

# Specimen collection 2: obtaining a catheter specimen of urine

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**Abstract** This article describes the procedure for collecting a catheter specimen of urine.

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Obtaining a specimen involves collecting tissue or fluids for laboratory analysis or near-patient testing, and may be a first step in determining a diagnosis and treatment (Dougherty and Lister, 2015).

Specimens must be collected at the right time, using the correct technique and equipment, and be delivered to the laboratory in a timely manner (Dougherty and Lister, 2015).

Box 1 provides a reminder of the general principles of specimen collection, which were discussed in more detail in part 1 (Shepherd, 2017).

## Indwelling urinary catheters

Indwelling urinary catheterisation involves the insertion of a tube into the bladder using aseptic technique (Dougherty and Lister, 2015).

The procedure is carried out on patients for a variety of reasons, including to:

- Manage acute and chronic urinary retention;
- Accurately measure urine output in acutely ill patients;

- Bypass an obstruction such as an enlarged prostate gland in men;
- Administer drugs directly into the bladder and carry out bladder function tests (Yates, 2017a).

Catheters can also be used to manage incontinence and maintain skin integrity when all other conservative management strategies have been attempted and failed (Dougherty and Lister, 2015; Royal College of Nursing, 2012).

Indwelling urinary catheterisation is associated with a number of complications, including:

- Catheter-associated urinary tract infection (CAUTI);
- Tissue damage;
- Bypassing and blockage (Yates, 2017a).

As there is a risk of complications, catheters should be used only when no alternatives are appropriate. Catheters should also be removed as soon as clinically appropriate (Loveday et al, 2014).

## Catheter specimen of urine

Catheter specimens of urine (CSU) are usually collected for microscopy, culture and

### Box 1. Professional issues and good practice principles

Nurses must:

- Be aware of their organisation's policies and procedures for specimen collection
- Be able to explain the purpose of the specimen to the patient and the implications for treatment, and to obtain informed consent
- Be competent to undertake the procedure (NMC, 2015). This includes knowledge of correct procedure for collection, handling and transportation of the sample (Dougherty and Lister, 2015)
- Be aware of infection prevention and control principles involved in collection of tissue and body fluids (Loveday et al, 2015)
- Understand the importance of accurate record keeping. Documentation should include time the specimen was collected, results and changes to treatment that occur in response to the results (Dougherty and Lister, 2015).

The specimen must be:

- Appropriate to the patient's clinical presentation
- Collected at the right time
- Collected in a way that minimises the risk of contamination
- Collected in a manner that reduces risk to all staff (including laboratory staff)
- Collected using the correct equipment
- Documented clearly
- Stored/transported appropriately (Higgins, 2008)
- The collection of any tissue/fluid carries a risk to staff from splash or inoculation injury, so standard precautions should be followed (Loveday, 2015).

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sensitivity (MC&S) testing when an infection has been suspected. The urine is tested to identify the organisms causing the infection as well as their sensitivities to antibiotics.

A CSU should only be collected when a patient has clinical signs of a CAUTI (Box 2). The decision should not be based solely on the sight or smell of urine in the drainage bag as these are not good indicators of infection in catheterised patients (Scottish Intercollegiate Guidelines Network, 2015).

#### Principles of specimen collection

Indwelling urinary catheters are usually attached to a drainage bag to create a closed drainage system. Breaking this closed system – for example by disconnecting the catheter from the drainage device or emptying the drainage bag, can increase the risk of CAUTI (Loveday et al, 2014).

Some patients have a catheter valve in place instead of a drainage bag, which allows the bladder to fill and then requires the patient (or a health professional or carer) to release the valve and allow the bladder to empty. Using the catheter valve helps maintain bladder tone and can be the method of choice for some patients. For further information on catheter valves see Yates (2017b).

A fresh sample of urine is required for a CSU and this must be obtained from the sampling port on the catheter bag or in the case of a catheter valve, directly from the valve. The sampling ports are designed to be accessed directly using a syringe and do not require a needle, therefore removing the risk of sharps injury (Dougherty and Lister, 2015).

Samples should not be collected from the drainage bag tap as the urine specimen may be contaminated (Brekke, 2014) and inaccurate results may lead to inappropriate treatment. Ideally, samples should be collected before antibiotics are commenced as they may affect the result of the laboratory investigation.

#### Box 2. Clinical signs of CAUTI

- Fever
- Rigors, shivering, shaking
- New onset or worsening confusion/delirium
- Lethargy with no other identified cause
- Back pain/pelvic pain
- Acute haematuria

Source: SIGN, 2015

***“Indwelling urinary catheters are usually attached to a drainage bag to create a closed drainage system. Breaking this closed system – for example by disconnecting the catheter from the drainage device or emptying the drainage bag, can increase the risk of CAUTI”***

#### Equipment

The following equipment is required:

- Clean tray to hold equipment;
- Non-sterile gloves;
- Apron;
- Sterile 10ml syringe (not required if taking a specimen from a catheter valve);
- Non-traumatic clamp (not required if taking a specimen from a catheter valve);
- Specimen container;
- Alcohol-impregnated swabs (2% chlorhexidine in 70% isopropyl alcohol);
- Sterile jug (if taking a CSU from a catheter valve);
- Documentation and forms.

#### The procedure

##### Collecting from a sampling port

An aseptic non-touch technique (ANTT) must be used to obtain a CSU as this reduces the risk of cross infection (Rowley, 2011).

1. Decontaminate hands and prepare the equipment.
2. Explain the procedure to the patient and gain informed consent to obtain the specimen. It is important to explain why the specimen is being collected, when the results will be available and implications for treatment (Dougherty and Lister, 2015).
3. Ensure the patient is comfortable and that their privacy and dignity is maintained throughout the procedure.

4. Decontaminate your hands and put on an apron.

5. If taking a specimen from a sampling port (Fig 1a), check first whether there is urine in the catheter tubing. If the tubing is empty apply a clamp below the level of the sampling port (Fig 1b). This allows urine to collect above the clamp so that a sample can be obtained.

6. Decontaminate your hands and apply non-sterile gloves. Clean the sampling port with an alcohol-impregnated swab according to local policy and allow to dry (Fig 1c). This reduces the risk of cross infection or contamination of the specimen (Rowley, 2011).

7. Stabilise the tubing by holding it below the level of the sampling port.

8. Insert the syringe tip into the sampling port (following manufacturer's instructions) (Fig 1d). Be careful to protect the sterile syringe tip and disinfected sample port from contamination.

9. Aspirate at least 10ml of urine and withdraw the syringe.

10. Put the urine into a sterile universal container, avoiding contact between the syringe and the pot (Fig 1e). Ensure the top of the specimen container is secured to prevent leakage and contamination of the specimen.

11. Wipe the sampling port with an alcohol-impregnated swab and allow to dry. This reduces the risk of cross infection and contamination (Dougherty and Lister, 2015).

12. If a clamp was used, release it to allow urine drainage freely. Failure to do this will cause the bladder to fill and can result in discomfort and bypassing of urine around the catheter, which can be distressing for the patient.

13. Remove and dispose of gloves and apron, and wash hands with soap and water.

14. Complete the request form, label the specimen and place in a specimen bag following local policies.

15. Send the sample to the laboratory immediately or refrigerate until it can be transported to ensure accurate results are obtained (Dougherty and Lister, 2015).

16. Document the date and time the sample was collected in the patient's notes.

##### Collecting from a catheter valve

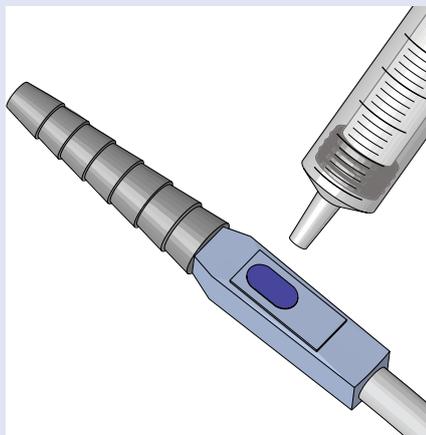
First, follow steps 1-4 above.

1. Ensure the patient has a full bladder.

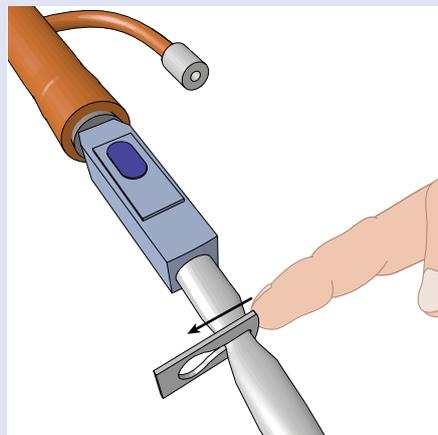
2. Apply non-sterile gloves and clean the catheter valve port with an alcohol-impregnated swab according to local policy and

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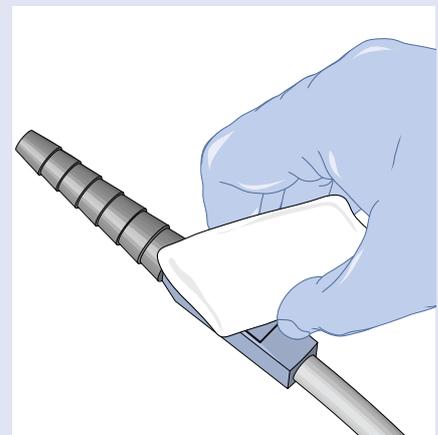
Fig 1. Collecting a catheter specimen of urine



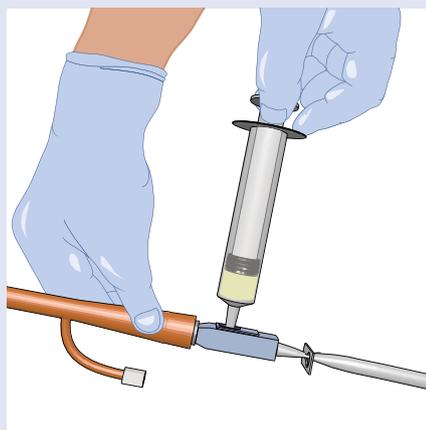
**1a.** A sampling port can be found on the tubing of the catheter drainage bag - urine should only be obtained from this point.



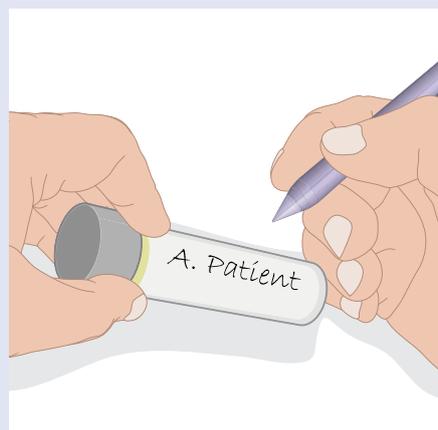
**1b.** Clamp the catheter below the port so that urine can collect above it in the tubing. Some catheter bags have an integral clamp.



**1c.** Swab the sampling port with an alcohol-impregnated swab following local policy to reduce the risk of cross infection and contamination of the specimen.



**1d.** Insert the syringe tip into the sampling port and withdraw the urine following manufacturer's instructions.



**1e.** Place sample in the specimen pot, avoiding contact with the syringe. Secure top to prevent leakage and contamination, then label, place in a specimen bag and seal.



**1f.** If the sample is taken from a catheter valve, the valve must be cleaned with an alcohol-impregnated swab first to reduce the risk of cross infection.

allow to dry. This reduces the risk of cross infection (Fig 1f).

**3.** Open the valve and release a small amount of urine to flush the valve.

**4.** Open the valve again and empty the remaining urine into a sterile jug, ensuring the valve does not come into direct contact with the jug.

### Professional responsibilities

This procedure should be undertaken only after approved training, supervised practice and competency assessment, and carried out in accordance with local policies and protocols.

**5.** Put a sample of urine in a sterile universal container. Ensure the top of the specimen container is secured to prevent leakage and any contamination of the specimen.

**6.** Close off the valve and wipe the port with an alcohol-impregnated swab.

**7.** Dispose of any remaining urine according to local policy.

**8.** Follow steps 13-16 above to complete the procedure. **NT**

### References

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### Specimen collection series

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Part 3: Stool specimen	Sep
Part 4: Sputum specimen	Oct