

# Cystostomy, CIC: Indication & Management

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**Cystostomy: Indication/ Contraindication**

**Catheter complication**

**Principle of management**

**Patient education**

**CIC: Indication & Management**

# Indication

## Urethral catheter indication

- Retention/ Bladder outlet obstruction
- Maintain a continuous outflow of urine
- Need for accurate measurements of urinary output
- Perioperative use for selected surgical procedures.
- Need for intra-operative monitoring of urinary output.

# Indication

## Urethral catheter indication

- To assist in healing of open sacral or perineal wounds
- Patient requires prolonged immobilization
- To allow bladder irrigation/lavage.
- To facilitate continence and maintain skin integrity
- To improve comfort for end of life care if needed.
- Management of intractable incontinence.

(Guideline for prevention of EAUN 2012)

# Indication

## Suprapubic catheter indication

- >In addition to the indications of the urethral catheterization the following indications apply
- Acute and chronic urine retention that is not able to be adequately drained with a urethral catheter.
- Preferred by patient due to patient needs e.g. wheelchair user, sexual issues.
- Acute prostatitis.

# Indication

## Suprapubic catheter indication

- Obstruction, stricture, abnormal urethral anatomy.
- Pelvic trauma.
- Complications of long-term urethral catheterization.
- Complex urethral or abdominal surgery.
- Fecal incontinent patients

# Contraindication

## Urethral catheter contraindication

- **Acute prostatitis**
  - aggravate inflammation
  - risk of complication
- **Suspicious of urethral trauma**
  - partial injury->complete injury

# Contraindication

## Suprapubic catheter contraindication

- Known or suspected carcinoma of the bladder.
- Previous lower abdominal surgery
- Coagulopathy (until the abnormality is corrected)
- Ascites
- Prosthetic devices in lower abdomen e.g. hernia mesh



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# Catheter complication

**Catheter Associated Urinary Tract Infection**

**Epididymitis**

**Catheter blockage**

**Catheter bypassing**

**Iatrogenic trauma**

**Bladder spasm**

**Bladder pain**

# Catheter complication

Hematuria

Granuloma formation

Urinary extravasation

Inability to remove catheter

Squamous Cell Carcinoma (SCC)

# Catheter complication

## Catheter associated Urinary Tract Infection(CAUTI)

### **Definition**

도뇨관이 유치되어 있거나 제거한지 48시간 이내의 환자에서 발생한 요로감염  
청결채취 소변 1ml당  $10^3$ 개 이상 배양된 세균뇨가 있는 경우  
(요로감염 임상진료지침 권고 Infection&chemother 2011)

### **Prevention**

Fluid intake  
Hand washing  
Use of closed drainage systems

**(European Associated of urology nurse 2012)**

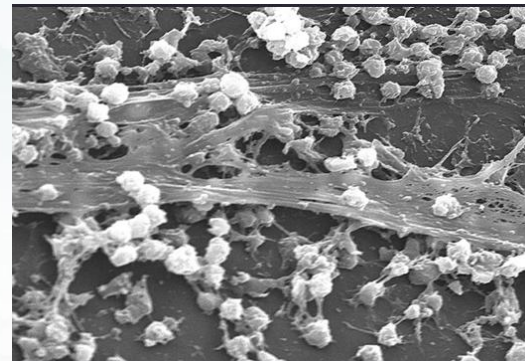
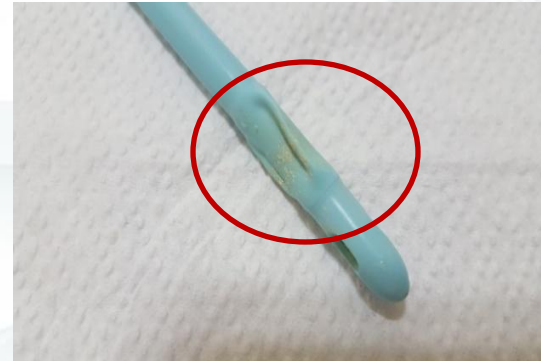
# Catheter complication

## Catheter blockage

40~50% of patients with indwelling catheters

### Etiology

1. **Catheter encrustation** :  
may occur as bacterial cells,  
such as "Proteus mirabilis"
2. **Debri**
3. **Biofilm**
4. **Chronic constipation**
5. **Kinking of the catheter**



# Catheter complication

## Catheter blockage

### Prevention

1. Increased fluid intake
2. Silicone catheter
3. Adequate urine bag height
4. Larger catheter lumens

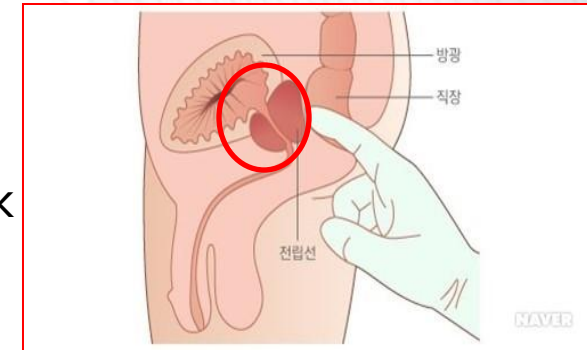


# Catheter complication

## Iatrogenic trauma

### Urethral catheterization

1. False passage/ Urethral stricture in the male  
Usually at the level of the prostate or bladder neck
2. Paraphimosis
3. Urethral Sphincter disruption in the female



### Suprapubic catheterization

1. Visceral injury  
previous lower abdominal surgery and neurological disease  
2~3% bowel perforation

# Catheter complication

## Bladder spasm / pain

### **Etiology**

1. 요도 방광 반사(음부신경과 내장성 구심신경활성화)
2. Traction, Chronic constipation
3. Too large diameter of the catheter

### **Management**

1. Maintaining regular bowel function : high fiber& fluid intake
2. Catheter: smaller lumen and balloon size
3. Anticholinergic drugs



# Catheter complication

## Hematuria

### Etiology

1. During urethral catheterization, prostatic trauma
2. Decompression of high pressure chronic retention
3. Stone

### Management

1. Irrigation -> fail -> formal bladder washout under G/A

# Catheter complication

## Granuloma formation / stricture/urinary extravasation

This complication is limited to SPC

### Management

silver nitrate, surgical excision



### 알보칠 효능 및 효과, 특징, 사용법

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# Principle of management

Aseptic technique

Changing indwelling catheters

Catheter size

Balloon size and filling

Secure the urethral catheter

Urinalysis

Bladder irrigation

# Principle of management

## **Aseptic technique**

Following aseptic insertion of the catheter, maintain a closed drainage system

## **Changing indwelling catheter**

Do not fixed intervals

### **Immediately replaced**

- Infection
- Obstruction
- Closed system is compromised

### **Catheter changes are base of**

- Function of the catheter
- Degree of catheter encrustation
- Frequency of blockage
- Patient discomfort

# Principle of management

## Catheter size

As small as possible

### General Guided( ICS, 2009)

Urethral	12~16Fr
Suprapubic	16~20Fr
Hematuria	20~24Fr

1Fr = 1/3mm

## Balloon size and filling

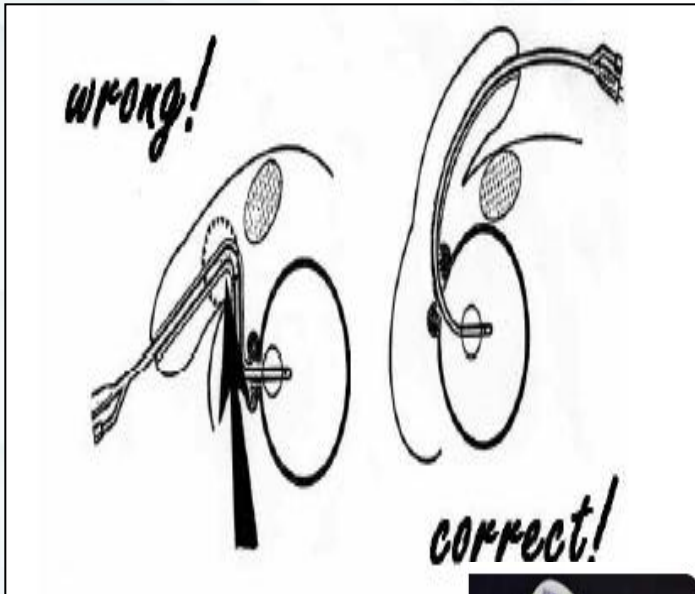
5~10cc balloon(per manufacture suggested guidelines)

- ✓ Do not use saline: crystalize
- ✓ Do not use air : “float” in bladder



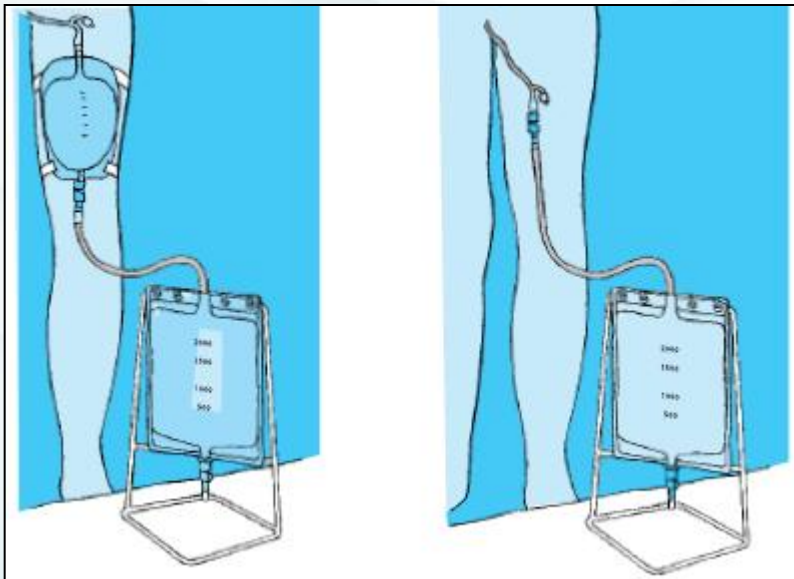
# Principle of management

## Secure the urethral catheter

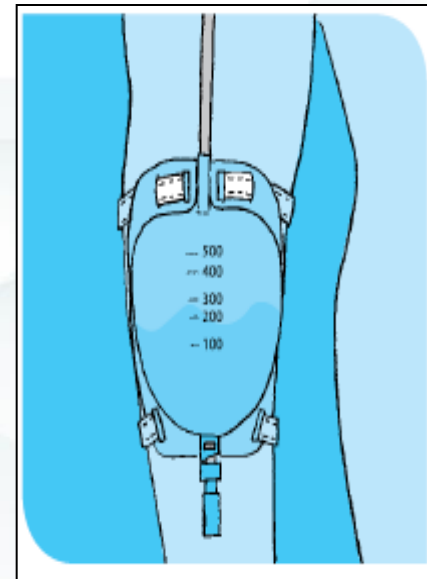


# Principle of management

## Secure the urethral catheter



Overnight drainage system



Bag fixed at the leg



# Principle of management

## Urinalysis

### Indications

1. Patient is systemically unwell
2. Patient has a high temperature
3. Following lack of response to treatment
4. Admitted/Transferred to hospital to ascertain the presence of HAI or CAI



준비물	- D-set, 소독제(10% Betadine 또는 2% CHG), 10cc 멸균 주사기, 멸균장갑, Urine culture bottle
절차	<ul style="list-style-type: none"><li>- <u>검체 채취 전에 손위생을 시행</u></li><li>- 도뇨관을 clamp 하여 도뇨관 안에 소변을 모음</li><li>- 손위생을 시행 후 멸균장갑 착용</li><li>- <u>sampling port를 소독제로 닦고 건조시킨다.</u></li><li>- 주사기를 이용하여 무균적으로 소변채취* sampling port 없는 경우 도뇨관의 고무(latex)부위 소독 후 무균적으로 소변채취</li><li>- Culture bottle 에 소변 담기</li><li>- Clamp한 배뇨관을 열고, 장갑 제거 후 손위생 시행</li><li>- 채취한 소변은 2시간 이내에 검사실로 보내거나 냉장고에 보관</li><li>- 소변이 실온에서 2시간이 경과하면 <math>10^5</math> CFU/mL 증식 되어 요로감염으로 잘못 판단 할 수 있음</li><li>- 도뇨관 고무 부위로 검체 채취 시 도뇨관 손상 가능성 있으므로 26G 바늘 사용</li></ul>

# Principle of management

## Bladder irrigation

Routinely bladder washouts are not beneficial

: Breaking the closed system to perform a bladder washout will increase the risk of infection

**Recommended in special circumstances**

1. Removal of encrustation
  2. Removal of blood clot after urological surgery
  3. Palliative treatment of intractable hematuria
- For the purpose of preventing blockage!!  
to be performed an aseptic technique must be followed!!

(Cochrane Database of Systematic Reviews)

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# Patient education

**Hand washing**

**Fluid intake**

**Maintain a closed system**

**Maintain a unobstructed urine flow**

**Perineal cleansing**

**Prophylatic antibiotics**

# Patient education

Possible color and odor changes in urine due to food or medication

Medication	Color/Odor
Amitriptyline	Blue-green
Antibiotics	Offensive smell
Ibuprofen	Red
Levodopa	Darkens
Metronidazole	Red to brown
Sulfonamides	Greenish blue
Vitamine B com	Dark yellow
Wafarin	Orange

Food and drink	Color/Odor
Asparagus	Green
Beetroot	Pink to dark red
Red fruit drinks	Pink to dark red
Oily fish	Fishy

Certain food smells appears to pass through into the urine  
e.g. onion, garlic, some spices

# The principles of bladder management

- The bladder **should empty regularly and efficiently**.
- Bladder management should be **appropriate to functional capacity**. (UDS/ voiding diary)
  - 각 환자 별로 최적의 방광 관리 방법을 선택해야 한다.
- Bladder emptying should be **independent** of caregivers.
- **Effective bowel management** is critical to effective bladder management.
- There are **sex differences** in neurogenic bladder management.
  - 비뇨기계의 구조적 남녀 차이를 고려하여 방광 관리 방법을 선택해야 한다

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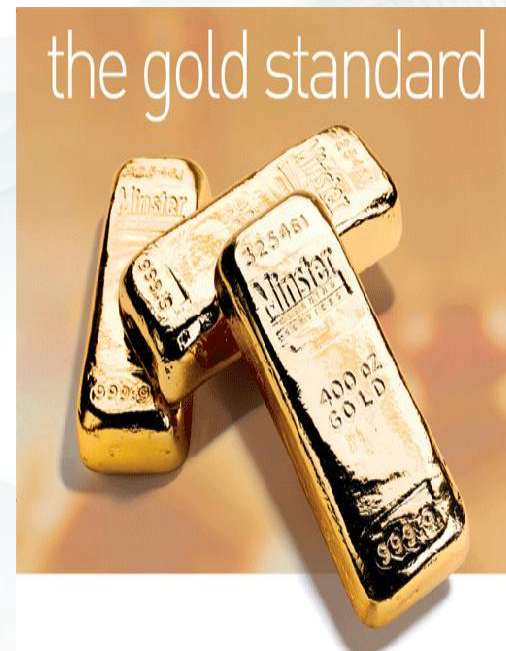
# Indication

## CIC indication

### Best practice / the gold standard

The principles of using intermittent catheterisation are based on regular (typically 4-6 times daily) and complete emptying of the bladder to maintain a low bladder pressure and minimal residual urine volumes, consequently securing bladder and renal health.

**Rationale:** Intermittent catheterization provides a method of emptying the neurogenic bladder without leaving an indwelling catheter and lessens the frequency of long-term complications





# Contraindication

## CIC contraindication

- high intravesical pressure : requires free drainage to prevent renal damage (Vahr et al, 2013)
- Patients with serious physical disabilities or impaired hand function=>impossible to undertake
- Patients with a small –capacity bladder (below 200mls) => not suitable : require frequent catheterization
- Can cause occasional urethral false passage formation
- Procedure can be time consuming

# EAUN guidelines categorizes catheter with various factors

1. Catheter materials	2. Types of catheter	3. Catheters system / complete sets	4. Catheters tips
	<ul style="list-style-type: none"><li>• Single-use catheter<ul style="list-style-type: none"><li>• Single-use catheter without coating</li><li>• Single-use catheter with coating or gel<ul style="list-style-type: none"><li>• Male and female catheters</li><li>• Discreet / compact catheters</li></ul></li></ul></li><li>• Reusable catheters</li></ul>		<ul style="list-style-type: none"><li>• Nelaton</li><li>• Tiemann / Coudé</li><li>• Flexible rounded tip</li><li>• Pointed tip (IQ-Cath®)</li><li>• Mercier</li><li>• Couvelaire</li><li>• Introducer tip</li></ul>
Catheter connectors	Diameter size and length	Catheter lubrication / catheter coating	Insertion aids and help device
	<ul style="list-style-type: none"><li>• Size</li><li>• Length</li></ul>		

# Types of catheter

Single-use / Reuse catheter without coating

카테터 + 윤활제  
(Catheter + Lubrication)



소변줄 PVC



고무



실리콘

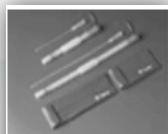
+



비닐위생장갑



윤활젤리

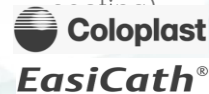


실리콘(휴대용)

Single-use catheter with coating or gel

표면 활성화 혹은 윤활이  
필요한 1회용 카테터  
(Single use catheter with  
surface to activate or lubricate)

건조한 표면을 가진 단일 카테터  
(Single catheter w/ a dry surface – to be  
activated w/ water for a hydrophilic)



예비 윤활 처리된 1회용 카테터  
(Pre-lubricated single use  
Catheter)

젖은 용액에 담겨진 1회용  
카테터

(Single catheter laying in a wet solution)



# Using hydrophilic coated catheters can decrease the risk of UTI by ~20 %

- Data from hospital setting is the best measure for a difference in UTI rates, as rates of UTI is higher in hospital settings than in community<sup>1</sup>
- Systematic review of hydrophilic coated catheters effect on UTI, presented by Cochrane at ICS 2014 in Brazil support decrease risk of UTI in hospital settings<sup>2</sup>

p=0.04	Number of patients		UTI / yr.	
	Uncoated	HCIC	Uncoated	HCIC
Cardenas 2011	114	105	8.18	6.47
UTI reduction				21 %

p=0.04	Number of patients		1 or more UTI /yr.	
	Uncoated	HCIC	Uncoated	HCIC
De Ridder 2005	62	61	51	39
Cardenas 2009	23	22	14	12
UTI reduction				20 %

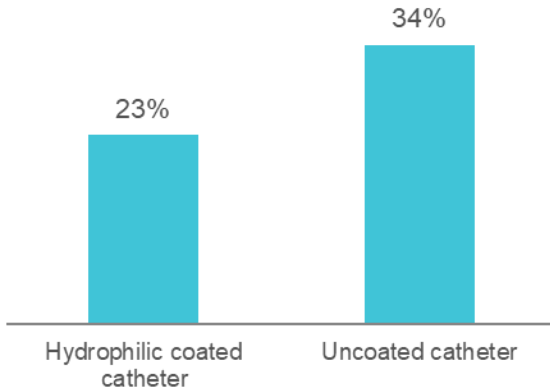
1. Cardenas et al. 2011

2. Cochrane poster ICS 2014, Brazil adapted to typo in Cardenas 2009

# Hydrophilic catheters is associated with less urethral damage measured by heamaturia

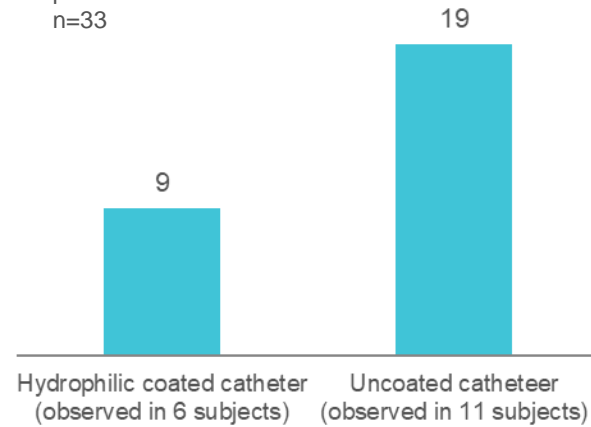
## Occurrence of microhematuria

p<0.0001  
n=224



## Episodes of microhematuria

p<0.05  
n=33



Cardenas et al. 2011 May;3(5):408-17

Sutherland et al, J Urol 1996

# Intermittent catheterisation – a well defined treatment

- Mean catheterisation volumes **<400 ml** is associated with fewer UTIs ( $p=0.009$ )<sup>1</sup>

## RECOMMENDATION

Intermittent catheterisation should

- be done 4-6 times per day
- ensuring completely emptying of the bladder
- ensure that mean catheterisation volume does not exceed 400 ml and keeping the bladder pressure low.<sup>1,2</sup>



1. Bakke et al. 1997
2. Stöhrer et al. EAU guideline 2009

# How to perform intermittent catheterisation

19 JUNE, 2015

Treatment options for people with NLUTD

# An aseptic technique is generally recommended in a clinical setting, whereas the clean technique is used in community

All medical experts and practitioners agree that urinary catheters should be sterile and inserted using an aseptic technique, when carried out by staff at hospital and in other health care institutions. A clean technique is however suitable for most users in community.

## Aseptic technique

Aseptic technique means that the catheter, which is inserted into the urethra, has **no direct contact with the person performing the catheterization**. This 'no-touch' method reduces the potential of external contamination. Methods for an aseptic technique may vary from product to product and between local markets. [\[share local guidelines\]](#)

## Clean technique

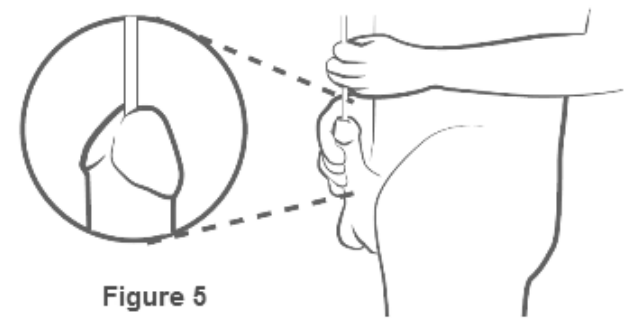
The clean technique is the technique most often used outside a professional health care setting, meaning in community. It is normal that you here have contact with the catheter, but that hands and penis/urethral opening have been **washed thoroughly with soap and water**.





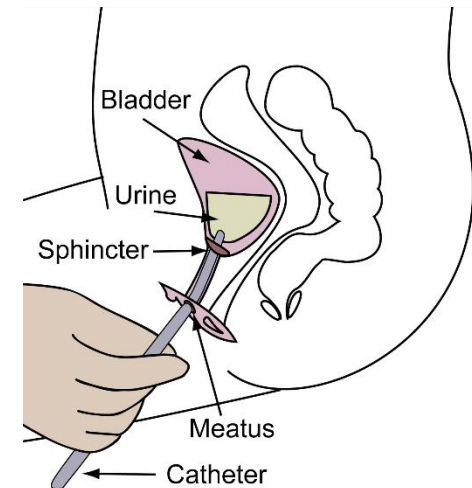
# The catheterisation process for a man

- Start by washing your hands thoroughly with water and soap.
- To prevent pushing bacteria into the urethra and bladder you must clean the head of your penis properly. Gently pull the foreskin back (if not circumcised) and wash the head of the penis and keep it back during the procedure.
- Hold your penis pointing upwards and close to your stomach. This will ease the insertion of the catheter.
- Provide a gentle pressure to the head of your penis in order to open up the urethra and gently insert the catheter into the urethra.
- Continue to insert the catheter until it reaches your bladder and the urine starts to flow. Then continue for a few centimetres further.
- If you feel resistance, pause for a few seconds and then gently continue to insert the catheter. Do not use force. Contact your HCP if insertion is not possible.
- When the flow stops, move a little and straighten yourself up. Withdraw the catheter, slowly to ensure that you drain any remaining urine at the base of your bladder. Wash your hands thoroughly as you did before.



# The catheterisation process for a woman

- Start by washing your hands thoroughly with water and soap.
- To prevent pushing bacteria into the urethra and bladder you must clean the area around the urethra. Gently spread the labia apart and wash the opening of the urethra. Wash from front to back so that you don't transfer any bacteria from the anus. Only use each wipe once.
- Slowly and gently insert the catheter into the urethra. To help insertion of the catheter it is important that you relax.
- Continue to insert the catheter until it reaches your bladder and the urine starts to flow. Then continue for a few centimetres further.
- If you feel resistance, pause for a few seconds and then gently continue to insert the catheter. Do not use force. Contact your HCP if insertion is not possible.
- When the flow stops, move a little and straighten yourself up. Withdraw the catheter, slowly to ensure that you drain any remaining urine at the base of your bladder.
- Wash your hands thoroughly as you did before.



Ver1.0  
방광건강캠페인  
2019년 3월

대한배뇨장애요실금학회 제공

# 올바른 간헐적도뇨법 (Clean Intermittent Catheterization, CIC) 사용을 위한 안내 지침서 : 무엇이 궁금하신가요?

본 지침서는 대한배뇨장애요실금학회에서 일회용 간헐적도뇨법이 필요한 환자 및 보호자에게 도움을 주고자 2018년 방광건강캠페인의 일환으로 제작되었으며 상업화의 의도가 없으며 특정 회사에 대한 지지가 없음을 알려드립니다. 본문에 기술되고 있는 회사로부터 어떠한 금전적 지원도 받지 않았으며 각 회사의 기술 순서는 특정인 혹은 특정 단체의 선호도나 제품의 성능과 관계가 없으며 회사 이름은 가나다 순으로 기술되어 있습니다.

본지침서는 2019년도 3월에 제작되었으므로 추후 제품 가격 등의 정보가 변경될 수 있습니다. 더 많은 정보는 배뇨장애요실금학회 홈페이지 (<http://www.kcsoffice.org>)의 [일반인 광장에서] 제공하고 있습니다.

## 내용안내

1. 간헐적도뇨법은 유치도뇨법(도뇨관을 계속 유치하고 있는 방법)에 비해 어떤 장점이 있고 왜 간헐적도뇨법을 해야 하나요?
2. 간헐적도뇨관을 구입하는데 보험 적용을 받으면 어떤 장점이 있고 어떻게 하면 보험 적용을 받아 처방 받을 수 있나요?
3. 보험 적용을 받을 수 있는 진단명/상병코드와 처방에 필요한 검사는 무엇인가요?
4. 간헐적도뇨관을 선택할 때 무엇을 고려해야 할까요?
5. 국내 시판중인 간헐적도뇨관의 종류, 특징, 가격, 연락처는 어떻게 되나요?
6. 간헐적자가도뇨법을 시행할 때 알고 있어야 할 주의사항은 무엇인가요?
7. 올바른 간헐적자가도뇨법은 어떻게 되나요?
8. 간헐적도뇨법을 시행할 때 어느 경우에 병원에 가야 하나요?

## 7. 올바른 간헐적자가도뇨법은 어떻게 되나요?

### ■ 남성 환자의 경우(그림 2)

- 1) 편안한 장소에 도뇨 물품을 준비하세요(필요한 물품: 도뇨관, 수용성 윤활제, 물티슈 또는 물과 비누).
- 2) 사용하기 전 도뇨관 확인: 도뇨관이나 포장지에 손상이 있다면 사용하지 마세요.
- 3) 물과 비누를 이용하여 깨끗하게 손을 씻으세요.
- 4) 음경 끝을 물과 중성비누, 또는 물티슈로 청결하게 닦으세요. 물티슈로 닦을 때는 요도 입구를 중심으로 바깥 방향으로 돌리면서 닦으세요.
- 5) 도뇨 자세: 변기 앞에 서거나 앉으세요(대부분 서서 하는 자세를 선호).
- 6) 도뇨관 끝에 수용성 윤활제를 충분히 바르세요(제품에 따라 윤활제가 필요 없는 경우가 있으니 확인하세요).
- 7) 음경을 60~70도 각도로 세워 잡은 후 소변이 나올 때까지 요도 안으로 도뇨관을 천천히 부드럽게 삽입하세요. 소변이 나오기 시작하면 도뇨관을 조금 더 삽입하고 소변이 다 나올 때까지 도뇨관을 잡고 기다리세요.
- 8) 소변이 다 나오고 나면 도뇨관을 천천히 제거하세요. 도뇨관을 제거하는 도중 소변이 더 나오면 잠시 멈추고 기다리세요.
- 9) 도뇨가 끝나면 손을 씻고 소변의 양상을 관찰하세요: 소변색, 냄새, 혼탁도



그림 2. 남자의 경우 참고 그림 (출처 : 월스펙스)

■ 여성 환자의 경우(그림 3)

- 1) 편안한 장소에 도뇨 물품을 준비하세요(필요한 물품: 도뇨관, 수용성 윤활제, 물 티슈 또는 물과 비누, 손거울).
- 2) 사용하기 전 도뇨관 확인: 도뇨관이 포장지에 손상이 있다면 사용하지 마세요.
- 3) 물과 비누를 이용하여 깨끗하게 손을 씻으세요.
- 4) 도뇨 자세: 다리를 벌리고 엉덩이를 살짝 앞으로 당겨 비스듬히 기대어 앉으세요.
- 5) 요도 주변을 물과 중성비누로 씻거나, 한 손으로 음순을 벌리고 물티슈로 요도 주변을 앞에서 뒤로 깨끗하게 닦으세요.
- 6) 도뇨관 끝에 수용성 윤활제를 충분히 바르세요(제품에 따라 윤활제가 필요 없는 경우가 있으니 확인하세요).
- 7) 요도 안으로 도뇨관을 소변이 나올 때까지 천천히 부드럽게 삽입하세요. 소변이 나오기 시작하면 도뇨관을 조금 더 삽입 한 후 소변이 다 나올 때까지 도뇨관을 잡고 기다리세요.
- 8) 소변이 다 나오고 나면 도뇨관을 천천히 제거하세요. 도뇨관을 제거하는 도중 소변이 더 나오면 잠시 멈추고 기다리세요.
- 9) 도뇨가 끝나면 손을 씻고 소변의 양상을 관찰하세요: 소변색, 냄새, 혼탁도



그림 3. 여자 환자의 경우 참고 그림 (출처 : 월스펙트)

# 감사합니다

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