

**MANUAL FOR
BOWEL MANAGEMENT IN PERSONS
WITH SPINAL CORD INJURY**

Editor
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**NATIONAL REHABILITATION CENTER
FOR PERSONS WITH DISABILITIES
JAPAN**

(WHO COLLABORATING CENTRE)
July, 2013

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Rehabilitation Manual 29

Manual for Bowel Management in Persons with Spinal Cord Injury

July 31,2013

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PREFACE

Spinal cord injury causes bladder and bowel disturbance that affect the everyday lives of the injured persons. Despite being able to independently transfer from a wheelchair, these persons still have excretion difficulties because of injury to the autonomic nervous system. Bladder and bowel disturbance involve 2 disorders: dysuria and dyschezia. In dysuria, a regular urological follow-up is essential even after urinary independence is achieved after urethral self-catheterization, because traditionally, renal failure affects prognosis. In contrast, dyschezia has received less attention. It is not well known that many persons with dyschezia need several hours for a single defecation, despite being able to evacuate every several days. For such persons, diet should be carefully considered; many drugs, including oral medicine, are administered; and fecal disimpaction is performed. Nevertheless, there are currently useful information other than empirical data.

This manual provides information on all aspects of bowel management, and I hope that the readers will find it useful.

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Introduction

Many patients with spinal cord injury are admitted to our center for rehabilitation. One of the symptoms of spinal cord injury is dyschezia. These patients experience constipation, fecal incontinence, and diarrhea that cause discomfort and restrict their life activities. Therefore, they stay at our center to, first, regain the habit of regular bowel movements and, second, to be able to develop bowel management.

Persons with paralyzed limbs and/or muscle weakness have difficulties in transferring to a standard toilet. These persons can choose the most comfortable approach for their defecation by improve toilet environment. In addition, it is important to understand the appropriate diet, fluid intake, and medications —factors related to defecation—for such individuals.

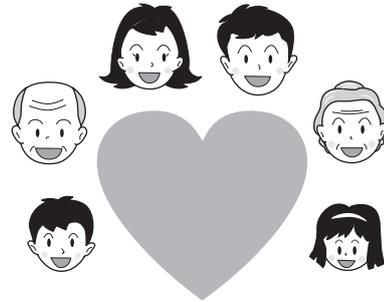
This manual provides extensive information on bowel management in persons with spinal cord injury and explains the purpose of bowel management, defecation mechanism, defecation procedures, improvement of toilets, and other related issues. We hope that persons with spinal cord injury, caregivers, or medical and health-care professionals will find this manual useful.

Chapter 1.

Purpose of Bowel Management in Persons with Spinal Cord Injury

1. Maintenance of a Healthy Life

Normal bowel movement is one of the barometers of health. An abnormal enteric environment causes symptoms such as abdominal flatulence, abdominal pain, and constipation. Excessive toxins in stool and gases are absorbed in the intestine through blood vessels and spread systemically throughout the body, causing skin problems, headaches, stiff shoulders, lassitude, and other symptoms. In addition, the condition worsens when beneficial bacteria in the intestine, which support general immunocompetence, decrease while pathogenic bacteria increase in this enteric condition, weakening the immune system and causing physical deconditioning. Moreover, accumulation of stool in the rectum may cause ileus*.



2. Prevention of Constipation, Fecal Incontinence, and Diarrhea

Unpredictable bowel movement affects the everyday lives of persons with these conditions; for example, going out of the house becomes a problem. Therefore, achieving regular bowel movement is necessary to improve the quality of life of persons with spinal cord injury.

3. Prevention of Decubitus Ulcer*

Persons with spinal cord injury lose sensation in the skin and thus tend to be slow in realizing the presence of a skin wound and decubitus ulcer. They are also prone to developing decubitus because of the poor blood flow caused by the compression of the hips during prolonged

* Ileus: The state in which the flow of food and digestive juices is disrupted in the small and large intestines. That is, the intestine becomes clogged with contents. Symptoms of ileus include stomachache caused by abdominal distension due to flatulence, nausea, and vomiting due to the reflux of intestinal contents. Surgery is sometimes required to treat this condition.

* Decubitus ulcer: The state in which the skin and deeper tissues are impaired by continuous external force (compression and shear) to a part of the body. Decubitus occurs in bony protrusions such as the sacral, ischial, coccygeal, great trochanter, and iliac regions, and on the heels.

wheelchair sitting. In addition, prolonged moist conditions in the hip region due to diaper use are likely to cause decubitus ulcers. Diapers are required in patients with diarrhea, frequent bowel movements, and fecal incontinence. Therefore, decubitus ulcers can be prevented by promoting regular bowel movement, eliminating the necessity for diaper use.

4. Prevention of Autonomic Hyperreflexia

Autonomic hyperreflexia is a symptom of injury in the fifth and sixth thoracic spinal cord segments. In this condition, because of some stimuli or accumulated urine and stool, high blood pressure, headache, sweating, horripilation, tightness in the chest, and other symptoms may occur. Stool removal can alleviate some of these symptoms.

Chapter 2.

Structure of the Intestine and the Mechanism of Defecation

1. Structure of the Intestine

nutritionFigure 1 shows the structure of the intestine.

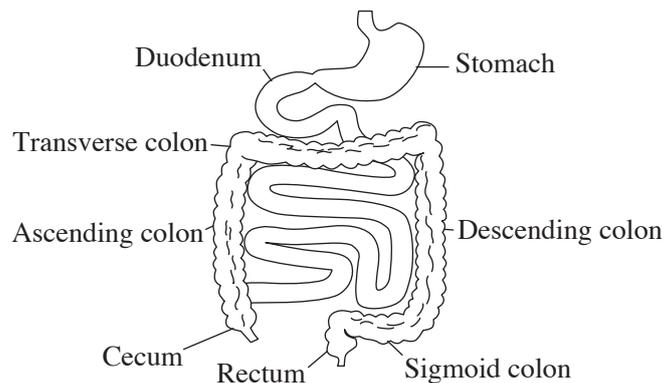


Figure 1. Intestinal structures involved in defecation

2. Mechanism of Defecation

Food is digested in the stomach and absorbed in the small intestine, and then transferred together with fluids to the large intestine to produce solid stool. When the stool moves from the colon to the rectum, the rectal wall is stimulated. Then, the stimulation signal is transferred to the cerebrum, causing the urge to defecate. The internal anal sphincter reflexively relaxes in response to the defecation urge, and the internal anal pressure increases. Then, the external anal sphincter relaxes to push out the stool from the anus.

The movement of the intestine is paralyzed immediately after spinal cord injury, and the intestine gradually recovers to release gases. In general, it is considered that the normal functions of the enteric nervous system are maintained in the chronic phase of injury.

In the case of sacral spinal cord injury, the colon relaxes and the reflex movement of the intestinal reflex does not exist, resulting in constipation, which might cause incontinence. In the case of spinal injury above the sacral cord, the colon and anus are subjected to excessive muscle tone, referred to as spasticity, and therefore, the external anal sphincter cannot be controlled voluntarily and is kept firmly contracted. Intestinal movement that allows movement of the stool to the anus decreases, and therefore, the stool accumulates in the colon. Rectal relaxation, however, relaxes the internal anal sphincter, and simultaneously, defecation reflex is triggered. Therefore, cathartic drugs and stimuli are effective in promoting defecation. In addition,

sensation in the anal mucosa is reduced or numbed in the case of spinal cord injury.

In the case of injury above the eighth thoracic spinal cord, loss of abdominal muscle straining can cause constipation.

3. Types and Amount of Stool

The type of stool can be checked with the Bristol Stool Chart, which shows 7 categories, as visually presented in Figure 2.

Types 1 and 2 in the Bristol Stool Chart are lumpy stools and indicate constipation; types 3, 4, and 5 are near-normal stools; and types 6 and 7 are watery stools and indicate diarrhea. If an individual produces a significant amount of type 3, 4, or 5 stool after the absence of bowel movement for several days, this defecation interval is considered the proper defecation cycle for this individual¹⁾.

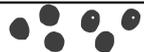
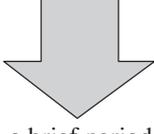
Type1	Separate hard lumps, like nuts (hard to pass)		<div style="text-align: center;"> <p>an extensive period</p>  <p>Transit time in the digestive system</p>  <p>a brief period</p> </div>
Type2	Sausage-shaped but lumpy		
Type3	Like a sausage but with cracks on its surface		
Type4	Like a sausage or snake, smooth and soft		
Type5	Soft blobs with clear-cut edges (passed easily)		
Type6	Fluffy pieces with ragged edges, a mushy stool		
Type7	Watery, no solid pieces Entirely Liquid		

Figure 2: Bristol Stool Chart

Source: Ryoko Takasaki, Kaoru Nishimura, "Assessment and care plan for bowel disorders," Japanese Journal of Nursing Arts, Vol. 55, No. 4, Medical Friend Co. Ltd., 2009, P24

The amount of stool excreted per day by an adult depends. a lot of fibers of foods

Generally, a Japanese individual taking ordinary meals excretes approximately 100–250 g²³⁾.

It is recommended to record the time and date of defecation and the type and amount of stool, as well as the defecation procedures performed and the use of medications. The latter 2 factors can be used as a guide for bowel management. (Table 1).

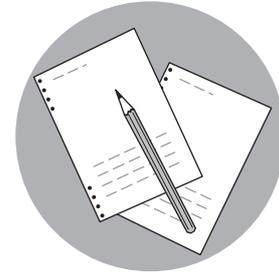


Table 1: Defecation record

Month/Day	February/6	February/9	February/12	Month/Day
Time	9:30–10:30	9:30–10:20	9:30–10:00	:-:
Amount	200g	200g	100g	
Bristol Stool Chart type	3	3	3	
Defecation procedure	3 Suppositories, disimpaction	3 Suppositories, disimpaction	Disimpaction	
Medication	2 Pirsennid tablets at 21:00 the previous day			
Others	In bed	In bed	Wheelchair toilet	

4. Types of Constipation

There are 2 types of habitual constipation in persons with spinal cord injury.

i. Rectal constipation

No defecation reflex is induced although stools move down to the rectum.

ii. Colonic constipation

Stool cannot be pushed out because of poor intestinal movement in many cases and because of reduced straining strength.



The treatment procedures for constipation depend on whether the stool moves down to the rectum. First, the presence of stool should be confirmed by inserting a finger into the rectum. Before the procedure, a rubber glove should be worn on the dominant hand and lubricants such as petrolatum and olive oil should be placed on the finger to be inserted.

If the absence of stool is thus confirmed, suppositories and enemas would not work. Therefore, intestinal movement needs to be improved by using cathartic drugs and other stimulants methods.

If stool is present in the rectum, taking stimulant cathartics might cause diarrhea; however, it is necessary to induce easy evacuation of stool. Procedures for this type of constipation include knowing the timing of when the stool reaches the rectum, maintaining a position for easy defecation, stimulating the anus with a (warm) water wash while seated on the toilet seat, directly stimulating the rectum with a finger, and performing disimpaction and enema.

The defecation cycle depends on each individual. Efficient bowel movement can be ensured by understanding the cycle of when the stool moves down to the rectum, allowing timely defecation on the basis of this cycle³⁾.

Chapter 3.

Defecation Procedures for Persons with Spinal Cord Injury

Natural bowel movement is ideal. For persons with bowel disorders, the following procedures are considered depending on the degree of the spinal cord injury; the most appropriate procedure for each individual should be chosen.

1. Procedures for Smooth Defecation

i. Timing of defecation

Trying to defecate at the same time each day helps in developing the habit of defecation. Defecation after meals may be easier because of the accelerated intestinal movement at this time. When defecation after meals is not possible, for example, because of an individual's work environment, it can be done in the morning or at night when there is enough time. If caregiver assistance is needed, defecation should be timed to when the caregiver is available to assist.

ii. Position for easy defecation

Bending forward while in the sitting position makes it easier to defecate because this creates an obtuse angle between the rectum and the anus. In contrast, a lying-down position makes the defecation reflex less likely to occur. Therefore, defecation should be performed in the sitting position as often as possible.

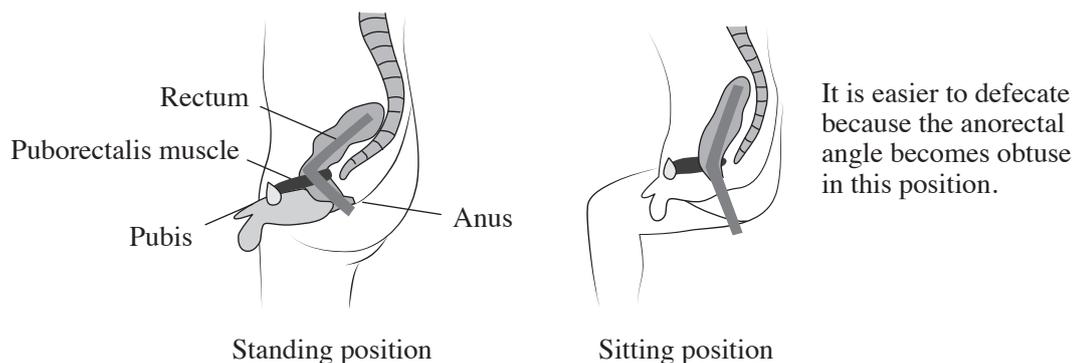


Figure 3: Anorectal angles in 2 positions

Source: Management Support Committee for Persons with Cervical Spinal Cord Injury, Beppu Rehabilitation Center for Physical Disabilities; Handbook of Self-management Support for Persons with Cervical Spinal Cord Injury, Chuohoki Publishing Co., Ltd., 2008, P121.

In the case of spinal injury above the eighth thoracic spinal cord, the hips tend to move forward in the sitting position because of the paralysis of the abdominal and back muscles.

To promote bowel movement, maintain a straight-back position during defecation.

For defecation while lying down in bed, turn the face to the left and bend the knees to expand the angle between the rectum and the anus. Elevate the upper body whenever possible.

iii. Abdominal massage

Massage the abdomen with circular motion along the course of the large intestine several times.

iv. Abdominal compression

Because stool tends to accumulate at the entrance of the large intestine and at the junction between the transverse descending colons, it is effective to apply pressure on the upper right of the pelvis and left sides.

v. Anal stimulation with a (warm) water wash

A toilet seat washer may be used to apply warm water to the anus when the defecation reflex occurs.

vi. Stimulation with a finger

Wear a rubber glove on the dominant hand and place a lubricant such as petrolatum and olive oil on a finger. Insert the finger into the anus and move it in a circular motion along the wall of the rectum. Ensure that the mucosa of the rectum is not damaged during stimulation.

vii. Disimpaction

When finger stimulation alone is not effective for complete evacuation but the stool reaches the anus, gently pick out the remaining stool with a finger. Ensure that the nail on the finger is short so as to avoid damaging the rectal mucosa. In the case of anesthesia around the anus because of paralysis, ensure that the skin around the anus is not damaged or overly expanded. If bleeding occurs, allow others to confirm the presence of a wound, when possible. For self-confirmation of the presence of wound, a mirror, mobile phone camera, or digital camera can be used.

In the case of the spinal injuries at or above the fifth and sixth thoracic spinal cords, disimpaction may cause autonomic hyperreflexia and therefore should be carefully performed.

viii. Insertion of suppositories

Wear a rubber glove on the dominant hand and place a lubricant such as petrolatum and olive oil on the fingers and on the suppository. Slowly insert the suppository deep into the anus.

Use a suppository insertion device when you cannot appropriately use your fingers because of cervical spinal cord injury.

Place a lubricated suppository on the spring of the device and insert the agent into the anus.

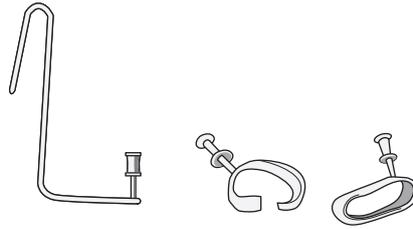


Figure 4: Suppository insertion device

xi. Use of enemas

When constipation continues, the stool near the anus hardens and cannot be evacuated by straining,

laxative use, and suppository use. In such cases, use an enema as the final step.

Make sure to use a glycerin enema while lying on the bed with the face to the left, because its use while in a standing position could cause rectal perforation. It should be noted that glycerin absorption into the damaged mucosa may cause adverse effects (e.g., hemolysis and renal dysfunction). Persons whose mucosa tend to be easily damaged, including those who have hemorrhoids and/or are using steroids, should not use glycerin enema. In addition, be careful about overturning and falling caused by anemia. The following are steps on using an enema.

- i. Warm the enema solution to approximately body temperature.
- ii. Lie on the bed with the face to the left.
- iii. Place a lubricant on the tip of the enema tube.
- iv. Hold the enema tube 5 to 6 cm from the tip and slowly insert 5 to 6 cm of the enema tube toward the hilum.
- v. Slowly inject 60 mL of the enema solution for approximately 20 seconds.
- vi. Check whether the stool comes out, whether stomachache and discomfort occur, and if bleeding is present.

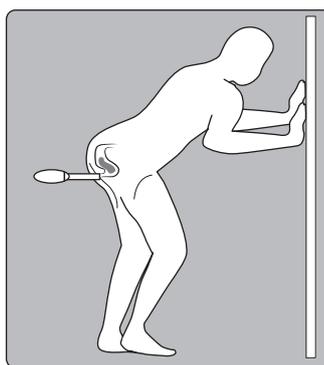


Figure 5: Prohibited position for enema insertion

Source: Kanagawa Nursing Association, Division of Patient Safety, Patient Safety Alerts No. 6, “Safe administration of glycerin enemas.”
"http://www.kana-kango.or.jp/img/anzenkeiho_6.pdf" http://www.kana-kango.or.jp/img/anzenkeiho_6.pdf
(Japanese only)

x. Intestinal lavage

This is a procedure performed to solve constipation and fecal impaction. Inject 500–1000 mL of lukewarm water at approximately body temperature, into the anus through a tube to remove the stool.

For intestinal lavage, a specific instrument is needed. These instruments are commercially available; follow their respective instructions for use.

2. Other Procedures

i. Artificial anus

An artificial anus can be established in the case of severe constipation and fecal incontinence or can be established to avoid the burden of prolonged defecation. A part of the intestine is surgically brought out of the abdominal wall to create an exit for stool, as a substitute for the anus. Then, a specific type of bag is attached to this exit from which stool and gases are regularly removed. Although the timing of when the stool comes out cannot be predicted and it causes odor problems, replacing the drainage bag requires a short time.

ii. Cecum port

Instead of injecting the enema solution from the anus, it can be injected from an entry (port) created in the upper part of the large intestine, and the stool is removed from the intestine. This type of surgery was started in Japan in 2002; however, only a limited number of hospitals perform this surgery, and only under the self-pay option.

Chapter 4.

Special Types of Toilets for Persons with Spinal Cord Injury

Persons with spinal cord injury who cannot transfer to a standard toilet or maintain a sitting position on a toilet seat need special toilet types. Alternatively, toilets or places for defecation may be customized according to their needs. The defecation procedure or type of toilet should depend on the degree of the spinal cord injury, status of activities of daily living, possibilities of care, and economic aspects.

Table 2: Transfer and defecation procedures expected according to the level of spinal cord injury

*Level of injury	Transfer procedures	Defecation procedures	Defecation aids
Above C4	Total assistance	Defecation in bed	
C5	Total assistance	Defecation in bed	
	Partial assistance for forward (forward and backward) transfer	High-floored toilet	
C6	Independent in forward and backward transfer	High-floored toilet	Insertion device of suppository, bottom wiper
	Independent in forward and backward transfer	Oval toilet	Insertion device of suppository, bottom wiper
	Partial assistance to independent in side (lateral) transfer	Wheelchair toilet (seat with armrests)	Suppository insertion device
C7	Independent in side (lateral) transfer	Wheelchair toilet (seat with armrests)	Suppository insertion device
C8 to T1	Independent in side (lateral) transfer	Wheelchair toilet (seat with armrests)	

Below are several types of toilets and procedures for defecation with or without assistance.

* Level of injury: Spinal nerves are classified, from the top to the bottom, as follows: cervical spinal cord (C1 to C8), thoracic spinal cord (T1 to T12), lumbar spinal cord (L1 to L5), sacral cord (S1 to S5), and coccygeal cord. The level of injury indicates the extent by which the spinal cord (level) shows no paralysis.

1. Defecation with Assistance

i. Defecation in bed

This is mainly used for persons with spinal cord injury at or above the fifth cervical spinal cord who cannot transfer to a toilet or maintain a sitting position on a toilet seat. Defecation in bed makes it easier for the caregiver to perform disimpaction.

This procedure is also used for persons with decubitus ulcers, orthostatic hypotension*, and/or heterotopic ossification*, or those who cannot sit on a toilet because of the post-surgery status.

Orthostatic hypotension occurs in the case of spinal cord injury at or above the fifth and sixth thoracic spinal cord. Defecation in bed is also recommended for persons who experience strong discomfort or wobble during defecation in the sitting position. In such individuals when using the toilet, the body should be fixed with a belt and a caregiver should be present to provide assistance.

ii. Combination of a shower chair and a Western-style toilet seat

A shower chair (with a hole at the center of the seat) can be used to transfer a person with spinal cord injury into a standard Western-style toilet to defecate. Both self- and assistant-propelled shower chairs have a height-adjustable seat. Such shower chairs can be used in smaller spaces, compared with a wheelchair toilet, and therefore, this combination is used when the toilet space is too small to fit a wheelchair or when the home cannot be remodeled.

* Orthostatic hypotension: A condition in which the blood pressure suddenly decreases upon getting up or decreases after defecation. The symptoms include discomfort, dizziness, palpitation, and cold sweat. Sometimes, the entire eye turns white.

* Heterotopic ossification: An event in which osteogenesis occurs at the site where there are originally no bones. The occurrence of heterotopic ossification near junctions may disturb the activities of daily living.

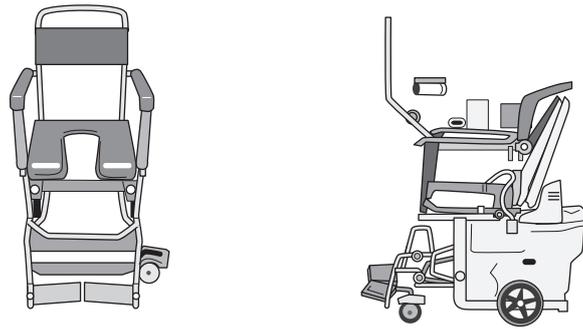


Figure 6: Assistant-propelled shower chair

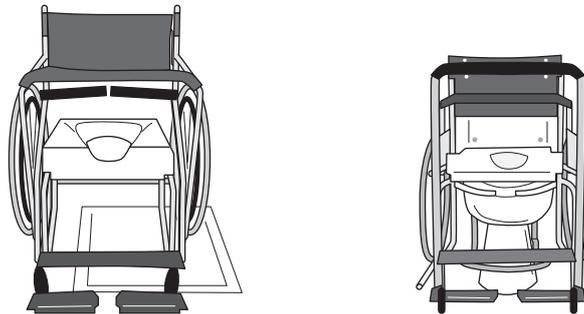


Figure 7: Self-propelled shower chair

A shower chair with a bucket can be used at bedside. For persons with orthostatic hypotension or those with poor balance in the sitting position, adjust the height of the bed to that of the shower chair and raise the legs above the bed.

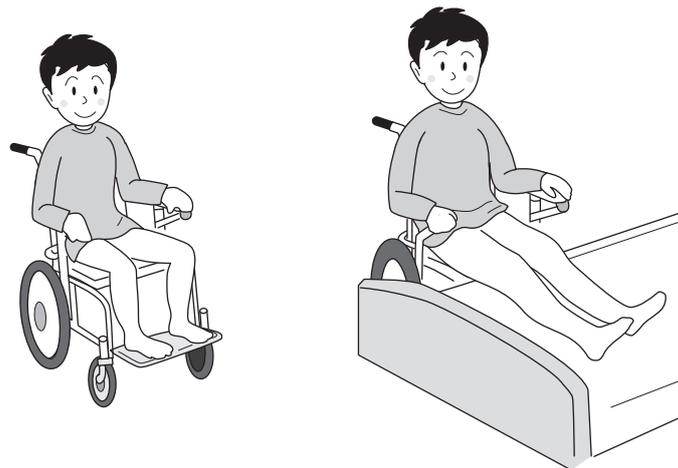


Figure 8: Shower chair at bedside

Source: Management Support Committee for Persons with Cervical Spinal Cord Injury, Beppu Rehabilitation Center for Physical Disabilities; Handbook of Self-management Support for Persons with Cervical Spinal Cord Injury, Chuohoki Publishing Co., Ltd., 2008, P130.

iii. Wheelchair toilet

This is used for persons who can transfer with partial assistance and maintain a sitting position on a toilet with a backrest and armrests. A care lift* can be used for transfer.

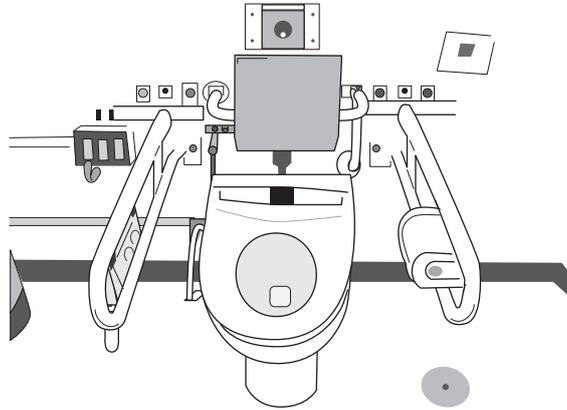


Figure 9: Wheelchair toilet

Below is an example of how to perform a side (lateral) transfer with assistance (instructions for the caregiver):

- a. Raise 1 of the armrests of the wheelchair toilet and place the wheelchair alongside the toilet seat at a slight angle
- b. Stand in front of the wheelchair
- c. Remove the feet of the care receiver from the footrest of the wheelchair and place them on the floor. Position the heels on either side of the toilet seat
- d. Place your head under the armpit of the care receiver with your 1 arm under the other armpit
- e. Hold up the body of the care receiver, pulling it closer to your side while performing the transfer to the toilet seat.

* Care lift: A lifting device with wheels for transferring a person who cannot transfer alone or move without assistance, from the bed to the wheelchair, toilet, or bathroom.

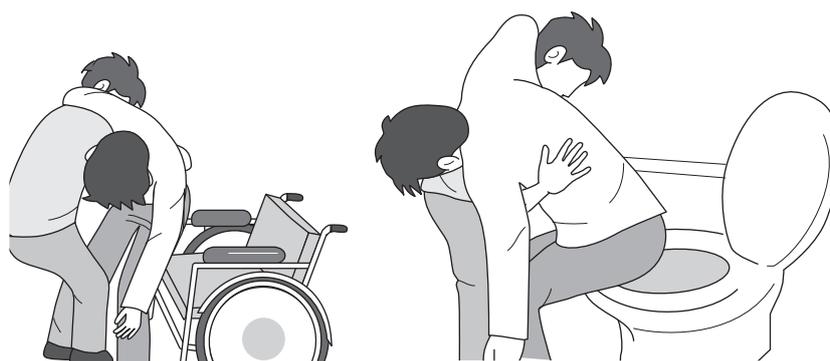


Figure 10: Example of side (lateral) transfer with assistance

Source: Management Support Committee for Persons with Cervical Spinal Cord Injury, Beppu Rehabilitation Center for Physical Disabilities; Handbook of Self-management Support for Persons with Cervical Spinal Cord Injury, Chuohoki Publishing Co., Ltd., 2008, P132.

2 Defecation without Assistance

Persons who are able to transfer between a bed and a wheelchair may be trained for defecation in the toilet, according to procedures listed in Table 2. Although defecation without assistance might be difficult at first, it becomes easier with practice.

i. High-floored toilet(also called high-floor-embedded toilet seat, Zashki [Japanese room] toilet, and Keison [cervical spinal cord injury] toilet)

Persons with cervical spinal cord injury who can move their own body on the bed and transfer orthogonally on a plane surface through a push-up* movement can use this specialized toilet. The wheelchair is positioned at a right angle to the toilet during transfer. A high-floored toilet has enough space to move the body to the side, and therefore, it is possible to take off and pull on underpants and pants. However, creating a high-floored toilet requires has spatial and financial consideration. Concerning the structure of a high-floored toilet, a seat is embedded in a flat board at the same level as the wheelchair. A soft mat should be spread over the flat board to protect the hips. A backrest and armrests should be installed to lean against. In addition, a small wash stand and shower may be installed near the toilet seat for convenience. This requires plumbing installation.

* Push-up: To remove the hips from the seat by pushing the seat with the hands.

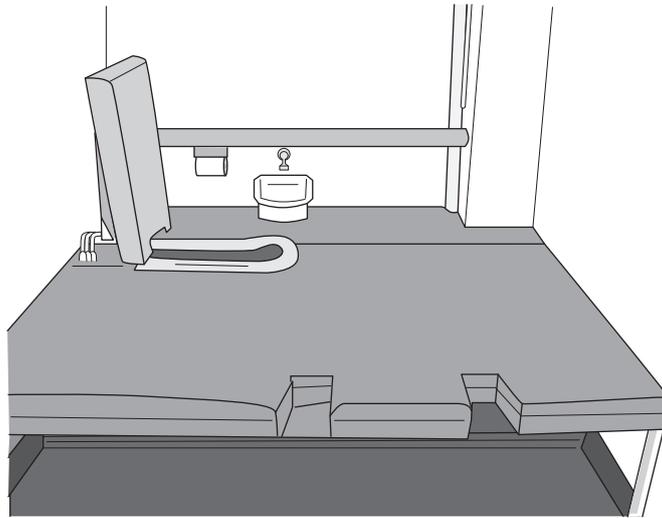


Figure 11: High-floored toilet

The procedures for forward transfer are as follows:

- a. Position the wheelchair at a right angle to the floor.
- b. Place the feet on the floor and move to the toilet seat in the long-sitting position (i.e., with the legs extended).

How to defecate:

- a. Push down pants and underpants. An armrest can be used as support while taking off clothes.
- b. Use self-help tools (see Chapter 6) for the insertion of suppositories and stimulation of the anus. These activities are done with the upper body in an elevated position and one knee on the floor, viewing the hip area through a mirror.
- c. Wipe the anus clean with toilet paper in 1 hand or with a bottom wiper, in the same body position as in step 2.

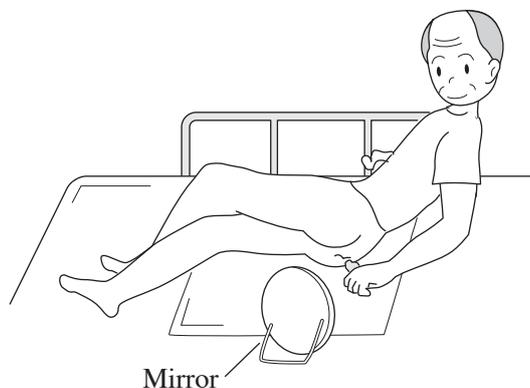


Figure 12: Defecation in bed

ii. Toilet for forward transfer (also called oval toilet)

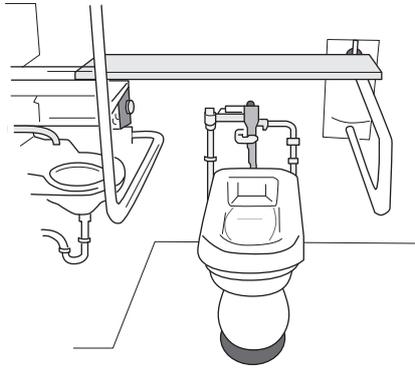


Figure 13: Toilet for forward transfer

Persons who can transfer forward and backward from a wheelchair positioned in front of the toilet seat can use this type of toilet. The oval-shaped seat gives enough room for the hand during disimpaction and insertion of suppositories. This type of toilet is less widely distributed than the standard wheelchair toilet, and therefore, is much more expensive.

How to transfer forward and backward:

- a. Position the wheelchair in front of the toilet seat.
- b. Remove the feet from the footrest and place them on the floor and step over the toilet seat.
- c. Hold the armrests of the wheelchair toilet and move forward.

To take off and pull on pants and underpants, lean on 1 side by using the armrest and lift the hip to move the clothes. Repeat this action with the other side.

iii. Wheelchair toilet

To defecate independently on a wheelchair toilet, training for transferring to the seat, maintaining the sitting position on the seat, and ability to take off and pull on clothes are required. For individuals who cannot strain properly during defecation, abdominal compression, abdominal massage, anal stimulation with a (warm) water wash, disimpaction, and insertion of suppositories are performed.

Example of side (lateral) transfer:

- a. Raise 1 of the armrests of the wheelchair toilet and place the wheelchair alongside the toilet seat at a slight angle.

- b. Remove the feet from the footrest of the wheelchair and place them on the floor. The heels should be positioned on either side of the toilet seat.
- c. Move the hips to the forward of the wheelchair.
- d. Hold the immovable armrest of the wheelchair toilet with one hand. Hold the distal armrest of with the other hand (or place the hand between the wheelchair armrest and the hips).
- e. Use the strength of both hands to transfer from the wheelchair to the toilet seat.
- f. Position the feet correctly.
- g. Move the wheelchair in front of the toilet seat. (When bending forward to insert suppositories and do disimpaction, the wheelchair can be used as a balancing support for the hands and the head.)



Figure 14: Example of side transfer without assistance

How to transfer forward and backward.

- a. Position the wheelchair in front of the toilet seat.
- b. Remove the feet from the footrest of the wheelchair place them on the floor and step over the toilet seat.

c. Hold the armrests of the wheelchair toilet and move forward.

To take off and pull on pants and underpants, lean on 1 side by using the armrest and lift the hip to move the clothes. Repeat this action with the other side.

Chapter 5.

Defecation in Bed

1. Necessary Materials for Defecation

Plastic bags (approximately 20 L), suppositories (for constipation), lubricants, rubber gloves, disposable diapers, and toilet paper.

2. Procedures

- i. Take off underwear and place a disposable diaper under the hips.
- ii. Lie on the bed with face to the left.
- iii. Slide one side of the top of the plastic bag deep between the disposable diaper and the hips.
- iv. Get a suppository and apply a lubricant on its tapered tip.
- v. Wear rubber gloves. Insert the suppository deep into the anus. Spread toilet paper on the plastic bag.
- vi. Lift the other side of the plastic bag, and tape the corners together over the right hip bone..
- vii. After 10–30 min from the insertion of the suppository, massage and press the abdomen. Do self-massage, when possible.
- viii. Wear rubber gloves and insert a lubricated finger into the anus to stimulate the rectum and do disimpaction.
- xi. If the stool remains deep in the rectum or if the anus becomes loose, insert another suppository and repeat step 6.
- x. Defecation is complete if no stool and a tight anus is felt by the finger.

Chapter 6.

Tools and Devices for Defecation

1. Suppository Insertion Device

Persons who cannot properly insert a suppository into the anus because of finger paralysis may use this device (see Figure 4 in Chapter 3).

2. Bottom Wiper

A bottom wiper that holds toilet paper is used by persons who cannot properly wipe their bottom because of finger paralysis.

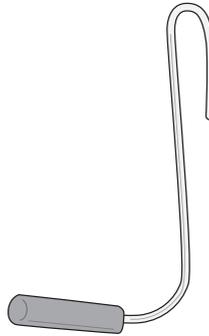


Figure 15: Bottom wiper

3. Push-up Stand

For persons who cannot hold onto armrests, a flat stand could be installed next to the armrests on which they can place their hands for support in order to make transfer, as well as taking off and putting on clothes, easier.



Figure 16: Push-up stand

Source: Management Support Committee for Persons with Cervical Spinal Cord Injury, Beppu National Rehabilitation Center for Persons with Severe Disabilities; Handbook of Self-management Support for Persons with Cervical Spinal Cord Injury, Chuohoki Publishing Co., Ltd., 2008, P123

4. Specialized Clothes

For persons with difficulties in holding their clothes while defecating, pants and underpants with loop bands, into which fingers are hooked, can be used.

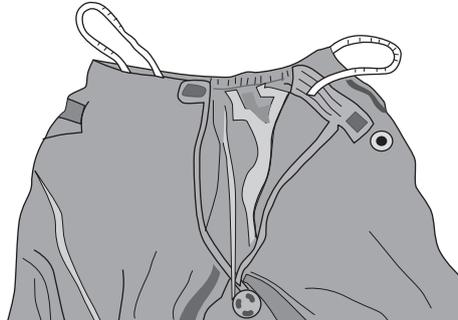


Figure 17: Customized pants



Figure 18: Customized underpants

5. Toilet Seat

If possible, select a U- or O-type seat with a large hole. These seats provide room for easier insertion of a suppository and disimpaction.

6. Soft Toilet Seat

A soft toilet seat is a cushion used by persons who experience pain while sitting for long and is also used to prevent decubitus ulcers. It does not require complicated installation procedures because it is simply placed over the toilet seat before use. It can also be washed with water.

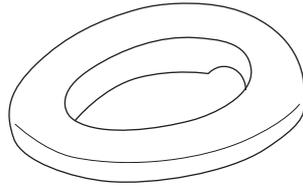
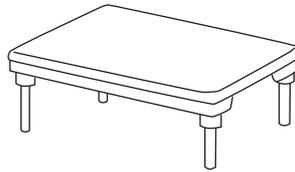


Figure 19: Soft toilet seat

7. Footrest

A footrest is used when the height of the toilet seat prevents the feet from touching the floor.



In addition, a special stand may be used if a person cannot take off and put back on underpants and pants on a wheelchair toilet but can do so when their feet are at the level of the toilet seat.

Chapter 7.

Diet and Defecation

Food intake is closely related to bowel movements. Irregular eating patterns disrupt the movement of the intestine and the defecation rhythm, and may cause constipation, fecal incontinence, and diarrhea. Try to maintain regular eating habits and determine the proper diet suited for your conditions.

1. Recommended Food and Drinks against Constipation

i. Regular meals and fluid

Avoid being selective with food and regularly take 3 meals a day.

Slowly drink lukewarm water or warm tea several times each day.

As the tannin content of bitter tea is diuretic, the intestine becomes unable to absorb enough fluid, resulting in hard stools.

Water, boiled water, isotonic drinks, weak coarse tea, and barley tea are recommended over green tea, black tea, and oolong tea.

ii. Dietary fibers, vitamins, and minerals

High intake of dietary fibers together with sufficient fluid intake is effective in increasing stool volume.

Because vegetables are rich in dietary fibers and fluids, it may be good to eat plenty of cooked, souped, or boiled vegetables.

Seaweed and fruits contain high amounts of soluble dietary fibers.

Soluble dietary fibers with high water-holding capacity produce stools that easily absorb fluid, and therefore promote bowel movements.

As insufficient vitamins and minerals cause poor movement of the intestine, eating plenty of fruits, vegetables, and seaweed is recommended.

iii. Dairy products

To stimulate the intestine, it is effective to drink cold milk or water immediately after getting up in the morning.

Especially, lactose-containing milk is effective in softening the stool.

Yogurt and cheese have components that modulate the enteric environment and are effective in improving the movement of the intestine.



iv. Oligosaccharides

Oligosaccharides promote the growth of *Bifidobacterium bifidum* in the intestines, and improve the functions of the intestines, as dietary fibers do.

Oligosaccharide-containing food products include onions, sugarcane, cabbage, asparagus, potatoes, soybeans, garlic, corns, barley and wheat, and green soybeans. In addition, bananas, milk, yogurt, and honey also contain oligosaccharides. Oligosaccharides are naturally present in vegetables and various other food products.

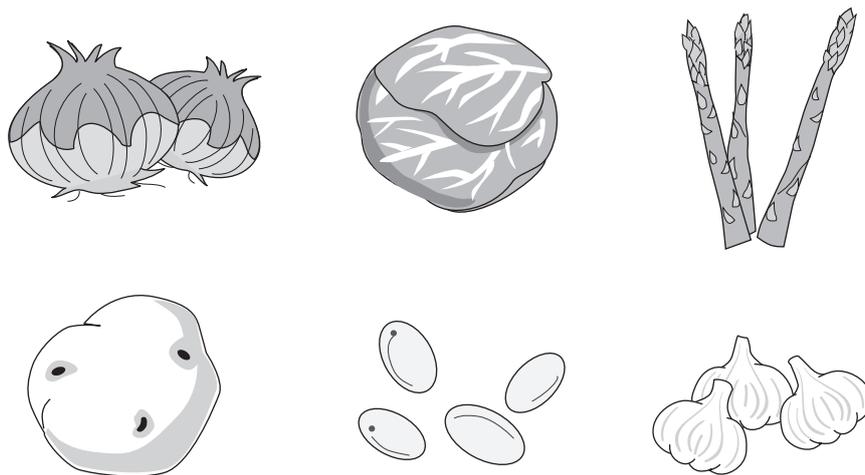


Figure 20: Food products rich in oligosaccharides

2. Food and Drinks Likely to Cause Fecal Incontinence and Diarrhea, and Dietary Suggestions

i. Irregular meals

Avoid irregular diet and overeating.

Chew meals slowly to increase the temperature of food in the mouth, in order to reduce gastrointestinal tract stimulation.

ii. Foods that stimulate the intestines

Avoid cold and/or hot meals that stimulate the intestinal mucosa, and try to eat easily digestible meals.

Insufficiently digested fat stimulates the intestinal wall. Cup noodles, fried potatoes, and hamburgers may cause diarrhea.

Caffeine, alcohol, and carbonic acid promote the peristaltic movement of the large intestine.

Do not eat too much beans (azuki beans and kidney beans), potatoes (sweet potatoes), pumpkin, chestnuts, and bananas, which are fermented in the intestines, generate gases, and stimulate the intestinal wall.

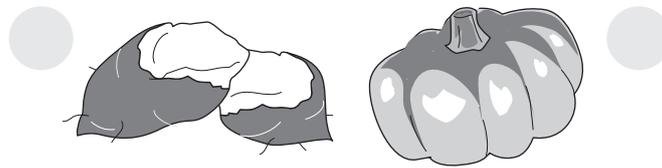


Figure 21: Food products that stimulate the intestines

iii. Sucrose, lactose, fructose, and other saccharides

Foods containing high amounts of sucrose, lactose, and fructose can cause diarrhea. Do not take too much isotonic drinks and gam (sugarless) containing sorbitol.

iv. Allergy

Food allergy can cause diarrhea. Milk, dairy products, eggs, and fish all tend to cause allergy; confirm your allergic status to these food products before taking them.

Chapter 8. Medications

When lifestyle change does not solve constipation, medications such as cathartics are used upon consultation with physicians and pharmacists.

When stool does not move down to the rectum, do not readily use laxatives; antifatulents and mild laxatives are considered to improve the properties of stool. It takes several days before these medications take effect, and therefore, carefully observe whether they are working.

If constipation continues after taking antifatulents and laxatives, cathartics are then used. The dose is adjusted so that the medication taken induces stool of the types 3–5 (Bristol Stool Chart) the next day. The absence of defecation despite medication with cathartics means that the dose or cycle of the drug is not appropriate. If diarrhea occurs, the dose should be decreased. It is recommended to keep a record of defecation in order to check the conditions⁴.

When the stool reaches the rectum, use suppositories and enemas but not cathartics. Table 3 shows the classification of cathartics.

Table 3: Classification of laxatives

Class		Property	
Mechanical cathartic	Saline cathartic	Collects body liquid into the intestines, softens stools, and increases the stool volume.	
	Saccharide cathartic	Increases the volume of liquids in the intestines and softens stools.	
	Bulk cathartic	Promotes liquid absorption to increase the volume of and soften stool, which promotes defecation. Agar and wheat bran are equally effective.	
Irritant cathartic	Small intestine irritant cathartic	Known to cause less adverse reactions compared with colon irritant cathartic.	
	Large intestine irritant	Anthraquinone	Stimulates the intestine to promote intestinal movement resulting in defecation. It has high efficacy but can be addictive. Chronic administration may attenuate the efficacy.
		Diphenolic	Stimulates the large intestine and improves the movement of the intestine to promote defecation. It is suited for persons with poor intestinal movement. As an irritant cathartic, it has little addictive property. It is available in

For the dosage of cathartics, see the following table.

Table 4: Dosage of cathartics (for Japanese)

Generic name	Dose	Expected time-to-effect onset
Magnesium oxide	0.5–2 g/d (in 1–3 times divided doses)	8–10 h
Carmellose sodium	2–8 g/d (in 3 times divided doses)	12–24 h
Castor oil	15–30 mL/d	2–6 h
Olive oil	15–30 mL/d	
Senna	0.5–1 g/d (1-2 times/ d)	8–10 h
	1–2 tablets/d (up to 4 tablets in one time)	8–10 h
Visco sodium sulfate	10–15 drops/d	7–12 h
Bisacodyl	2 tablets/d	6–11 h

Expected time to-effect onset is different depend on the individual.

Chapter 9.

Going Out and Staying Out

During activities outside of the home, fecal incontinence may occur because of changes in the food and drinks taken in, and may also be induced by the movement of vehicles while in transit. If you are planning to go out or stay out for an extended period, adequate preparation is recommended.

1. Prior Defecation

When you have a regular defecation habit, complete the defecation on the day before your planned outdoor activity.

2. Meals

If you are currently admitted in a hospital, you might experience fecal incontinence due to changes in meals and drinks during temporary going or staying out from the hospital.

See Chapter 7-2.

3. What to Bring

It is useful to prepare a set of necessary materials before going out. The following items are useful in case of sudden fecal incontinence. Another set should be prepared for keeping in the car or the place of work.

- Paper diapers
- Extra clothes
- Toilet paper
- Wet tissue paper (non-alcohol)
- Newspapers
- Rubber gloves
- Plastic bags (several garbage bags or grocery bags)
- Suppositories
- Refresher if necessary

4. Coping with Fecal Incontinence

When you have fecal incontinence while on the wheelchair, move to the bed or the wheelchair toilet.

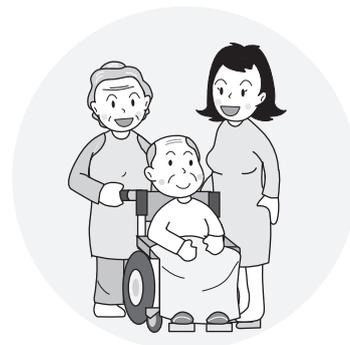
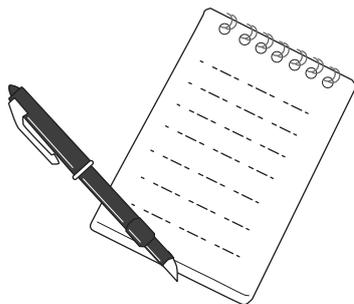
Before transferring to the bed, it is useful to spread newspaper, a garbage bag, or a paper diaper over the bed so as not to contaminate it. Wear rubber gloves when available and wipe off the stool with toilet paper. Take off pants and underpants, rolling them down so as not to contaminate the feet. Next, confirm the presence of remaining stool in the anus with a finger. When stool materials remain in the anus, manual disimpaction or insertion of suppositories is performed.

Also remove pants and underpants when transferring to the wheelchair toilet. If available, use the toilet washer to wash the hip area with warm water. When stool materials remain in the anus, try manual disimpaction or insertion of suppositories.

If you are worried about fecal incontinence, putting on a paper diaper in advance may offer some comfort.

5. Preliminary Check

Confirm in advance whether wheelchair toilets are available near or at the place where you plan to go.



Cited References

1. Ryoko Takasaki et al.. Assessment and care plan for bowel disorders , Continenace care of defecation. The Japanese Journal of Nursing Arts No. 4, Vol. 55, 2009, p. 25
2. Kaoru Fujisaki. Systematic nursing science Speciality area I Basic nursing Science(3), Igaku – Shoin Ltd, 2011, p.71
3. Kaoru Nishimura. Bowel management based on assessment, Chuohoki Publishing Co.,Ltd, 2008, p.24
4. Kaoru Nishimura. Actual of continence care of bowel management. Monthly Journal “Nursing”, No.14, Vol26

References

1. Rehabilitation of cervical spinal cord injury, Rehabilitation manual of National Rehabilitation Center for Persons with Disabilities, Edited by Naoichi Tsuyama; KYODO ISHO SHUPPAN CO., Ltd., 2000
2. Handbook of self-management support for persons with cervical spinal cord injury, Edited by the Management Support Committee for Persons with Cervical Cord Injury, Beppu Severe Physical Disabilities Institution, National Rehabilitation Center for Persons with Disabilities; Chuohoki Publishing Co., Ltd., 2008
3. Health Care of SCI-Basics, Edited by the Spinal cord injury health care editorial committee, NPO Japan Spinal Cord Foundation, 2005
4. Health Care of SCI-Q&A, Edited by the Spinal cord injury health care editorial committee, NPO Japan Spinal Cord Foundation, 2006
5. Nursing care of Spinal cord injury, Assistance for self-care, Spinal cord injury Nursing care editorial committee, Nursing department, Kanagawa Rehabilitation Hospital, 2003
6. Ryoko Takasaki et al.,.Assessment and care plan for bowel disorders , Continenace care of defecation. The Japanese Journal of Nursing Arts No. 4, Vol. 55, 2009, p. 23-27.
7. Kaoru Nishimura,.Physical assessment, Continenace care of defecation, the Japanese Journal of Nursing Arts, No. 4, Vol. 55, 2009, p. 28-33