NHS E-Learning Training Course: Fundamentals of Catheterisation Best Practice

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With special thanks to those that contributed to this work:

Fiona Le Ber – The Royal College of Nursing
Mandy Bulter – Gloucestershire Hospital NHS Foundation Trust
Cathrine Weller – Somerset NHS Foundation Trust
Ann Yates - Cardiff and Vale UHB - Primary Care
Janice Thompson – Wirral Community Health and Care NHS Foundation Trust
Laurie Simcock – Swansea Bay UHB
Sue Harper – Royal Wolverhampton NHS Trust
Rowena Woods – Maidstone and Tunbridge Wells NHS Trust

Foreword from Fiona Le Ber, Royal College of Nursing

Urinary catheterisation is one of the most frequently performed clinical procedures across health and social care settings, yet it remains among the most significant contributors to avoidable patient harm when not carried out in line with best practice. As the NHS continues to prioritise patient safety, infection prevention, and high-quality, person-centred care, ensuring that all healthcare professionals are equipped with the right knowledge, skills, and confidence in catheter management is more important than ever.

This training course has been developed to provide a comprehensive, evidence-based foundation for safe and effective catheter practice, bringing together the essential principles of anatomy, clinical assessment, equipment selection, aseptic technique, risk reduction, and ongoing care. It also reflects the realities facing modern healthcare staff from rising rates of catheter-associated urinary tract infections (CAUTIs) to an ageing population with complex needs, to increasing demand for care delivered in community settings.

What makes this course particularly valuable is its focus not just on technical skill, but on clinical reasoning and compassionate practice. Good catheter care requires more than procedural competence: it relies on thoughtful decision-making, clear communication, respect for patient dignity, and an understanding of the profound impact catheterisation can have on an individual's comfort, independence, and quality of life.

These principles align closely with the values of the Royal College of Nursing (RCN):

- **Equity, Diversity, and Inclusion** – ensuring that every patient and professional is treated with respect and dignity, and that care is delivered without discrimination.
- **Professionalism and Trust** – upholding the highest standards of practice, prioritising people, and promoting safety and confidence in care.
- **Support for Members** – fostering continuous learning and professional development, so that nurses and carers can grow and thrive in their roles.
- **Commitment to Public Health** – championing safe, evidence-based care that improves outcomes and addresses wider health challenges.
- **Respect for Human Rights** – recognising the cultural and individual rights of every person and ensuring care is compassionate and inclusive.

By completing this course, you are contributing to a culture of safer, more consistent, and more compassionate care across the NHS, one that reflects these core values. I hope you find the content both informative and practical, and that it supports you in delivering high-quality catheter care in every setting.

1 Course Introduction & Learning Objectives

Course Introduction

This training course is designed to equip nurses with the essential knowledge and understanding needed to carry out catheterisation safely, competently, and in line with current best practice. It is based on the Royal College of Nursing (RCN) Catheter Care Guidance (2021) and other key evidence-based standards, supporting safe practice in indwelling, intermittent, and suprapubic catheterisation.

Learners are reminded that this course should be completed in conjunction with their organisation's local policies, procedures, and clinical governance frameworks. Local guidance must always be followed to ensure safe and legally compliant care within your specific practice setting.

Why does this training matter?

Catheter training is crucial for healthcare professionals, to ensure safe and effective catheter care, minimising risks like infections and complications. Effective training equips individuals with the knowledge and skills to manage catheters properly, maintain hygiene, monitor for signs of infection, and address potential issues, ultimately improving patient comfort and well-being.

With approximately 13% of all NHS patients catheterised (Shackley et al, 2017), and 90,000 patients in England having long-term catheters in the community (Gage et al, 2017), the demand for catheter care training is at an all-time high. According to NHS England (2018) unplanned admissions for urinary tract infections (UTIs) cost £432 million per year.

UTIs are the most common healthcare-associated infection (HCAI) in the UK, comprising 19% of all HCAIs, 43-56% of UTIs are associated with urethral catheters.

Catheter associated urinary tract infections (CAUTI) have significant associated costs of additional bed days and treatment, estimated to cost the NHS up to £99m per year.

CAUTI can occur whether a person has either a short-term or a long-term catheter. There is a strong association between duration of urinary catheterisation and risk of infection, and catheters are sometimes inserted inappropriately or there is a delay in removing them. This risk is greatly reduced by complying with all parts of the process for safe catheter insertion, maintenance and removal as soon as it is no longer needed. This is important in terms of both infection prevention and patient comfort and experience. (NICE 2014)

This training will also aid understanding of the appropriate reasons for catheterisation, suitable equipment selection, other potential catheter complications and effective catheter management.

Module Learning Objectives

By the end of this course, learners will be able to:

1. Understand the anatomy and physiology of the male and female urinary tract.
2. Describe the indications and contraindications for urinary catheterisation.
3. Differentiate between intermittent, short-term, and long-term catheter use.
4. Apply principles of aseptic technique and infection prevention.
5. Demonstrate awareness of potential complications and how to prevent them.
6. Deliver catheter care that is safe, evidence-based, and person-centred.
7. Understand legal, professional, and ethical responsibilities relating to catheterisation.

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2 Anatomy & Physiology of the Urinary System

Module Introduction

An in-depth understanding of urinary system anatomy and the micturition cycle is essential for safe and effective catheterisation. This knowledge underpins the assessment, insertion, and ongoing management of urinary catheters in clinical practice.hh

Module Learning Objectives

By the end of this module, learners will be able to:

1. Describe the anatomy and function of the kidneys, ureters, bladder, urethra, and associated structures in the context of urinary catheterisation.
2. Explain the physiological processes of urine formation, storage, and voiding, including the roles of nephrons, detrusor muscle, and sphincters.
3. Differentiate between male and female urethral anatomy and the clinical considerations for catheter insertion and maintenance in each.
4. Recognise signs and causes of common dysfunctions such as urinary retention, incontinence, urethral trauma, and catheter-related complications.
5. Apply anatomical and physiological knowledge to support safe, person-centred catheterisation practice in a diverse patient population.

The Kidneys (RCN, 2021)

Urine production is controlled by the kidneys, **a minimum of 30mls of urine an hour** is produced by the normal functioning kidneys. The primary function of kidneys is to remove and restore selected amounts of water and solutes, in order to maintain homeostasis of blood pressure.

Renal function in the formation of urine is carried out by the nephrons. Nephrons carry out three important functions:

- the control of blood concentration and volume by removing selected amounts of water solutes
- regulating blood pH
- removing toxic waste from the blood.

The nephrons remove many unwanted materials from blood, return ones that the body needs and excrete the remainder as urine.

The kidneys become less effective with age; at 70 years of age the filtering mechanism is half that of someone who is 40 years of age.

Bladder (RCN, 2021)

The bladder is a hollow muscular organ situated retroperitoneal in the pelvic cavity. Its shape depends on the volume of urine in it; empty, it is collapsed and becomes spherical when slightly distended. It rises into the abdominal cavity as urine volume increases. The function of the bladder is to store urine.

Prostate (RCN, 2021)

Only present in males and transgender females. It sits around the urethra just below the level of the bladder. It enlarges normally with age, causing bladder outflow obstruction, which can lead to urinary retention and is a common reason to insert a urinary catheter. Outflow obstruction can also be caused by inflammation of the prostate.

In catheterisation technique, it is important to understand how the patient reacts and the feeling of obstruction as the catheter is passed through the prostate gland. It is also important to be aware of catheter insertion and removal techniques in individuals following prostatic surgery.

Urethral sphincters (RCN, 2021)

There are two urethral sphincters.

- The internal sphincter is under the control of the brain and spinal cord nerve pathways.
- The external sphincter has an element of learned behaviour that the patient can control. Closure of the sphincters during bladder filling help to maintain continence, but damage or excessive detrusor pressure can lead to incontinence. They may be damaged during catheterisation or post prostatic surgery.

In catheterisation, it is important to understand how the patient reacts and the feeling of obstruction as the catheter passes through the sphincters.

Urethra (RCN, 2021)

The function of the urethra is to allow the discharge of urine from the body. In males, the urethra also transports semen (which contains sperm) during ejaculation, making it part of both the urinary and reproductive systems.

The anatomy of the urethra makes it sensitive to trauma during catheterisation.

- The lumen of the urethra is a convoluted, ribbon-like structure, only dilating during urination or when accommodating a urethral catheter.
- The urethra is lined with transitional epithelium; underlying the epithelium lays is a thin layer of tissue that is rich in blood vessels.

Any trauma to the epithelium during urethral catheterisation provides convenient entry sites for micro-organisms into the blood and lymphatic system.

Its length is important in relation to how much of the catheter is needed to

reach the bladder.

- The female urethra is 3 to 5cm long and its elasticity is influenced by circulating oestrogens.
- The male urethra is 18 to 22cm long; trauma to the male urethra often results in the formation of scar tissue which can cause urethral stricture.

Pelvic floor muscles (RCN, 2021)

In females, the pelvic floor supports the organs within the abdominal cavity, resists increased intra-abdominal pressure and draws the anus towards the pubis and constricts it. Nerve supply is from sacral nerves S3 to S4 and the perineal and pudendal nerve.

Where catheters fall out of females, pelvic floor laxity should be considered as a cause.

Micturition (RCN, 2021)

Micturition is the process of passing urine from the urinary bladder to the outside of the body—in other words, urination or voiding.

This occurs by a combination of involuntary and voluntary nerve impulses.

- As the bladder fills, stretch receptors in the bladder wall transmit nerve impulses to the spinal cord. These impulses transmit by way of sensory tracts to the cortex, initiating a conscious desire to void.
- Parasympathetic impulses from the micturition centre in the sacral spinal cord are conducted to the urinary bladder wall and internal urethral sphincter. These cause contraction of the detrusor muscle and relaxation of the internal urethral sphincter.
- The cerebral cortex of the brain then allows voluntary relaxation of the external sphincter and urination takes place.

Involuntary Micturition (RCN, 2021)

This can occur as a result of:

- unconsciousness

- injury to the spinal nerves controlling the urinary bladder
- irritation due to abnormal constituents in urine
- disease of the urinary bladder
- damage to the external sphincter
- inability of the detrusor muscle to relax.

Urinary retention (RCN, 2021)

This can occur as a result of:

- obstruction at the bladder neck
- enlarged or inflamed prostate
- obstruction of the urethra (stricture)
- contraction of the urethra during voiding
- lack of sensation to pass urine
- neurological dysfunction
- urinary tract infection
- the effects of medication
- pain overriding normal bladder sensation
- psychological causes.

Nervous system (RCN, 2021)

This needs to be intact to allow normal bladder function to take place, but it may be a reason for catheterisation. Poor or no bladder sensation can lead to incomplete emptying or urinary retention. Catheterisation technique needs more caution in individuals with altered sensation, as normal reactions are absent.

Endocrine system (RCN, 2021)

There are a number of factors that influence its effect on the production of urine, such as angiotensin II and antidiuretic hormone (ADH) or vasopressin.

- **Angiotensin II** stimulates thirst, promotes the release of aldosterone, which increases the rate of salt and water re-absorption by the kidneys.
- **Antidiuretic hormone (ADH)** is produced by the hypothalamus and released into the blood stream by the posterior pituitary gland. This hormone regulates

the rate of water reabsorption by the kidneys and causes constriction of blood vessels.

- **Aldosterone** is secreted by the renal cortex; release of aldosterone enhances the reabsorption of sodium and water.
- **Glycosuria** is usually an indicator of diabetes mellitus. When glucose exceeds the renal threshold in normal glomerular filtration, the sodium glucose symporters cannot work fast enough to reabsorb the glucose and glucose is excreted in the urine. It can lead to symptoms of urgency and frequency and can also become infected as bacteria have a medium by which to multiply quickly.

Cardiac system (RCN, 2021)

The heart is responsible for pumping blood around the body. As the blood flows through body tissues, it picks up waste products which are excreted via the kidneys. An inefficiently functioning heart can produce the side effects of nocturia or nocturnal polyuria. If a catheterised patient produces more urine at night than during the day, it could be nocturnal polyuria and appropriate interventions should be considered.

Sexual function (RCN, 2021)

This can become compromised with the use of a catheter.

- Altered body image due to urethral or suprapubic catheterisation may impede the person's desire to want sexual intercourse.
- The presence of an indwelling catheter in a male urethra may cause trauma to the urethra on erection.
- Painful erections, particularly when sleeping, are a common complication of having an indwelling urethral catheter.

Skin (RCN, 2021)

Has several functions, but related to continence and catheterisation it offers:

- **protection** – providing a physical barrier that protects the underlying tissues from physical abrasion, bacterial invasion and dehydration
- **sensation** – skin contains abundant nerve endings and receptors that detect

stimuli related to pain, touch and pressure.

It is important to make every effort to ensure that incontinence and catheterisation do not compromise these vital functions of the skin. Catheterisation can increase sacral skin breakdown due to lack of movement. Where sacral skin breakdown has occurred, catheter-related complications increase because of cross infection from wound to bladder. It can also increase the risk of bacteraemia.

Female Genital Mutilation (FGM) (RCN, 2021)

This is the alteration/mutilation of the female genitalia for any non-medical reason. It can involve piercing, tattooing, removal of the clitoris and labial folds and suturing. It is illegal in the UK to allow FGM practices. All HCPs have a legal duty of care to report any known episodes of FGM or anyone at risk of FGM. For further guidance see the RCN's publication Female Genital Mutilation (2023).

Transgender individuals (RCN, 2021)

Individuals who undergo treatment or surgery to alter their gender. Their internal urethral structure is altered, and this may affect the choice of catheter used. Careful assessment and sensitive questions are required to ensure the correct equipment and products are used.

Term	Definition
Aldosterone	A hormone secreted by the renal cortex that enhances the re-absorption of sodium and water in the kidneys.
Angiotensin II	A hormone that stimulates thirst and promotes the release of aldosterone to increase salt and water retention.
Bacteraemia	The presence of bacteria in the bloodstream, which may be transient, but can lead to serious systemic infections like sepsis if not managed promptly.
Bladder	A hollow muscular organ that stores urine and changes shape depending on volume; situated retroperitoneally in the pelvic cavity.
Cardiac system	The heart and blood vessels that circulate blood; cardiac dysfunction may cause nocturia or nocturnal polyuria.
Detrusor muscle	The muscle in the bladder wall that contracts during urination to expel urine.
External urethral sphincter	A voluntary muscle that maintains continence by contracting to close the urethra; part of learned behaviour.
Glycosuria	Presence of glucose in urine, often due to diabetes mellitus, increasing risk of infection.
Internal urethral sphincter	An involuntary muscle at the bladder neck controlled by the autonomic nervous system; helps maintain continence.
Kidneys	Organs that filter blood, regulate water and electrolyte balance, and produce urine; kidney function declines with age.

Micturition	The process of urination, involving bladder filling, sensory signals, detrusor contraction, and sphincter relaxation.
Nephrons	The functional units of the kidneys responsible for urine formation via filtration, reabsorption, and secretion.
Nocturia	A condition in which a person wakes one or more times during the night to urinate, often impacting sleep and quality of life.
Nocturnal polyuria	An excessive production of urine at night, defined as night-time urine output exceeding 33% of the total 24-hour urine volume in adults.
Parasympathetic nervous system	Activates the detrusor muscle and relaxes the internal sphincter during micturition.
Pelvic floor muscles	Muscles that support pelvic organs and maintain continence; nerve supply is via the sacral nerves and pudendal nerve.
Prostate	A gland surrounding the male urethra that may enlarge with age, causing urinary retention and requiring catheterisation.
Pudendal nerve	A somatic nerve originating from the sacral spinal cord (S2–S4), the pudendal nerve innervates the external urethral sphincter and pelvic floor muscles, playing a key role in urinary continence and sensation.
Urethra	The tube through which urine exits the body; sensitive to trauma during catheterisation; varies in length by sex.
Urethral sphincters	Two sphincters (internal and external) that help control urine flow and maintain continence.
Urinary retention	Incomplete bladder emptying due to obstruction, nerve dysfunction, infection, or psychological factors.
Urinary system	Includes the kidneys, ureters, bladder, and urethra;

	maintains fluid/electrolyte balance and excretes waste as urine.
Vasopressin (ADH)	Also known as antidiuretic hormone; regulates water reabsorption by the kidneys and causes vasoconstriction.

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2 Anatomy & Physiology of the Urinary System

Knowledge Check

Example multiple choice questions (correct answers highlighted):

1. What is the minimum normal hourly urine output from functioning kidneys?

A. 10ml
B. 20ml
C. **30ml**
D. 50ml
E. 100ml

2. What are the main functions of nephrons in the kidney?

A. Regulation of hormone secretion
B. Blood glucose management
C. **Regulating blood volume, pH, and removing waste**
D. Controlling urine storage
E. Managing red blood cell production

3. Which of the following structures is responsible for storing urine?

A. Kidney
B. Urethra
C. **Bladder**
D. Nephron
E. Prostate

4. Which anatomical structure only exists in males and transgender females?

A. External urethral sphincter
B. Bladder neck
C. Transitional epithelium
D. **Prostate**
E. Pelvic floor

5. What is the role of the internal urethral sphincter during micturition?

A. Voluntarily contracts to prevent urination
B. **Involuntarily relaxes to allow urine flow**
C. Voluntarily relaxes to release urine
D. Contracts to initiate bladder filling
E. Detects pressure changes

6. Which hormone increases the reabsorption of sodium and water in the kidneys?

A. Vasopressin
B. Glucagon
C. **Aldosterone**
D. Adrenaline
E. Insulin

7. Which of the following is a common reason for catheterisation in older males?

A. High urine output
B. **Enlarged prostate**
C. Elevated blood sugar
D. Strong pelvic floor tone
E. Frequent sexual activity

8. What might urethral trauma during catheterisation lead to?

A. Entry of micro-organisms into the bloodstream
B. Pelvic organ prolapse
C. Reduced blood pressure
D. Kidney enlargement
E. Skin breakdown

9. What condition is associated with the presence of glucose in urine?

A. Anaemia

B. Hypertension
C. Hyperthyroidism
D. Prostate cancer
E. **Diabetes mellitus**

10. What might indicate pelvic floor laxity in females during catheter care?

A. Haematuria
B. **Catheter falling out repeatedly**
C. Increased detrusor pressure
D. Sensation loss during micturition
E. Painful erections

3 Decisions Influencing Catheterisation

Module Introduction

Catheterisation, while often clinically necessary, carries significant risks that must be carefully assessed and managed. These risks include infection, trauma, and complications such as catheter-associated urinary tract infections (CAUTIs), which can lead to life-threatening conditions like sepsis. The Royal College of Nursing (RCN, 2021) emphasise that careful risk assessment must underpin all catheterisation decisions and ongoing care in every setting.

Module Learning Objectives

- Identify the key risks and complications associated with urinary catheterisation
- Recognise patient-specific risk factors that increase susceptibility to catheter-related complications
- Apply knowledge of allergy risks associated with catheterisation
- Assess and respond appropriately to complications indicating the need for clinical review
- Utilise the HOUDINI protocol to critically evaluate the ongoing need for catheterisation and support timely removal when safe and appropriate.
- Demonstrate understanding of the legal and ethical responsibilities related to informed consent and the Mental Capacity Act (2005) in the context of catheter care.
- Incorporate person-centred principles into decision-making

The Risks of Catheterisation

Using any form of catheter has associated risks and with the continued risk of urine infections and associated life-threatening complications, such as sepsis. it is of great importance that risk assessment becomes an essential part of clinical decisions and catheter care in all care settings (RCN, 2021).

It is important to minimise the use and duration of urinary catheterisation in all patients, but especially those at higher risk for CAUTI-related morbidity and mortality such as:

- women
- the elderly
- individuals with impaired immunity.

Additional risk factors which may increase the potential for serious complications of CAUTI include if the patient:

- has been in hospital in the last 12 months, exposed to the risk of colonisation with multi-resistant bacteria
- has taken antibiotics in the last six months, as this increases the risk of C. difficile infection
- is pregnant
- has diabetes mellitus
- has more than six medications – indicative of compromised health status
- has had chemotherapy within the last six months (immune compromised)
- is taking steroids (immune compromised, increased infection risk)
- has underlying renal tract abnormalities
- has one kidney (due to the potential implications of a renal infection)
- has one functioning kidney – currently taking antibiotics for a urinary tract infection
- has a history of repeated urine infection or at least one urinary tract infection since using a catheter
- has chronic wounds that require dressings (could potentially cross-infect the catheter and drainage system)

- has an artificial heart valve or heart defect (due to risk of endocarditis)
- is immuno-suppressed
- has organ transplants
- has poor bowel control/diarrhoea.

Allergy risks related to catheterisation include:

- latex
- Soap / chlorhexidine
- lubrication gels containing lidocaine.

Complications which indicate a need for further investigation include:

- previous difficulty in catheter insertion and/or removal
- history of frequent catheter blockage
- catheter has fallen out
- bypassing of urine
- pain, discomfort and discharge associated with catheter usage
- recurrent infection.

Risks of haematuria include:

- use of medication such as aspirin or warfarin
- recent catheter-related trauma
- recent urinary tract surgery
- known bladder/prostate cancer
- prostatic trauma. Careful consideration should be given to patients where:
- blood clots have been observed
- meatal bleeding is observed.

Decision-Making

HCPs must ensure that catheterisation is based on a balanced decision with more benefits than disadvantages and in consultation with the patient, where possible (RCN, 2021).

When considering long-term catheterisation, a risk assessment should consider the

patient's quality of life, particularly:

- the impact of the catheter on the patient
- their sexuality and body image
- their social support networks
- if they can manage the catheter independently at home and, if not, what support needs to be arranged
- the patient's and family / carers education
- the supply of equipment
- how the equipment will be ordered and where from. (EAUN, 2024)

Healthcare professionals must critically assess when catheterisation is clinically appropriate. Alternatives should always be considered first, in line with person-centred care principles that balance clinical need with patient quality of life. (RCN, 2021). Unnecessary catheterisation can lead to infection, trauma, and long-term dependency (Loveday et.al., 2014; RCN, 2021).

HOUDINI Protocol

When a catheter is already being used, the HOUDINI protocol can be used to consider if it is necessary (Adams et al, 2012).

- **H**aematuria (e.g., post-op with irrigation needs)
- **O**bstruction (e.g., urinary outlet obstruction)
- **U**rological surgery/intervention
- **D**ecubitus ulcer (severe, sacral, and incontinent)
- **I**nput/output monitoring in critical care
- **N**o code/comfort care (end of life)
- **I**mmobility (e.g., spinal trauma)

This structured approach encourages prompt reassessment and catheter removal where safe and appropriate.

Legislation, policy and good practice

You need to know and apply the following:

- legislation, policy and good practice, the current international, European, UK and national legislation, guidelines and local policies, protocols and procedures which affect your work practice in relation to the care of individuals using urinary catheters
- a factual knowledge of the current European and national legislation, national guidelines, organisational policies and protocols in accordance with clinical/ corporate governance which affect your work practice in relation to the care of individuals using urinary catheters

In 2019–2020, NHS Resolution recorded 148 catheter-related claims. Many were due to incomplete consent, inadequate documentation, or failure to manage complications (NHS Resolution, 2021).

Informed Consent and Capacity (RCN, 2021)
The law requires that the patient must give valid consent before the procedure (catheterisation) or care is given. In terms of care and support of the patient, know how to obtain valid consent and how to confirm that sufficient information has been provided on which to base this judgment

- **Obtaining consent is essential before carrying out catheterisation.** Without consent, the care or treatment may be considered unlawful and the patient could take legal action against the health profession, even if treatment was for the patient's benefit.
- **Consent can only be given by the patient.** To enable the patient to give consent they must have capacity to understand and retain the information and be able to weigh the risks against the benefits.
- **You must respect and support an individual's right to accept or decline treatment.** You should uphold their right to be fully involved in decisions about their care, plus be aware of the legislation regarding mental capacity (NMC, 2018; Mental Capacity Act, 2005).

Mental Capacity Act (2005)

The five key principles of the Mental Capacity Act (2005) need to be taken into consideration when obtaining consent from a patient for catheterisation.

1. **A presumption of capacity** – every adult has the right to make their own decisions and must be assumed to have capacity to do so unless it is proved otherwise.
2. **Individuals should be supported to make their own decisions** – a person must be given all practicable help before anyone treats them as not being able to make their own decisions.
3. **Unwise decisions** – just because an individual makes what might be seen as an unwise decision, they should not be treated as lacking capacity to make that decision.
4. **Best interests** – an act done, or decision made under the Act for, or on behalf of a person who lacks capacity, must be done in their best interests.
5. **Least restrictive option** – anything done for, or on behalf of a person who lacks capacity, should be the least restrictive of their basic rights and freedoms.

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3 Decisions Influencing Catheterisation

Knowledge Check

Example multiple choice questions (correct answers highlighted):

1. What life-threatening complication can arise from catheter-associated urinary tract infections (CAUTIs)?

A. Pneumonia
B. Heart failure
C. **Sepsis**
D. Deep vein thrombosis
E. Stroke

2. Which of the following patients is at higher risk of CAUTI-related complications?

A. A healthy adult male
B. A young child
C. A post-menopausal woman
D. **An elderly patient with diabetes**
E. A middle-aged office worker

3. Which of the following is a recognised allergy risk related to catheterisation?

A. **Latex**
B. Penicillin
C. Alcohol wipes
D. Silicone
E. Talcum powder

4. What is the purpose of the HOUDINI protocol in catheter care?

A. To help patients remove their own catheters
B. To manage urinary incontinence

C. **To assess whether catheterisation is still clinically necessary**
D. To select appropriate catheter size
E. To evaluate renal function

5. Which of the following are examples of complications requiring further investigation in catheterised patients?

A. **Catheter bypassing and persistent discomfort**
B. Loud bowel sounds
C. High blood pressure
D. Difficulty walking
E. Skin rashes

6. What is a key consideration before performing catheterisation?

A. The patient's dietary preferences
B. Whether the patient is left- or right-handed
C. The availability of a private room
D. **Obtaining valid, informed consent**
E. The brand of catheter available

7. Under the Mental Capacity Act (2005), which principle affirms that individuals have the right to make their own decisions unless proven otherwise?

A. Best interests
B. Least restrictive option
C. **Presumption of capacity**
D. Supported decision-making
E. Informed autonomy

8. Which of the following is included in a risk assessment when considering long-term catheterisation?

A. The patient's hair colour
B. Whether the patient drives

C. **The patient's social support and quality of life**

D. The proximity to a hospital

E. Whether the patient owns a mobile phone

9. Which of the following factors may increase the risk of CAUTI complications?

A. Recent hospitalization

B. Immunosuppression

C. Use of multiple medications

D. Chronic wounds

E. **All of the above**

10. According to NHS Resolution (2021), which of the following contributed to catheter-related claims?

A. Excessive use of sterile gloves

B. **Incomplete consent and poor documentation**

C. Reuse of catheter equipment

D. Delayed food service

E. Lack of catheter size options

4 Urinary Catheterisation: Indications and Alternatives

Module Introduction

Indwelling urinary catheterisation must only be used when clinically indicated and following an assessment and discussion with the patient (EPIC, 2014). A plan for removal of the catheter must be made at the point of catheter insertion and reviewed regularly (RCN, 2021). Indwelling urinary catheters should be used only after alternative methods of management have been considered (NICE, 2012).

Module Learning Objectives

By the end of this module, learners will be able to:

- Identify the clinical indications for short- and long-term indwelling urinary catheterisation.
- Explain the potential complications and risks associated with inappropriate or prolonged use of indwelling catheters.
- Describe the contraindications and cautions related to urethral catheterisation.
- Differentiate between intermittent self-catheterisation (ISC), indwelling urethral catheterisation, and external urine collection devices in terms of indication, technique, and associated risks.
- Evaluate alternative urine management approaches to reduce reliance on catheterisation and preserve patient dignity.

Indications for Urethral Catheterisation

Catheterisation may be clinically justified in the following scenarios (EAUN, 2024):

Indications	Details
Urinary retention	• Acute • Chronic
Voiding difficulties	• As a result of neurological disorders that cause paralysis or loss of sensation affecting urination (coma) • Due to bladder outlet obstruction • Urethral stricture • Enlarged prostate gland in men
Measurement of urinary output	• In critically ill patients • Intraoperative monitoring
Intravesical therapy	• Bladder irrigation • Lavage
Surgery	• In selected surgical procedures • Urological surgery, e.g.: urethrotomy, trans urethral resection of prostate (TURP) • In case of spinal/epidural anaesthesia, e.g., prolonged labour • Surgery on contiguous structures of the genitourinary tract • When bladder emptiness is needed
To assist in incontinent patients	• **When conservative treatment methods have been unsuccessful** • In healing of open sacral or perineal wounds • To maintain skin integrity • Intractable incontinence
Prolonged immobilisation	• Potentially unstable thoracic or lumbar

	spine • Multiple traumatic injuries such as pelvic fractures
Bladder decompression	• Gradual or rapid
To improve comfort at end-of-life care	

Urethral catheterisation at the end of life (RCN, 2021)

There is a lack of evidence on the role of catheters at end of life/palliative care. If a full distended bladder or urinary retention is suspected, then prompt action of urethral catheterisation is needed before the patient becomes agitated or distressed. It is important to note that retention can be a peripheral side effect of opioid medication.

Indications for urethral catheterisation at the end of life

- The management or prevention of wound damage (for example, sacral pressure
- Ulcers, fungating wounds or soreness of the anus, perineum, vulva or penis).
- Painful physical movements due to frequent changes of bed linen caused by incontinence.
- Pain or difficulty for female patients getting in and out of bed to use a commode.
- Urinary incontinence associated with obstruction.
- Urinary retention/distended bladder – excessive oedema of the genitalia making micturition uncomfortable.

Bladder ultrasound scanning should be used as the first choice to help a healthcare professional make an informed decision about the clinical management of a patient presenting with urinary bladder complications (UACC, 2020).

Relative contraindications for urethral catheterisation (EAUN, 2024)

- Acute or symptomatic chronic prostatitis
- Suspicion of urethral trauma
- Traumatic hypospadias secondary to previous long-term indwelling urethral catheterisation

Alternatives to Indwelling Catheterisation

Urinary catheters should only be used when clinically necessary. Unnecessary catheterisation may cause physical and psychological harm, including loss of dignity, discomfort (RCN, 2021), and increased risk of infection (NICE, 2019).

The following alternatives to an indwelling catheter should be considered: (EAUN, 2024)

1. Male external catheter or sheath
2. Female external urinary catheter
3. Intermittent catheterisation by a nurse, carer, family member or the patient
4. Continence pad/containment product.

External Urinary Collection Devices

External urine collection devices are non-invasive systems used to collect urine without insertion into the bladder or urethra. They are positioned externally and are typically used for patients who are incontinent or have limited mobility, but who do not require bladder catheterisation.

Indications

- Patients with urinary incontinence (especially functional incontinence).
- When indwelling catheterisation is inappropriate or high risk.
- Post-operative patients or individuals requiring fluid balance monitoring.

Male External Catheters (MEC)

- A silicone or latex sheath is rolled over the penis, similar to a condom.
- Attached to a drainage tube and bag (leg or bedside).

- Held in place with adhesive, straps, or self-adhesive lining.

Contraindications

- Severe penile retraction (making it difficult to apply the sheath)
- Patients with skin allergies or breakdown in the genital area
- Patients who have a high post-void residual volume (requiring bladder drainage)

Female External Collection Devices

- These include suction-based or absorbent pad systems that fit between the labia or in the perineal region.
- Some use low-level continuous suction to draw urine away into a canister
- Useful for bedbound patients or those with limited toileting ability.

Intermittent Self-Catheterisation (ISC)

Intermittent self-catheterisation (ISC) is a technique where an individual inserts a catheter into their bladder at regular intervals to drain urine and then removes it immediately after the bladder is emptied. Unlike an indwelling catheter, which remains in place continuously, ISC involves periodic catheterisation only when needed. ISC has a reduced infection rate when compared to indwelling catheters, although there still is a risk (RCN, 2021).

Intermittent catheterisation is preferable to an indwelling urethral or suprapubic catheter with patients who have a bladder emptying dysfunction or a spinal cord injury (RCN, 2021).

Where a trial without catheter is unsuccessful, the HCP should, if appropriate, consider introducing the use of intermittent catheterisation.

Indications: (RCN, 2021)

- **Neurogenic bladder** (e.g., spinal cord injury, MS)
- **Chronic retention** with high residual volumes

- **Post-operative bladder management**
- **Assessment of post-void residual urine** (wherever possible, a bladder scanner is the preferred option to measure residual urine volumes).

Contraindications:

- **Urethral strictures or recent urethral trauma**
- **Limited manual dexterity or cognitive impairment**
- **High bleeding risk** (e.g., bladder tumours or anticoagulation)

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Term	Definition
Acute Urinary Retention (AUR)	A sudden, painful inability to pass urine despite a full bladder; often requires urgent catheterisation.
Bladder Irrigation / Lavage	The flushing of the bladder with fluid to treat or prevent blockages, bleeding, or infection.
Bladder Scanner	A non-invasive ultrasound device used to measure post-void residual urine volume.
Chronic Urinary Retention	Long-term incomplete bladder emptying, treated with catheterisation only if symptomatic or with renal compromise.
False Passage	An abnormal tract in the urethra formed when a catheter is inadvertently forced through the urethral wall.
Fournier's gangrene	An polymicrobial infection that causes necrosis in the fascia and subcutaneous tissue of the perineal and genital areas. It typically affects men, but women and children can also be affected.
Hypospadias	A condition in which the opening of the urethra is not located at the tip of the penis, but rather somewhere along the underside. The severity varies based on where the opening is located. May be congenital or iatrogenic, which occurs when the urethra is inadvertently damaged, typically due to prolonged or improper use of urethral catheters.
Neurogenic Bladder	Bladder dysfunction caused by neurological conditions (e.g., spinal cord injury, multiple sclerosis).
Post-Void Residual (PVR)	The volume of urine remaining in the bladder after urination; measured to assess retention.
Priapism	A prolonged, painful penile erection lasting >4 hours and

	not related to sexual activity; a contraindication for catheterisation.
Renal Compromise	Impaired kidney function due to prolonged retention or obstruction, sometimes requiring catheterisation.
Trial Without Catheter (TWOC)	A planned removal of the catheter to test whether the patient can pass urine independently.
Urodynamic Assessment	Tests that assess bladder pressure and urine flow to evaluate urinary function and diagnose disorders.
Urethral Injury	Trauma or damage to the urethra, making catheterisation via the urethra inappropriate.
Urethral Stricture	A narrowing of the urethra from scar tissue or inflammation, which may obstruct flow and complicate catheter insertion.

Example multiple choice questions (correct answers highlighted):

1. Which of the following is a valid clinical indication for indwelling urinary catheterisation?

A. Functional incontinence
B. **Acute urinary retention (AUR)**
C. Limited mobility
D. Night-time frequency
E. Urinary tract infection

2. When should a plan for catheter removal be made?

A. At the time of discharge
B. After 7 days of catheterisation
C. **At the point of catheter insertion**
D. Only if complications arise
E. When requested by the patient

3. Which of the following is classified as a *contraindication* to urethral catheterisation according to clinical guidance?

A. Post-operative bladder management
B. Functional incontinence
C. Neurogenic bladder
D. **Suspected urethral injury**
E. Limited dexterity

4. Which of the following statements best describes a "false passage"?

A. **A tract created when a catheter perforates the urethral wall**
B. A blocked catheter lumen
C. A congenital narrowing of the urethra
D. A route for urine to bypass the kidneys

E. A catheter left in the bladder too long

5. Intermittent self-catheterisation (ISC) is generally preferable to indwelling catheterisation in which of the following scenarios?

A. **Patients with bladder emptying dysfunction**
B. Patients with frequent UTIs
C. Patients with priapism
D. Patients with urethral trauma
E. Patients with recent urethral surgery

6. Which of the following is an appropriate alternative to urethral catheterisation for a male patient with functional incontinence?

A. Bladder irrigation
B. Urethral dilator
C. **External sheath**
D. Indwelling suprapubic catheter
E. IV diuretics

7. What is one of the *main benefits* of using a bladder scanner instead of inserting a catheter to assess residual volume?

A. It measures urine pH levels
B. **It reduces infection risk by avoiding catheter use**
C. It improves patient hydration
D. It allows for immediate antibiotic therapy
E. It eliminates the need for clinical observation

8. Which of the following is an appropriate indication for bladder irrigation?

A. Treating urinary frequency
B. **Managing haematuria with clots**
C. Assessing renal output in ICU
D. Preventing urinary retention
E. Collecting a routine urine sample

9. In which of the following patient scenarios should *caution* be used—rather than complete avoidance—when inserting a urethral catheter?

A. Acute urinary retention
B. **Female genital mutilation**
C. Functional incontinence
D. Suspected urethral tumour
E. Priapism

10. Which of the following statements about external urinary collection devices (EUCDs) is TRUE?

A. They are inserted into the bladder
B. They should only be used with spinal cord injuries
C. They require catheter lubricants
D. **They are non-invasive and used externally**
E. They replace the need for continence assessment

5 Catheter Equipment and Selection

Module Introduction

Urinary catheters and related equipment are medical devices. HCPs must therefore understand the importance of research and audit for the appropriate evaluation, selection and use of urinary catheters and associated catheter equipment.

Important Note on Local Policy and Guidelines

This module is based on current national guidelines and best available evidence to support safe and effective practice. However, it is essential that healthcare professionals always follow their organisation's local policies, procedures, and governance frameworks.

In many localities, prescribing formularies and equipment lists are in place to guide decision-making around product selection, including catheter types, lubricants, and drainage systems. These local documents reflect approved items for use within the organisation and should be referred to when making clinical choices.

Where national guidance and local policy differ, local policy must take precedence.

Module Learning Objectives

By the end of this module, learners will be able to:

- Identify the key factors influencing urinary catheter selection, including material, size, length, and tip type.
- Describe the appropriate use and duration for different catheter materials.
- Explain the rationale for using catheter trays and lubricating gels in practice.
- Apply best practice principles in selecting and using catheters to minimise patient harm and infection risk.

Selection of a catheter

Catheter products require a CE mark. This is a declaration of conformity by the manufacturer that the device is fit for intended purpose and meets legislation relating to safety (RCN, 2021).

Types of material and coating

The catheter's material determines how long it can safely remain in situ. This should be matched to clinical need and reviewed regularly (RCN, 2021; EAUN, 2022). Always follow the manufacturer's instructions for use.

Catheter material / coating	Advantages	Disadvantages	Recommended use
Latex	• Flexible • Cheap	• Not suitable for • people with latex • allergy • More risk of • irritation	Short-term
Silicone	• Wider lumen than latex • Less encrustation • Suitable for people with latex allergy • May reduce mucosal encrustation	• Less flexible • Balloon may shrink due to fluid loss through diffusion	Long-term
Hydrogel-coated latex	• May reduce friction during insertion • May reduce	• Not suitable for people with latex allergy	Long-term

	encrustation		
Silicone-coated latex	• Flexibility between latex and pure silicone • Biocompatibility of silicone and flexibility of latex	• Not suitable for people with latex allergy	Long-term
PTFE (Teflon)-coated latex	• Prevents encrustation and irritation	• Not suitable for people with latex allergy	Long-term
Silver alloy-coated	• Reduces biofilm-formation	• May be more expensive	Short-term

Note: Latex-containing catheters must not be used in patients with known or suspected latex allergy (RCN, 2021).

Diameter and length

Catheter diameter is measured in Charrière (Ch or CH) also known as French Gauge (F, Fr or FG) and indicates the external diameter. 1 mm = 3 Ch and the sizes range from Ch 6 to 30 (EAUN, 2024):

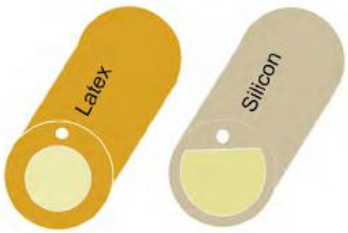
- Female patients: typically 12–14 Ch
- Male patients: typically 12–16 Ch

Using a catheter that is too large can lead to pain, urethral trauma, strictures, and pressure injury. **Use the smallest size that allows effective drainage** (RCN, 2021).

Color		Size French	Size Millimeter
	Green	6	2.0
	Blue	8	2.7
	Black	10	3.3
	White	12	4.0
	Green	14	4.7
	Orange	16	5.3
	Red	18	6.0
	Yellow	20	6.7
	Purple	22	7.3
	Blue	24	8.0
	Black	26	8.7

[Example image provided for reference only – requires permissions]

The inner lumen of the catheter varies between different catheter materials; e.g., latex and silicone, so inserting a larger Charrière catheter does not necessarily ensure a wider drainage channel (EAUN, 2024).



[Example image provided for reference only – requires permissions]

Catheter Length

- Female: 26 cm
- Male (standard): 40 cm

The female length catheter should not be used for men as inflation of the balloon within the urethra can result in severe trauma (EAUN, 2024)

Tip Design (EAUN, 2024)

There are a wide variety of catheter tips. The two main tips are the straight tip and

coudé tip. Coudé is French and means a catheter which is bended slightly at the tip.

Straight tip (Nelaton tip)

A catheter with a standard round tip with drainage eyes is called a Nelaton catheter. For routine catheterisation, a straight-tipped catheter should be used.

Bended tip (coudé tip)

There are three different coudé tip designs:

Tiemann

The Tiemann catheter with the curved tip is designed to negotiate the male prostatic curve and can be helpful for difficult insertions.

Olive tip

The olive tip is a little larger than a standard tip but the circular shape allows to widen narrow urethras. The rounded end helps to avoid to get stuck in any obstruction.

Tapered tip

The tapered tip catheter has a curved tip just like the Tiemann catheter but has one, two or three drainage eyes situated in the curved tip.

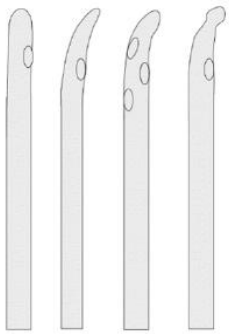


Fig. 14 From left to right: Nelaton tip, Tiemann tip, tapered tip and olive tip

[Example image provided for reference only – requires permissions]

Balloon Sizes

When the catheter has been placed in the bladder, the balloon can be inflated

according to manufacturer's instructions (EAUN, 2024).

Balloon Type	Recommended Volume
Standard two-way catheter	10 mL
Three-way / post-prostate surgery	30 mL

To make sure the catheter is not inflated in the urethra, insert the catheter until the hub/bifurcation before filling the balloon, especially in men (EAUN, 2024)

Under- or overinflation can cause occlusion of drainage eyes, irritate the bladder wall, and lead to bladder spasms (EAUN, 2024).

Catheterisation Sets (EAUN, 2024)

Different types of catheter sets (may also referred to as "packs" or "trays") are available for indwelling and suprapubic catheterisation (refer to local policy or product formulary). There is no standard list of materials for a catheterisation set.

A catheter set could contain gloves, underlay, cotton balls and gauzes, forceps, and aperture drape for the preparatory stage of catheterisation. It also provides the lubricating gel for the introduction of the urinary catheter and sterile water for inflating the balloon of a self-retaining Foley catheter.

Lubricating Gel

- Insertion of a urinary catheter, both suprapubic and urethral, requires the use of an appropriate lubricant so that trauma, discomfort and the risk of infection can be minimised (Loveday et al, 2014).
- The lubricant dilates and lubricates the urethra. The lubricant does not need to be antiseptic or anaesthetic.

Four types of lubricants can be distinguished:

1. Water soluble
2. Water soluble with chlorhexidine (antiseptic)
3. Water soluble with anaesthetic lignocaine/lidocaine
4. Water soluble with anaesthetic lignocaine/lidocaine and chlorhexidine (EAUN 2024)

- If the lubricant contains lignocaine/lidocaine or chlorhexidine, care should be taken if the patient has an open wound, or severe damaged mucous membranes and/or infections in the regions where the lubricant will be used.
- Rare but serious allergic reactions (anaphylaxis) have been reported with widely used skin antiseptic products and lubricants containing chlorhexidine gluconate. (EAUN 2024).

Catheter Securement Devices

Purpose and Function

Securement devices are designed to secure the catheter to prevent movement, reduce trauma, and improve patient comfort.

Key Features

- **Catheter stabilisation devices, and adhesive securement devices**.
- Helps prevent **catheter dislodgement and urethral trauma**.
- Reduces risk of **bladder spasms and discomfort**.

Which Patients Require Them?

- All patients with indwelling catheters (urethral and suprapubic).
- Patients prone to catheter movement or accidental pulling.
- Patients experiencing bladder spasms or discomfort from catheter displacement.

Best Practices for Use:

- Secure the catheter at the thigh to prevent movement.
- Ensure firm but comfortable placement to avoid pressure injuries.

- Replace every 5-7 days (according to manufacturer's instructions or as needed).

Catheter Valves

Catheter valves give the patient more freedom to move and a more discreet drainage option. Most valves are designed to fit with linked systems so it is possible to connect them to a drainage bag. For example, at night-time and for long journeys. The valves provide a well-accepted system of bladder emptying for suitable patients who are able to manipulate the valve mechanism and empty the bladder regularly to avoid overfilling.

Valves are inexpensive and could help patients have a better catheter experience so should be considered; however it is not an optimal solution for all patients, especially those with poor bladder compliance due to possible upper tract deterioration.

The catheter valve is contraindicated in patients with:

- Urological surgery requiring an empty bladder postoperatively (prostatectomy, nephrectomy with removal of ureter and in case of bladder perforation)
- Short time catheter use postoperatively (to relieve pressure on the bladder)
- A risk of upper tract deterioration (patients with poor bladder compliance)
- Severe cognitive impairment (the patient must be able to recognise the need to empty the bladder through sensation or on a timed schedule)
- Overactive bladder syndrome; might cause urinary leakage
- Ureteral reflux or renal impairment
- Small or limited bladder capacity; the valve would have to be opened often
- UTI
- Poor manual dexterity, (EAUN, 2024).

When using valves:

- Ensure the patient has good dexterity and cognitive ability to operate the valve.

  They should open the valve every 3-4 hours to prevent overfilling.

- If the patient experiences bladder pain, check for overdistension and consider reducing intervals.
- Replace valve every 5-7 days unless soiled or damaged, using a clean technique and taking care not to touch the key parts.

Catheter Drainage Bags

Indwelling catheters should be connected to a sterile closed urinary drainage system or catheter valve. Healthcare workers should ensure that the connection between the catheter and the urinary drainage system is not broken, except for good clinical reasons (for example, changing the bag in line with the manufacturer's recommendations)

There are many different bags available; selection of the bag depends on whether it is for short-term drainage at the hospital or for long-term use, the patient's mobility, cognitive function, daily life etc. The bags can have a variety of special features. (EAUN 2024)

Day Bags

Day drainage bags are used for collecting urine during the patient's waking hours. They are typically attached to the catheter via tubing and secured to the patient's leg using straps or a sleeve for mobility.

Key features

- **Capacity:** usually 350ml to 1L (designed for frequent emptying).
- **Tubing:** can have long or short tubing to accommodate patient mobility.
- **Ports:** equipped with a non-return valve to prevent backflow and reduce infection risk.
- **Emptying mechanism**: taps or lever taps allow controlled emptying.

Which patients require them?

- Patients who are mobile and active.

- Patients with indwelling urethral or suprapubic catheters.
- Patients using catheter valves who may need a collection option.

Best practices for use

- Secure to the patient's leg with leg straps or a sleeve to prevent pulling.
- Keep the bag below bladder level to ensure proper drainage.
- Empty when two-thirds full to avoid excessive weight pulling on the catheter.
- Replace every 5-7 days unless soiled or damaged, Bags should be changed using a clean technique, taking care not to touch the key parts.

Night Bags/Large capacity bags

Night drainage bags are designed for overnight urine collection or if patients pass high volumes of urine. They have a larger capacity than day bags to reduce the need for frequent emptying. (EAUN 2024)

Key features

- **Capacity:** 2L to 3L
- **Tubing:** Longer tubing to allow the patient to move while in bed.

Which patients require them?

- Patients using day bags who require increased capacity overnight.
- Patients with high urine output (e.g., diuretic use, heart disease).
- Patients who are bedbound or have limited mobility.

Combination of leg bag and overnight/bedside bag

Large capacity bags can also be used as overnight bags. Patients normally require a 2L drainage bag that is connected to the leg bag at night. The outlet tap on the leg bag is left open so that the urine collects in the larger bag without breaking the

closed drainage system. The night bag requires a stand for support, to reduce the risk of dislodging the link system. (EAUN 2024)

Best Practices for Use

- Attach to the day bag/valve before bed
- Position the bag below bladder level on a nightstand or drainage stand to prevent reflux.
- Use a sterile single-use night bag where possible to reduce infection risk.

5 Catheter Equipment and Selection

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5 Catheter Equipment and Selection

Knowledge Check

Example multiple choice questions (correct answers highlighted):

1. What does the CE mark on catheter products indicate?

Approval by the NHS

A. Compliance with manufacturer's branding
B. **Conformity with safety and legal standards for intended use**
C. Suitability for patients with allergies
D. Recyclability of the device

2. Which catheter material is most appropriate for a patient with a known latex allergy?

A. Hydrogel-coated latex
B. PTFE-coated latex
C. **Silicone**
D. Silicone-coated latex
E. Latex

3. What is the most appropriate catheter size (Charrière) for routine use in female patients?

A. 10–12 Ch
B. 6–8 Ch
C. 14–16 Ch
D. **12–14 Ch**
E. 18–20 Ch

4. What is the primary risk of using a catheter that is too large for the patient?

A. Blocked drainage eyes
B. **Pain and urethral trauma**
C. Infection due to backflow

D. Balloon rupture

E. Shortened wear time

5. When should the balloon of an indwelling catheter be inflated?

A. Before insertion begins

B. After the first urine is seen

C. **After insertion to the catheter bifurcation/hub**

D. Once the patient is comfortable

E. 2 cm past the external meatus

6. What is the typical balloon volume for a standard two-way Foley catheter?

A. 5 mL

B. **10 mL**

C. 15 mL

D. 20 mL

E. 30 mL

7. What is the recommended practice for catheter securement in patients with indwelling catheters?

A. Avoid securement to improve mobility

B. Use an adhesive dressing over the insertion site

C. **Secure to the patient's thigh to prevent movement**

D. Secure to the abdomen for ease of access

E. Change securement device every 14 days

8. What is a best practice for managing urinary drainage bags?

A. Keep the bag above bladder level to assist flow

B. Replace every 10–14 days

C. Disconnect regularly to prevent backflow

D. **Secure below bladder level and empty when two-thirds full**

E. Only use night bags during hospital admission

9. What should a healthcare professional do when national guidance differs from local policy?

A. Always follow national guidance
B. Use their own clinical judgement
C. Refer the decision to a pharmacist
D. Follow local policy and procedures
E. Choose the option most convenient for the patient

10. Which of the following patients is most likely contraindicated for use of a catheter valve?

A. A patient with stable renal function
B. **A patient recovering from recent prostate surgery**
C. A patient with good manual dexterity
D. A patient requesting discreet drainage
E. A patient who can empty the bladder on a timed schedule

6 Catheter Related Procedures

Module Introduction

This e-learning module is designed to provide an overview of evidence-based best practice and to support the development of knowledge and understanding. It is not intended to replace formal training or detailed procedural instruction. Learners must always follow their organisation's local policies, procedures, and clinical guidelines. These local documents take precedence and may include specific requirements, product choices, or processes tailored to the local setting.

Please note: this resource does not contain full, step-by-step procedural instructions. Any practical skills must be undertaken in accordance with locally approved training and supervision arrangements, and only within the scope of your professional role and competence.

Module Learning Objectives

By the end of this section, learners will be able to:

1. Explain the principles of Aseptic Non-Touch Technique (ANTT) in urinary catheterisation.
2. Identify common complications of catheterisation and outline prevention strategies.
3. Apply infection prevention and control measures in accordance with national guidelines.
4. Explain the indications and contraindications for suprapubic catheterisation.
5. Identify common complications associated with suprapubic catheter use and appropriate management strategies.
6. Outline best practice for ongoing care and patient education, including the use of drainage systems.
7. Explain the purpose of Trial Without Catheter (TWOC).

Aseptic Non-Touch Technique (ANTT)

Aseptic Non-Touch Technique (ANTT) is a fundamental infection prevention strategy used during urinary catheterisation to reduce the risk of catheter-associated urinary tract infections (CAUTIs). It is a standardised, evidence-based approach that ensures critical sterile components (such as the catheter tip) remain untouched, preventing the introduction of microorganisms into the urinary tract (RCN, 2021).

The urethra acts as a direct pathway into the bladder, and catheterisation presents a high risk for infection if aseptic technique is compromised. Without strict adherence, patients are significantly more likely to develop bladder inflammation and CAUTIs.

Why ANTT is Critical in Catheterisation

- **Reduces infection risk:** Prevents bacteria from entering the urethra.
- **Promotes asepsis:** Maintains sterility by avoiding contact with key parts.
- **Supports consistency and safety:** Standardises best practices and reduces variation.

Adherence to ANTT principles during catheterisation is shown to significantly lower infection rates and enhance patient outcomes (RCN, 2021; Loveday et al., 2014).

Core Principles of ANTT

According to RCN Catheter Care Guidance (2021), ANTT involves:

1. **Hand hygiene:** Wash hands thoroughly and apply alcohol-based hand rub before and after the procedure.
2. **Non-touch technique:** Never touch key sterile parts, such as the catheter tip or drainage tubing.
3. **Sterile equipment:** Use single-use sterile gloves, drapes, and catheterisation packs.
4. **Controlled environment:** Perform the procedure in a clean environment with minimal airflow disturbance.



[Example image provided for reference only – requires permissions]

Male Urethral Catheterisation

Male catheterisation requires anatomical understanding and careful technique. The male urethra is approximately 18–22 cm in length and passes through the prostate gland, making insertion more complex—particularly in older men with prostatic enlargement (RCN, 2021).

Always follow local policies and the manufacturer's instructions for use.

Preparation and Infection Control (RCN, 2021)

- Explain the procedure and obtain informed consent.
- Check for allergies (latex, lubricants, antiseptics).
- Position patient supine with legs apart.
- Perform hand hygiene and apply alcohol-based hand rub.

Aseptic Setup and Catheter Insertion

- Open the sterile catheter pack without contaminating key parts.

- Don sterile gloves to handle equipment.
- Clean the penile and urethral area with sterile saline or chlorhexidine.
- Instil sterile lubricating gel into the urethra and allow time for effect.
- Change gloves and reapply sterile gloves.
- Retract foreskin (if present) to expose the urethral meatus.
- Hold the penis at a 60–90° angle.
- Insert the catheter slowly until urine flows.
- Advance 2–3 cm further to ensure full bladder entry.
- Inflate the balloon with sterile water per manufacturer instructions.
- Attach drainage system if required.
- Return the foreskin to its natural position to prevent paraphimosis.
- Secure catheter and perform hand hygiene.

Complications: Male Catheterisation

Urethral Trauma and False Passage (RCN, 2021)

Causes:

- Forcing catheter past resistance.
- Inappropriate angle during insertion.
- Enlarged prostate causing obstruction.
- Balloon inflated before full insertion.

Signs:

- Urethral bleeding.
- Pain or discomfort.
- Insertion resistance beyond the prostatic region.

Prevention:

- Stop if resistance is met—never force.
- Use smallest appropriate catheter size.
- Apply adequate lubrication.
- Confirm urine flow before balloon inflation.
- Consider Tiemann catheters for known prostatic enlargement (requires additional training and/or senior input).

Female Urethral Catheterisation

Although often perceived as simpler, female urethral catheterisation requires equal precision. The female urethra is approximately 4–6 cm long, increasing the risk of ascending infections like UTIs (RCN, 2021).

Always follow local policies and manufacturer guidance.

Preparation and Infection Control (RCN, 2021)

- Explain the procedure and obtain informed consent.
- Check for allergies (latex, lubricants, antiseptics).
- Position the patient in a dorsal recumbent position.
- Perform hand hygiene and apply alcohol-based hand rub.

Aseptic Setup and Catheter Insertion

- Open the sterile pack without contaminating key parts.
- Use sterile gloves and forceps to handle equipment.
- Clean the perineal area with sterile saline or chlorhexidine.
- Instil lubricating gel into the urethra and allow time for effect.
- Change gloves and apply sterile gloves.
- Gently insert the catheter until urine is seen.
- Advance 2–3 cm to ensure bladder placement.

- Inflate the balloon with sterile water.
- Attach drainage system if required.
- Secure catheter and perform hand hygiene.

Complications: Female Catheterisation

Urethral Trauma and Discomfort

Causes:

- Inadequate lubrication or rough technique.
- Forcing catheter past resistance.
- Early balloon inflation.
- Oversized catheter.

Signs:

- Pain or burning on insertion.
- Haematuria.
- Urethral swelling or redness.

Prevention:

- Use 12–14 Fr catheter unless otherwise indicated.
- Do not force catheter—stop and reassess if resistance is met.
- Ensure adequate lubrication.
- Inflate balloon only after confirming urine flow.

Suprapubic Catheterisation

Suprapubic catheterisation is the insertion of a catheter directly into the bladder through the lower abdominal wall to drain urine. For initial insertion sterile technique

is used and the procedure is normally carried out by a urologist (EAUN, 2024).

It is an alternative to urethral catheterisation and is commonly used when urethral catheterisation is not possible or appropriate. Suprapubic catheterisation is often preferred in spinal cord injury patients because it avoids urethral trauma and facilitates sexual function (EAUN, 2024).

Indications for suprapubic catheterisation (EAUN, 2024)

In addition to the indications of the urethral catheterisation the following indications apply:

- Acute and chronic urine retention that cannot be adequately drained with a urethral catheter.
- Preferred by patient due to their needs, e.g., user of a wheelchair, sexual issues.
- Acute prostatitis
- Fournier's gangrene
- Urethral stricture or obstruction, abnormal urethral anatomy
- Urethral or pelvic trauma
- Complications to long-term urethral catheterisation
- When long-term catheterisation is used to manage incontinence
- Complex urethral or abdominal surgery
- Patients with faecal incontinence who are constantly soiling the urethral catheter
- To protect a perineal wound from urinary contamination

Contraindications for Suprapubic Catheterisation

Suprapubic catheterisation should not be performed in the following situations (RCN,

2021):

- **Inability to distend the bladder**: If the bladder cannot be filled with fluid or visualised on ultrasound, safe insertion may not be possible.
- **Bladder cancer or suspected malignancy**: Tumours in the bladder may increase the risk of perforation or seeding cancer cells into surrounding tissue.
- **Blood clotting disorders**: Patients with coagulopathies or on anticoagulation therapy have an increased risk of haemorrhage.
- **Ascites or abdominal distension**: Large volumes of fluid in the abdominal cavity can interfere with catheter placement.
- **Previous lower abdominal surgery**: Scarring or adhesions may make catheter insertion difficult or dangerous.
- **Presence of prosthetic devices**: Patients with hernia mesh or other prosthetic implants in the lower abdomen may be at increased risk of complications.

Changing a suprapubic catheter

Following the initial insertion of a suprapubic catheter, the catheter must stay in place for 4 to 6 weeks, depending on local guidelines. This allows time for the tract to become established EAUN (2024).

First change of a suprapubic catheter

There are potential risks when changing a suprapubic catheter (for example, the loss of the tract), therefore, the first change must be done without delay so that the cystostomy is not allowed to close. Local guidelines should state where and when the first change of a suprapubic catheter should take place.

Usually, the same size catheter is replaced, generally standard length 16-18ch

unless otherwise indicated.

Subsequent changes of a suprapubic catheter

Subsequent changes, when the cystostomy is established, are not so time critical but do need to be carried out immediately after removal of the old catheter. Most uncomplicated changes occur in a community setting or within the patient's own home.

Subsequent changes should be undertaken on an individual basis, when clinically indicated, or when local protocols dictate. Training and experience in changing a suprapubic catheter is essential.

Only appropriately trained staff should undertake a suprapubic catheter change and they should ensure that they comply with local protocol and procedures. It is also important that checks are made with the manufacturer to ensure that the catheters, and any lubricant used, are licensed for suprapubic usage (EAUN, 2024).

Incorrect insertion into the bladder can potentially lead to tissue trauma of the suprapubic tract. Further complications can be caused if the catheter is inserted too far; the catheter can advance into the urethra, resulting in trauma when the balloon is inflated.

When changing a suprapubic catheter, it is essential to observe:

- the lie of the existing catheter
- the angle of insertion
- how much of the catheter length is viable outside of the body.

On insertion of the catheter, advance the catheter into the tract 3 cm deeper than the removed catheter. If no urine drains, gently apply pressure on the symphysis pubic area.

Once urine starts to drain, slowly inflate the catheter balloon according to the manufacturer's instructions. Withdraw the catheter slightly and attach the drainage

bag (if this has not already been done) and secure with the appropriate support strap (EAUN, 2024).

Dressings

Dressings are often unnecessary and are best avoided, if a dressing is used to contain a discharge this should be undertaken with strict aseptic technique to protect against infection. Wherever possible, patients should be encouraged to change their own dressing (EAUN, 2024).

Suprapubic catheter complications:

Swelling, infection, cellulitis and over granulation of the cystostomy site.

To help prevent over granulation the EAUN (2024) recommend changing the angle of the balloon so that the catheter lies externally against the abdominal wall. An appropriate catheter fixation device should be used to reduce migration and potential trauma. To reduce infection, always ensure good hand hygiene is performed prior to any intervention, and ensure an aseptic technique is followed during catheter changes. National guidelines recommend that daily cleansing of the site with soap and water is all that is required as excess cleansing may increase the risk of infection (EAUN, 2024).

Cuffing and/or encrustation can make suprapubic catheter removal difficult, causing pain and trauma. This has often been associated with all-silicone catheters. EAUN (2024) recommend that by leaving the catheter in situ for five minutes after deflating the balloon, allows the catheter to regain its original shape. Then, on removal, rotate the catheter slowly. The use of an all-silicone catheter with an integral balloon may help reduce the risk of cuffing.

Bladder stones are more prevalent in suprapubic catheterisation than in urethral catheterisation, and can cause recurrent urinary tract infections, haematuria and catheter blockages. The EAUN (2024) recommend that frequent catheter blockages should be investigated using a cystoscopy as these blockages are often related to

the development of bladder stones.

Documentation

Once any catheter has been inserted it is imperative to document it (RCN, 2021).

Good documentation:

- contributes to and establishes a diagnosis
- influences a care bundle and pathway of catheter care for an individual patient
- is a legal record of care bundle provision and what actually happened
- provides effective communication for other health care professionals involved in a patient's care
- is a point of reference and can be used to influence decisions for further interventions
- facilitates product tracing (if for any reason an individual patient experience product failure) document product, lot no. etc.
- provides a record for the investigation of complaints and/or litigation
- facilitates critical reflective thinking
- offers a focus for clinical professional supervision and identification of learning needs
- completes an episode of care, end of a procedure or care bundle (group of procedures, tasks or activities forming a bundle of care).
- Ensure all documentation is audit friendly and understood by the patient. You must be thorough in how consent is recorded and documented, whether it is written or verbally provided.

You should consider including the following information in your catheter insertion documentation:

- The reason for the catheterisation, catheter change or ongoing need for a

catheter with all its risks.

- The results of any risk assessment prior to catheterisation.
- The health status of the patient prior to catheterisation – well/unwell.
- Is the patient febrile, do they have a temperature (over 39°C, are blood cultures needed?
- If taking antibiotics for a urinary tract infection, are these appropriate and still required?
- Is the individual patient in any form of localised discomfort or pain?
- It may be necessary to record fluid intake balanced against urinary output and, in some cases, this may be ongoing (for example, renal function and or failure).
- The use of a bladder scanner to determine bladder capacity, pre and post void residuals.
- Allergy status (for example, latex, gels and medication).
- Has consent been obtained for the procedure? Some organisations now require this to be in written form.
- If antibiotic cover has been used, state drug and dosage. Check prescription is correctly written and document administration of medicine.
- Meatal or genital abnormalities observed, including discharge.
- If the insertion was easy or difficult.
- Relevant information should also be recorded in the patient's catheter passport.

Trial Without Catheter

A Trial Without Catheter (TWOC) is a structured process in which a patient's indwelling urinary catheter is removed to assess whether they can pass urine

independently.

This is a key step in reducing unnecessary catheter use and preventing long-term complications such as catheter-associated urinary tract infections (CAUTIs), bladder atrophy, and urethral trauma (RCN, 2021).

Common examples of when a TWOC should be considered include (RCN, 2021):

- to assess voiding function post-operatively
- following an episode of acute urinary retention

Always refer to your local policy and guidelines when assessing suitability for and undertaking TWOC.

Urinalysis

Urinalysis should not be routinely performed on all long-term catheterised patients, as nearly all patients will have bacteria present in their urine. Unjustified ordering or improper collection of urine for urinalysis or culture from catheterised patients often leads to adverse health care events, including over-treatment of patients with antimicrobial agents and thus predisposing to the development of multidrug-resistant organisms. The use of a dipstick to detect UTI is not recommended. (EAUN, 2024).

Indications

Urinalysis/catheter specimen of urine should be undertaken when:

1. Patients are systemically unwell
2. Patients have a high temperature
3. After lack of response to treatment
4. Admitted/transferred to hospital to ascertain the presence of hospital- or community-acquired infection.

A urine specimen for culture should be obtained prior to initiating antimicrobial therapy for presumed CAUTI due to the wide spectrum of potential infecting organisms and the increased likelihood of antimicrobial resistance.

Urine samples from a catheter must be obtained using aseptic technique from the needle-free sampling port by syringe aspiration. The sampling port has been specially designed to re-seal after aspiration of the urine sample (EAUN, 2024)

Urine samples must be obtained from a sampling port using an aseptic technique (NICE, 2024).

EAUN. (2024). *Evidence-based guidelines for best practice in urological health care: Catheterisation – Indwelling catheters in adults. Urethral and suprapubic.* European Association of Urology Nurses.
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6 Catheter Related Procedures

Knowledge Check

Example multiple choice questions (correct answers highlighted):

1. What is the primary purpose of using Aseptic Non-Touch Technique (ANTT) during urinary catheterisation?

A. To speed up the catheter insertion process
B. **To reduce the risk of catheter-associated urinary tract infections (CAUTIs)**
C. To allow reuse of sterile equipment
D. To avoid the need for hand hygiene
E. To eliminate the need for sterile gloves

2. Which of the following is NOT a core principle of Aseptic Non-Touch Technique (ANTT)?

A. Hand hygiene before and after the procedure
B. Non-touch of key sterile parts such as the catheter tip
C. Use of sterile equipment including gloves and drapes
D. **Performing the procedure in a high airflow environment to prevent contamination**
E. Maintaining a sterile field throughout the procedure

3. What anatomical feature of the male urethra makes catheter insertion more complex?

A. It is very short, about 2–3 cm
B. **It passes through the prostate gland, which can enlarge with age**
C. It has multiple branches increasing insertion difficulty
D. It is located externally and is easily visible
E. It has a wider diameter than the female urethra

4. What is the correct patient position for female urethral catheterisation?

A. Supine with legs together
B. **Dorsal recumbent position**
C. Sitting upright
D. Prone position
E. Lithotomy position

5. Which of the following is a cause of urethral trauma during male catheterisation?

A. Adequate lubrication
B. **Inflating the balloon before the catheter is fully inserted**
C. Using the smallest catheter size available
D. Stopping if resistance is met
E. Inserting the catheter slowly and carefully

6. Which patients are most likely to be candidates for suprapubic catheterisation?

A. **Patients with acute and chronic urine retention not adequately drained by urethral catheter**
B. Patients without bladder issues but requiring short-term catheterisation
C. Patients with no contraindications to urethral catheterisation
D. Patients with a recent urinary tract infection only
E. Patients who refuse urethral catheterisation due to discomfort

7. What is a contraindication for suprapubic catheterisation?

A. Urethral stricture
B. **Previous lower abdominal surgery with scarring**
C. Spinal cord injury
D. Patient preference
E. Bladder cancer

8. How long should the initial suprapubic catheter remain in place after insertion to allow the tract to establish?

A. 1–2 days
B. **4–6 weeks**
C. 3 months
D. 24 hours
E. 10 days

9. Which of the following best describes good documentation practice after catheter insertion?

A. Only record the procedure if complications arise
B. **Document the reason for catheterisation, risk assessment, consent, and any patient allergies**
C. Leave documentation until the next shift for completion
D. Use only verbal consent and no written records
E. Document only the catheter size and insertion date

10. What is the purpose of a Trial Without Catheter (TWO?

A. To test the effectiveness of a new catheter brand
B. **To assess whether a patient can urinate independently after catheter removal**
C. To permanently remove the need for a catheter in all patients
D. To reduce the risk of infection during catheter changes
E. To drain the bladder more efficiently

11. Why should routine urinalysis not be performed on all long-term catheterised patients?

A. **Because bacteria are almost always present and do not necessarily indicate infection**
B. Because it is expensive and time-consuming
C. Because urine samples are difficult to collect
D. Because catheter-associated infections do not exist
E. Because antibiotic treatment is always unnecessary

12. How should urine samples be collected from catheterised patients for culture?

A. From the drainage bag using a clean cup
B. By disconnecting the catheter and collecting midstream urine
C. **Using aseptic technique from the needle-free sampling port by syringe aspiration**
D. By inserting a new catheter for the sample
E. Collecting directly from the catheter tip after removal

7 Catheter Care & Maintenance

Module Introduction

Catheter care and maintenance is crucial for preventing infections, maintaining patient comfort, and ensuring the effective functioning of the catheter.

Catheters increase the risk of UTIs, which can have serious health consequences. Good care and maintenance significantly reduce this risk and helps prevent skin breakdown and other possible complications.

Established protocols should be followed when maintaining catheters, and patients should receive adequate education on catheter care and maintenance to ensure they can effectively manage their catheters at home.

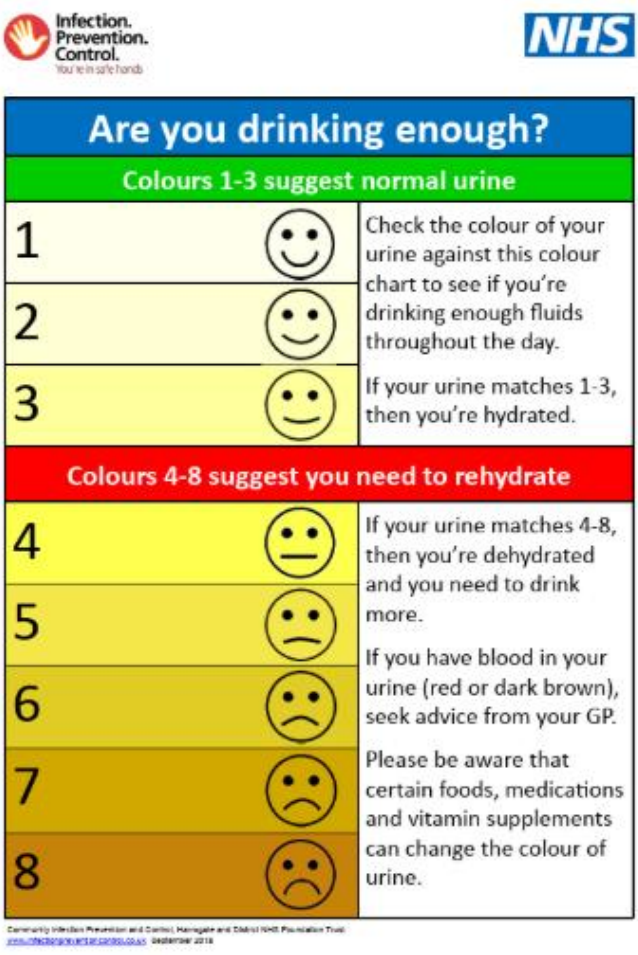
Module Learning Objectives

By the end of this section, learners will be able to:

1. Explain the importance of adequate hydration in reducing the risk of catheter blockages and urinary tract infections.
2. Identify the recommended daily fluid intake for catheterised patients and recognise common signs of dehydration.
3. Describe how diet and medications can affect urine colour and odour, and how to effectively reassure patients and carers about these changes.
4. Discuss the impact of constipation on catheter drainage and outline strategies to support bowel regularity and prevent complications.
5. Apply best practice in personal hygiene and meatal care, including specific care considerations for male patients, to maintain catheter site cleanliness and prevent infection.
6. Implement measures to maintain a closed drainage system and ensure correct positioning and timely emptying of catheter bags to prevent backflow and infection.
7. Support patients and carers in self-managing catheter care by providing clear education, resources, and guidance on hygiene, drainage systems, recognising complications, and accessing support.

Hydration (RCN, 2021)
Proper bladder care is essential for catheterised patients to prevent complications such as infections, blockages, and discomfort. The following principles help maintain optimal bladder function and patient well-being. (RCN Guidance, p. 48-54)

1. **Hydration's role in catheter care:** Drinking sufficient fluids helps keep urine diluted, reducing the risk of catheter blockage from a build-up of sediment or encrustation and urinary tract infections (UTIs).
2. **Daily fluid intake:** Patients should drink **1.5-2 litres of fluids per day**, unless contraindicated.
3. **Monitoring hydration status:** Healthcare staff should check fluid intake levels daily and educate patients about the importance of hydration. (RCN, 2021.
4. **Signs of dehydration:** Dark urine, strong odour, dry mouth, dizziness, and confusion—especially in elderly patients.



[Example -image provided for reference only – requires permissions]

Changes in urine due to food and medication

The presence of an appliance for collecting urine increases patients' awareness of odour and colour changes affecting the urine caused by some drugs and food products. Patients and carers should be told that these changes are not harmful and do not necessarily occur in all patients. Normal urine is clear, straw coloured with almost no odour. A pungent odour, due to the production of ammonia, is typical of most bacterial urinary tract infection, whereas there is often a sweet or fruity odour with ketones in the urine. Some rare conditions confer a characteristic odour to the urine. (EAUN 2024)

Constipation

Constipation may cause pressure on the drainage lumen that prevents the catheter from draining adequately, which can cause ureteric reflux and back pressure on the kidneys. Chronic constipation may also cause leaking of urine and bladder spasms. Maintaining regular bowel function with a high-fibre and high-fluid intake helps prevent constipation. (EAUN 2024)

Hygiene and Skin Care

Clean the catheter insertion site daily, according to local policy. It is recommended that the meatus is washed daily with soap and water as part of routine daily personal hygiene (NICE, 2024). Male patients must gently pull the foreskin back (if present) to cleanse the area. The foreskin must be returned to its usual position after cleansing to avoid paraphimosis (EAUN, 2024).

Closed Drainage Systems

Maintain a closed drainage system and avoid unnecessary disconnections. A closed catheter drainage system is an aseptic system in which the path from the tip of the catheter inserted into the bladder, to the bag which catches urine, is closed and should not be disconnected unnecessarily. This is intended to eliminate inoculation of the urinary tract with bacteria via the catheter drainage tubing and from the collection bag (EAUN, 2024).

Positioning and drainage

1. Ensure the drainage bag is correctly positioned **below bladder level** to promote continuous emptying
2. Ensure that the drainage system allows free flow of urine to prevent backflow, stagnation and infections.
3. Empty the bag before it's completely full (around half to three-quarters). Valves should be used to drain urine at regular intervals throughout the day to prevent urine building up in the bladder.
4. Leg bags and valves should be changed every 5-7 days, bags should be labeled with change date. (NHS website)

Securement

Catheter securement devices are designed to prevent excessive traction of the catheter against the bladder neck or inadvertent catheter removal. There are different kinds of securement devices such as tape, Velcro (EAUN 2024)
An appropriate catheter fixation device should always be used to reduce migration and potential trauma (RCN 2021).

Social and psychological implications

Consider the psychological implications of catheterisation: how is the patient coping with the catheter, how do they feel about having a urinary catheter? Does the catheter impact on their lifestyle and quality of life? Discuss any concerns, such as the potential impact on employment and home life (including sexual activity, sports and recreation, body image and confidence, socialising, travel and holidays). Provide support, reassurance and information to the patient. (RCN 2021)

Patient Advice

Patients who independently manage their catheter care must be provided with appropriate support. Practical planned education and written information is required to ensure the patient can competently care for their catheter. This education must include hand decontamination and personal hygiene information to maintain infection

control (RCN 2021).

All patients and carers should be provided with written and verbal information to support the following:

- Knowledge about simple anatomy of the urinary tract
- What is a catheter, and position of the catheter in the bladder in relation to function
- Hygiene and hand washing
- Care of the drainage system and obtaining further supplies
- How to set up a link system and care for a free-standing bag
- Frequency of catheter and bag changes
- Information on who will change their catheter
- Avoiding constipation, fluid intake advice
- How to recognise the onset of problems such as blockage and infection
- How to deal with specific problems, where and when to seek further advice (nurse specialist, urologist or urology department), date of re-catheterisation and who will do this
- Contact numbers to access advice and support (EAUN, 2024).

Catheter Passports

NICE-commissioned audits (2019) revealed that over 25% of urinary catheters lacked a documented indication, reinforcing the need for regular justification and review (NICE Audit Data, 2019).

The National Urinary Catheter Care Passport (NCP) is a national initiative in the UK that aims to standardise the use of catheter passports across different health and social care settings.

A catheter passport is a document that provides guidance on managing a urinary catheter, including insertion, care, and prevention of complications. It serves as a tool for education and communication between patients and healthcare providers regarding the catheter and its purpose. The document also includes clinical sections

for healthcare professionals to record relevant information.

The use of catheter passports helps reduce the risk of catheter-associated urinary tract infections (CAUTI) by promoting self-management and awareness of the catheter's care.

The passport typically includes information on:

- Why a catheter is needed.
- How to care for the catheter, including hygiene, bag changes, and valve operation.
- Signs and symptoms of potential complications, such as infection.
- Clinical sections for healthcare professionals to document catheter details, including insertion date, type of catheter, and future plans.

EAUN. (2024). *Evidence-based guidelines for best practice in urological health care: Catheterisation – Indwelling catheters in adults. Urethral and suprapubic.* European Association of Urology Nurses.
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https://www.rcn.org.uk/professional-development/publications/rcn-catheter-care-uk-pub-009-107

Example multiple choice questions (correct answers highlighte:

1. What is the main reason adequate hydration is recommended for patients with urinary catheters?

A. To prevent bladder spasms
B. **To reduce risk of urinary tract infections and catheter blockages**
C. To lower blood pressure
D. To improve sleep patterns
E. To avoid the need for catheter securement

2. What is the typical recommended daily fluid intake for catheterised patients, unless contraindicated?

A. 500–750 mL
B. 2.5–3 litres
C. 1.5–2 litres
D. Less than 1 litre
E. More than 3 litres

3. Which of the following is NOT typically a sign of dehydration in catheterised patients?

A. Confusion
B. **Pale, odourless urine**
C. Dizziness
D. Dry mouth
E. Strong-smelling urine

4. Which statement best reflects how food and medication can affect urine in catheterised patients?

A. These changes are always harmful and require investigation

B. All patients will experience changes in colour and smell

C. Changes in urine caused by food or drugs should be reported as adverse events

D. **Such changes are often harmless but may not occur in all patients**

E. Urine changes are only caused by infection

5. How can constipation negatively affect urinary catheter function?

A. It causes the catheter to dissolve

B. It can lead to ureteric reflux and back pressure on the kidneys

C. It prevents bacteria from entering the bladder

D. It increases urine output

E. It improves drainage flow

6. According to best practice, how often should the catheter insertion site be cleaned?

A. After every meal

B. Once a week

C. After every bowel movement

D. **Daily, using soap and water**

E. Only when visibly soiled

7. What is the purpose of maintaining a closed catheter drainage system?

A. To make urine collection more discreet

B. To prevent skin irritation

C. **To reduce bacterial contamination and infection risk**

D. To eliminate the need for securement devices

E. To allow for easier bag changes

8. Which of the following are best practices for managing catheter drainage bags?

A. Empty the bag when completely full
B. Use valves to drain urine at regular intervals
C. Position the bag above bladder level
D. Change leg bags monthly
E. Drain directly into the toilet at night

9. Which of the following should be included in catheter care education for patients and carers?

A. How to perform hand hygiene
B. When and how to seek further advice
C. How to care for drainage systems
D. Recognising signs of infection or blockage
E. **All of the above**

10. What is the main purpose of a catheter passport?

A. To allow patients to travel with medical clearance
B. To document hydration levels
C. To reduce the frequency of catheter changes
D. **To standardise catheter care and support communication**
E. To record bowel movements

8 Catheter Troubleshooting

Module Introduction

This module provides an overview of the key complications associated with urinary catheter use. While urinary catheters are essential medical devices for many patients, they also present significant risks when not managed appropriately. Early recognition and effective management of complications are essential to maintain patient safety, promote comfort, and reduce the risk of avoidable harm.

The content is based on current evidence and national guidance. However, it is not a substitute for formal procedural training and does not contain full, step-by-step clinical procedures. All healthcare professionals must work within the boundaries of their competence and adhere to local organisational policies, protocols, and formularies as a matter of priority.

Module Learning Objectives

By the end of this module, learners will be able to:

1. Identify common and serious complications associated with urinary catheterisation.
2. Recognise early signs and symptoms of catheter-associated urinary tract infection.
3. Apply principles of assessment to evaluate catheter function, positioning, securement, and suitability of equipment in the context of patient symptoms.
4. Discuss interventions used to manage or prevent complications
5. Understand the importance of infection prevention strategies.
6. Recognise and appropriately escalate urological emergencies.
7. Evaluate the potential implications of long-term catheter use.
8. Promote best practice in documentation and clinical decision-making.

Signs of complications

Consider and discuss any complications the patient is experiencing. Complications include: bypassing, discomfort or pain, bleeding, painful erections, blocked catheter, infection, insertion and removal problems, history of difficult catheterisation, meatal soreness, bladder and meatal erosion, stone formation and catheter rejection (EAUN, 2024).

Catheter Associated Urinary Tract Infection (CAUTI)

Catheter-associated urinary tract infection (CAUTI), is one of the most common health care-acquired infections, and 70–80% of these are attributable to use of indwelling urethral catheters. It is estimated that 69% of CAUTI events are avoidable by following guidelines (EAUN, 2024). Urinary tract infection extends hospital length of stay and can be expensive to treat (NICE, 2018).

People with CAUTI should be closely monitored to ensure the infection is treated appropriately due to the risk of sepsis if the infection is not resolved (RCN, 2021) Urosepsis has an associated mortality rate of between 20% and 60% (NICE, 2018).

Early signs of UTI in catheterised patients (EAUN, 2024; RCN, 2021)

- Cloudy, strong-smelling, or blood-tinged urine,
- Fever, chills, or increased body temperature.
- Pain or discomfort in the lower abdomen or around the catheter site.
- Increased confusion or delirium, particularly in elderly patients.

Best practices for minimising infection risk

- Maintain a closed system and avoid unnecessary disconnection (Gould et al., 2010; CDC, 2023).
- Use securement devices to prevent dislodgement and tension (EAUN, 2024).
- Keep the drainage bag below bladder level to avoid backflow (Gould et al., 2010).
- Perform daily meatal hygiene (RCN, 2021; Mitchell et al., 2021).

- Assess catheter necessity daily and remove as soon as possible (PHE, 2021).
- Educate patients on catheter care to reduce self-contamination (ENACT, 2021; CDC, 2023)

A Public Health England audit found that using catheter care bundles (e.g. HOUDINI + daily documentation) led to a **35% reduction in CAUTIs** across NHS Trusts (PHE, 2021).

Overuse of antibiotics for asymptomatic bacteriuria contributes to AMR (RCN, 2021; EPIC, 2014). Antibiotics should only be prescribed if the patient is systemically unwell and an infection is suspected following clinical assessment. (RCN 2021). Antimicrobial stewardship should be promoted through education, documentation, and early catheter removal (NICE, 2020).

Catheters should be changed as soon as possible when a bacterial infection has been confirmed or is suspected. The clinical evidence is limited, but expert opinion recommends this should be immediately (if the patient is stable and comfortable) or within 48 to 72 hours of starting antibiotic treatment. (European Association of Urology, 2024).

Autonomic dysreflexia (SIA, 2022).

Autonomic dysreflexia (AD) is a condition unique to spinal cord injured (SCI) people and most commonly affects those with injuries at or above T6 level. It is a sudden and potentially lethal rise in blood pressure and is the body's way of responding to a problem, often triggered by acute pain or another harmful stimulus in the body, such as an overfull bladder, this is usually due to a blockage or obstruction, such as a blocked or kinked catheter or a full leg bag, which prevents urine from flowing from the bladder. The rapid rise in blood pressure (hypertension) can lead to a stroke (cerebral haemorrhage) and even death.

A pounding, usually frontal, headache is often present alongside one or more of the following symptoms:

- Flushed (red) appearance of skin above the level of injury
- Profuse sweating above the level of injury
- Pale coloured skin below the level of injury
- Stuffy nose
- Severe hypertension (note: SCI people typically have a lower resting blood pressure than non-SCI people)
- A tight chest
- Slow heart rate (bradycardia)

Recognising AD quickly is essential so that treatment can be started at once. The trigger causing the episode must be identified and resolved to prevent dangerously high blood pressure. **Autonomic dysreflexia should ALWAYS be treated as a medical emergency** (SIA, 2022).

Paraphimosis

Paraphimosis is a urological emergency in which the retracted foreskin of an uncircumcised male cannot be returned to its normal anatomic position. It is important for clinicians to recognise this condition promptly, as it can result in gangrene and amputation of the glans penis (EAUN, 2024).

Paraphimosis can often be effectively treated by manual manipulation of the swollen foreskin tissue. This involves compressing the glans and moving the foreskin back to its normal position, perhaps with the aid of a lubricant, cold compression and local anaesthesia – as necessary. If this fails, the tight oedematous band of tissue can be relieved surgically with a dorsal slit or circumcision (EAUN, 2024).

Blocked Catheters

People requiring long-term bladder drainage with an indwelling catheter can experience catheter blockage. The most common problem of long-term indwelling catheters is the formation of encrustations on the luminal and outer surfaces, with consequent blockage and bypassing of urine resulting in urinary leakage. (EAUN 2024)

If a catheter is blocked:

- Check for kinks or bladder spasms (EPIC, 2014).
- Give constipation / hydration advice
- Avoid unnecessary flushing (RCN, 2021; EPIC, 2014).
- Escalate persistent issues.

Debris

Catheters can become blocked by debris - accumulated tiny pieces of biological matter that originates from urothelial cells from the bladder or tumours shedding cells, blood from infection, disease, urological surgery or trauma, or from mucus. (EAUN 2024)

Recognising and managing catheter encrustation

Catheter encrustation is characterised by the buildup of minerals and bacteria that may lead to blockages and infections. Catheterised individuals with a high urine pH (alkaline urine), recurrent UTIs, and prolonged catheter use are more susceptible. Encrustation is a result of bacteria in the urine, most commonly Proteus mirabilis, that produce an enzyme called urease, which splits urinary urea into ammonia and carbon dioxide. This results in an increase in alkalinity, providing ideal conditions for the development of crystals; e.g. magnesium ammonium phosphate (struvite) or calcium phosphate. The crystals develop around the eyelets, balloon and internal lumen of the catheter. About 50% of long-term catheterised patients develop encrustations (EAUN 2024).

Prevention strategies:

- Encourage hydration to prevent crystal formation.
- Monitor for early warning signs such as reduced urine flow or sediment/crystal accumulation in the catheter (RCN, 2021).
- Use citric acid catheter maintenance solutions in high-risk patients (per trust protocols).

Catheter maintenance solutions, bladder irrigation, and washouts

Bladder irrigation, instillation and washouts do not prevent catheter-associated infection. Regular use can lead to an increased risk if the sterile closed drainage system is repeatedly broken, which can lead to infection, sepsis and death. When considering the use of washouts/maintenance solutions, there must be evidence of an individualised assessment and the clinical indication for use must be recorded.

Bladder irrigation

This is a continuous irrigation of the bladder via a 3-way catheter for the purpose of removing clots and debris post urology surgery. This method of irrigation is normally used for short periods only and only within an acute care setting.

Bladder washouts

These involve flushing the bladder with sterile normal saline to remove clots, debris or mucus.

Consider the following when using this technique:

- Best practice guidance suggests that small sequential volumes are more effective than a single larger volume administration.
- There is a high risk of infection due to the breaking of the closed drainage system every time an administration is performed.
- There should be a clear, documented clinical rationale for using bladder washouts with evidence of effectiveness.
- The administration should be via a pre-filled administration set.
- Bladder washouts should be administered, where possible, using gravity rather than direct pressure to avoid tissue trauma.
- In the case of a patient with a surgically augmented bladder (where bowel tissue has been used to enlarge the bladder capacity), it may be necessary to use a sterile 50ml syringe to administer the washout due to the high level of mucus present.
- Consider using an irrigation connection device (inserted into the needle-free sample port of the catheter bag) to minimise the risk of infection caused by breaking the closed drainage system.

Catheter maintenance solutions

These are sterile prefilled prescription-only products, they should only be used when all other options for blocked catheters have been considered. Evidence suggests smaller volumes, instilled sequentially, are more effective than large volume single administrations. The use is based on an individual assessment and several considerations must be made before use.

- Clear rationale for use must be documented.
- Frequency of administration should be according to severity and manufacturer's instructions.
- Always use sterile gloves and ensure an aseptic technique procedure is followed.
- Warm solution to room temperature.
- Consider use of closed irrigation administration set to minimise infection risk.
- Leave solution in situ in line with manufacturer's instructions.
- Record the effectiveness of the intervention each time.

Types of catheter maintenance solutions

- **Normal saline** – mechanical removal of small clots, debris, tissue etc. Not effective for encrustation. Use as required.
- **3.23% citric acid** – dissolves crystals formed by urease producing bacteria. Contains magnesium oxide to protect the bladder. Use once weekly, up to a maximum of twice daily (depending on severity of symptoms). Instil for 5 to 10 minutes in the bladder.
- **6% citric acid** – stronger solution, effective in severe encrustation and dissolves persistent crystallisation in the bladder or catheter. Can also be used prior to catheter removal to prevent trauma. Use once a week, up to a maximum of twice a day (depending on severity of symptoms). Instil for 5 to 10 minutes in the bladder (5 to 10 minutes prior to removal of a catheter). When considering the use of any instillation, HCPs should consider the clinical rationale, evidence and manufacturer's advice before commencing.

A clear clinical rationale must be documented and reviewed regularly.

Managing bladder spasm and discomfort

Bladder spasm occurs when the detrusor muscle contracts involuntarily around the catheter, leading to discomfort and / or urine leakage around the catheter. Bladder spasm is common in patients with indwelling catheters and is best managed with anticholinergic medication. Bladder spasms can be related to CAUTI and chronic constipation. Maintaining regular bowel function with a high-fibre and high-fluid intake helps prevent constipation. Sometimes a different catheter (smaller lumen) can reduce the spasm (EAUN 2024).

Management techniques:

- Ensure the catheter is **not blocked, kinked, or incorrectly placed**.
- Use the **smallest appropriate catheter size** to minimise irritation.
- **Anticholinergic medications** may be prescribed in persistent cases to relax bladder muscles.

Bladder pain

Bladder pain is experienced in about 25% of catheterised patients and may be an extreme form of urgency as a consequence of detrusor spasm or may be a distinct entity without an associated urge to void. Catheter-associated bladder pain is exacerbated by constipation, which therefore should be treated as a priority in affected individual (EAUN, 2024).

Urethritis

Urethritis, or inflammation of the urethral meatus, can be a major source of discomfort and contributes to a breakdown in tissue integrity. It can be due to the frequent insertion of catheters or forceful catheterisation against an obstruction.

Erosion

Erosion (tearing) of the urethra, primarily the urinary meatus, usually occurs in individuals who have had indwelling catheters for a long period of time. This erosion

is usually secondary to catheter tension on the distal urethra at the meatus. This condition can be caused by various factors, including improper catheter securement. It is important to regularly review the catheter and recognise distress or trauma (EPIC, 2014).

Review securement and catheter positioning (RCN, 2021; EPIC, 2014).

The manner in which a catheter is secured should be alternated to prevent prolonged tension or pressure at an individual site. Also, larger size catheters can result in increased pressure at the meatus causing urethral erosion in both men and women. In men, if this is not rectified, erosion can occur from the meatus down the glans and result in cleaved penis, which is a rare but serious complication and can cause patients both physical and psychological distress.

Urethral fistulas

Urethral fistulas can develop in patients being managed long term with a urethral catheters. Such fistula formation most commonly develops in women between the bladder and the anterior vaginal wall. Often if they have developed a fistula they will experience urine leakage and drainage from the vagina.

Bladder stones

Bladder stones are also more likely to occur in patients with long term indwelling catheters and can form on the catheter or the balloon. Haematuria is a possible sign of kidney stones. While bleeding may occur during catheter insertion, if the bleeding persists a referral to a urologist may be indicated as bladder cancer may also need to be excluded.

Catheter expulsion or inadvertent dislodgment

Expulsion of a catheter, sometimes with the balloon still inflated, can be a traumatic event for patients.This can be caused by acute delirium or chronic dementia, which compromises the patient's awareness of the rationale for catheterisation and the consequences of removal, or detrusor overactivity or "bladder spasms," straining and

constipation, or even excessive tension on the catheter.

Inability to remove catheter

Catheters may occasionally prove impossible to remove via balloon deflation. This may be as a consequence of balloon calcific encrustation or a faulty deflation mechanism.

Note: Cutting the catheter will invalidate product liability - seek specialist advice (i.e. urologist) as ultrasound-guided transabdominal balloon puncture may be required (EAUN, 2024).

Squamous cell carcinoma

Long-term catheterisation, in common with other forms of long-term urothelial irritation, may increase the risk of squamous cell carcinoma formation (EAUN, 2024).

Other complications relating to catheterised men

In men the catheter can interfere with drainage of seminal secretions. Urethral catheterisation can be associated with epididymitis, orchitis, scrotal abscess, prostatitis, and prostatic abscess. This can start at the time of insertion of the catheter, but risk increases with long-term catheter use.

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National Institute for Health and Care Excellence. (2024). *Intermittent urethral catheters for long-term urinary management in adults: Final scope*. NICE.

Public Health England (PHE). (2021). *Exploring the implementation of interventions to reduce catheter-associated urinary tract infections (ENACT)*. GOV.UK.

Royal College of Nursing (RCN). (2021). *Catheter care: Standards, indications and guidelines for catheter management*. RCN.

Sci-Info-pages (SIA) (2022) *Spinal Cord Injury Information Pages*. Available at: https://www.sci-info-pages.com/wp-content/media/autonomic-dysreflexia-card.pdf

Example multiple choice questions (correct answers highlighted):

1. Which of the following is considered a urological emergency requiring immediate intervention?

A. Catheter bypassing
B. Urethritis
C. **Paraphimosis**
D. Catheter encrustation
E. Meatal soreness

2. Which of the following signs is an early indicator of catheter-associated urinary tract infection (CAUTI)?

A. Constipation
B. Lower back pain only
C. Increased urine output
D. Weight loss
E. **Cloudy or strong-smelling urine**

3. What is the most appropriate initial response to a blocked urinary catheter?

A. Remove the catheter and reinsert immediately
B. Administer bladder washout via direct pressure
C. Start empirical antibiotics
D. **Check for kinks and assess for bladder spasms**
E. Replace the catheter with a larger size

4. What is the most significant risk of frequent bladder washouts using saline?

A. **Introduction of infection due to breaking the closed system**
B. Crystallisation in the catheter
C. Reduction in catheter encrustation

D. Increased urine output

E. Balloon rupture

5. Which of the following is a recommended strategy to minimise the risk of catheter-associated urinary tract infections (CAUTI)?

A. Flush the catheter daily with saline

B. **Keep the drainage bag below bladder level**

C. Change the catheter weekly

D. Leave the system open to air periodically

E. Disconnect the drainage bag every shift

6. When should antibiotics be prescribed for catheterised patients?

A. When the patient complains of discomfort

B. At the time of catheter insertion

C. When urine appears cloudy

D. **Only if the patient is systemically unwell and infection is suspected**

E. With any change in urine output

7. Which of the following complications is associated with long-term catheter use and may lead to fistula formation in women?

A. Urethral erosion

B. **Urethral-vaginal fistula**

C. Paraphimosis

D. Bladder rupture

E. Acute urinary retention

8. What is the correct action if a catheter cannot be removed due to balloon deflation failure?

A. Cut the catheter and remove manually

B. **Seek specialist advice – ultrasound-guided puncture may be needed**

C. Instil cold saline into the balloon

D. Use excessive traction

E. Leave it in place until next review

9. What is the recommended technique for administering catheter maintenance solutions in patients with severe encrustation?

A. One large volume instilled rapidly under pressure
B. Daily flush with sterile water
C. Injection through balloon port
D. Leave solution in for at least 60 minutes
E. **Smaller volumes instilled sequentially using aseptic technique**

10. Which of the following is a key factor in preventing urethral erosion in catheterised patients?

A. Using a 24Fr catheter for all adults
B. Increasing the balloon volume
C. **Alternating catheter securement sites regularly**
D. Applying traction to prevent dislodgement
E. Using intermittent open drainage

9 Further Reading

Local documentation [Insert here]

Examples may include:

- antibiotic policy
- catheter care policy
- infection control policy
- Continence Products Formulary.

Published resources [Insert here]

Examples may include:

- RCN & EAUN Guidelines
- NICE publications
- Other relevant evidence-based documents