REHABILITATION MANUAL 11

INTERMITTENT BALLOON CATHETERIZATION

Editor
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NATIONAL REHABILITATION CENTER
FOR THE DISABLED
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National Rehabilitation Center for the Disabled
WHO Collaborating Centre for Disability Prevention and Rehabilitation

Rehabilitation Manual 11
Intermittent Balloon Catheterization
December 27, 2002

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PREFACE

Disturbances of the excretory function were probably the most serious problems for those who had suffered spinal cord injuries. Urinary disturbance resulting from neurogenic bladder can lead directly to urinary tract infections. Frequent urinary tract infections can trigger serious secondary disorders, causing renal dysfunction, progressing to renal failure and finally resulting in death.

In the 1970s, clean intermittent self-catheterization was developed. Wider use of catheterization made it possible to drastically reduce urinary tract infections that would otherwise have frequently resulted in renal failure.

However, self-catheterization must be done at least several times a day, thus presenting both physical and mental obstacles to the patients concerned. The need to perform frequent catheterization also restricted their ability to participate in recreational outings or other social activities, as well as interrupting their sleep at night. Urinary incontinence and the cumbersome procedures required to allow voiding have had significant impacts on patients' self-respect and their capacity to live a fulfilling life.

Management of urination is a serious problem for those who suffer from urinary disturbance due to neurogenic bladder. Simplified management of urination could reduce the risk of secondary disorders, thus greatly benefiting patients with urinary disturbance.

This manual introduces intermittent balloon catheterization, which is the latest approach to urinary tract management. This method is expected not only to compensate for the defects of conventional catheterization but also to remove a serious problem faced by patients in their daily lives. I sincerely hope that this manual will lead to the wider use of intermittent balloon catheterization and also be of some help to those having spinal cord injuries or urinary disturbance in restoring their self-respect and helping them to lead a fulfilling life.

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CONTENTS

Introduction

It is vitally important to provide patients having urinary disturbance resulting from lesions of the brain, spinal cord or peripheral nerves with tools that facilitate self-management of urination and measures to prevent urinary incontinence. In 1972, Lapides advocated the use of self-catheterization in patients with urinary disturbance, thus contributing to a wider use of clean intermittent self-catheterization. This approach is of great assistance to those suffering from urinary disturbance as it helps them to manage appropriate patterns of urination. Urinary incontinence gives rise to serious physical and mental barriers in patients. Where residual urine volume is larger than normal (for example, 100mL or greater), even in people who are able to pass urine by themselves, self-catheterization can be a helpful technique to empty the bladder, increasing the physical capacity of the bladder and leading to reducing the frequency of urination or incontinence. Thus, self-catheterization is now a mainstay in the management of urination in those having urinary disturbance.

However, self-catheterization has several associated problems. Patients having urinary disturbance may have difficulty in conducting self-catheterization when they have urinary incontinence due to nervous detrusor overactive bladder that is not amenable to medical management or they are in a social environment or situation where self-catheterization is not possible. There is a strong need to provide urination programs that allow them to participate in social activities more easily.

One approach is intermittent balloon catheterization developed and advocated by Osamu Tsukada in 1995. Intermittent balloon catheterization is a novel method that makes it possible for the patients to insert a balloon catheter into the bladder by themselves whenever necessary. An advantage of the intermittent balloon catheter is that it allows patients to insert the catheter temporarily, thus improving quality of life (QOL). To be more specific, insertion of an indwelling catheter means that patients who need to urinate frequently at night can have a good sleep, and the technique allows them to participate in a wider range of daytime activities too, including social activities, going to school or working. Thus, intermittent balloon catheterization has made a great contribution towards helping patients enjoy a fulfilling life and improving their overall quality of life. Problems that users may experience include clouding of urine, the catheter slipping out due to rupture of the balloon or bleeding from the urinary tract. No complications such as serious urinary tract infections or lithogenesis have been reported so far. In future, this approach to catheterization may become a routine part of health care

in the home or be used to reduce diaper use.

Patients who adopt this catheterization technique require basic education and training on proper usage to prevent unnecessarily long indwelling or incorrect manipulation of the device that could result in medical problems. It is necessary for the users to have a regular health check-up at a medical institution. This manual has been prepared as a reference for medical personnel who will be giving guidance to patients with urinary disturbance, the patients themselves and those who care for the patients.

Chapter 1.
Purposes and Indications of the Intermittent Balloon Catheterization

1. Purposes of the Intermittent Balloon Catheterization

Some people who can pass urine using self-catheterization have problems resulting from urinary disturbance. This impacts negatively on their social activities. As explained previously, they suffer from interrupted sleep due to urinary frequency or urinary incontinence at night or have to wake up for self-catheterization, thus losing a good night's sleep. Those who are studying or work during the day have difficulty finding the time or place for self-catheterization at the educational institution or in the office. They often become so worried about their urination and incontinence that they become unwilling to go on trips outside the house. Urinary incontinence may result in genital infection or decubitus ulcer. To solve these problems and make it possible for patients with urinary disturbance to lead a normal and comfortable life, Osamu Tsukada invented the intermittent balloon catheter in 1995. Catheterization of the urethra is an approach for managing urination that enables patients to pass urine continuously at a lower pressure, although it has a potential risk of being accompanied by the urinary tract infections resulting from the introduction of foreign substances into the urinary tract. The intermittent balloon catheter characterized by a shorter indwelling time is able to minimize the risk of urinary tract infections, thus making it possible for the users to participate again in social activities. Only one type of intermittent balloon catheter is available, however, the using methods vary depending on the purposes as shown in the table below. For examples, it is called the Night Balloon when used by those suffering from urinary frequency at night and the Day Balloon when used by those who wear it only during the day. Further, the Day Balloon is subdivided into the Schooler and Commuter Balloons when used by those who go to school or work, and the Spot Balloon when used while traveling or for temporary use. Intermittent balloon catheterization is carried out together with self-catheterization.

Table : Purposes of intermittent balloon catheter

Type	Use method
Night Balloon	Used only at night by patients having urinary frequency or urinary incontinence at night
Schooler and Commuter Balloon	Used only when patients go to school or work and is removed at home or on days off
Spot Balloon	Used when patients are unable to perform self-catheterization for a certain period. E.g., when traveling, driving or drinking alcoholic beverages

2. Indications for the Intermittent Balloon Catheterization

This catheterization is primarily indicated in the treatment of the following diseases.

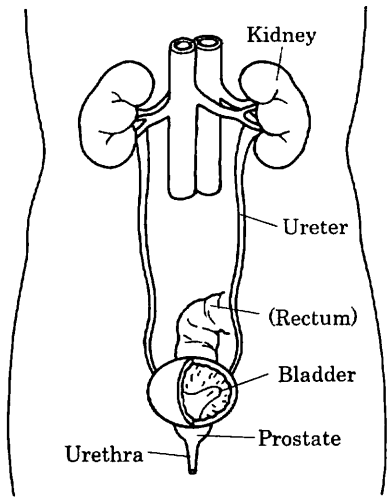
1) Brain lesions : cerebrovascular accidents, cerebral tumors, traumatic brain damage, multiple sclerosis and Parkinson's disease
2) Spinal cord lesions : traumatic spinal cord injuries, transverse myelitis, multiple sclerosis, spinal cord tumors, myelodysplasia and spinal canal stenosis
3) Peripheral nerve lesions : diabetic neuropathy, Guillain-Barre syndrome, complications with pelvic surgery (E.g., rectal or uterine cancer)
4) Urethral obstruction in males : prostatic hypertrophy and prostatic cancer

Chapter 2.
Intermittent Balloon Catheterization for males

Intermittent balloon catheterization can be successfully conducted under two different conditions, namely, aseptic and clean. In the aseptic method, medical personnel wear sterile gloves and use sterilized tools and materials such as forceps and cotton balls (soaked in disinfectant) when catheterizing patients with urinary disturbance. This method is recommended in hospitals where there is a higher risk of infection.

The clean method is the form of catheterization employed by outpatients at home. This method does not necessitate aseptic conditions but can be performed in any situation provided the surroundings are clean. Using the catheter for only a short time minimizes the risk of possible infection. This text deals with intermittent balloon catheterization using the clean method.

Insertion of the intermittent balloon catheter can be performed before going out, taking a trip or driving a vehicle, and is usually carried out on a bed or in a toilet at home.



( ) : The organ in brackets is not a urinary organ.

Figure 1 : Urinary organ

1. Composition and Parts of the Intermittent Balloon Catheter and Urinary Organs

1) Urinary Organs

Figure 1 shows urinary organs. The urethra is an outlet canal starting from the bladder and passing through the penis to the outside of the body. The male urethra is about 23cm in length, the upper part of which is ringed by the prostate gland. The external urethra sphincter, a striated muscle, is positioned at the distal part of the prostate gland and extends down to the bottom of thebladder, constantly pressing the urethra. The sphincter is subject to voluntary inhibition.

The bladder is a hollow organ positioned in front of the pelvis and made up of muscular walls. It is connected to the kidneys via the ureters. The kidneys discharge urine into the bladder at a rate of about 1mL every minute. In general, when about 150mL of urine is retained in the bladder, the urge to urinate is aroused, and when retained in a quantity of more than 400mL, urine must be voided.

Urination takes place by relaxing the sphincter to open up the urethra and contracting the muscular walls of the bladder to push out urine. Passing urine is necessary before more than 400mL of urine has accumulated in the bladder.

2) Composition and Parts of the Intermittent Balloon Catheter (Figure 2)

Conducting intermittent balloon catheterization requires a catheter and a cylindrically-shaped case (hereinafter referred to as the case), which are available in a set for easy conveyance.

The catheter is provided with a tube for urination and another tube for inflating the balloon. Distilled water is fed into the tube for inflating the balloon (Figure 3). The catheter consists of a reservoir, clamp, catheter shaft, balloon and case. The reservoir acts as a pump to feed water to the balloon that fixes the catheter in the bladder and also acts as a container for holding the water when the catheter is removed. The clamp is a device to prevent the water from flowing back to the reservoir. The balloon catheter is provided with marks at positions of 5, 10, 15 and 20cm away from the tip to indicate what length of catheter has been inserted into the urethra. The catheter is also provided with accessories such as cap and attachment. The cap is inserted into the funnel (outlet) as a stopper to prevent urine from flowing out. The attachment is inserted into the cap to connect the urine collection bag. When stored, the catheter shaft is placed into the case (re-use type). The case can be folded for handy use (Figure 4).

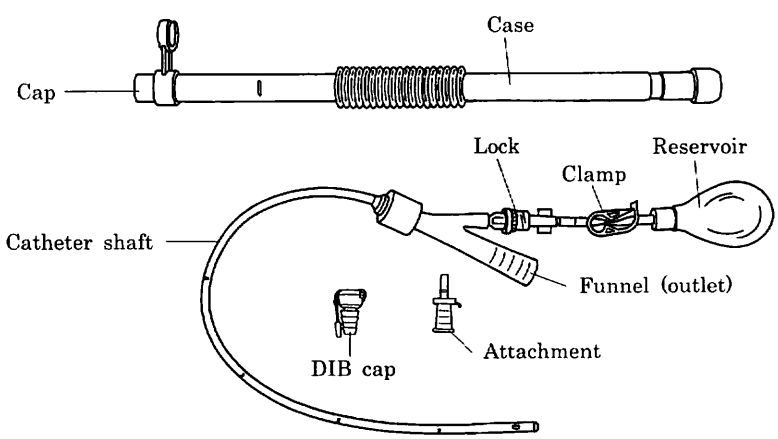


Figure 2 : Composition of the intermittent balloon catheter and the names of its components

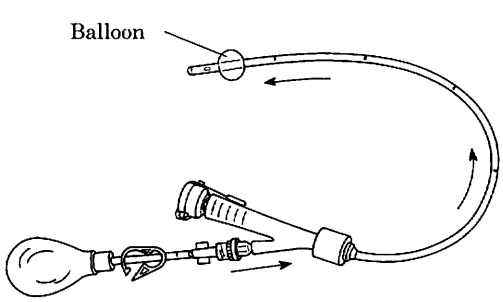


Figure 3 : Distilled water is fed into the balloon

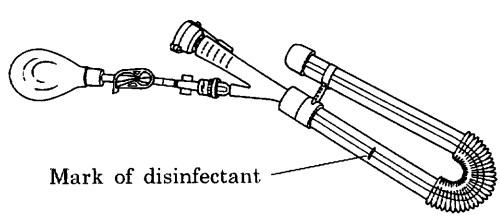


Figure 4 : Folded catheter

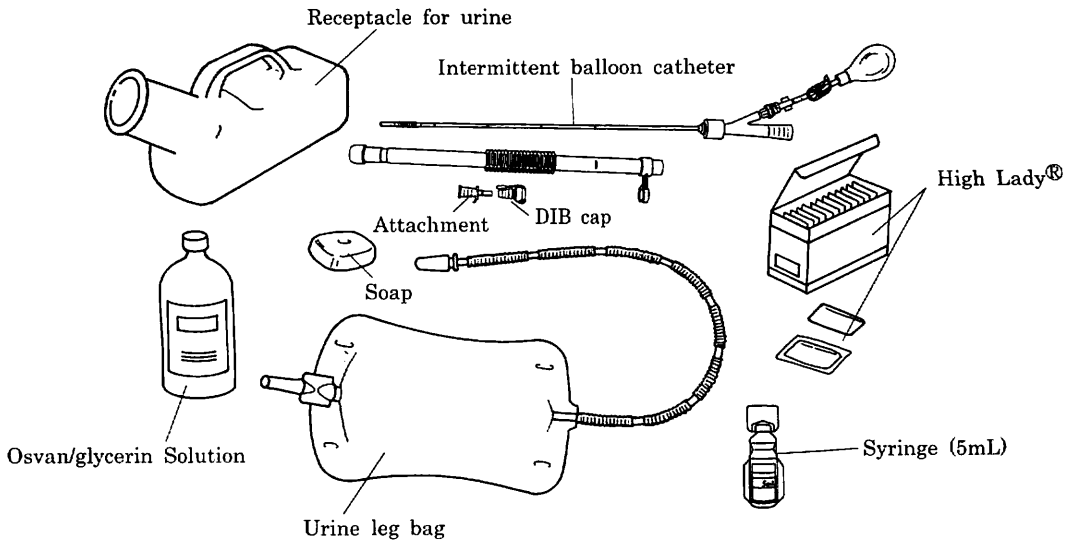


Figure 5 : Preparation of tools and disposables

2. Basic Technique for the Intermittent Balloon Catheterization by Clean Method

1) Preparation of the Intermittent Balloon Catheter

(1) Preparation of tools and disposables

The followings are prepared in advance (Figure 5).

- Intermittent balloon catheter (handy type, re-use type)
- Sterilization (0.02% Osvan/glycerin solution)
- Receptacle for urine
- High Lady® (sterile cotton containing 0.02% chlorhexidine gluconate solution) or any clean cotton containing 0.02% chlorhexidine gluconate solution or 0.02% benzalkoniuim chloride solution(Osvan®) will do.
- Soap
- Urine leg bag (urine collection bag)
- Sterilized distilled water(hereinafter referred to as distilled water) 5mL

(2) Sterilization of intermittent balloon catheter

An intermittent balloon catheter is available in a non-sterilized bag and should be sterilized prior to first use. Before sterilization, air is introduced into the balloon to confirm inflation, deformity or possible leakage of air from the balloon. The catheter should be sterilized after confirmation of any abnormal findings. More particularly, 0.02% Osvan/glycerin solution is fed into the case up to the 7th section of the case (the case has gradations) into which the catheter is placed and left for one hour for sterilization.

(3) Procedures for feeding distilled water into the reservoir

① Open the lid of the distilled water container, and use scissors to widen the opening. Then, open the clamp of the reservoir, and depress it with the fingers. Place the tip of the catheter belonging to the reservoir into the distilled water container, and suck the distilled water into the reservoir using the sucker (Figure 6).

② Confirm that an appropriate quantity of distilled water is sucked into the reservoir by referring to the 5 mL gradations on the reservoir and close the clamp (Figure 7).

③ Connect the reservoir with the catheter and twist them until they lock in place. Twist them slowly because excessively tight closure may result in breakage (Figure 8).

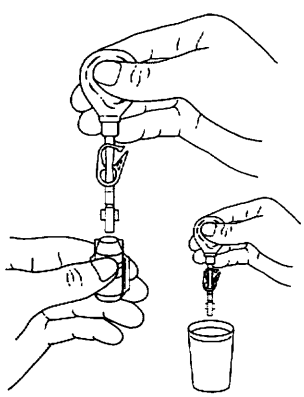


Figure 6 : Preparation of 5mL distilled water

Figure 7 : Confirmation of 5mL quantity and closure with the clamp

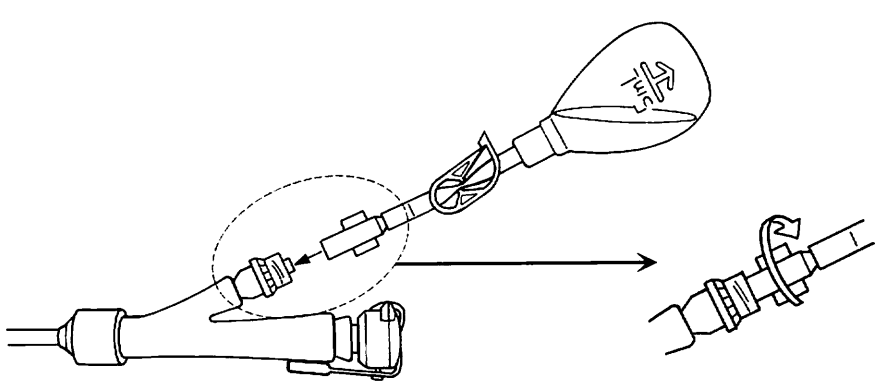


Figure 8 : Connection of the reservoir to the catheter

Figure 9 : Hand washing

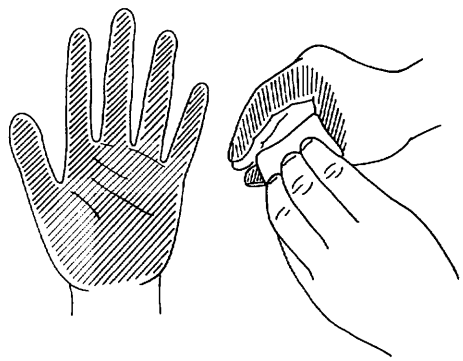


Figure10 : Sterilization of hands and fingers

2) Procedures for Inserting the Intermittent Balloon Catheter

(1) Wash hands and wipe them (Figure 9) (Figure10). Then, remove pants and sit on the bed with the legs stretched out and slightly opened. Wipe the hands well with High Lady® . Also wipe well the glans penis with High Lady® as in the case of self-catheterization.

(2) Hold the catheter about 7cm apart from the tip (distal position) with the thumb and the index finger (Figure 11). The outlet on the opposite side of the catheter (proximal position) is provided with the reservoir and the cap. Bend the catheter and grasp the proximal part of the catheter between the ring finger and the little finger so that the catheter can be inserted easily.

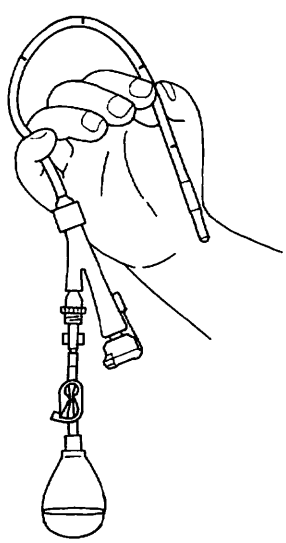


Figure11 : How to hold the intermittent balloon catheter

(3) The following shows how to insert the intermittent balloon catheter.

① Sit down, with the legs stretched out and opened, to insert the catheter. More particularly, when the catheter is inserted into the urethral meatus, hold the base of the glans penis and lift the penis keeping it straight with the glans penis pointing upward. Hold the penis at an angle about 70° to the floor. Insert the catheter straight into the urethral meatus to a depth of 6-7 cm. Turn the catheter around when necessary, but be sure not to push it forward forcibly (Figure 12) (Figure 13).

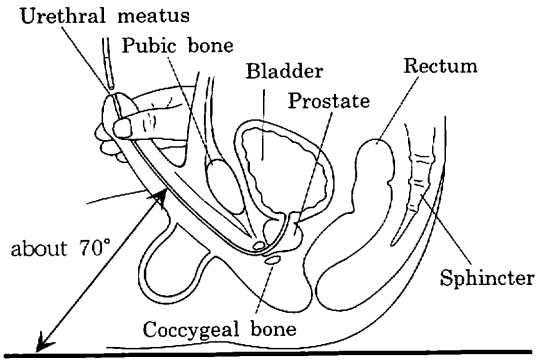


Figure12 : Position to be maintained during catheter insertion

② Insert the catheter to a depth of 6-7cm at first and then insert it in 5 cm or so stages until it is finally inserted to a depth of about 15-20cm. At this point, some resistance from the external urethra sphincter may be felt if the catheter is pushed further, but continue to insert the catheter gradually by exerting steady, gentle pressure. Then urine begins to pass.

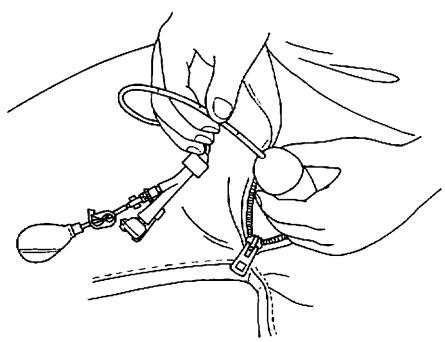


Figure13 : Insertion of the intermittent balloon catheter

③ When urine begins to pass, insert the catheter about a further 3 cm. The balloon should be pushed well into the bladder to prevent the balloon from being inflated inside urethra (Figure 14). If the catheter is inserted to an inappropriate depth, the balloon may be retained inside the urethra, with the risk of

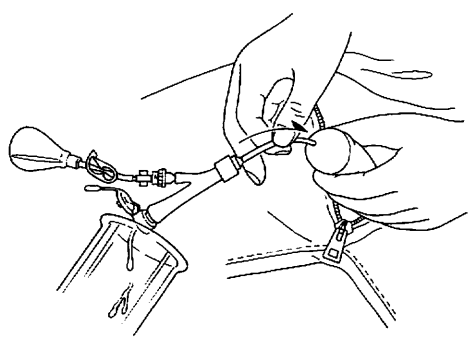


Figure14 : Additional 3cm insertion after initial passing of urine

in urethral bleeding or urethral stricture. Therefore, the catheter must be inserted cautiously.

(4) After insertion of the catheter, confirm that urine begins to pass from the funnel (outlet) (which means that the balloon is inserted in its entirety into the bladder), and then lift up the reservoir slightly to remove the clamp (Figure 15).

(5) When distilled water is fed into the balloon, lift up the reservoir slightly to collect the distilled water in the catheter so that air will not be introduced into the balloon. Then, push the reservoir and feed the distilled water into the balloon slowly (Figure 16).

(6) Close the clamp so that the distilled water will not return to the reservoir (Figure17)

(7) After closure of the clamp, hold the catheter, draw back the balloon slowly until some resistance is felt and confirm that the balloon is retained inside the bladder. At this time, do not draw the balloon back forcibly because strongly tugging the catheter or additional pulling after the resistance is felt may damage the urethra (Figure 18).

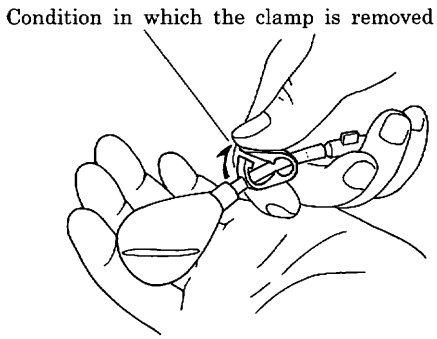


Figure15 : Keep the clamp opened

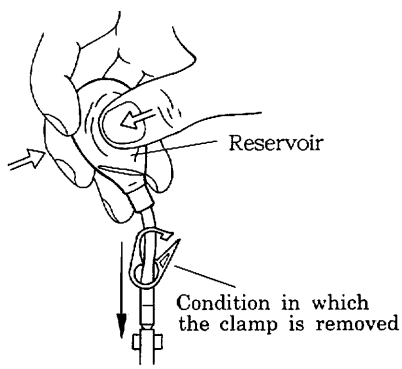


Figure16 : Feeding of distilled water into the balloon

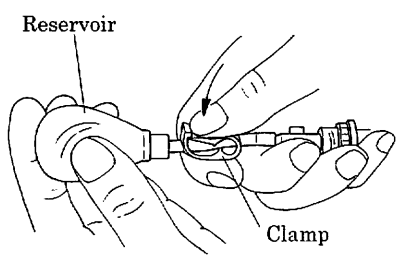


Figure17 : Closure of the tube with the clamp

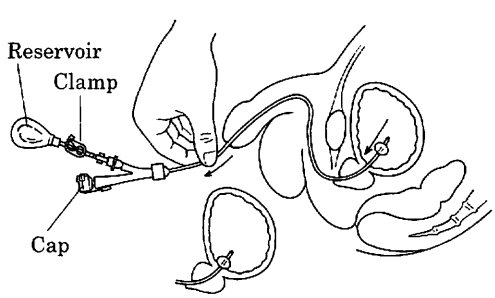


Figure18 : Confirmation of indwelling of the balloon catheter

3) Connection of Urine Collection Bag (Figure 19)

(1) Connect the funnel of the intermittent balloon catheter (outlet) to the urine collection bag. The check-valve mechanism is provided at the inlet of the urine collection bag so that the urine once entered into the bag does not flow backward. Any bag without this mechanism should not be used.

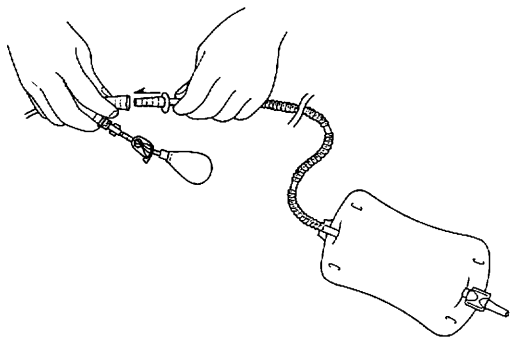


Figure 19 : Connection of the urine collection bag to the catheter

(2) The urine collection bag should be fixed on the inner side of the lower thigh (Figure 20).

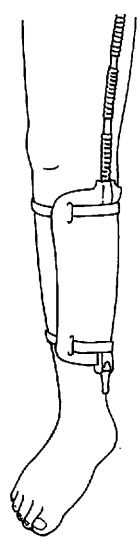


Figure 20 : Fixture of the urine collection bag to the inside of the lower thigh

(3) Where the urine collection bag is not used, put a DIB cap (magnet-equipped lid) on the funnel (outlet) and close the lid of the DIB cap (Figure 21).

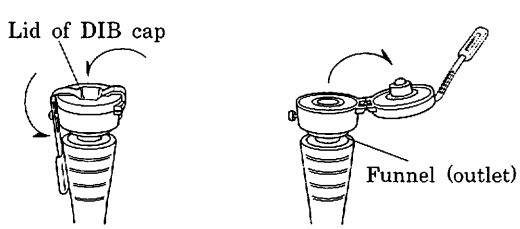


Figure 21 : Opening and closing of the cap

4) Method of Using the Urine Collection Bag

To empty the urine collection bag, open the stopper at the lower part of the bag to flush away urine into a toilet (Figure 22). Where the DIB cap is used, open the lid of the cap to flush away urine into a toilet or other suitable receptacle. In both cases, wash hands after the urine is flushed away. The urine collection bag can be reused for up to 2-4 weeks.

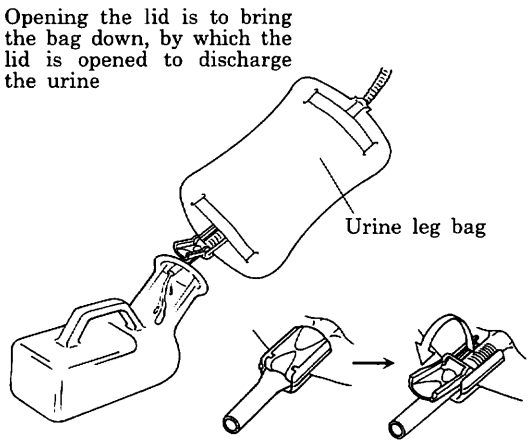


Figure 22 : Open the lid of the urine collection bag to discharge the urine

5) Procedure for Removing the Intermittent Balloon Catheter

Timing of removing the catheter depends on which of the three different types of the catheter is being used (refer to the Table). In the case of the Night Balloon, or a catheter used at night by patients with urinary frequency, the catheter should be removed the following morning. In the case of Schooler and Commuter Balloons, or a catheter used by patients who go to school or work, the catheter should be removed after they return home. In the case of a Spot Balloon, or a catheter used by patients on a trip or when driving a vehicle, the catheter should be removed after they arrive at their destination. The following shows the procedure for removing the catheter.

(1) Open the clamp to drain the distilled water back into the reservoir (Figure 23). At this time, keep the clamp open because some of the distilled water may remain in the balloon.

(2) Hold the intermittent balloon catheter at the part close to the outlet and remove it with a straight pulling movement.

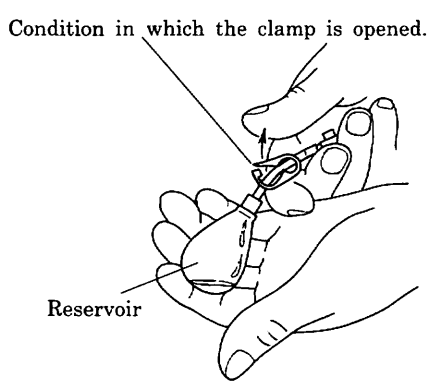


Figure 23 : The clamp is opened to return the distilled water to the reservoir

(3) After the catheter is used, hold it at the part close to the outlet, run the catheter under tap water from the faucet and wash the interior and exterior of the catheter thoroughly while rubbing it lightly with the fingers (Figure 24).

(4) Place the intermittent balloon catheter into a case filled with a disinfectant. Confirm that the lumen of the catheter is washed with the disinfectant and put a lid of the DIP cap to store the catheter. (Figure 25).

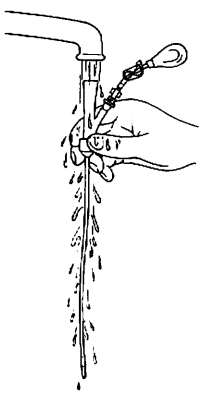


Figure 24 : Washing the catheter with water

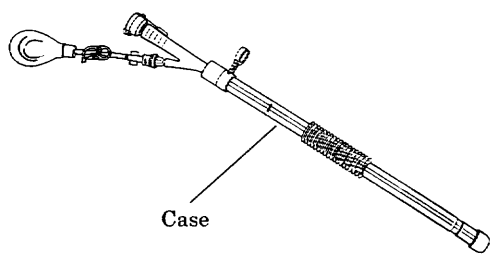
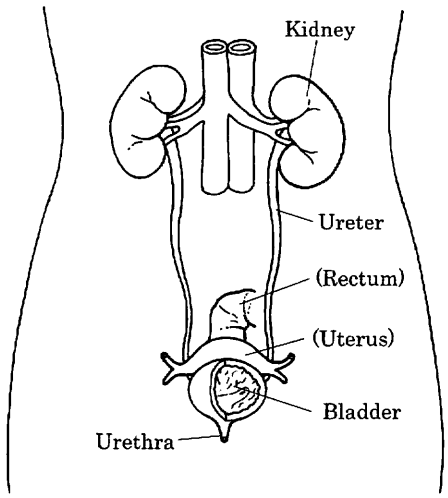


Figure 25 : Placing the catheter in the case

Chapter 3.
Intermittent Balloon Catheterization for Females

Intermittent balloon catheterization can be successfully conducted under two different conditions, namely, aseptic and clean. In the aseptic method, medical personnel wear sterile gloves and use sterilized tools and materials such as forceps and cotton balls (soaked in disinfectant) when catheterizing patients with urinary disturbance. This method is recommended in hospitals where there is a higher risk of infection.

The clean method is the form of catheterization employed by outpatients at home. This method does not necessitate aseptic conditions but can be performed in any situation provided the surroundings are clean. Using the catheter for only a short time minimizes the risk of possible infection. This text deals with intermittent balloon catheterization using the clean method.



( ) : The organ in brackets is not a urinary organ.

Figure26 : Urinary organ

Insertion of the intermittent balloon catheter can be performed before going out, taking a trip or driving a vehicle, and is usually carried out on a bed or in a toilet at home.

1. Composition and Parts of the Intermittent Balloon Catheter and Urinary Organs

1) Urinary Organs

Figure 26 shows the urinary organs. The urethra is the outlet canal that starts from the bladder and passes to the outside of the body. The female urethra (4cm) is shorter than the male urethra (23cm). Females are more vulnerable to urinary tract infections because of the shorter urethra. Two thirds of the upper urethra is surrounded by the external urethral sphincter. The sphincter is subject to voluntary control.

The bladder is a hollow organ positioned in front of the pelvis and made up of muscular walls. It is connected to the kidneys via the ureters. In the pelvis, the bladder is in front of the uterus and the rectum is behind the uterus.

The kidneys discharge urine into the bladder at a rate of about 1mL every minute. In general, when about 150mL of urine is retained in the bladder, the urge to urinate is aroused, and when retained in a quantity of more than 400mL, urine must be voided.

2) Composition and Parts of the Intermittent Balloon Catheter (Figure 27)

Conducting intermittent balloon catheterization requires a catheter and a cylindrically-shaped case (hereinafter referred to as the case), which are available in a set for easy conveyance.

The catheter is provided with a tube for urination and another tube for inflating the balloon. Distilled water is fed into the tube for inflating the balloon (Figure 28). The catheter consists of a reservoir, clamp, catheter shaft, balloon and case. The reservoir acts as a pump to feed water to the balloon that fixes the catheter in the bladder and also acts as a container for holding the water when the catheter is removed. The clamp is a device to prevent the water from flowing back to the reservoir. The balloon catheter is provided with marks at positions of 5, 10, 15 and 20cm away from the tip to indicate what length of catheter has been inserted into the urethra. The catheter is also provided with accessories such as cap and attachment. The cap is inserted into the funnel (outlet) as a stopper to prevent urine from flowing out. The attachment is inserted into the cap to connect the urine collection bag. When stored, the catheter shaft is placed into the case (re-use type). The case can be folded for handy use (Figure 29).

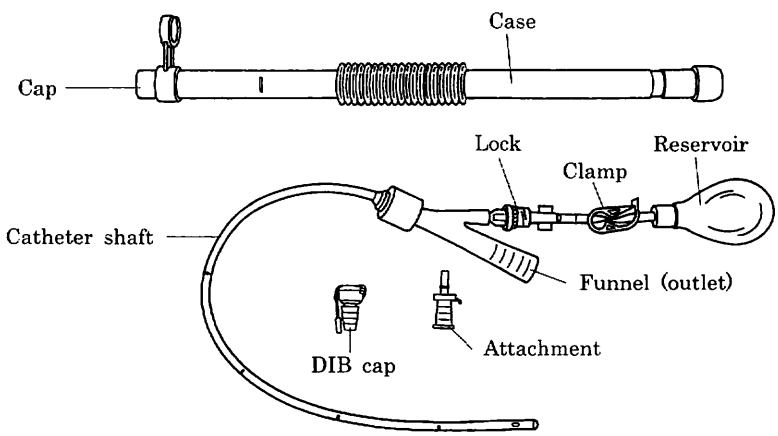


Figure27 : Composition of the intermittent balloon catheter and the names of its components

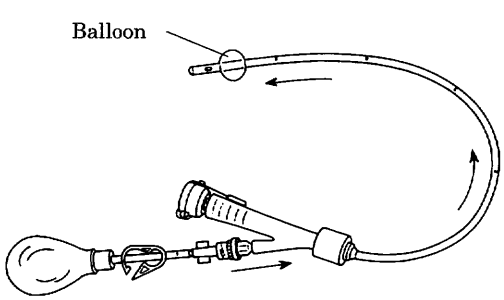


Figure28 : Distilled water is fed into the balloon

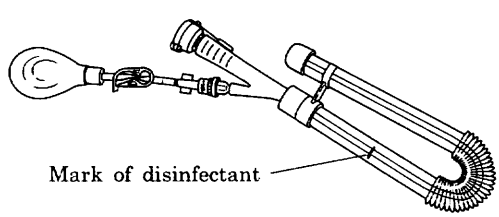


Figure29 : Folded catheter

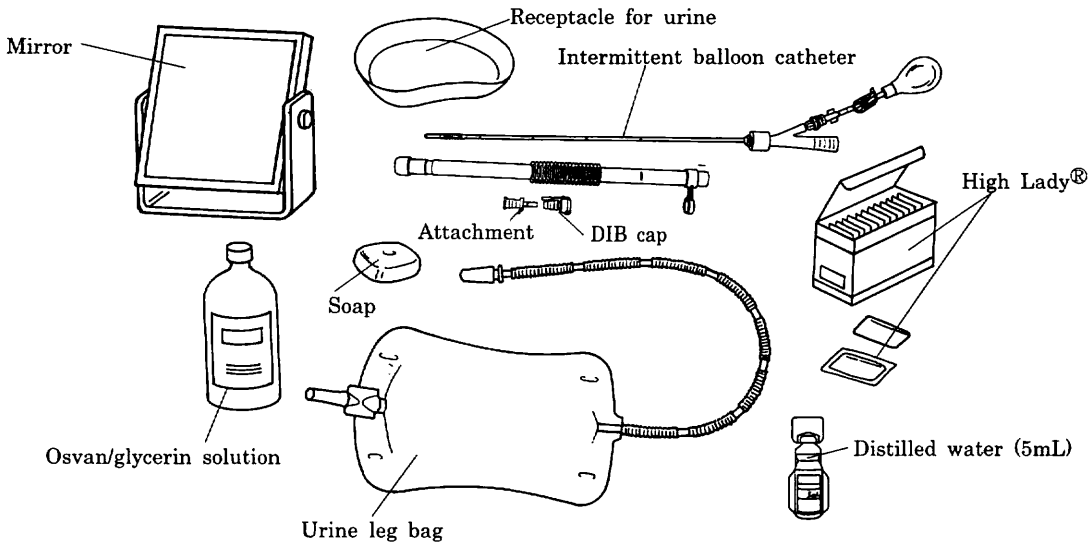


Figure30 : Preparation of tools and disposables

2. Basic Technique for the Intermittent Balloon Catheterization by Clean Method

1) Preparation of the Intermittent Balloon Catheter

(1) Preparation of tools and disposables

The followings are prepared in advance (Figure 30).

- Intermittent balloon catheter (handy type, re-use type)
- Sterilization (0.02% Osvan/glycerin solution)
- Receptacle for urine (Wide-mouthed)
- High Lady® (sterile cotton containing 0.02% chlorhexidine gluconate solution) or any clean cotton containing 0.02% chlorhexidine gluconate solution or 0.02% benzalkoniuim chloride solution(Osvan®) will do.
- Soap
- Urine leg bag (urine collection bag)
- Sterilized distilled water(hereinafter referred to as distilled water) 5mL
- Mirror

(2) Sterilization of intermittent balloon catheter

An intermittent balloon catheter is available in a non-sterilized bag and should be sterilized prior to first use. Before sterilization, air is introduced into the balloon to confirm inflation, deformity or possible leakage of air from the balloon. The catheter should be sterilized after confirmation of any abnormal findings. More particularly, 0.02% Osvan/glycerin solution is fed into the case up to the 7/10 of the case (the case has gradations) into which the catheter is placed and left for one hour for sterilization.

(3) Procedures for feeding distilled water into the reservoir

① Open the lid of the distilled water container, and use scissors to widen the opening. Then, open the clamp of the reservoir, and depress it with the fingers. Place the tip of the tube belonging to the reservoir into the distilled water container, and suck the distilled water into the reservoir using the sucker (Figure 31).

② Confirm that an appropriate quantity of distilled water is sucked into the reservoir by referring to the 5 mL gradations on the reservoir and close the clamp (Figure 32).

③ Connect the reservoir with the catheter and twist them until they lock in place. Twist them slowly because excessively tight closure may result in breakage (Figure 33).

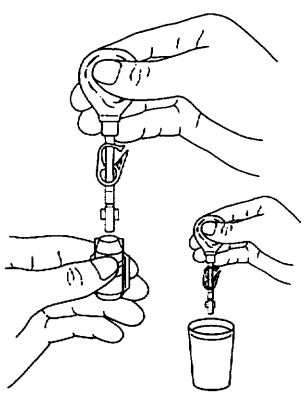


Figure31 : Preparation of 5mL distilled water

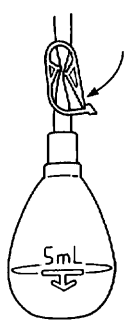


Figure32 : Confirmation of 5mL quantity and closure with the clamp

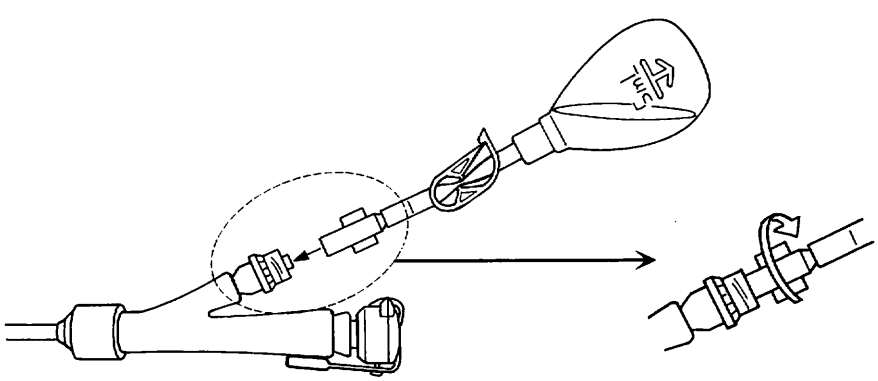


Figure33 : Connection of the reservoir to the catheter

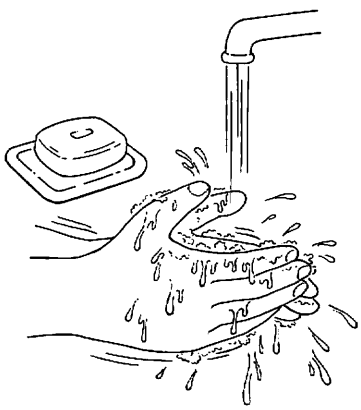


Figure34 : Hand washing

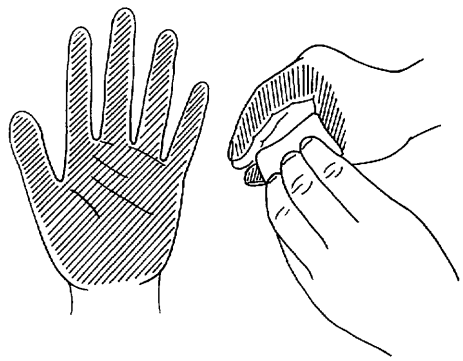


Figure35 : Sterilization of hands and fingers

2) Procedures for Inserting the Intermittent Balloon Catheter

(1) Wash hands (Figure 34). Wash your hands and take off your skirt and panties on the bed. Sit down on the bed, with the legs stretched out and opened and with the knees slightly bent. This is a stable posture for inserting the catheter. Place the mirror between your legs (Figure 36). Keep two sets of High Lady® and wipe your hands well with one of the sets (Figure 35). Divide another set of the High Lady® into two portions and put them individually on sheets for subsequent use.

Figure36 : Posture adopted for inserting the catheter and fixation of the mirror

(2) Locate the urethral meatus. Part the labia with the index finger and the ring finger. You will get a better view of the urethral meatus if the labia are pulled upward (Figure 37). The position of the urethral meatus is shown in Figure 38.

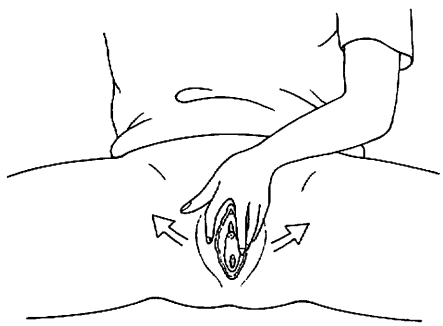


Figure37 : Part the labia and pull them upward

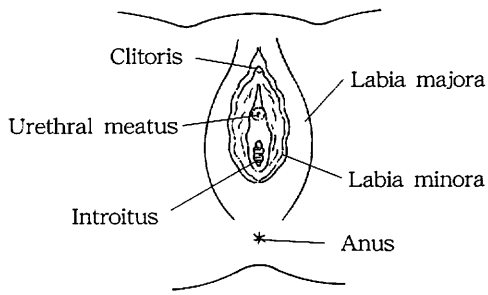


Figure38 : Position of the urethral meatus

(3) Wipe the vulva with the High Lady® (r) several times as shown in Figure 39. More particularly, use one of the sheets to wipe the urethral meatus downward and use another sheet to wipe the labia minora downward.

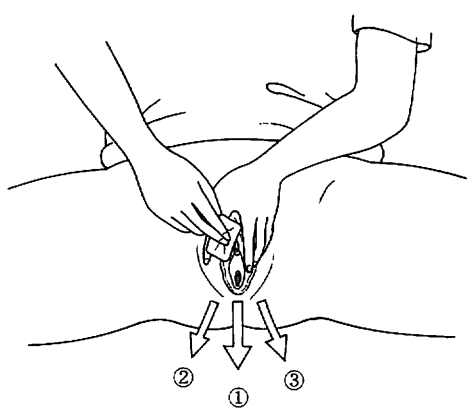


Figure39 : Procedure for wiping

(4) Hold the catheter about 7cm apart from the tip (distal position) with the thumb and the index finger (Figure 40). The outlet on the opposite side of the catheter (proximal position) is provided with the reservoir and the cap. Bend the catheter and grasp the proximal part of the catheter between the ring finger and the little finger so that the catheter can be inserted easily.

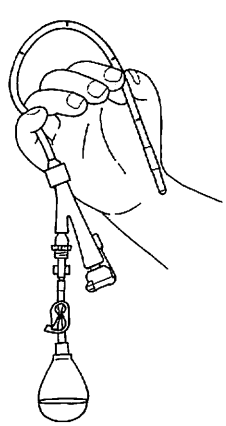


Figure40 : How to hold the intermittent balloon catheter

(5) The person should take a long-leg sitting position with posterior pelvic tilt and round-back posture on the bed. Doing so, it becomes easy to identify the urethral openi ng. A lumbar support is convenient apparatus to keep this posture.

Pull up the vulva with your index and middle or ring fingers, so you can easily look at the urethral opening.

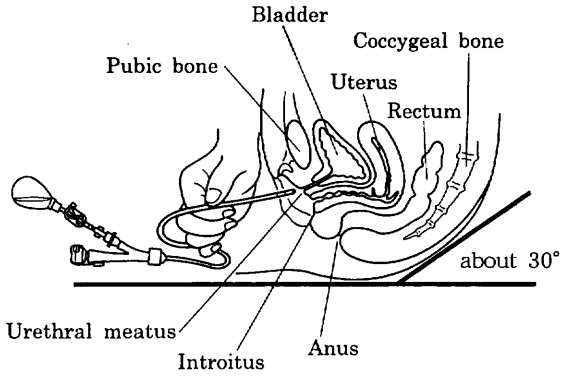


Figure41 : Position to be maintained during catheter insertion

(6) The following shows how to insert the intermittent balloon catheter.

① Insert the catheter into the urethral meatus to a depth of 4 ~ 5cm. You may rotate the catheter gently, if necessary, but be sure not to push it forward forcibly (Figure 41) (Figure 42).

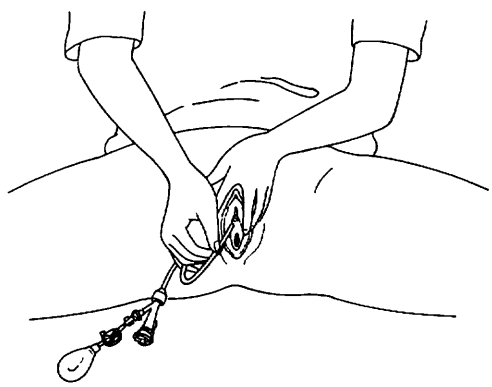


Figure42 : Insertion of the intermittent balloon catheter

② When urine begins to pass, insert the catheter about a further 3 cm. The balloon should be pushed well into the bladder to prevent the balloon from being inflated inside urethra (Figure 43). If the catheter is inserted to an insufficient depth, the catheter may slip out or the balloon may be retained inside the urethra, with the risk of urethral bleeding or stricture. Therefore, the catheter must be inserted cautiously.

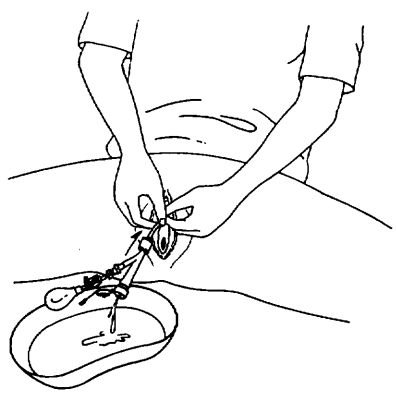


Figure43 : Additional 3cm insertion after initial passing of urine

(7) After insertion of the catheter, confirm that urine begins to pass from the funnel (outlet) (which means that the balloon is inserted in its entirety into the bladder), and then lift up the reservoir slightly to remove the clamp (Figure 44).

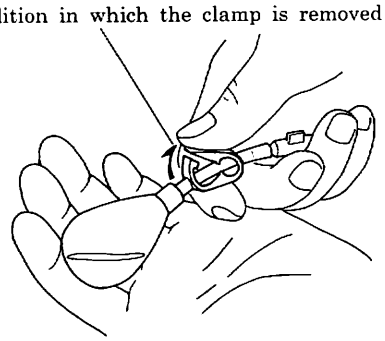


Figure44 : Keep the clamp opened

(8) When distilled water is fed into the balloon, lift up the reservoir slightly to collect the distilled water in the catheter so that air will not be introduced into the reservoir. Then, push the reservoir and feed the distilled water into the balloon slowly (Figure 45).

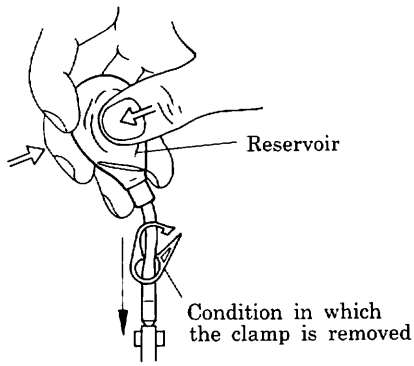


Figure45 : Feeding of distilled water into the balloon

(9) Close the clamp so that the distilled water will not return to the reservoir (Figure46)

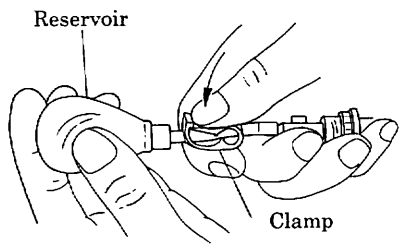


Figure46 : Closure of the tube with the clamp

(10) After closure of the clamp, hold the catheter, draw back the balloon slowly until some resistance is felt and confirm that the balloon is retained inside the bladder. At this time, do not draw the balloon back forcibly because strongly tugging the catheter or additional pulling after the resistance is felt may damage the urethra (Figure 47).

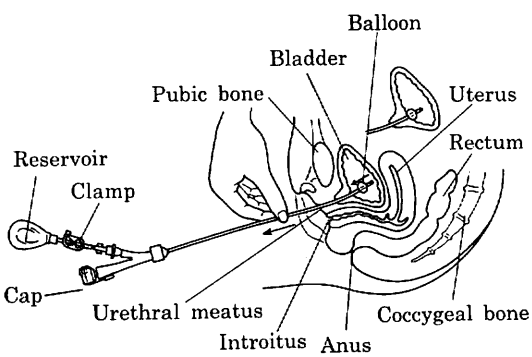


Figure47 : Confirmation of indwelling of the balloon catheter

3) Connection of Urine Collection Bag (Figure 48)

(1) Connect the funnel of the intermittent balloon catheter (outlet) to the urine collection bag. Do not use a urine collection bag lacking a check-valve mechanism at the inlet of the bag.

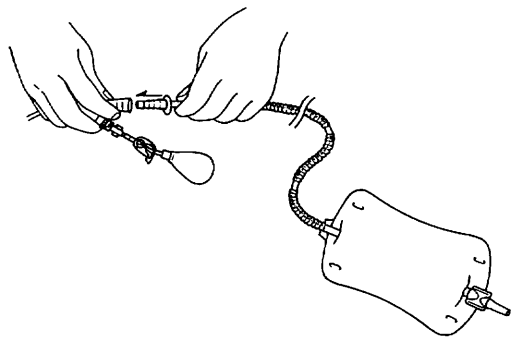


Figure48 : Connection of the urine collection bag to the catheter

(2) The urine collection bag should be fixed on the inner side of the leg (Figure 49).

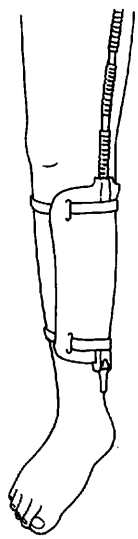


Figure49 : Fixture of the urine collection bag to the inside of the leg.

(3) Where the urine collection bag is not used, put a DIB cap (magnet-equipped lid) on the funnel (outlet) and close the lid of the DIB cap (Figure 50).

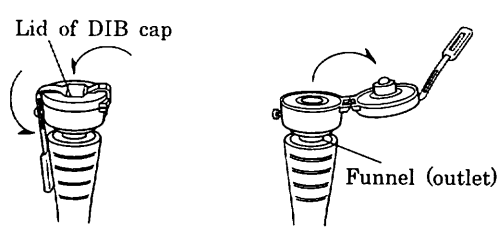


Figure50 : Opening and closing of the cap

4) Method of Using the Urine Collection Bag

To empty the urine collection bag, open the stopper at the lower part of the bag to flush away urine into a toilet (Figure 51). Where the DIB cap is used, open the lid of the cap to flush away urine into a toilet or other suitable receptacle. In both cases, wash hands after the urine is flushed away. The urine collection bag can be reused for up to 2-4 weeks.

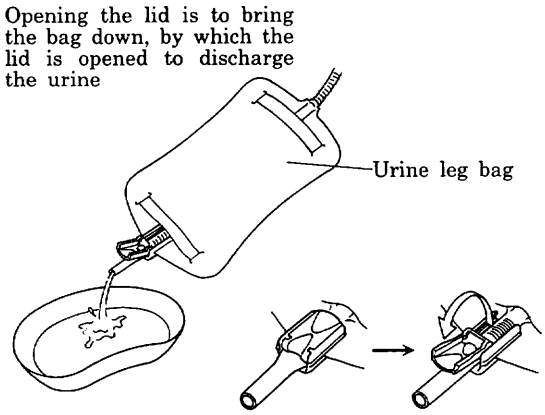


Figure 51 : Open the lid of the urine collection bag to discharge the urine

5) Procedure for Removing the Intermittent Balloon Catheter

Timing of removing the catheter depends on which of the three different types of the catheter is being used (refer to the Table). In the case of the Night Balloon, or a catheter used at night by patients with urinary frequency, the catheter should be removed the following morning. In the case of Schooler and Commuter Balloons, or a catheter used by patients who go to school or work, the catheter should be removed after they return home. In the case of a Spot Balloon, or a catheter used by patients on a trip or when driving a vehicle, the catheter should be removed after they arrive at their destination. The following shows the procedure for removing the catheter.

(1) Open the clamp to drain the distilled water back into the reservoir (Figure 52). At this time, keep the clamp open because some of the distilled water may remain in the balloon.

(2) Hold the intermittent balloon catheter at the part close to the outlet and remove it with a straight pulling movement

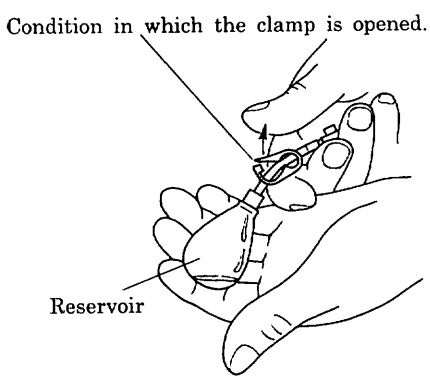


Figure 52 : The clamp is opened to return the distilled water to the reservoir

(3) After the catheter is used, hold it at the part close to the outlet, run the catheter under tap water from the faucet and wash the interior and exterior of the catheter thoroughly while rubbing it lightly with the fingers (Figure 53).

(4) Place the intermittent balloon catheter into a case filled with a disinfectant. Confirm that the lumen of the catheter is washed with the disinfectant and put a lid of the DIP cap to store the catheter. (Figure 54).

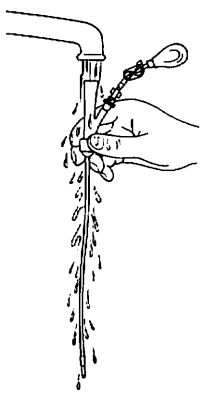


Figure 53 : Washing the catheter with water

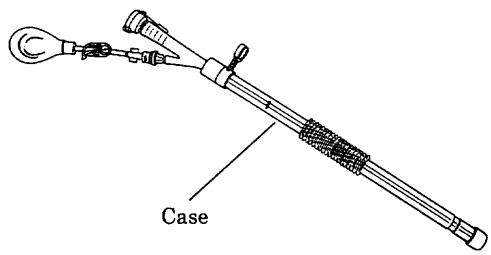


Figure 54 : Placing the catheter in the case

Chapter 4.
Complications with Intermittent Balloon Catheterization

1) Hematuria

Hematuria is any condition in which the urine contains blood or red blood cells. The condition varies from a slight reddish appearance of the urine, an apparent appearance of blood to dark red urine where large amounts of blood are present. It also includes the condition where the urine contains blood clots.

The use of catheters may cause hematuria when the urethra or bladder is slightly injured. In most cases, this type of hematuria causes only bright reddish urine.

Usually, hematuria will cure itself in one or two days. If the condition persists, it is recommended to consult a urologist.

2) Acute Cystitis

The use of an intermittent balloon catheter may cause transient bacteriuria or acute cystitis. Clinical symptoms and signs of cystitis include difficulty in urination, frequent urination, urinary urgency, urinary incontinence, clouding of urine and occasional hematuria.

Most of these symptoms and signs will be improved when the intermittent balloon catheter is removed and self-catheterization is resumed. Broad-spectrum antibiotics are prescribed to treat these conditions. Some specialists are against the prophylactic use of antibiotics when catheters are used intermittently (Linsenmeyer et al,1993).

3) Acute Cystopyelonephritis

Where there are symptoms such as chill, high fever and clouding of urine, the possibility exists that the entire urinary tract may be infected including the kidneys. Consult with a regular physician at the earliest opportunity.

4) Actions to be taken when the balloon catheter comes out spontaneously

When the balloon catheter comes out spontaneously, check the following:

① Check that the required amount of distilled water is present in the reservoir.

② Check whether the clamp is positioned at the center of the tube. If the clamp deviates from the center to the right or to the left, the distilled water may drain back into the reservoir, resulting in the balloon slipping out.

③ Check to see if there is a crack on the connecter as distilled water may

leak from the crack. Be sure to replace the cracked connector with a new one.

5) Actions to be taken when the intermittent balloon catheter cannot be removed

When the intermittent balloon catheter cannot be removed, immediately consult with a physician.

6) Actions to be taken when the intermittent balloon catheter is contaminated

The intermittent balloon catheter can be used for up to one month. However, when washing with water does not remove urinary residues on the lumen of the catheter, change it for a new catheter immediately without waiting for a lapse of one month.

Chapter 5.
Disinfectant

The case and lumen of the intermittent balloon catheter are sterilized using a mixture of disinfectant (benzalkoniuim chloride solution; Osvan) and a lubricant (glycerin). Benzalkoniuim chloride solution is prepared to give a 0.02% solution.

When the disinfectant is prepared by a patient, add 1 mL of 10% Osvan® solution to 500mL of 50% commercially available glycerin using a syringe to give a 0.02% Osvan/glycerin solution.

The disinfectant should be changed once a week. If a disinfectant is retained for a prolonged period, it may become contaminated with microorganisms. The use of contaminated disinfectant may cause cystitis or urethritis.

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