CONDITION

Catheter-related UTI

A catheter-related UTI is a urinary infection linked to using a tube that drains urine from the bladder.

WHAT IT IS
Urinary infection associated with a bladder catheter

BODY SYSTEM
Urinary system

MAIN SYMPTOMS
Fever, lower abdominal pain, side pain, new confusion

WHAT CAUSES IT
Bacteria entering the urinary tract

HOW IT IS DIAGNOSED
Symptoms, examination, and urine culture

MAIN TREATMENT
Catheter management and antibiotics

CAN IT BE CURED?
Yes - most infections respond to treatment

IS IT AN EMERGENCY?
Sometimes - sepsis symptoms need emergency care

LONG-TERM OUTLOOK
Usually good, but recurrence is possible

Overview

A catheter-related urinary tract infection is an infection associated with a urinary catheter. It is often called a catheter-associated urinary tract infection, or CAUTI.

A urinary catheter is a thin, flexible tube used to drain urine from the bladder. An indwelling catheter stays in place and drains into a collection bag. An intermittent catheter is inserted to empty the bladder and then removed.

Catheters can allow bacteria or other germs to enter the urinary tract. The risk increases the longer an indwelling catheter remains in place. Infection may affect the bladder and can sometimes spread to the kidneys, bloodstream, or tissues around the urinary tract.

Bacteria in the urine do not always mean there is an infection that needs treatment. Many

people with long-term catheters have bacteria in their urine without symptoms. This is called asymptomatic bacteriuria . Antibiotics like amoxicillin or doxycycline are not usually helpful for this finding alone and can cause side effects or encourage antibiotic-resistant bacteria.

The important distinction is between bacteria present without illness and a symptomatic infection. Symptoms, an examination, and urine test results are considered together.

Symptoms

Symptoms can be less obvious when a catheter is in place. For example, you may not notice the usual pain when passing urine because urine drains through the tube.

Possible symptoms include:

In some older or medically vulnerable people, infection may occur with a sudden change in alertness or behaviour. New confusion can have many causes, including dehydration, medicines, constipation, low oxygen, or other infections. It should not be assumed to be a UTI without an assessment.

Cloudy, dark, or strong-smelling urine is common in people using catheters. On its own, it does not confirm a UTI. Sediment in the tubing can also occur without infection.

Urine leaking around a catheter may result from bladder spasms, constipation, blockage, or catheter position. It is not proof of infection, but the catheter may need checking.

- Fever, chills, or feeling unusually unwell
- Pain or tenderness in the lower abdomen
- Pain in the back or side, below the ribs
- Pelvic discomfort
- New burning or pain when passing urine after catheter removal
- A sudden need to pass urine or passing urine often after removal
- Blood in the urine when there is no other clear explanation

Causes and risk factors

Most catheter-related UTIs happen when bacteria enter the urinary tract along the catheter or through the drainage system. Bacteria can form a sticky layer called a biofilm on a catheter. Biofilms make bacteria difficult to remove while the catheter remains in place.

The most important risk factor is how long an indwelling catheter is used. Risk is also affected

by the reason for catheterisation and your general health.

Factors that can raise the risk include:

Intermittent catheter use can also introduce bacteria, although it does not leave a tube continuously inside the bladder. Following the technique taught by your healthcare team helps reduce contamination and injury.

A catheter may irritate the bladder or urethra without causing infection. This can produce discomfort, spasms, leakage, or a small amount of blood. These symptoms still deserve attention if they are new, persistent, or worsening.

- A catheter remaining in place longer than necessary
- Breaks or disconnections in the closed drainage system
- The drainage bag being raised above bladder level
- Blocked or poorly draining tubing
- Catheter insertion without appropriate clean or sterile technique
- Recent urinary procedures
- Difficulty emptying the bladder
- Diabetes or a weakened immune system
- Previous antibiotic exposure or antibiotic-resistant bacteria

Diagnosis

Diagnosis begins with your symptoms and an assessment of the catheter. A healthcare professional may ask when the catheter was inserted, why it is needed, whether it is draining properly, and whether it has recently been changed.

They may check your temperature, pulse, blood pressure, hydration, abdomen, back, catheter tubing, and drainage bag. If you are seriously unwell, blood tests and blood cultures may be needed to look for infection affecting the whole body.

A urine culture is used to identify bacteria or yeast and show which medicines may work against them. The sample should be collected using the catheter's sampling port with the correct technique. It should not be taken from the drainage bag.

If an indwelling catheter has been in place and still needs to be used, it may be replaced before the sample is collected. The sample can then be taken from the new catheter. This may give a more useful result and removes some biofilm.

A urine dipstick alone is not reliable for diagnosing a catheter-related UTI. Catheter users often have white blood cells or bacteria in their urine even when they do not have a symptomatic infection.

Imaging, such as an ultrasound or CT scan, is not routinely required. It may be considered if there is concern about a blockage, kidney stone, abscess, structural problem, or infection that is not improving as expected.

Treatment and management

Treatment is based on your symptoms, illness severity, urine culture, catheter needs, allergies, kidney function, and local patterns of antibiotic resistance.

If the catheter is no longer needed, it is usually removed. If it is still needed and has been in place for some time, it may be replaced. Catheter removal or replacement does not substitute for antibiotics when a symptomatic bacterial infection requires them.

Antibiotics are used for symptomatic catheter-related UTIs. The initial choice may be adjusted when culture results identify the germ and its antibiotic sensitivities. More severe infections may require treatment in hospital and antibiotics given into a vein.

It is important to take an antibiotic exactly as directed and complete the advised course unless the prescribing clinician tells you to stop or change it. Seek advice if you develop troublesome side effects, a rash, or severe diarrhoea.

Antibiotics are generally not used simply because a routine urine sample contains bacteria. Exceptions exist in specific situations, including some pregnancies and before certain urinary procedures. These require individual medical assessment.

Other management may include:

Do not flush, remove, or replace an indwelling catheter unless you have been trained and advised to do so.

- Keeping the drainage bag below bladder level
- Removing kinks and avoiding tension on the tubing
- Ensuring the catheter is secured comfortably
- Drinking enough fluid if this is safe for you
- Managing constipation, which can affect drainage
- Using appropriate pain relief

Complications

Most catheter-related UTIs improve with appropriate treatment. Possible complications include infection spreading from the bladder to the kidneys or bloodstream.

A bloodstream response to infection can lead to sepsis , a serious condition in which the body's response to infection begins to damage its organs. Prompt medical care lowers the risk of severe harm.

Other possible complications include:

Long-term catheter use can also cause problems unrelated to infection, such as bladder spasms, urethral injury, leakage, bladder stones, and skin irritation.

- Repeated infections
- Catheter blockage
- Kidney infection
- Abscess around the kidney or urinary tract
- Blood in the urine
- Infection with antibiotic-resistant bacteria
- Side effects from unnecessary or repeated antibiotics

Prevention

Not every catheter-related UTI can be prevented. However, avoiding unnecessary catheter use and removing an indwelling catheter as soon as it is no longer needed are the main ways to reduce risk.

If you use a catheter at home:

Routine antiseptic cleaning around the catheter is not usually needed; normal daily hygiene is generally used. Do not apply powders, creams, or antiseptics unless they have been recommended for a specific reason.

Routine antibiotics do not prevent catheter-related infection safely and may promote resistance. Routine urine testing without symptoms can also lead to unnecessary treatment.

If you use intermittent catheters, use the technique and equipment recommended for you. Ask for practical help if poor vision, reduced hand movement, pain, or changes in living arrangements make the technique difficult.

- Clean your hands before and after touching the catheter or bag
- Follow the catheter-care method you were taught
- Keep the drainage system closed unless disconnection is necessary
- Keep the bag below bladder level and off the floor
- Prevent pulling, twisting, or kinking of the tubing
- Empty the bag using a clean container without touching the outlet
- Clean the area where the catheter enters the body as instructed
- Check regularly that urine is flowing

Living with it and what to expect

A treated catheter-related UTI often starts to improve over the following days, although recovery time is influenced by the infection's severity and your overall health. Seek reassessment if symptoms worsen or do not begin to settle within the timeframe given by your healthcare team.

Having one catheter-related UTI does not mean you will always have infections. However, bacteria commonly return to the urine while a long-term catheter remains in place. This does not necessarily mean another symptomatic UTI has developed.

If you need a catheter for months or years, care usually focuses on keeping it draining, limiting disconnections, changing it according to your planned schedule, and treating symptoms rather than urine-test results alone. Your catheter's continued need should be reviewed periodically.

Repeated symptoms may lead to a review of catheter size, type, position, change schedule, drainage equipment, and the reason the catheter is needed. Other drainage options may be considered in some cases.

Keep track of symptoms that reliably occur during your infections, but remember that urine colour and smell can change for many reasons. A written catheter-care plan can clarify who to contact for routine problems, planned changes, and urgent concerns.

When to get medical help

Contact your usual healthcare service promptly if you have possible infection symptoms, such as a new fever, chills, lower abdominal pain, side or back pain, or new pain when passing urine after catheter removal.

You should also get prompt advice if:

A change in urine smell, colour, or cloudiness without other symptoms is usually not an emergency. Check that you are following your fluid plan and that the tubing is draining, then seek routine advice if the change continues.

Seek emergency medical help for signs of severe infection or sepsis, including:

- The catheter stops draining and your bladder feels full or painful
- Urine repeatedly leaks around the catheter
- There is new or increasing blood in the urine
- The catheter falls out
- Symptoms worsen or do not improve after treatment begins
- You develop a new medication reaction
- Severe breathlessness or very fast breathing
- New marked confusion, extreme drowsiness, or difficulty waking
- Fainting, collapse, or cold and mottled skin
- Severe weakness with rapidly worsening illness
- Very little urine along with feeling seriously unwell
- Severe pain with fever and repeated vomiting

Common questions

Is cloudy or smelly urine always a catheter-related UTI?

No. Cloudy or strong-smelling urine is common with catheter use and can be affected by hydration, food, medicines, sediment, and bacteria that are not causing illness. A UTI is assessed using symptoms and, when appropriate, a urine culture.

Why are bacteria found in my urine when I feel well?

Bacteria can settle on a catheter and form a biofilm. This often leads to bacteria being found in urine without symptoms. This is called asymptomatic bacteriuria and usually does not need antibiotics.

Should my catheter be changed if I have a UTI?

It may be removed if it is no longer needed. If it is still required and has been in place for some time, a healthcare professional may replace it and collect a sample from the new catheter. Do

not change it yourself unless you have been trained to do so.

Can I get a UTI from an intermittent catheter?

Yes. Any catheter can introduce bacteria, but intermittent catheterisation does not leave a tube continuously in the bladder. Hand hygiene and the technique you were taught are important.

Why did my urine test show infection but I was not given antibiotics?

A positive urine culture does not always mean there is an active infection. When there are no compatible symptoms, antibiotics often provide no benefit and may cause side effects or antibiotic resistance. Certain situations require different management.

Can a catheter-related UTI come back?

Yes. Recurrence is possible, especially while an indwelling catheter remains necessary. Repeated infections may prompt a review of the catheter, drainage system, bladder emptying, and other urinary problems.

Sources

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