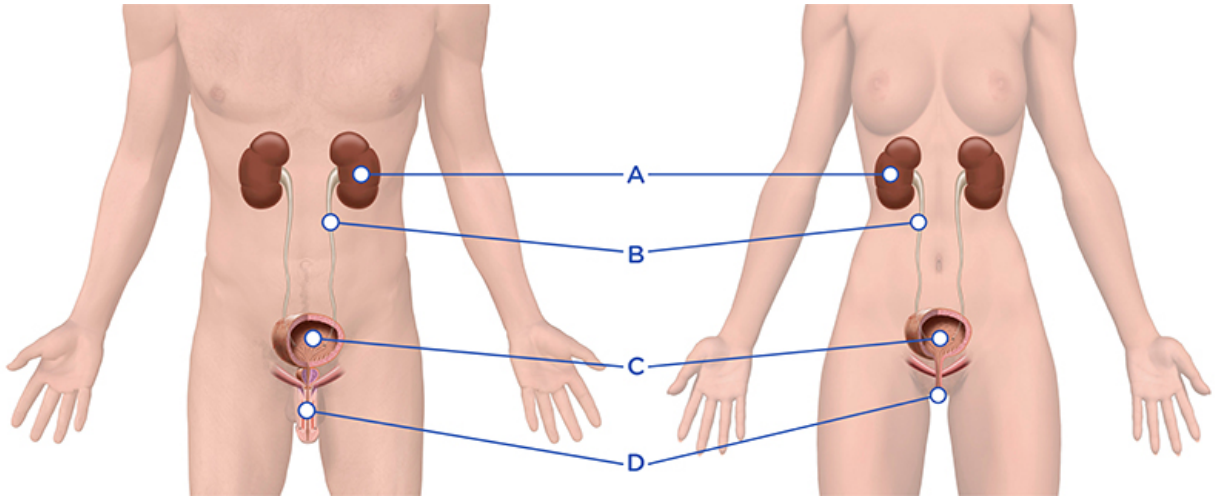
UTI TOOL TO PATIENT

The urinary system is responsible for the eliminating of waste and extra fluid in the body, by making and excreting urine.

What is the urinary system and how does it work?

The normal recurring function of emptying and storing of urine is called the micturition cycle. It is divided into a filling and emptying phase. This acts as an interaction between the nervous system and the lower urinary tract. It's important that all parts of the urinary system work in partnership for normal urination to occur. The urinary system consists of **kidneys**(A), **ureters**(B), **bladder**(C) and **urethra**(D).



Why is the urinary system important?

Besides filtering and eliminating waste products from the body, the urinary system also maintains our electrolyte balance of sodium, potassium and calcium, blood volume and blood pressure.

What are the different functions of each part of the urinary system?

The **kidneys** are large, bean-shaped organs located towards the back of the abdomen, either side of the spine. They remove waste products by manufacturing urine. They have a special system of small network of tubes (nephrons) which allow substances to be filtered. The kidneys regulate the amount of water in the body, and humans produce about 1.5 litres of urine a day.

The **ureters** drain urine from the kidneys to the bladder. They are 25–30 cm long tubes lined with smooth muscle. The muscular tissue uses peristalsis to move urine downwards. The ureters enter into the back of the bladder via the Trigone area, a valve prevents reflux of urine back to the kidneys.

The **urinary bladder** is a hollow organ which stores urine and located in the pelvis above and behind the pelvic bone. The bladder's elastic and muscular wall is called the detrusor, and will stretch to hold an average volume of 400-600mls of urine. The inside of the bladder wall is covered with several layers of epithelium (mucosa). The mucosa is folded when the bladder is empty, but stretches out as the bladder fills. It is normal to urinate 4 -8 times per day and (0-1 during the night), normally 200-400 mls each time.

Bladder Trigone

The Trigone is an area inside of the bladder; the triangular area between the ureteric orifices and the internal urethral opening. The area undergoes little change in size during bladder filling. It is very sensitive to stretch as it contains a large number of sensory nerve endings.

Internal Sphincter

A band of the detrusor muscle encircles the urethra at the junction of the bladder to form the internal urethral sphincter.

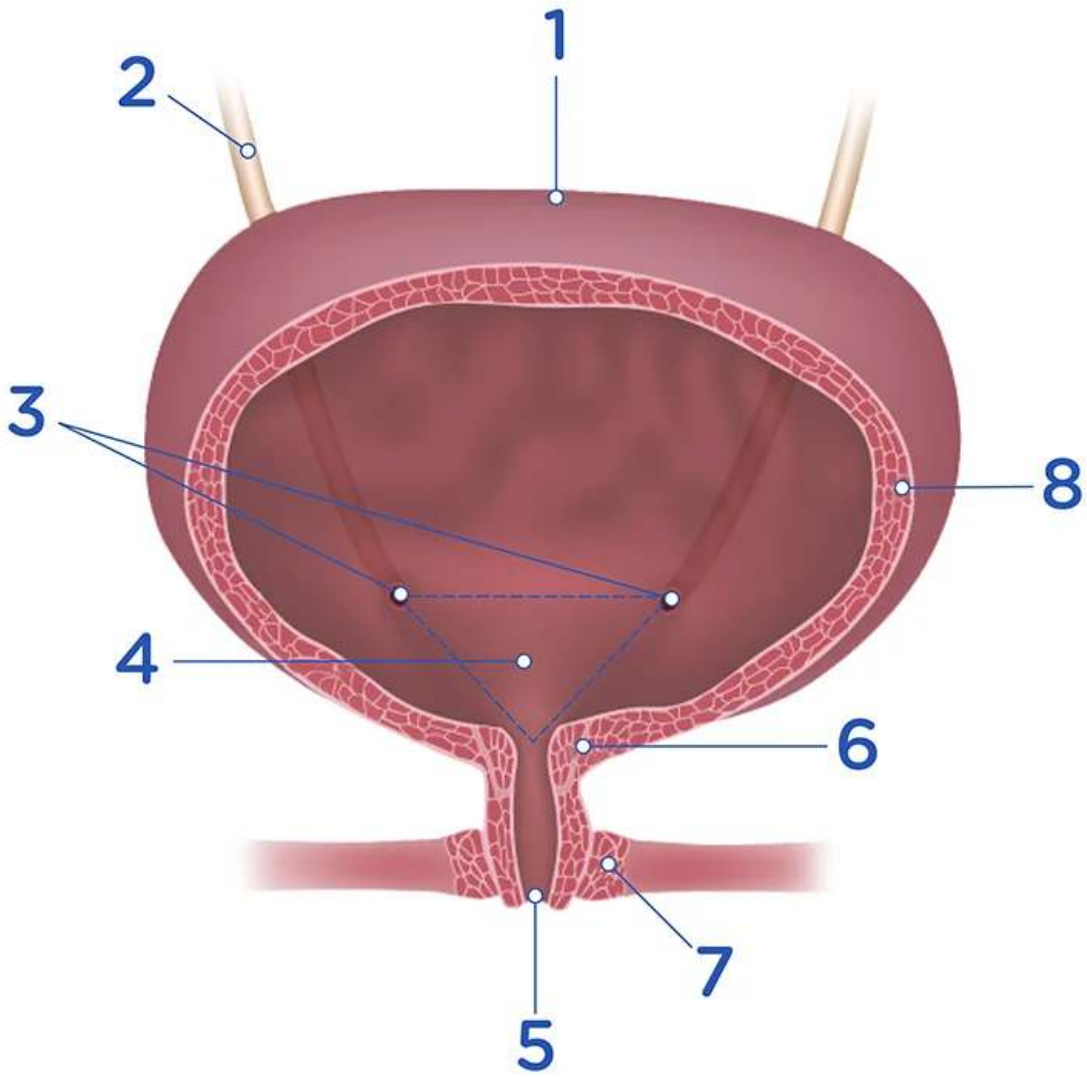
Urethra and External Sphincter

The urethra is the tube through which urine passes from the bladder to outside the body. The female urethra is around 3-5cm long and almost straight. In males, the urethra is around 20-27 cm and shaped like an S.

The urethra is also an organ of the male reproductive system as it carries sperm out of the body through the penis. An external sphincter is at the furthest end of the urethra and has two important functions; keeping the urine in the bladder, but also relaxes on bladder emptying.

What is the difference between the Internal & External Sphincter?

The external sphincter can, unlike the internal sphincter, be controlled voluntarily. The internal sphincter is under influence of the autonomic (involuntary) nervous system.



1. Urinary bladder
2. Ureter
3. Ureteral openings
4. Trigone
5. Urethra
6. Internal urethral sphincter (striated muscle)
7. External urethral sphincter (striated muscle)
8. Detrusor muscle (smooth muscle layers)

Table Of Contents

Paragraphs are the building blocks of papers. Many students define paragraphs in terms of length: a paragraph is a group of at least five sentences a paragraph is half a page long etc.

Chapter heading page

#	First Name	Last Name	Username
1	Mark	Otto	@mdo
2	Jacob	Thornton	@fat
3	Larry	the Bird	@twitter

Media heading

Cras sit amet nibh libero, in gravida nulla. Nulla vel metus scelerisque ante sollicitudin commodo. Cras purus odio, vestibulum in vulputate at, tempus viverra turpis. Fusce condimentum nunc ac nisi vulputate fringilla. Donec lacinia congue felis in faucibus.

Inline CTA

Summary

Feel free to write down any after-reading insights and thoughts

After reading this, I feel right now...

1. _____
2. _____
3. _____
4. _____
5. _____

Weekly planner

Plan and manage your weekly tasks

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1							
2							
3							
4							
5							
6							

Interactive tool for recurrent urinary tract infections in patients who perform intermittent catheterization

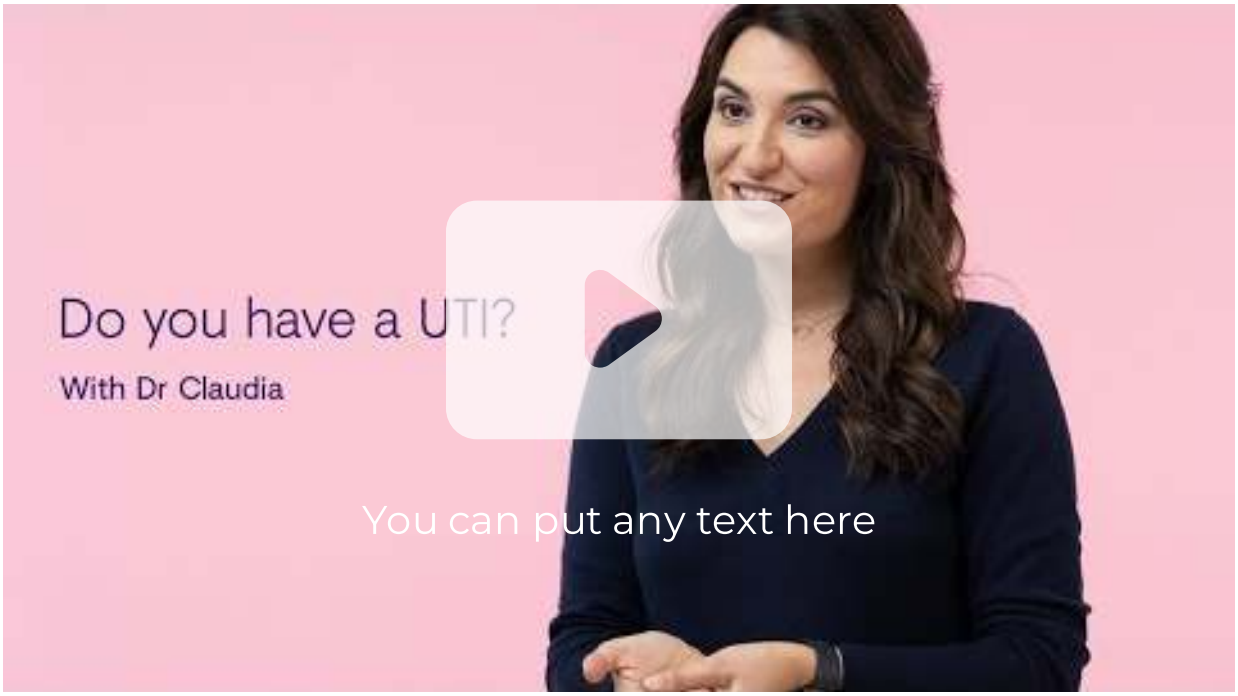
What do you think?

Text Field

Do you struggle with recurrent UTIs (rUTI), repetitive periods of antibiotic treatment and negative impact on quality of life? There might be things to consider to reduce risks of rUTIs and improve your health. Use this material as a check list to go through different parameters within the intermittent catheterization (IC) procedure.

What do I want to accomplish?

What is important to me?



The material was developed together with health care professionals (HCPs) from Sweden, Denmark, Italy and Spain and follow EAUN IC guidelines from 2024. It's directed towards patients with recurrent UTIs, and also performing IC.

The aim with the material is to facilitate for you to:

To do list

Start to plan your goals based on the tips you learned

In 6 months from now I want to achieve...

- [ ] _____
- [ ] _____
- [ ] _____
- [ ] _____
- [ ] _____

Budget Manager

Plan and manage your budget

Title	Title	Title	Title	Title	Title
1					
2					
3					
4					
5					
6					

DO YOU WANT TO LEARN MORE?

In this informative short video (approx. 5 minutes), Susanne Vahr, a registered nurse and senior researcher with nearly 30 years of experience in urology, dives deep into the complexities of urinary tract infections (UTIs).

Watch this video and read more

1. Identify if you have a UTI or not
2. Highlight the known risk factors of getting a UTI and minimize those risks by using the material as a check list.
3. Take part of available clinical studies and evidence about prophylactic methods against UTIs.

Basic information about UTIs

Definition for recurrent urinary tract infection (rUTI)
= 3 or more infections in one year or two infections in six months.

Ref: Aggarwal et al, StatPearl, 2024

1. Basic facts about UTIs

Antibiotics

UTIs are painful and constitute a burden on both on you as an individual, as well as the society and health care system. Increased antibiotic use in the world causes bacteria to adapt and develop new ways to reduce antibiotic efficacy. When new antibiotic resistance develops, only the resistant bacteria survive and transfer their DNA with resistant patterns from generation to generation.

Resistance to specific antibiotics may require the use of broad-spectrum antibiotics and extend both treatment period and recovery with the risk of side effects.

All antibiotics affect the natural bacterial flora and the composition of different bacteria (those in symbiosis and those that are pathogenic), which leads to the individual becoming more sensitive to bacterial invasion. Repeated antibiotic treatments can therefore contribute to recurrent urinary tract infections. This is a vicious cycle that needs to be broken.

By using this educational material as a checklist you might be able to change somethings to reduce risks of getting UTIs.

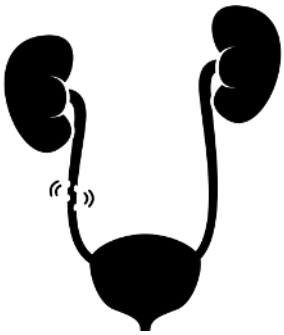
Risk factors for UTIs

The reasons for getting a UTI are complex, but there are specific risk factors to consider for reducing the risks, they may be divided into different groups/domains. All four domains of risk factors are applicable to individuals using IC to empty their bladder. Three of the domains refer to factors influencing the patient in different ways, and the fourth is the IC procedure itself. Even though IC is gold standard and is associated to less severe UTIs and additional complications compared to indwelling, there is still a higher risk of getting a UTI compared to normal voiding.

💙 4 Likes

January 2025

SUN	MON	TUES	WED	THURS	FRI	SAT
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	



Please go through the most important risk factors for each domain below, and the complete list is in the slide.

1. General factors are:

-The individual's immune system and if previous antibiotic was used, which may have affected the balance between ‘good’ and ‘bad’ bacteria.

-Bowel dysfunction since constipation may cause incomplete bladder emptying.

-Age is a risk factor and postmenopausal women have higher risk because of reduced levels of estrogen.

Common symptoms of estrogen deficiency in the vagina can be urinary urgency and repeated urinary tract infections. These symptoms often increase with age. Topical estrogen is a very effective treatment and can be offered to the vast majority of women (check contraindications).

-Gender also is a factor and women are at higher risk than men because of the shorter urethra and shorter distance for bacteria to travel. Additionally, the urethral orifice and rectum are closer in women compared to men.

-Neurogenic Bladder Dysfunction (with higher bladder pressure), e.g individuals with SCI or MS.

Individuals with a high level injury are at greater risk of UTI (Farrelly , Scand J Urol., 2020).

-Functional variations (if the patient needs an assistant due to mental and physical disabilities).

2. Local factors are:

-If the individual had previous UTIs, it is easier to get them again.

-Bladder stones/kidney stones are known risk factors for UTIs.

-Abnormal anatomical conditions e.g. bladder diverticula or cystocele. Link to explaining this condition: Cystocele - Wellspect

3. User compliance (factors specific to each individual):.

-Insufficient fluid intake (water, not coffee or similar) can increase the risk of UTIs by reducing overall urine production and preventing the dilution of bacteria.

-Non-hygienic IC procedure, (hand- and genital hygiene should be done according to local guidelines)

-Insufficient education about the IC procedure (educational tutorials of IC material will come later in this material)

-Residual urine in the bladder due to incorrect catheterization technique.

4. IC per se poses an increased risk of UTIs compared to normal voiding since it flushes out bacteria:

-If the catheter does not maintain its lubrication during the whole catheterization, microtrauma can be created in the urethra and bladder.

-If the catheter fails to empty the bladder completely (e.g. if the catheter is not long enough) or if incorrect IC technique is used.

-If foreign bacteria are introduced into the urethra via the catheter.

Different Types of Urinary Tract Infections

A UTI is a bacterial infection that effects some part of the urinary tract, they can be divided according to location and severity:

A lower urinary tract infection is an infection of the bladder, usually caused by bacteria from the gastrointestinal tract entering the urethra.

Upper urinary tract infections typically cause flu-like symptoms that affect the whole body.

Temp ≥38°C, CRP ≥30 mg/l, fever (may be absent in the elderly) and general effects to varying degrees. Ev. chills, headache, nausea and vomiting.

A urinary tract infection is termed complicated when there is a simultaneous structural or functional disturbance in the urinary tract or when there is an underlying disease that impairs the patient's defense against the infection or response to treatment.

This material focus on recurrent UTIs in people performing IC (many time referred to as complicated UTIs).

Watch this descriptive stepwise animation for a clear understanding of the sequential process of how a UTI occurs.

UTIs and intermittent catheter users

Intermittent catheterization has many advantages and is associated to far less complications compared to indwelling catheterization. However, when inserting something into the urethra to urinate there is an increased risk for urinary tract infections (UTIs) compared to natural bladder emptying. When emptying the urine via a plastic tube we lack the flushing effect which occurs in natural voiding and may hinder bacteria to attach and cause a UTI.

But if you are aware of the risk factors for UTIs you may reduce them. This short, descriptive animation demonstrates what the IC user should be aware to avoid complications such as UTIs.

Which are common symptoms of UTIs?

The most common symptoms of a UTI is a change to the voiding pattern, e.g., increased frequency. It's also common to have stinging/ burning sensation or feeling of not being able to empty completely. In patients with neurogenic injury/disease the UTI can cause increased spasticity. Elderly people may become confused and people with high spinal cord injuries above T6 may have autonomic dysreflexia.

- Stinging/burning sensation
  when emptying the bladder
- Urinary incontinence
- Increased micturition frequency
- Foul-smelling urine and or cloudy urine
- Leakage/increased leakage
- Pain over lower part of abdomen or back
- Fever and/or impaired general condition
- Increased spasticity
- Confusion (for elderly)
- Blood in urine

Did you tick 1 or more boxes above? Contact your general practitioner (GP) for a urine analysis/ dipstick.

Urine culture should always be done when there is an indication for antibiotic treatment. This is to determine bacteria species and resistance patterns. Especially for IC users suffering from rUTIs this should be standard.

If the amount of bacteria is > 10^3 CFU/ml in combination with symptoms you have a UTI. CFU= Colony Forming Units

In addition the GP may take tests for:

- Positive nitrite
    - A positive nitrite will be achieved for infections caused by the most common gram-negative uropathogens (E. Coli , Proteus , Klebsiella)
    - On the contrary nitrite will be negative in gram-positive infections (typically caused by staphylococci , streptococci, enterococci) and in pseudomonas infection .
- Leukocytes

  This test indicates inflammation in the bladder.

- Glucose in the urine

  If glucose is apparent on the urine stick, this is a sign of a diabetes patient, and thereby an increased risk of UTI. A person with diabetes and/or insulin levels not properly adjusted, requires that the patient is referred to experts in the field for further investigation.

- Blood in the urine

How to collect the urine when using Intermittent catheterization

Strive for urine that has been in the bladder a long time, preferably morning urine. A urine sample collected via intermittent catheterization must be taken as a midstream sample. Perform the catheterization according to the recommended routine:

1.Empty the first amount of urine into the toilet/similar

2. Collect the midstream urine with the collection vessel.

3. Empty the bladder completely

4. Remove the catheter.

5. Close the sampling vessel

1. Checklist to identify risk factors for rUTIs in IC users

   Catheter choice

   - Is the catheter length correct?
   - Is the bladder emptied completely?
   - Is the charrière size and tip type, correct?
   - Is the choice of the catheter adapted to the patient's lifestyle (function and handling)?
   - Is the catheterization frequency correct?
   - Is the catheterized volume of urine less than 400 ml?
   - Are there clinical evidence regarding the safety of the product (e.g. clinical studies regarding long-term use)?

   Did you tick 1 or more boxes above? Contact your general practitioner(GP) to go through different factors related to your catheter choice.

   Non-touch Technology

   Does the product enable non-touch technology?

   Ensure the catheter has an easy-to-grip handle that helps you hold the catheter without having to touch the catheter surface prior to catheterization. This gives you more control and makes it easy to insert the catheter into the urethra. Additionally, it helps you to avoid touching the catheter tubing, making the procedure more hygienic and reducing the risk of introducing foreign bacteria.

   (EAUN IC guidelines 2024)

   Non-touch technique is supported by the EAUN guidelines to reduce risk of inserting foreign bacteria leading to UTIs.

   Hygienic factors to consider

Wash hands with soap and water before and after catheterization. Pay attention to how this can be solved if the sink is outside the toilet (public toilets) and especially if you are in a wheelchair (dirty floor and need to touch the wheels after handwash) making sure to maintain clean hands before catheterization.

Hand sanitizer should be used before catheterizing in a public toilet.

Perform daily genital hygiene using unscented soap (not antibacterial soap), or only lukewarm water to not dry out the mucus membranes/ change the pH/ disrupt normal bacterial flora*. Wash the perineum if necessary (e.g. after faecal leakage or major urine leakage).

Women always wash from front to back.

For men, it is also important to wash under the foreskin.

*Local differences exist.

Factors to consider if suspecting incomplete bladder emptying

Ensure the catheterization technique is correct and that the catheter is not removed too quickly. In new IC users it may happen that the catheter is removed before the emptying is complete.

Change position to get a better emptying effect. Bladder diverticula may cause incomplete emptying. Some catheters are too short to empty the bladder completely, the eyelets do not reach all the way into the bladder as the bladder collapses when emptying.

Sometimes it is necessary to increase the charrière size of the catheter. A catheter with larger lumen has an increased flow rate due to basic physical parameters.

Make sure the position for IC is optimal, if you perform IC in bed it's an increased risk of not empty the bladder completely. By raising the upper part of the bed a better position is gained. Is the toilet at the workplace adapted so that complete emptying can take place?

Contact your GP if you suspect incomplete bladder emptying. It may be necessary to assess if there is any residual urine after IC by using a bladder scanner.

A micturition list can help to visualize how much the patient drinks and urinates. It is important to measure both the urine which is emptied with help from a catheter as well as volumes of normal voiding.

The regular bladder emptying during the day is important and the EAUN guidelines recommend 4-6 times/day and not exceeding 400 ml* of urine per occasion (morning urine is often a larger amount).

The total volume of urine is typically 1000-2000 ml/ day.

Fluid intake should be a minimum of 1500 ml and increased in case of a UTI.

The micturition list can help you get an overview of how much you drink and pee during the day. It's often requested by the GP as a tool during follow-up, and it is an excellent basis for discussion and further actions.

*Local differences exist

What is the link between the bowel and UTI frequency?

The bladder and the bowel are closely connected and affect each other. There is a link between the frequency of UTIs and the status of the bowel. The exact reasons are not known but it is believed that a full rectum hinders the bladder to empty completely. It might also be that E.Coli from the rectum travels more easily if the stool is very loose (diarrhea/ fecal incontinence).

It's important to ensure a good bowel emptying regime, but it's quite hard to know what is normal. As an indication you may refer to: 3 times a day to 3 times a week, as normal bowel movements.

The toilet position is important for a successful bowel emptying, and by using a foot stool to raise legs and change angle, the stool may pass more easily.

Contact your GP if you experience difficulties with your bowels, it's important to investigate the reasons behind the bowel emptying problems to find the best treatment pathway.

-Is it constipation that prevents the bladder from emptying completely and thereby an increased risk of UTI?

-Is it fecal incontinence causing bacteria /(E.Coli) from the gut that are transferred into the urinary tract, and thereby causing a UTI?

A bowel diary is often a useful tool in contact with a GP for initial investigation.

The Bristol Stool Scale is often used to facilitate for you to explain the consistence of the stool for your GP and estimate if the problems are mainly constipation of fecal incontinence.

Factors to consider if you use assistance/care givers to perform IC

You should always be offered an individualized care plan where the lifestyle, and the impact on quality of life, is taken into account.

If there are many assistant carers, it needs to be ensured that everyone performs IC in the same way and has received adequate training.

The frequency of IC is extremely important to avoid distending the bladder

Are clear schedules and routines set up?

Since it's hard for many individuals in need of IC to know when the bladder is full, it's crucial to have set time points when to empty the bladder.

Contact your GP if you feel any uncertainty about the above. Wellspect has several training videos on how to teach IC that your GP may pass on to the responsible nurse/assistant/care giver.

Wellspect provides both products and educational material to reduce risks of UTIs

This material has been developed in collaboration with the following HCPs

Simone Bajardo, nurse, Hospital Negrar di Valpolicella, Italy

Birgitta Magnusson, urotherapist, Karlstad hospital, Sweden

Katarina Gunséus, urotherapist, Sunderby Hospital, Sweden

Lars Hjertzell, urotherapist, Karolinska University hospital, Sweden

Helén Hummer, urotherapist, Örebro University hospital, Sweden

Vicki Buitenhuis, head nurse, Gentofte hospital, Denmark

The Wellspect U.S. Clinicians who participated in the UTI tool review and feedback are:

Lisa Beauchemin, Katherine Fernandez, Misty Lloyd, Colleen Rickard and Kelsi Smith.

1. Medical evidence for reduced risk of UTIs

Non-touch Technology

The link between bowel and UTI frequency

A clinical study by Furuta et al 2021 in children with spina bifida have shown positive effects of transanal irrigation (TAI) for improved bowel habits and washing of the colorectal tract, for reduced risk of bladder contamination by E. Coli.

What prophylactic methods are available to hinder UTIs?

The clinical evidence around prophylactic methods to avoid UTIs are contradictory. In the literature there are evidence for the following substances to have an effect on group level:

- Probiotics, especially some types of lactobacillus (vaginal probiotics) Probiotika..
- Cranberry capsules. The juice on the other hand is not better than placebo. Very large amounts of juice are needed to reach an effect, and juice contains a lot of sugar, which can have a negative effect on people with diabetes etc.
- Propolis (“Bee glue”) has an anti-inflammatory effect
- By hindering bacteria to attach to the cell layer in the bladder you can have a positive effect, this may be done with the following substances:
- Glucose amino glycans (GAGs):
- Hyaluronic acid + chondroitin sulfate (barrier)
- D-mannose (inhibit the attachment of bacteria)

Vivamus vestibulum ntulla nec ante.

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitationullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit involuptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat nonproident, sunt in culpa qui officia deserunt mollit anim id est laborum.