



Additional Notes

Detecting and Managing Urinary Tract Infections

Learning Outcomes:

After viewing the course participants should be able to:

- Define what a urinary tract infection is, the different types of UTI and the symptoms.
- Explain the causes, risk factors and the dangers in regard to morbidity and mortality.
- Identify and implement the correct treatments and preventative measures.

Additional Notes:

The urinary tract is a series of channels within the urinary system (also known as the renal system) by which urine passes from the kidneys and out of the body. The primary organs of the urinary system are:

- The kidneys – (which) are bean-shaped organs that remove urea, waste substances and water from the blood, forming urine.
- The ureters – (which) are two thin tubes that transport urine from the kidneys in to the bladder.
- The bladder – a hollow balloon shaped organ that stores urine until it needs to be excreted from the body.
- The urethra – a tube that allows urine to be passed from the body.¹

The term urinary tract is further classified by anatomical position in to two regions:

- The upper urinary tract which includes the kidneys and the ureters.
- The lower urinary tract which includes the bladder and the urethra.

A urinary tract infection (UTI) is an infection occurring in any part of the urinary tract. However, most infections occur in the lower urinary tract resulting in:²

- Urethritis; an inflammation of the urethra.
- Cystitis; an inflammation of the bladder.

Upper urinary tract infections result in:

- Urethritis; an inflammation of the ureters.
- Pyelonephritis; an inflammation of the kidneys.

General Symptoms:

- Urinary incontinence
- Polyuria (excessive production of urine)
- Urgency and frequency of urine
- Infrequent passing of urine (oliguria)
- Burning and stinging when passing urine (dysuria)
- Cloudy, malodourous urine
- Blood in urine (haematuria)
- Suprapubic or flank pain

¹ <http://www.nhs.uk/conditions/Urinary-tract-infection-adults/Pages/Introduction.aspx>

² www.mayoclinic.org/.../urinary-tract-infection/.../definition/con-20037892

- Vomiting
- Decreased or increased temperature and Rigors (shivering)
- Confusion or Delirium – which can often be confused with dementia³

Specific symptoms of a lower UTI can include:

- Urinary urgency and frequency
- Dysuria
- Blood in the urine (Haematuria)
- Cloudy, malodorous (unpleasant smelling) urine
- Suprapubic pain
- Malaise - generally feeling unwell
- Mild temperature
- Altered mental state/confusion, particularly in the OP

Specific symptoms of an upper UTI can include:

- A high temperature (fever) of 38°C (100.4°F) or above
- Rigors (uncontrollable shivering)
- Nausea
- Vomiting
- Diarrhoea
- Flank and abdominal pain⁴

The urinary tract is one of the most common sites of healthcare-associated infections, accounting for 20-30% of infections reported by long-term care facilities.⁵

Recurrent (more than 2 in 3 months) or undiagnosed UTIs can lead to other diseases and complications. A person with renal impairment is also likely to develop high blood pressure (hypertension).

Recurrent UTIs can lead to renal impairment, such as scarring, reduced kidney function and, in extreme cases renal failure. Renal impairment can pre-dispose the individual to the development of cardiac and circulatory problems.

In the case of a serious untreated upper urinary tract infection, there is a risk of sepsis potentially resulting in septic shock and even can lead to death.⁶

Causes:

Urinary tract Infection occurs when bacteria enters the urinary tract. Urine is usually sterile (free from bacteria). However, with advancing age low levels of bacteria may colonise and begin to multiply within the urinary tract; this is known as bacteriuria. Bacteriuria can be detected with urinalysis and confirmed by urine culture in a laboratory. Asymptomatic bacteriuria is the

³ SIGN (2012). Management of suspected bacterial urinary tract infection in adults. Healthcare Improvement Scotland. Edinburgh

⁴ <http://www.nhs.uk/Conditions/Urinary-tract-infection-adults/Pages/Symptoms.aspx>

⁵ http://www.cdc.gov/nhsn/PDFs/LTC/LTCF-UTI-protocol_FINAL_8-24-2012.pdf

⁶ <http://www.edren.org/pages/edreninfo/blood-pressure-and-kidney-disease.php>

occurrence of bacteria in the urine without causing symptoms. Asymptomatic bacteriuria in the older person is not normally treated because it is not associated with increased morbidity.⁷

The most common causative organism for UTI is *Escherichia coli* (E Coli). This bacterium is commonly found in the gastrointestinal tract. In women, the close proximity of the urethra and anus increases the risk of bacterial transfer.

More general causes include poor personal hygiene (wiping back to front – women) constipation, dehydration, and the presence of indwelling urinary catheter.

Another causal factor may be if the person is confined to bed or if continence pads are in use, as they can become wet and allow bacteria to multiply more quickly.

Additional Risk Factors:

Bladder and kidney problems may lead to infections being more likely. Kidney stones or other conditions that cause urine to pool and not drain properly. In males, prostatic enlargement may result in bladder outlet obstruction leading to urinary retention. Bacteria are likely to multiply and cause infection in a stagnant pool of urine.

In older females, post-menopausal changes to the urothelium (tissue lining of the urinary tract) and genital area can lead to genitourinary atrophy, atrophic vaginitis and genital prolapse increasing the risk of UTI.

Co-morbidities can also predispose the older person to UTI. For example individuals undergoing chemotherapy or radiotherapy can become immunocompromised, rendering them less able to ward off infection, and diabetes can lead to the presence of glucose in the urine which can increase the multiplication of bacteria.

Those who experience recurrent UTI have an increased risk of the development of subsequent UTIs.

Urinary tract infections and dementia

UTIs can cause sudden confusion (also known as delirium) in older people and people with dementia. If the person has a sudden and unexplained change in their behaviour, such as increased confusion, agitation, or withdrawal, this may be because of a UTI.

The person may not be able to communicate how they feel, therefore it is helpful to be familiar with the symptoms of UTIs and seek medical help to ensure they get the correct treatment promptly if suspected.

It is important to be aware that any infection could speed up the progression of dementia and so all infections should be identified and treated quickly.⁸

⁷ <http://www.merckmanuals.com/home/kidney-and-urinary-tract-disorders/urinary-tract-infections-uti/asymptomatic-bacteriuria>

⁸ http://www.alzheimers.org.uk/site/scripts/documents_info.php?documentID=1777

The assessment of the older person should be performed by an RN. Observations should include; physical examination, pulse, temperature, blood pressure, urinalysis, medication review, presenting symptoms and medical history including previous UTIs. A previous UTI within a 3 month time frame is considered a 'recurrent UTI' and this could have a bearing on how the infection is treated.

An RN is responsible for the assessment and treatment of UTIs, however they can delegate some aspects to care workers eg. urinalysis and prevention strategies. A positive urinalysis, particularly showing leucocytes or nitrates would generally lead to a doctor or nurse practitioner ordering a Mid-Stream Urine Test (MSU). This is a urine culture test that would reveal a bacterial overgrowth in the urine. This result combined with the symptomatic presentation of the resident would guide the diagnosis of a UTI and subsequent treatment with antibiotics.⁹

Urinalysis:

Routine urinalysis should be undertaken in accordance with local policies and procedures. If leucocytes and nitrites are present these can indicate the presence of a UTI. In certain cases a clean catch urine sample should also be taken and sent to the laboratory to identify which bacteria are present. This is called a urine culture. A doctor may request a urine culture for a number of reasons:

- Older Person has had recurrent UTI's
- If there are traces of either blood, white blood cells (immune cells produced in response to infection) or nitrites (a substance produced by bacteria) in the urine when the dip stick test is performed.
- If a person has any abnormalities of the urinary tract (eg problems with the bladder function).¹⁰

Obtaining samples of urine to test for a UTI

If a urine sample is required, either to do a routine urinalysis test or to be sent to the laboratory for testing, this should preferably be taken in the morning (the first time urine is passed that day) and should be a 'clean catch' (meaning it must not come into contact with the body or surroundings and use a sterile pot) of MSU (mid-stream urine).

Obtaining urine samples from a person with dementia can be difficult, and the relative or carer closest to them will probably be the best person to assist with this.

It can be difficult to obtain an MSU from a resident with dementia who is incontinent. Sometimes a 'clean catch' maybe all that can be obtained by placing a clean pan with a sterile kidney dish in the toilet and sitting the resident on the toilet.

Diagnosis:

Assessment is a key part of the process, when diagnosing a UTI. The doctor and nurse will need results of observations, they will also discuss how the older person feels.

They may use a pain assessment tool to measure the degree of pain the older person is in. They would usually carry out a dip stick urinalysis.

⁹ <http://www.uspharmacist.com/content/d/feature/c/44877/>

¹⁰ http://www.alzheimers.org.uk/site/scripts/documents_info.php?documentID=1777

The accuracy of the urinalysis in adults aged 65 years and over can vary. It is therefore important that factors other than the results of the urinalysis testing are taken into consideration when diagnosing a urinary tract infection in an older person to ensure appropriate management and avoid unnecessary use of antibiotics.¹¹

Treatments:

Treatments of urinary tract infections will vary depending on the part of the urinary tract that is affected, the older person's medical history and their symptoms. Usually in the case of a UTI a resident would be encouraged to increase fluid intake because this helps to flush bacteria through the system. Care staff would need to monitor input and output and document accordingly, raising concerns with the RN as appropriate.

An important part of treating an older person is reassuring them and explaining their treatment to them. Administer any prescribed analgesia (pain relief) and also monitor an older person's diet to ensure they are eating enough fibre.

Mild cases of acute cystitis may disappear spontaneously without treatment. However, because of the risk of the infection spreading to the kidneys (complicated UTI), treatment is usually recommended. Also, due to the high mortality rate in the elderly population, prompt treatment is extremely important.¹²

Antibiotics may be used to control the bacterial infection. The drug of choice and length of treatment depends on the patient's history and the urine test that identify the offending bacteria. It is imperative that they are administered at the correct time and that the Older Person finishes the entire course of prescribed antibiotics. Otherwise the bacteria can build up resistance to the antibiotics and they will become less effective.

The RN must be observing and monitoring to be alert to signs that the infection has spread to the kidneys. In this case there could be a requirement for stronger antibiotics given intravenously this may require hospital treatment.

Treatment for people with upper UTIs usually includes a 7- or 14-day course of antibiotics. For serious upper UTIs, people will need to go to a hospital for further testing and antibiotics that are given intravenously (directly into the veins, via a needle attached to a drip).

Men are usually referred to an urologist for investigations if they have symptoms of an upper UTI as it may be a sign of an underlying condition.¹³

Chronic or recurrent UTI should be treated thoroughly because of the chance of kidney infection (pyelonephritis). Antibiotics control the bacterial infection. Prophylactic low-dose antibiotics at night may be recommended once the acute symptoms have subsided. In chronic UTI, antibiotics may need to be given for long periods (as long as 6 months to 2 years).

The following tips can help to reduce the risk of a UTI - health promotion:

¹¹ <http://nice.org.uk/guidance/qs90/chapter/Quality-statement-1-Diagnosing-urinary-tract-infections-in-adults-aged-65-years-and-over>

¹² <http://www.hpb.gov.sg/HOPPortal/dandc-article/582>

¹³ http://www.alzheimers.org.uk/site/scripts/documents_info.php?documentID=1777

RNs have a role to play in sharing best practice and educating other care staff to be mindful of their role in helping to prevent UTI. RNs should aim to encourage awareness and vigilance in other care staff in the team of how to monitor and observe regularly and to be aware of the following:

- Adults should drink between six and eight glasses of fluid a day and drink alcohol only in moderation. Drinking a glass of cranberry juice each morning is considered to be a good protection against the development of a UTI.
- Encourage the person with dementia to drink by finding out their preferences and making drinks readily available and visible.
- Monitor fluid intake for people who are less mobile and at risk of dehydration. If someone is not drinking enough and/or has difficulty with swallowing, consider asking for an assessment by a speech and language therapist. Dehydration may cause the person to pass darker, more concentrated urine which may also cause pain on urination.
- Encourage people not hold urine in the bladder for too long. People with dementia should be prompted to use the toilet on a regular basis.
- Try to avoid the person becoming constipated as this can prevent the bladder from emptying properly, which in turn can cause a UTI.
- Maintain good hygiene - wash the genitals at least once a day using unperfumed soap and do not use talcum powder.
- Women should wipe 'front to back' after using the toilet. The availability of easily accessible wet wipes in the bathroom may help to promote good hygiene.
- When a urinary catheter is being used, follow good infection prevention measures, always follow your local guidelines and ensure whenever accessing the urinary catheter that it is done safely for your resident¹⁴

DISCLAIMER:

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¹⁴ Cranberry juice the facts: Nursing Times article : VOL: 96, ISSUE: 40, PAGE NO: 11