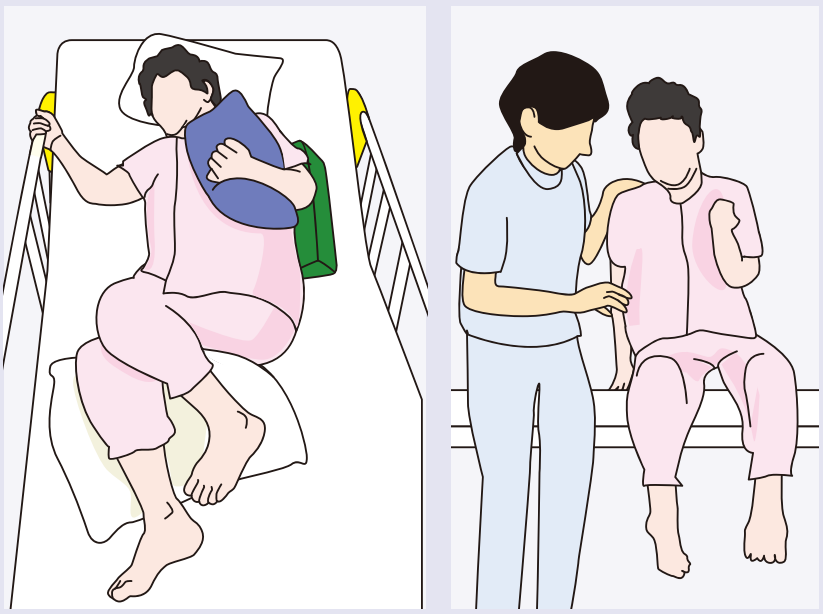
## Basic information:
## Female, 65 years of age

Height: 148 cm, weight: 46.6 kg (BMI 21. 2). She was admitted to hospital suffering from left hemiplegia due to encephalorrhagia. Independence degree of daily living was B2, being able to hold sitting position with assistance, communicate in spite of hoarseness. Due to ingestion/swallowing difficulty,gastrogavageand ingesting/swallowing training of a jerry food has been conducted. . Spasticity on the paralytic side is strong; shoulder adduction, elbow flexion, finger bending contracture, hip flexion, talipes equinus have been observed . Also knee hyperextension on the non-paralytic side have been observed. She constantly grips a side rail with her right hand, resulting in increase in muscle tone and she complains uneasiness and pain when changing posture. Position is changed every 2 hours including lateral position and 30 degree back raised position . Assistive equipment before the intervention is a static mattress, a beads pillow and one nasent pad.

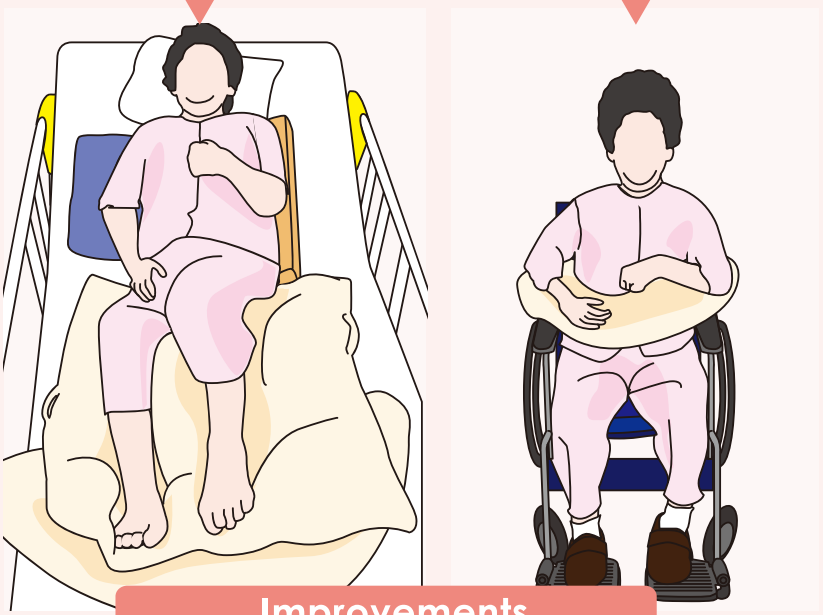
## Assistive equipment used for the case


Whole body

Before positioning



After positioning



## Improvements

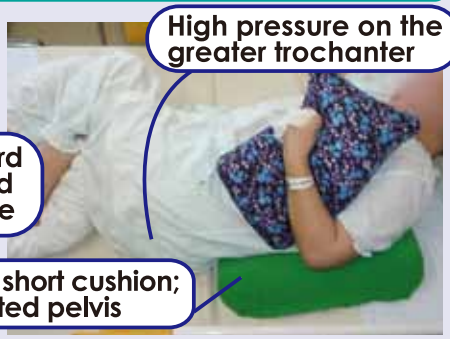
①Improving forward slipped posture by increasing supporting surface for the whole lower limbs reduced muscle tone, which can be confirmed by a facial expression of the patient and the fact that the patient can let go her grip of the side rail.

②Placing the patient in semi-lateral position by using a long wedge-shaped cushion implroved the torsion of the pelvis and reduced pressure on the greater trochanter.

③By supporting the plantar and holding the both legs in neutral position, conditions such as both legs laterally falling, left talipes equinus and right talipes equinovalgus have been improved.

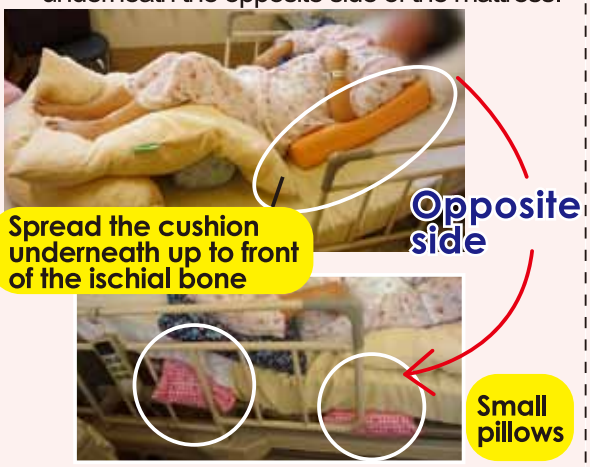
④The patient spending most of the day in the bed was encouraged to leave the bed, thereby she is now able to spend approximately an hour a day sitting in a wheelchair at a day room.

## Head/ neck Trunk




1. The wedge-shaped cushion is too short to support the pelvis and the lower body, making the pelvis twisted, giving high pressure on the greater trochanter.
2. The lying position is not appropriate, resulting in forward slip, increase in muscle tone.
3. The patient has poor sitting balance,lying in bed all day.

1′ The long wedge-shaped cushion supports the pelvis and reduces pressure on the greater trochanter. The posture is stabilized by placing a small pillow underneath the opposite side of the mattress.




2′ Spread a wide cushion underneath the patient up to front of the ischial bone to correct the lying position and raise the back 10 to 15 degrees to prevent forward slip.

3′ Setting a back cushion and a seat cushion to stabilize sitting posture on the wheelchair, enabled the patient to hold sitting and leave the bed.

## Upper limbs


1. The patient does not let go of the side rail due to the unstable posture.
2. The upper limbs of the paralytic side are placed on the chest due to lack of support.

1′ The stabilized posture relives uneasiness, making the patient release the grip on the side rail.

2′ Placing a cushion under the upper limbs to support the weight makes the position of the chest more comfortable and decreases muscle tone.


## Lower limbs

Right lateral position


Left lateral position


1. In right lateral position, both lower limbs have laterally fallen, resulting in high pressure on inside/outside of the knees and the greater trochanter.
2. In left lateral position, left talipes equinus and right talipes equinovalgus are observed.

1′ Weight of the whole lower limbs is supported by the wide cushion, preventing the limbs from turning sideways, to reduce pressure on the inside/outside of the knees.

2′ Supporting the plantar with the roll cushion improves left talipes equinus and right talipes equinovalgus.

# Case Study II:
# Case of kyphosis

## Basic information:
## Female, 87 years of age

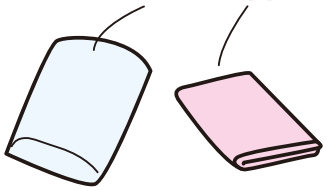
Height: 144 cm, weight: 23.4 kg (BMI 11.2). She was admitted to the hospital due to chronic renal failure and cerebral infarction sequelae. Independence degree of daily living was C2, being unable to communicate. The patient currently does not have bedsores, but has strong kyphosis and bony prominences are evident due to emaciation.

Internal rotation, adduction and flexion contracture of the upper limbs, internal rotation, adduction and flexion of the lower limbs are observed, and flexion contracture of the elbow and knee are gradually progressing. Her position is changed every two hours and nasoenteric feeding with back raised 30 degrees has been used. Assistive equipment before the intervention is a dynamic mattress , a Nasent pad, a beads pillow on the market (1 each).

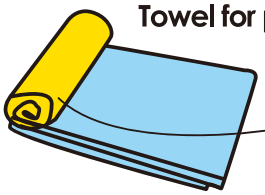
## Assistive equipment used for the case

**Nasent Ex Roll 200**

**Pillow and towel for upper limbs**



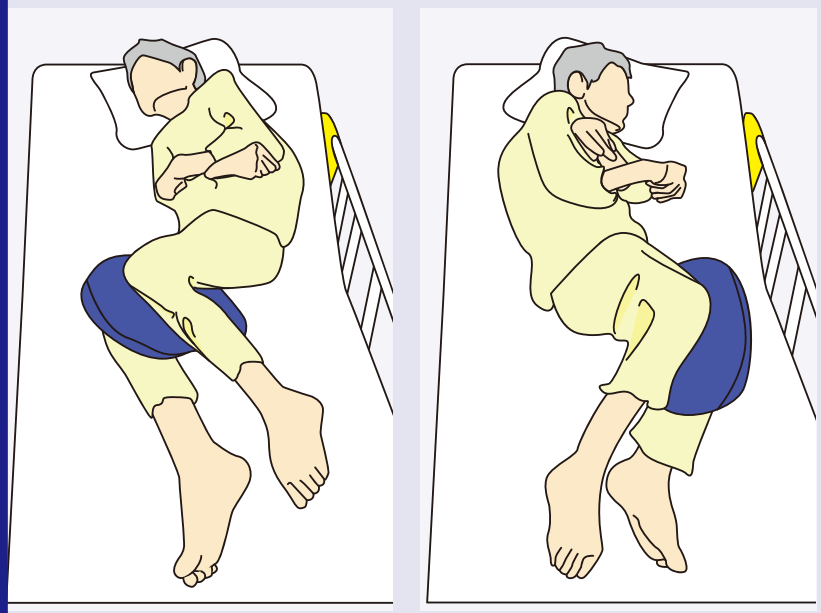
**Towel for pillow**



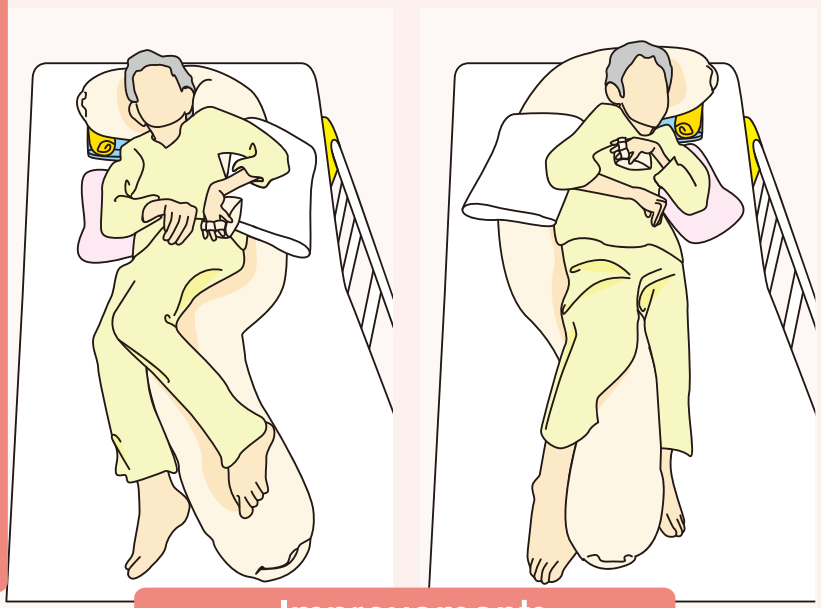

**Mouse shaped cushion**

## Whole body

**Before positioning**



**After positioning**



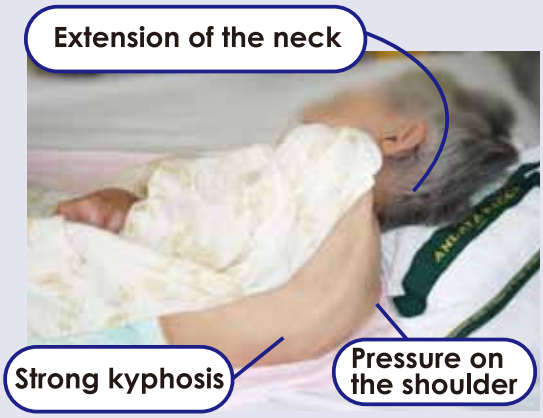
## Improvements

①Pressure on the shoulder and the greater trochanter has been reduced and the load supporting area has been expanded by switching from a full lateral position to a half lateral position.

②By spreading the upper limbs folded on the chest and supporting the weight of the arms on a cushion, the thorax is expanded, facilitating breathing and comfortability.

③Keeping the hip joints spread to the width of the pelvis prevents internal rotation/adduction of the hip joints and reduces pressure on the inside of the knees.

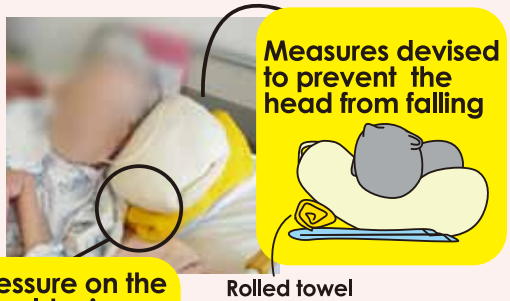
## Head/ neck Trunk



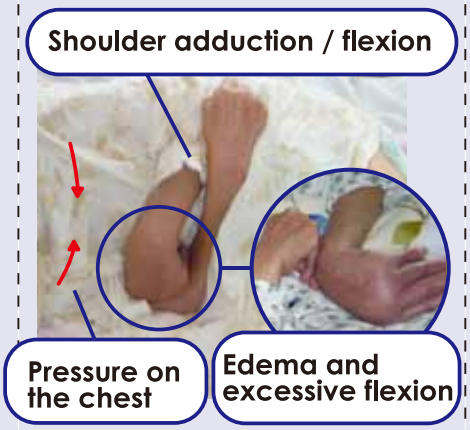

1. Because of strong kyphosis, the patient can only take a lateral position, giving strong pressure on the chest, the greater trochanter and the ilium.
2. Due to extension of the neck, position of the pillow is difficult to adjust, pressing the shoulder.

1′ Pressure on the thorax, the greater trochanter and the ilium is decreased by keeping a semi lateral position with a long cushion.


2′ A long cushion is used to keep the head being raised to relieve pressure on the shoulder. A rolled towel is placed on the incline to stabilize the head.




## Upper limbs




1. There is a concern for constriction of the thorax, giving negative impact on breathing and swallowing.
2. Excessive flexion and edema of the left hand are observed.

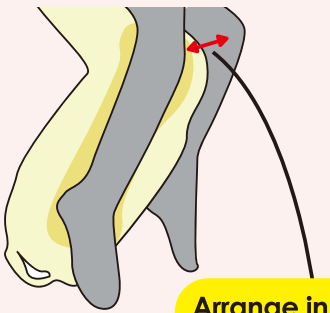
1′ Open both upper limbs outward and support the weight with a cushion to expand the thorax.


2′ Prevent excessive flexion of the left hand with a mouse shaped cushion.

## Lower limbs


1. The tendency of flexion in the lower limbs is progressing and both knees have laterally fallen, giving pressure on the greater trochanter and both side of the knee in the lower side.

1′ Open the lower limbs to the width of the pelvis and arrange the long cushion in the shape of “S” to prevent the legs from being overlapped.



# Case Study III:
# Case of flexion contracture

## Basic information:
## Female, 92 years of age

Height:153 cm, weight:41.2 kg (BMI 13.4). She was admitted to the hospital due to diabetes, heart failure, and multiple cerebral infarctions. Independence degree of daily living is C2, being not capable of changing a position without assistance and communicating with others. Patient's her position is changed every 2 to 3 hours. Nasoenteric feeding is conducted at a 40 degrees back raised position. Muscle tone of the whole body is extremely high; neck extension, shoulder adduction, elbow flexion and hip/knee adduction/flexion have been gradually progressing since admission. Shoulder joints, hip joints and knee joints are stiff, making it difficult to change clothes and diapers. Assistive equipment before the intervention is a three-motor-powered bed with a dynamic mattress laid on top a hard bed mattress, a wedge-shaped urethane cushion and 2 beads pillows on the market.

## Assistive equipment used for the case

Nasent pad A small piece

Medical pads 40

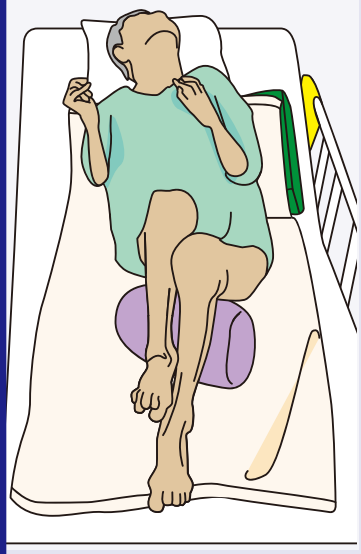
Cushions for upper limbs

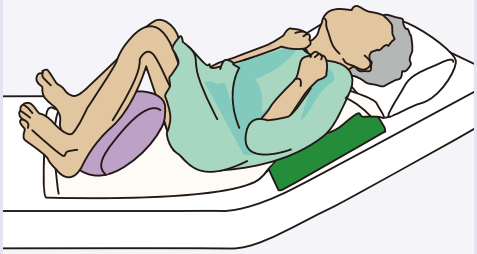
Nasent Ex Wide

Height adjustment pillow

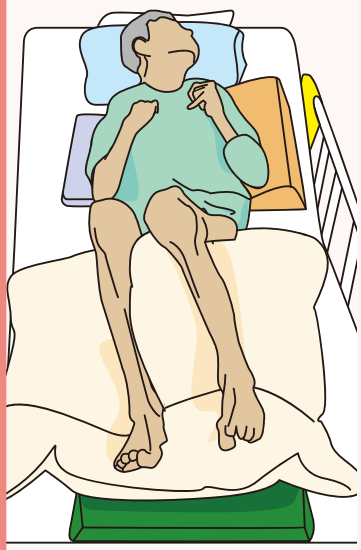
## Whole body

Before positioning





After positioning



## Improvements

①By inserting a cushion that supports the entire lower limbs and keeping 20 to 40 degrees back raised position, the load supported only by the upper body got additional support by the femur and the plantar, relieving muscle tone of the whole body.

②For the purpose of reducing burden of caregivers when changing diapers, the joints of the lower limbs are kept in a neutral position as much as possible to prevent deformation and contracture.

③In order to make the patient breath easier and more steadily , the arms are prevented from being pressed firmly against the chest by supporting the weight of the upper arms with cushions.

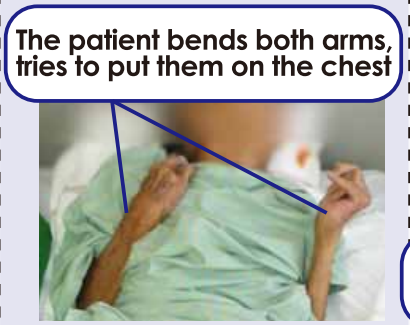
## Cervix / Spinal column Trunk


1. Muscle tone is extremely high and the upper body is supporting most weight of the body.
2. Because the arms are pressed firmly against the chest, respiration is shallow and patient is breathing hardly.

1′ Raising the back 20 to 40 degrees shifts some weight to the lower limbs, reducing muscle tone of the upper body and ameliorating extension of the neck.

2′ Supporting weight of the arms with cushions to decrease the pressure on the chest and help steady breathing.

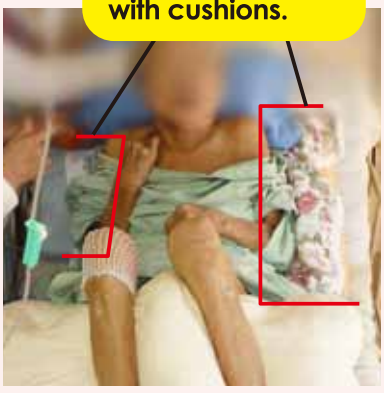

## Upper limbs




1. The both arms are pressed against the chest to be stabilized.
2. It is difficult to change pajamas due to shoulder adduction / elbow flexion.

1′ Flexion tendency of the both arms is reduced by supporting the weight of the arms with cushion.

2′ Decreasing muscle tone makes changing pajamas easier.




## Lower limbs


1. The lower limbs provides little weight support surface (just slightly by the plantar)
2. Knee adduction is strong, giving strong pressure on the insides of the knees.

1′ With a wide cushion, forming a weight support of the whole lower limbs and planta pedis

2′ Piling up chips of the wide cushion to keep the left and right knees separated.

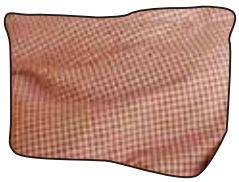
# Case Study IV:
# Case of edema with pain on motion

## Basic information:
## Female, 86 years of age

Height:144 cm, weight:34.6kg(BMI 16.6). She was admitted to the hospital due to post-hepatic encephalopathy disuse syndrome. The patient has hyperammonemia, lumbar compression fracture, etc in her medical history. Independence degree of daily living is C2, being incapable of changing position without assistance; position is changed every 2 to 3 hours. Muscle tone of the whole body is high; flexion and adduction of upper limb, extension,adduction / internal rotation / plantar inversion of lower limb are observed. Since the admission to the hospital,body tone, pain and arthrogryposis have been progressing, and the patient strongly complains about pain when changing diapers.The patient is losing an ability to feed on her own gradually; at the moment,total assistance for eating is required. Assistive equipment used for the case is a dynamic mattress,
a wedge-shaped urethane cushion and a beads pillow on the market.

## Assistive equipment used for the case

**Commercially available cushions**

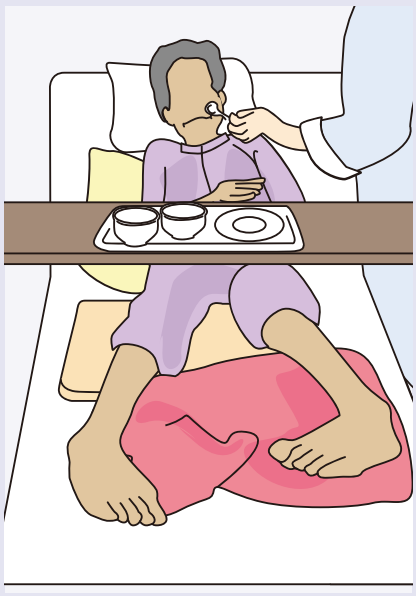


**Nasent Ex Roll 200**

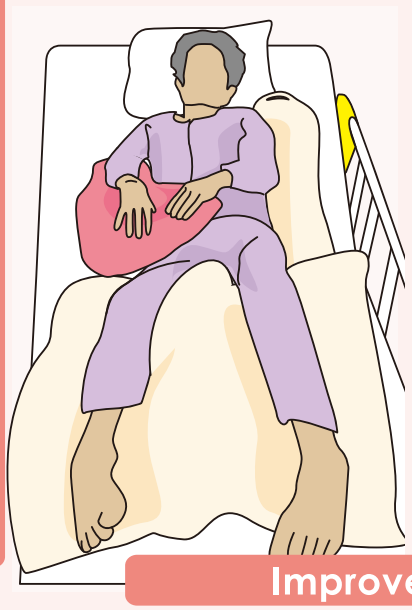
**Nasent Ex Wide**

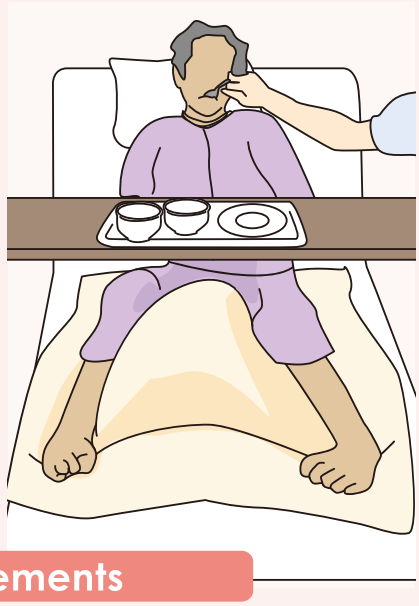
**Whole body**

**Before positioning**



**After positioning**





**Improvements**

①The pain has been reduced and relaxed facial expression was observed.

②Improvement of the slipped forward sitting position relieves pressure on the chest and the abdomen, stabilizes respiratory condition and stimulates feeding.

③The pain on motion was reduced, making the diaper change easier.

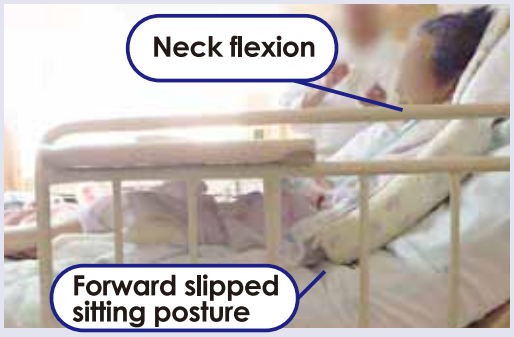
④The hip extension, adduction and medial rotation were improved; particularly the internal rotation tendency of the right lower limbs is reduced when the back is raised.

⑤The edema of the legs are improved.

## Head/ neck Trunk

1 Shallow, fast breathing SP02/HR/RR: 89-91/68 - 74/23

2 Eating in the forward slipped sitting posture.

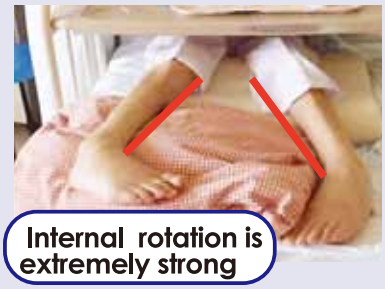



## Upper limbs

1 Muscle tone is extremely high; shoulder adduction and elbow flexion make shoulder abduction difficult.


## Lower limbs

1




2


1' Muscle tone was relieved and movement of the chest when breathing was improved by setting the patient in the semi-lateral position with a long cushion and supporting the entire lower limbs with a wide cushion. SPO2/HR/RR:93-95/68/16


2' Slippage during feeding has been resolved by spreading a wide cushion up to the ischial bone to support the soles.


1' Muscle tone decreased and the complaints about pain decreased as well. The arms were managed to be placed on the cushion.


1' Improvement of hip adduction/internal rotation is observed;particularly tendency of the right lower limb toward internal rotation at the back raised position has reduced.

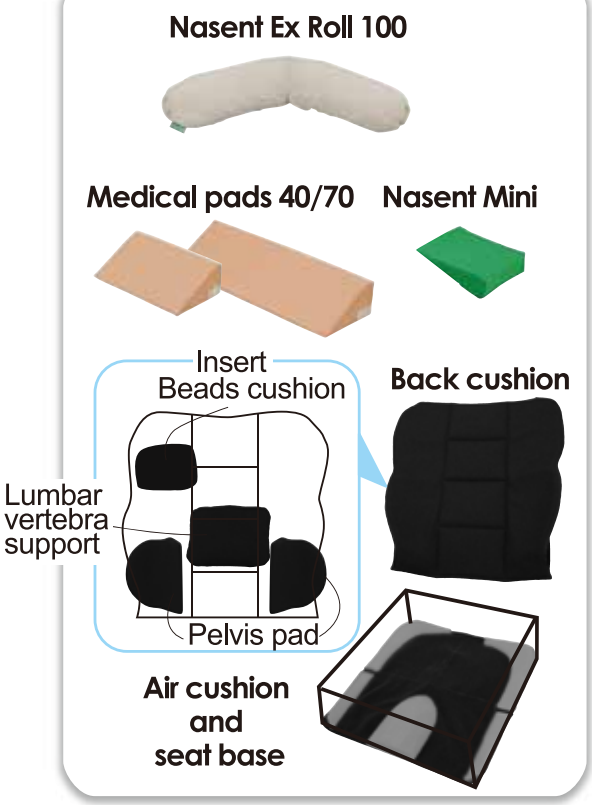

2' Edema of foot has been ameliorated.

# Case Study V:
# Case of cervical spinal cord injury kept in the same position for a long time

## Basic information:
## Female, 52 years of age

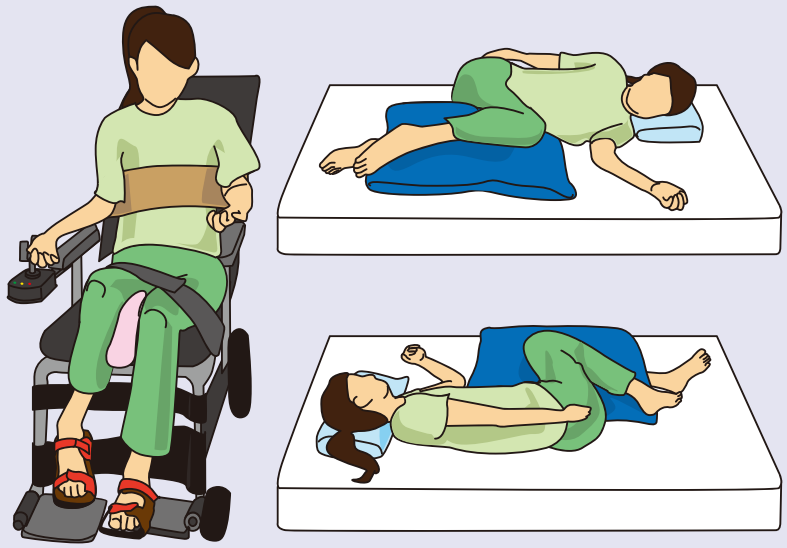
A cervical cord injury (C5) patient due to an automobile accident at age 19 that left her quadriplegic has been living at home for 5 years. There is a history of bedsores on the sacrum and the left ischial bone, and newly developed bedsores on the right ischial bone (depth III) ten months ago. Except going out for medical examinations using an electric power wheelchair, she stays in a lateral position on bed all day. Body position is changed twice a day by home visits. She spends 16 hours from morning to bedtime in left lateral position; sleeps in a right lateral position. There is a need for support to obtain an ability to manage her posture independently collaborating with home care workers. Assistive equipment used for the case is a reclining electric powered wheelchair, a nursing care lift, a 2-motor electric bed and a dynamic mattress.

## Assistive equipment used for the case

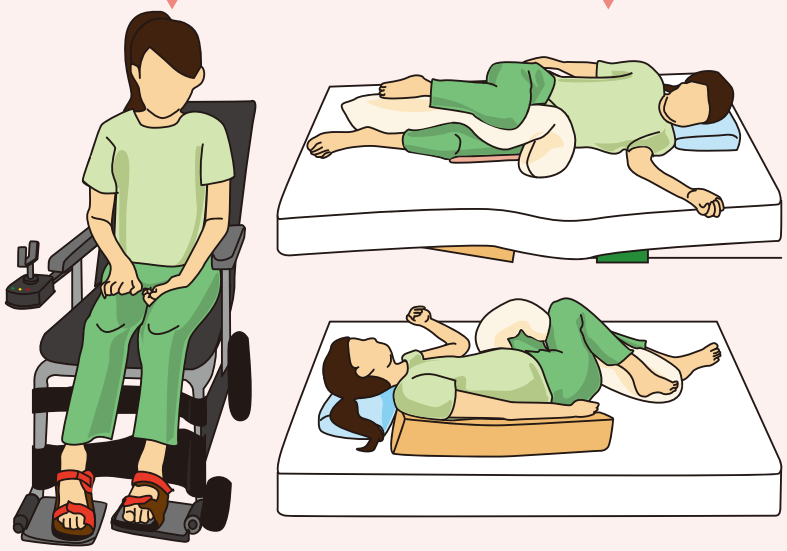



Whole body

Before positioning



After positioning



## Improvements

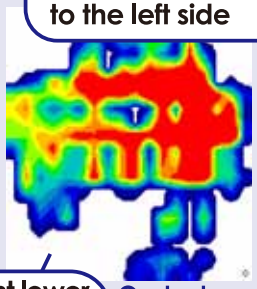
①Setting a rear cushion and a seat base on the electric powered wheelchair improved sacral sitting; Sitting posture was stabilized even without belts fastened.

②The patient has obtained an ability to shift the load by swaying trunk from side to side in order to relieve pressure while sitting in the electric powered wheelchair.

③Switching posture from the original complete lateral position to a semi- lateral position has reduced pressure on the greater trochanter, stabilized the upper body and increased mobility.

④Making contact pressure visible by the pressure distribution measuring system has given the patient and home care professionals (home nurses, caregivers, etc.) an opportunity to understand positioning better.

## Sitting posture in a wheel chair

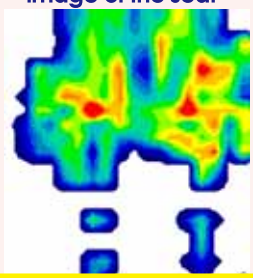

1. Because the seat depth is too long and the backing adjustment is insufficient, pelvis posterior inclination/rotation and spasticity with flexion of the lower limbs occur, which destabilize sitting balance.
2. Seat surface load is biased to the left, and the air cushion does not effectively disperse body pressure.

1′ Her sitting posture has been stabilized without belts, and posterior inclination and rotation of the pelvis have been relieved by inserting a pelvis / lumbar vertebra support back cushion to shorten seat depth and adjusting the back belt.

Seating posture is stable without belts

Spasticity of the right leg has decreased, making it possible to support the weight with the plantar

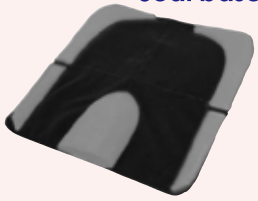
Contact pressure image of the seat



Sitting pressure is equally dispersed up to the thighs

2′ Alignment of sitting posture has been improved by inserting a seat base underneath the air cushion.

Seat base

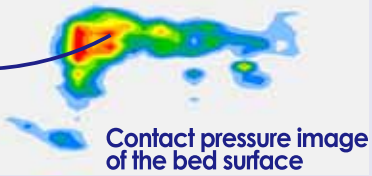


## Lying posture

Strong pressure on the shoulder

Hip / knee flexion

Strong pressure on the greater trochanter



Contact pressure image of the bed surface

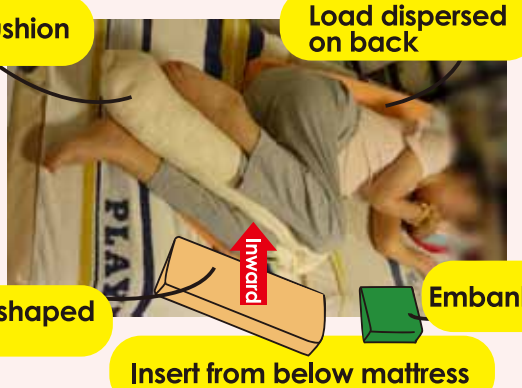
1. In order to avoid pressing the right ischial bone, the patient spent most of the time in a complete lateral position, giving strong pressure to the greater trochanter.
2. Because of the positioning using only a cushion applied to the lower limbs, excessive hip flexion due to spasticity was strengthened.

1′
- Pressure on the greater trochanter and the shoulder has been reduced by inserting wedge-shaped cushions between the back and the thighs (underneath the air mattress) to shift the load to the back.
- Spasticity with flexion have been reduced by maintaining the lower limbs in a neutral position with a long cushion.

2′ An embankment was formed by inserting wedge-shaped cushions under the mattress where the arms are to facilitate activities and comfort in lateral position.

Long cushion

Load dispersed on back



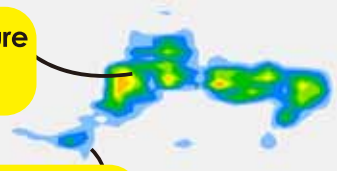

Wedge-shaped cushion

Embankment

Insert from below mattress

Relief of pressure on the greater trochanter

Improvement in flexion of lower limbs



Contact pressure image of the bed

# FAQs

## Q How can muscle tone be relieved?

### A Do you consider alignment balance of the whole body when performing positioning?

Is there any case such as relieving pressure on the heels and the sacrum resulted in making the upper body support the whole load or inserting wedge-shaped cushions behind the back to keep lateral position resulted in making the body axis twisted in an unnatural posture? Muscle tone may be an expression of discomfort from an unnatural posture. Assess and analyze causes of increased muscle tone.

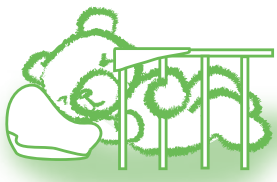
## Q Only lower limbs fall sideways, pressure on the greater trochanter and the hips is concerned.

### A Is the load of the lower limbs well supported by positioning pillows?

In the position that lower limbs are turned to the same side, pelvis tilts along with the weight of the legs, twisting the body and giving pressure on the chest. This not only gives pressure on the greater trochanter and the inner side of the knees, but has a negative impact on respiratory and swallowing fanction as well. To improve this condition, return the pelvis to the neutral position and prevent the legs from falling sideways by firmly supporting the weight of the lower limbs with a cushion. After doing so, try raising the back of the bed 10 to 15 degrees to shift the weight to the lower limbs.

## Q The patient holds a side rail and do not release the grip

### A Is the current position making the patient feel uneasy or uncomfortable?

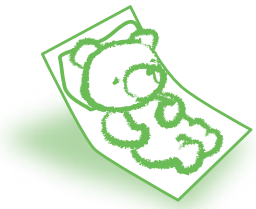


For example, is there anything that comes to your mind such as the mattress is too soft, the lateral position or the back raised position is making the patient almost falling out of the bed, postural change or transfer assistance that does not go with the self-motion perception of the patient or the patient is trying to avoid pain/pressure?
Provide a patient a comfortable positioning with a sense of security by a comprehensive assessment of a mental and physical condition, surrounding environment and assisting techniques applied.

## Q An air mattress has been introduced due to bedsores on the greater trochanter on the right side, but they are not recovering.

### A Do you raise the back of the bed with the patient in a lateral position?

Bedsores tend to occur on the right side greater trochanter if the back is raised with the patient in a lateral position in order to prevent aspiration when nutrient is being infused. Check if there is pressure on the greater trochanter due to the excessive inclining of the pelvis when the back of the bed is raised, or if there is friction or shear due to forward slippage. In the case of intense pressure, position the patient in a semi-half lateral position to decrease inclining of the pelvis to prevent pressure on the greater trochanter. In addition, insert a pillow from the front of the ischial bone to the lower limbs to prevent forward slipage when the back is raised.



## Q Using positioning pillows in summer caused miliaria.

### A Don' t you surround the patient' s body with a lot of positioning pillows?

Surrounding the patient' s body with a lot of positioning pillows in a hot season stores heat inside and could cause miliaria. Particularly beads cushions ss that change its shape along to the shape of the body tend to store heat. In this case, it is necessary to consider forming a space or lifting a body to let the heat to escape. The temperature around the beds near a window can be higher than around an exit, so it is important to adjust the direction of the wind from the air conditioner or provide skin care to prevent miliaria.

## Q Each caregiver performs positioning differently. How can the skill of all the caregivers be enhanced?

### A Have positioning pillows been selected from a standpoint of the cared person?

Caregivers may be confused if there are too many different types of assistive equipment. Try to minimize the types of assistive equipment used. In keeping with this, select simple types that are widely applicable and easy to use for caregivers in experiential learning. Experiential learning is essential for enhancing skills as it can offer experiences of discomfort, pain, tension and uneasiness from a standpoint of a cared person.

## ナーセント®メディカルシリーズ Nasent® Medical Series

### ナーセント®メディカルパット
### Nasent® Medical Pads

cover
Waterproof
(rear surface)

100℃
Can be cleaned with hot water!

**Provide comfort comfort by merit of superior body pressure dispersion**

**Medical Pads 70**
￥9,500 (tax not included)
70×22×12.3cm

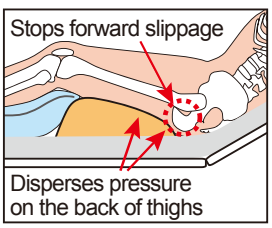
**Medical Pads 50**
￥8,200 (tax not included)
50×22×12.3cm

**Medical Pads 40**
￥6,200 (tax not included)
40×22×12.3cm

**Medical Pads 20**
￥4,200 (tax not included)
20×22×12.3cm

### ナーセント®メディカルスワロー
### Nasent® Medical Swallow

**Prevention of bedsores when back is raised**




**Nasent Swallow**
￥6,800 (tax not included)
50×25×10.5cm

### ナーセント®Ex ロール・ナーセント®Ex ワイド
### Nasent® Ex Roll / Nasent® Ex Wide

**Soft to touch; irresistible comfort**

Can be washed
135℃ Can be autoclave

**Ideal cushion material for positioning**

**Equipped with a handle that can be used to change position**

**Perspiration-absorbent cover that offers pleasant feeling**

**Nasent Ex Rolls 200**
¥16,400 (tax not included)
200×24×7cm

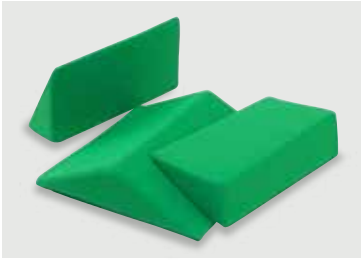
**Nasent Ex Rolls 150**
￥13,400 (tax not included)
150×24×7cm

**Nasent Ex Rolls 100**
￥9,400 (tax not included)
100×24×7cm

**Nasent Ex Wide**
￥15,800 (tax not included)
70×80×5cm

## ナーセントパット Nasent® Pads

### Compact size pads can be used for wheel chairs, combined freely; applicable to all kinds of positioning



**Nasent Pads A**
**Set of 3**
¥ 24,000 (tax not included)

Large×1：40×40×10cm
Small×2：40×20×10cm

**Nasent Pads A**
**Set of 2**
¥ 12,000 (tax not included)

Small×2：40×20×10cm

**Nasent Pads L50**
¥ 7,800 (tax not included)

50×20×10cm

**Nasent Min**
**Set of 4**
¥ 18,000 (tax not included)

26. 5 ×21×8cm

**Nasent Min**
**Set of 2**
¥ 9,400 (tax not included)

26. 5 ×21×8cm

### Waterproof cover available for all Nasent Pad products

- Waterproof laminated rear surface
- Aqua-dry construction offers perspiration absorbency and quick drying
- Sterilized

Color : Peppermint Green

### Comfortable long cushions fit body snugly

Can be washed

**Nasent Rolls L**
¥ 16,800 (tax not included)

168×φ20cm

**Nasent Rolls M**
¥ 12,800 (tax not included)

150×φ15cm

### Keeps both knees in correct position Knee positioning pillow

cover Waterproof (rear surface)

**Nasent Knee Supports**
**Set of 2**
¥ 19,000 (tax not included)

W23×D31×H22cm

### Facilitates turning over Waterproof rear surface

cover Waterproof (surface)

**Light Turn**
**Standard Type**
¥ 22,500 (tax not included)

W43×D13×H39cm

**Light Turn**
**C Type**
¥ 22,500 (tax not included)

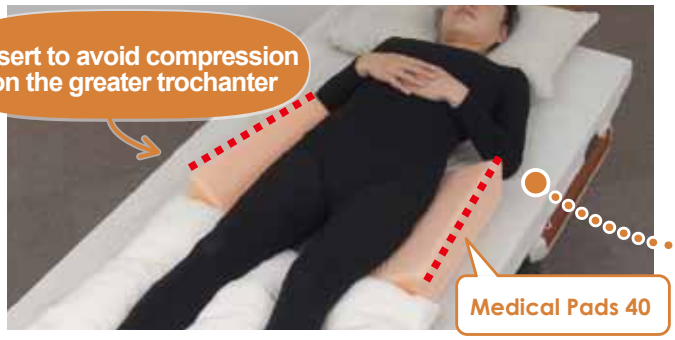
W40×D13×H39cm

# ナーセントメディカルパット Nasent® Medical Pads — Example of use

## Lateral position


## Lateral position (to distribute the pressure on the sacrum)


## Spine position (to distribute the pressure of sacrum)

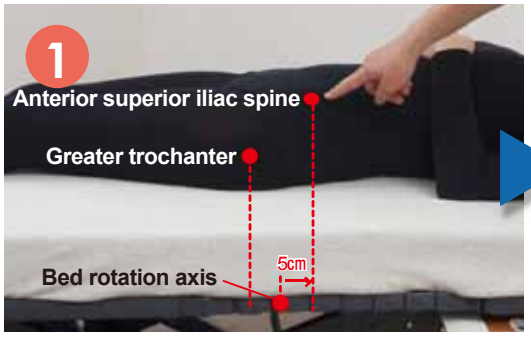



Insert a hand to check if pressure on the bony prominences is released

## Spine position (distribute pressure on the spine and the sacrum)


## Bed bath when changing a diaper


# ナーセントメディカルスワロー Nasent® Medical Swallow — Example of use




Correct patient' s lying position and adjust bed rotation axis with flexion points of body.
(5cm below the anterior superior iliac spine)
When rotational axis of the bed does not match the knee joints of small patients,release the knee-up mechanism of a electric bed


Insert "Medical swallow" to the base of the thigh.


Put a pillow so as to support the entire lower limbs,to reduce the pressure of the heels.

# Example of use

## Lateral position


## Lateral position＋upper limbs support


## Prone position


## Back raising posture for kyphosis


## Lateral position in consideration of the pressure dispersion of pelvis and lower extremities


## Holding good functional position of lower limbs

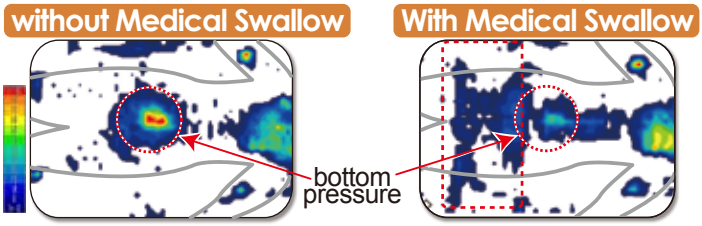


Raise the back to angle to fit the purpose. After raising the back and lowering the back, make sure to release the pressure.

## Medical Swallow Q&A

### Is it only applicable when the back is raised?

It can provide pressure dispersion effect for a bottom in supine position as well, so it is fine to be left inserted after lowering the back.



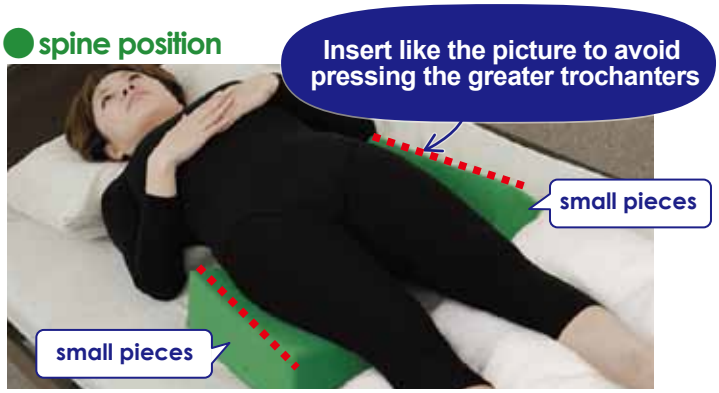

### To what degree of back raising the pressure dispersion effect can be provided?

The pressure dispersion effect for a bottom is provided in the range of 60 degrees back raised position to supine position. However, the effect is reduced at more than 60 degrees.

# Example of use

## 30° lateral position


## spine position

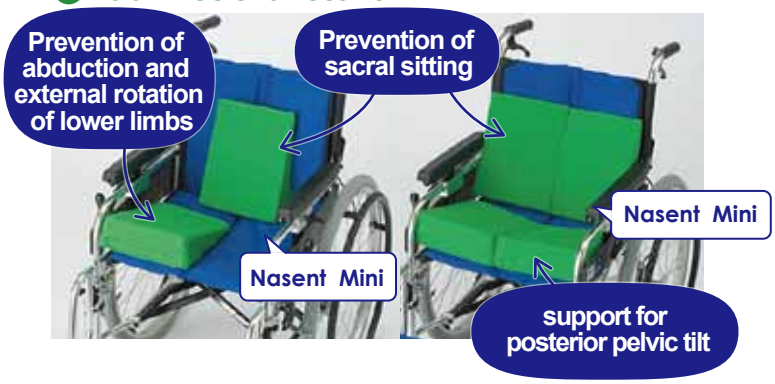



## Prevention of subluxation and pain on shoulder joint


## position to be cleaned after changing diapers


## Prevention of laterally fallen position


## As a wheelchair cushion




## Prevention of slipping forward in bed



## Prevention of pelvis from inclining backward


**After raising/lowering the back, make sure not to forget to relieve pressure.**

Release pressure and shear by pulling up the back, buttocks and legs with glide gloves.

# Example of use

1 Tilt the convex part of “light-turn” toward the foot, put the legs on the dent.

2 Turning up "light-turn" and put the knees in the dent.

3 Push the “light-turn” and the patient’ s shoulder to turn over.

4 It keeps the legs open, being able to reduce a burden of excretion care.

## It keeps your hands being used freely!

When the handle of “light-turn” fixed by s-hock or a string,excretion care is easily performed.

### Diaper change that useing a “light-turn”



### Using the bedpan with “light-turn”

### To hold posture when performing disimpaction

See the video!

http://www.nasent.net ナーセント Search


アイ・ソネックス株式会社

I Sonex Co., Ltd.
Main Office: 100-7 Enami, Naka-ku, Okayama-shi,
Okayama pref. 702-8004

TEL: +81-86-200-1550 FAX: +81-86-200-1553




2016.08