

ASEPTIC TECHNIQUE AND SPECIMEN COLLECTION

23

ROSE GALLAGHER

THIS CHAPTER COVERS

- Asepsis and aseptic technique
- Asepsis and your practice
- Specimen collection

REQUIRED KNOWLEDGE

- Before reading this chapter, it will be helpful to be aware of your local policies relating to aseptic technique and specimen collection.
- It will also be helpful to have read Chapter 22 – Infection Prevention and Control; and Chapter 6 – Law.

“

My name is Jo and I have a 3-year-old son called Sam. Sam had an accident and needs to have his wound dressed by the nurses every few days. This is painful as sometimes the dressing sticks and Sam now recognises when we are going to have it done and can be quite difficult. It's very upsetting to see him crying, but I know it's for the best.

The nurse has a wonderful way with Sam and we always make sure he has had some pain medicine before we start. I help her by keeping his hands away from his dressing and together we make sure the wound is clean and securely bandaged afterwards. It takes time of course, but Sam is always so pleased to get his bravery reward when we have finished! Sam is very interested in what happens when his dressing is changed; he has learned the importance of asepsis – perhaps we have a future nurse in the making!

Jo, mother to Sam

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INTRODUCTION

Asepsis and aseptic technique are two commonly used terms associated with processes to avoid or eliminate contamination of normally sterile body sites or specimens. They are linked to a number of nursing skills, including the collection of patient specimens, and are fundamental to the delivery of quality care because if these skills are undertaken incorrectly the patient may suffer adverse effects such as infection or inaccurate laboratory results. The need to avoid contamination of specimens is crucial, given the importance of these as part of decision-making points for patient treatment. This is particularly relevant to antibiotic prescribing, the main driver of antimicrobial resistance (AMR). There are numerous reasons why specimens are requested, from assisting in the diagnosis of disease or infection, through monitoring a patient's recovery from illness, to requirements outside of 'traditional' care roles, for example as part of drug and alcohol testing in sport or as part of a police investigation. The role of the nurse extends to many health, social and public arenas in which they can be required to support any such scenarios. However, as an introduction, the context of this chapter is the healthcare environment.

ASEPSIS AND ASEPTIC TECHNIQUE

An aseptic technique process can be used in a variety of scenarios (e.g. invasive device insertion sites), wounds and specimens. Historically, the aseptic technique originated in operating theatres but today is performed in clinical and non-clinical areas (such as patients' own homes) using sterile equipment combined with other practices to prevent contamination entering the patient's body.

History

Historically, a number of individuals have contributed to our modern-day interpretation of asepsis and aseptic technique, including Joseph Lister (1827–1912) (use of carbolic acid as an antiseptic in operating theatres), Ignaz Semmelweiss (1818–65) (hand-washing), Oliver Wendell Holmes (1809–94) (transmission of puerperal fever) and Louis Pasteur (1822–95) (pasteurisation and the germ theory). The work of these individuals and others has contributed to procedures we still use today in operating theatres to prevent infection in surgical wounds.

Asepsis and aseptic technique today, however, are used in and adapted to situations outside of operating theatres where control of the environment and equipment to reduce contamination is easier to achieve. This brings a number of practical challenges to reducing the risk of contamination of vulnerable body sites. A key challenge is the use of different terminologies/language to describe the aseptic technique, which can result in confusion. However, the biggest challenge is that there is no evidence to inform us *how* to best undertake an aseptic technique in non-theatre settings, including hospital and community situations. All we can consider is evidence of the impact of non-compliance with some elements of the process (Hopper and Moss, 2010). So, at best, aseptic technique has to be defined by 'best practice' or consensus agreement regarding principles with different interpretations, rituals, languages and preferences, all of which have contributed to its evolution over time.

Aseptic versus 'clean' technique

The term 'clean technique' describes a process or processes to meet the needs of different care settings (originally community settings, but this has expanded to potentially any area) which *reduces* contamination of vulnerable sites (for example, in the management of chronic leg ulcers which are

already known to be heavily colonised with bacteria). This is, however, a good example of confusion regarding language, process and outcome expectations for both techniques (Flores, 2008; Gillespie and Fenwick, 2009), and in reality the two processes overlap.

How to perform an ‘aseptic technique’

In practice, this issue has become a very contentious one, due to the need to move away from the traditional ‘procedural approach’ towards one that focuses on principles to avoid risks to vulnerable patient sites or devices. As a nurse, it is imperative to understand the fundamental principles, which you can then apply to any situation, rather than just being able to follow a procedure without the ability to customise it to meet patient or environmental demands.

It is important to apply the principles of asepsis to the chain of infection (see Figure 23.1). The chain of infection is a useful way of thinking about how different elements can combine to put patients at risk.

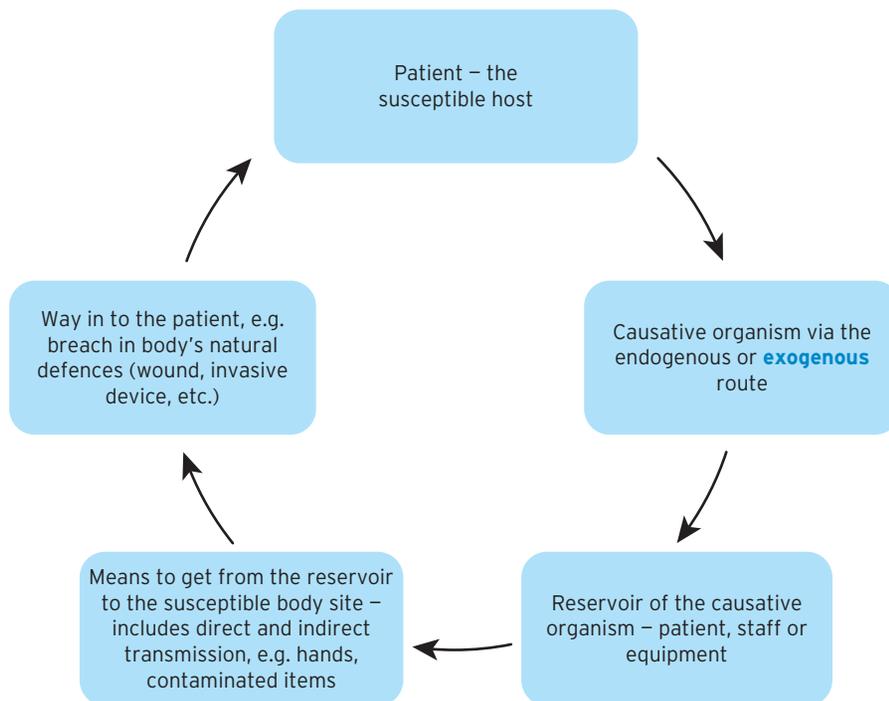


Figure 23.1 The chain of infection demonstrating where contamination can occur if an aseptic technique is not used

“ It is important to understand and apply aseptic techniques as they prevent cross infection or worsening conditions of an existing wound. If we do not use these techniques we will risk further infection of the wounds, prolonged healing time, cross infection for the patient and ourselves and others. ”

Julie Davis, LD nursing student

An aseptic technique, when performed correctly, will ‘break’ the chain of infection and by doing so protect the patient. However, procedures involving aseptic technique principles are frequently ‘prescribed’ within individual tasks, such as dressing a wound, inserting an intravenous cannula or administering intravenous drugs. There are potential problems with such an approach, as elements of ritual can find their way into practice and differences of opinion, and therefore variations in practice can develop which do not reduce the risk of contamination or produce benefit for the patient. Two examples relevant to current practice and debate are (1) whether it is necessary to wear gloves to perform an aseptic technique; and (2) if so, whether the gloves should be sterile or non-sterile. Another question is whether use of a dressing trolley is preferable to a tray in clinical settings.

The chain of infection

The ‘chain of infection’ (Figure 23.1) describes the necessary series of events that need to take place for infection to occur, regardless of whether this is caused by a virus, bacteria or fungi. For an infection to occur, all links in the chain must be present. As nurses, we prevent this from happening by putting in place procedures or techniques to ‘break’ the chain of infection. Always applying an appropriate aseptic technique is an excellent way of breaking the chain.

ACTIVITY 23.1: REFLECTION

Reflect on the aseptic techniques you have observed being carried out by the nurses you have been working with:

- Did they all do it the same way?
- What elements were common to all procedures observed?
- Did the option to use equipment such as gloves or a dressing tray/trolley require discussion? If so, how did you reach a decision regarding what was used?
- Do you think any elements of the chain of infection were broken?

ASEPSIS AND YOUR PRACTICE

Please note: this chapter does not provide a prescribed step-by-step procedure outlining how you should perform an aseptic technique, due to the issues previously highlighted. It does, however, present the important principles you need to consider (see Clinical Skill 23.1) and apply in the care you deliver to patients.

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To start with I found aseptic technique quite difficult – you have to concentrate the whole time, being very self-aware about what you are touching. I had to really think hard about when I put gloves on to overcome the temptation to wear them all the time just in case. My practice educator helped me to gain confidence by assessing any risks for blood and body fluids in advance according to what procedure I was doing. I now practice confidently knowing I have safe clean hands and my patients and I are both protected in the right way without wearing gloves unnecessarily.

Charlie Clisby, NQN

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Guidelines

There will be various local guidelines of which you must be aware when undertaking aseptic procedures. Remember never to undertake this care unless you are, or have supervision from, a trained, experienced and competent person. The types of guidelines you need to consider will be contained in:

- infection prevention and control policies
- local organisational policies, e.g. wound dressing formulary.

CASE STUDY 23.1: TOM

Tom is 15 and has a learning disability. He has a chronic wound on his leg which is very painful and smells offensive. Tom is very conscious of the smell and dislikes having his dressing changed. He expresses his anxiety through his behaviour, which can be perceived as aggressive at times, especially by people who do not know him.

Tom really enjoys bathing, because he finds it relaxes him and he loves playing with his collection of boats, and plastic dinosaurs.

To make Tom's dressing changes less stressful for him, your practice educator wants to use his bath as an opportunity to undertake his dressing change.

- What needs to be considered in order to prevent any contamination and support wound healing?

ACTIVITY 23.2: DECISION-MAKING

You and your practice educator are planning to dress a patient's wound while they are sitting in the living room of their home. The room is very unclean - there are six cats who live in the house and they have used the living room carpet as a litter tray. The facilities for you to wash your hands are poor, the sink is dirty and there is no hand towel, no hot water and only a trickle of cold.

- What actions would you take to reduce contamination of the wound?

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My name is Jan. I was admitted to hospital because I had diarrhoea which wouldn't settle. Weeks I've had it. The docs think I might have an infection. I was given a foil container like a pie dish and told to do my business in it. How was I supposed to do that? And in a public toilet?

My nurse was wonderful. I didn't have to tell him I was embarrassed or ask how to use it. He explained everything and helped set up the toilet so all I had to do was use it as usual. It's a horrible thing to have to have somebody else handle your business but he was so professional and organised, there was no fuss and most of all I kept my dignity.

The results showed I did have an infection, and now I'm back to normal. I'm so grateful to him; I don't think I could have faced doing it by myself.

Jan, patient

”

STEP-BY-STEP CLINICAL SKILL 23.1: PRINCIPLES OF ASEPSIS

Field-specific considerations

When caring for a patient with a learning disability, it is important to be mindful of their level of understanding, so that consent and cooperation for the procedure can be gained. You will need to allow time to explain what you are doing and consider whether it will cause discomfort or pain.

Patients who have impaired mental capacity may not understand why you need to undertake an aseptic procedure. They may therefore withhold consent and you may need to refer to local policies on presumed or assumed consent, which will reflect requirements of the Mental Capacity Act 2005 and best interest.

As younger children may not understand what you wish to do, you may need to modify your approach - it may be helpful to have the parents or carers present to assist.

Care-setting considerations

Aseptic technique can be undertaken in any care setting, although you may need to think carefully about how best to manage the patient and the patient's environment.

What to watch out for and action to take

While undertaking an aseptic procedure, you should also assess:

- the general condition of the patient; specific elements will vary according to the procedure being undertaken (e.g. respiratory rate for care of a chest drain)
- their neurological condition - are they alert and responsive? Are they agitated?
- any signs or complaints of pain or discomfort
- the patient's or relatives'/carers' views - for example, saying that their condition is 'not quite right' or they 'don't feel well'.

The information gained from these observations is additional to any assessment you make relating to, for example, the wound you are dressing and will enable you to fully assess the patient's condition and institute appropriate treatment as necessary, escalating care needs to senior nurses and the medical team.

Helpful hints

- Do I wear gloves and an apron? Gloves and aprons must only be worn if contact with blood/body fluids/excreta is anticipated or the patient is in source isolation for IPC requirements.
- Hand hygiene must be performed before touching a patient, before clean/aseptic procedures, after body fluid exposure/risk, after removal of gloves and after touching a patient or the patient's immediate surroundings.
- Waste should be disposed of into the correct waste stream in line with a risk assessment.

ASEPTIC TECHNIQUE GUIDELINES

BEFORE YOU START

- 1** **Before commencing any care activity, introduce yourself to the patient, explain the procedure and gain their consent**
Fully informed consent may not always be possible if the patient is a child or has impaired mental capacity or learning disabilities, but even in these circumstances, every effort should be made to explain what you are going to do in terms that the patient can understand. This is not only respectful of their individual human rights, but also helps to ensure that they will be more accepting of the treatment and that their anxieties are reduced
For patients who are unable to provide consent because they are unconscious, refer to local policies
- 2** **Assess the procedure and determine its complexity before you start, collecting all equipment that may be needed (and an assistant/chaperone if required)**
Ensures you are fully prepared; also avoids you having to leave the patient or interrupt the procedure
- 3** **Consider what is going on around you - do you really need to do an aseptic technique now (even if planned)? Is the patient due to have other investigations that will cause you to rush, e.g. an x-ray?**
Ensures that the environment is conducive to undertaking an aseptic technique - for example, there will be a negative environmental impact if bed-making or cleaning is being undertaken in close proximity to a large wound dressing being undertaken
- 4** **Ensure the patient is in a comfortable position where you can access the appropriate area**
Ensure the patient has received appropriate analgesia as required
Promotes patient comfort
- 5** **Clear sufficient space within the environment, e.g. around the bed space, chair or treatment area**
Ensure the area is private
Enables clear access for the patient and the nurse to work safely
Maintains patient privacy, dignity and comfort as required - patients will feel exposed if others can see the care they are receiving
- 6** **Transport equipment to the patient appropriately (consider a dressing trolley if available and appropriate)**
Ensures all equipment is to hand
Maintains cleanliness of equipment and aids transport of all items safely



- 7** **Perform hand hygiene and apply non-sterile gloves only if required**
Wearing apron and gloves is a standard infection prevention practice when dealing with body fluids or patients in isolation if they pose a risk of infection to others
Ensure your use of PPE is appropriate by considering the individual patient situation and the risk presented. Appropriate hand hygiene will assist in preventing and controlling infection

(Continued)

REMOVE AND DISPOSE

- 1** If present, remove any soiled dressings, 'contaminated' or 'dirty' items and place in appropriate waste bag according to risk assessment

In preparation for dressing (etc.) change

Ensure soiled, contaminated or dirty items are disposed of appropriately in the offensive or infectious waste stream depending on risk assessment



- 2** Remove gloves and perform hand hygiene

Appropriate hand hygiene will assist in preventing and controlling infection

CREATE A 'STERILE FIELD'

- 1** If using a dressing pack, open sterile items and create your 'sterile field' by placing only sterile items within this area

Creating a sterile field avoids contamination through direct contact with non-sterile items. Remember, your hands are not sterile!



- 2** Apply sterile or non-sterile gloves as required

A risk assessment will determine if sterile or non-sterile gloves are required



- 3** Undertake procedure ensuring:

- only sterile items come into contact with the susceptible site
- sterile and non-sterile items do not come into contact with each other

In order to prevent and control infection





TO CONCLUDE

1 After completing the required care, ensure the patient is in a comfortable position, with drinks and call bells available as necessary
Promotes patient comfort and ensures they are well nourished and hydrated

2 Dispose of all waste and any single-use equipment, discard PPE (if used) and perform hand hygiene
Clean any equipment used as per the relevant policy every time it is used
Prevents cross-infection and maintains equipment in working order



3 Record the care provided in the patient's record
Maintains patient safety and accurate records

4 If any abnormal findings are observed, report to your practice educator or a registered nurse immediately
It is vital to report abnormal findings to a registered nurse immediately so they can ensure care is escalated; failure to do so can result in the patient's condition deteriorating and potentially preventable adverse outcomes

Source: Loveday et al. (2013); NICE (2017); WHO (2009)

SPECIMEN COLLECTION

Analysis of a specimen will determine important clinical decisions regarding a patient's condition or disease progress. Results also influence choices regarding ongoing or new treatment such as the prescribing of antibiotics. A specimen received at the laboratory in poor condition or taken inappropriately could therefore have profound implications for patient care, diagnosis and timeliness of any subsequent treatment. Therefore, the quality of a specimen is very important.

Nurses commonly take or handle specimens such as:

- wound swabs
- faeces
- urine
- blood (cultures or samples for analysis)
- sputum
- nasal and throat swabs (for detection of infection or screening for presence of clinically important bacteria, e.g. **MRSA, Group A Streptococci**).

As previously outlined, specimens are tested for a multitude of reasons, which can be summarised as:

- screening – for disease or the presence of micro-organisms such as malarial parasites, MRSA or Carbapenemase Producing Enterobacteriaceae (CPE)
- case finding – similar to screening but in a defined population such as blood tests for BRCA1 and 2 genes for breast cancer

- monitoring – for example, to reveal levels of drugs in the body, e.g. Gentamicin, Vancomycin
- diagnosis – to confirm or exclude the presence of disease.

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I would discuss with the patient the reasons why we need to collect a specimen and gain consent. I would then discuss with them to see if they are happy to take their own nasal swab. If not I would explain what I need to do and collect the specimen as quickly and confidently as I could. Before collecting the specimen I would read up on the procedure and discuss with my practice educator, role playing it through with them if necessary.

Laura Grimley, adult nursing student

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The importance of multi-disciplinary relationships

As mentioned previously, patient outcomes are directly influenced by the quality of specimens. The collection, transport, processing, analysis and results reporting of specimens all require efficient and reliable multi-disciplinary relationships to exist. Those involved in this process include nurses, porters (or transport drivers in community settings), laboratory reception staff, laboratory staff, technicians and biomedical scientists, plus doctors to interpret and communicate results. Each element of this relationship is of equal importance and a problem in any part has the potential to adversely affect the accuracy of the result of the specimen testing.

WHAT'S THE EVIDENCE?

Historically, evidence has developed to inform laboratory techniques and 'standard operating procedures', but these do not in themselves often reflect the patient experience. One example of where patient experience can be adversely affected is the contamination of blood culture specimens, for example when MRSA is identified as a result of poor technique due to skin contamination at the venepuncture site. If we think about what Jan said in his patient voice, however, he makes it very clear that patients value the support, advice and experience a nurse can offer to ensure that specimen collection is as simple and convenient as possible

Laboratory testing

As there are endless different ways in which a specimen can be analysed, a summary of common laboratory types and the tests they undertake are presented in Table 23.1. Not all healthcare providers will have all types of laboratory services: refer to your local provider's website for detailed information on what laboratory services are available.

Note: this chapter does not include the use of rapid diagnostic tests – use of these is subject to local policies and procedures in line with the manufacturer's guidance.

Principles common to the effective collection of all types of specimen

There are a number of principles which are applicable to the collection of all specimens.

Table 23.1 Types of laboratory and the tests they undertake

Laboratory type	General description of function
Microbiology	Function focuses on micro-organisms and their impact on human health. A number of departments may be present in hospitals or specimens may be referred to national or regional reference laboratories for further investigation or analysis
Biochemistry	Function focuses on chemical analysis of bodily fluids such as blood, plasma or urine. Includes common tests such as urea and electrolytes (U&E), liver function tests, tumour markers, drug levels (prescribed and illegal) and mineral levels, e.g. calcium, zinc
Pathology/Histopathology	The examination of human tissue. Specimens may be taken from live or deceased patients. Includes cytology
Haematology	Undertakes analysis of blood, including full blood count (FBC), Erythrocyte Sedimentation Rate (ESR), INR, Sickle cell screen, etc.

Guidelines

There are various national and local guidelines of which you must be aware when collecting specimens. Remember never to undertake collection of any type of specimen unless you are, or have supervision from, a trained, experienced and competent person. The types of guidelines you need to consider will be contained in:

- infection prevention and control policy
- local pathology policies/guidelines.

Once you are aware of these, you need to undertake a number of steps that will be common for the collection of all types of specimen (see Clinical Skill 23.2).

The usual procedures for collecting common specimens are described below, but remember that this should be read in conjunction with relevant local policies. At all times, complete the common steps (Clinical Skill 23.2) and ensure appropriate adjustments are made to suit the needs of the individual patient – local guidelines will be helpful for this.

ACTIVITY 23.3: CRITICAL THINKING

Tilly is three months old and has persistently loose, watery and offensive-smelling bowel motions. Her mother has been asked to collect a stool specimen so it can be tested, but is uncertain how she should do this.

- How would you explain the procedure?

STEP-BY-STEP CLINICAL SKILL 23.2: COMMON STEPS FOR THE COLLECTION OF ALL TYPES OF SPECIMEN

Essential equipment - depends on the specimen but is likely to include one or more of the following:

- specimen container, specimen bag and laboratory form
- swabs as appropriate.

Field-specific considerations

When collecting a specimen from a patient with a learning disability, it is important to know their level of understanding so that consent and cooperation can be gained. You will need to allow time to explain what you are doing, why you are doing it and whether it will cause discomfort or pain.

Patients who have impaired mental health may not understand why you need to collect a specimen. They may therefore withhold consent and you may need to refer to local policies on presumed or assumed consent, which will reflect requirements of the Mental Capacity Act 2005 and best interests.

Younger children may not understand why you need to collect a specimen. You will need to adopt an appropriate approach for consent. It may be helpful to have the parents or carers present to assist.

Care-setting considerations

- Consideration must be given to any equipment needs, e.g. the refrigeration of viral transport media.
- Specimens can be collected in most care settings.

Key points to remember

- There is a clear clinical need for the specimen.
- Explain the rationale to the patient and gain consent (refer to Chapter 6).
- The specimen must be obtained without contamination.
- The specimen must be stored appropriately or transferred to a laboratory as soon as possible.
- Check result and act on it accordingly.

Helpful hints

- Gloves and aprons must be worn only if contact with blood/body fluids/excreta is anticipated or the patient is in isolation.
- Hand hygiene must be performed before touching a patient, before clean/aseptic procedures, after body fluid exposure/risk, after touching a patient and after touching a patient's surroundings.
- Waste should be disposed of in a waste bag if it is contaminated with blood/body fluids/excreta in line with risk assessment for waste, e.g. offensive or infectious waste.

SPECIMEN COLLECTION GUIDELINES

1

The first step of any procedure is to introduce yourself to the patient, explain the procedure and gain their consent

Fully informed consent may not always be possible if the patient is a child or has impaired mental health or learning disabilities, but even in these circumstances, every effort should be made to explain the procedure in terms that the patient can understand. This is not only respectful of their individual human rights, but also helps to ensure that they will be more accepting of the treatment and that their anxieties are reduced

For patients who are unable to provide consent because they are unconscious, local policies should be referred to

2

Ensure that it is an appropriate time to collect the specimen

The quality of the specimen can be affected by the time of collection and length of time before it reaches the laboratory. To make sure the specimen is of the best quality, ensure that it will reach the laboratory quickly once it has been collected and that it is the best time of day to collect the specimen. For example, it is best to collect a urine sample from the first voided urine in the morning for mycobacterial culture as this will contain the highest concentration of bacteria present

3

Gather the equipment required to collect the specimen; ensure this is clean and in working order

Reduces the chance of inaccurate results

All lids, containers and specimen bags should be checked to ensure there are no leaks or breaches which could result in spillage during transportation

Containers used for the collection and transportation of specimens should be CE-marked as this confirms that the container complies with essential requirements - only approved containers should contain specimens for laboratory analysis

This reduces the chance of infection and helps maintain the quality of the specimen

4

Clear sufficient space within the environment where the specimen is to be collected, for example around the bed space or chair

Enables clear access for the patient and the nurse to safely use the equipment required

5

Standard precautions should be used whenever there is a need to collect specimens

Wearing an apron and gloves as part of personal protective equipment (PPE) is a standard infection-control procedure when there is contact with body fluids or a patient is in isolation

Ensure your use of PPE such as gloves and disposable aprons is appropriate by considering the individual patient's situation and the risk presented. Do not use 'just in case'

6

Patients need to be in a private, comfortable and appropriate position and surroundings

Maintain patient privacy, dignity and comfort as required

To promote patient comfort and reduce anxiety

7

Complete the appropriate laboratory forms

The information provided on specimen or laboratory forms is very important. Incorrectly spelled or wrong patient names and identifying information could result in the wrong result being placed in a patient's notes. Alternatively, poorly completed forms could result in specimens being rejected by the laboratory, with significant implications for the patient

Some organisations use electronically generated specimen request forms and specimen labels to support laboratory tests. Always check local policies for more information



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The laboratory request form must include the following information:

- patient surname and forename (care should be taken to avoid use of nicknames)
- date of birth
- gender
- NHS or hospital number - refer to local policies regarding patient unique identifiers and their use
- location of where specimen obtained (if relevant)
- requesting clinician or consultant in charge
- sample date and time
- name or initial of the person taking the specimen
- clinical information relevant to the specimen - this helps laboratory staff to interpret the clinical significance of specimen results. Examples include symptoms, possible or confirmed diagnosis, any current treatment (e.g. antibiotics) and other pertinent history such as foreign travel

Note: some NHS organisations are using barcoding technology to support procedures and trace specimens/equipment used to support patient care. If you are required to use this technology, ensure you have been trained on how to use this before undertaking procedures

8 Double-check to ensure the patient is correctly identified - ask the patient (where possible) to state their full name and date of birth. Use patient identifiers (e.g. wristbands) where possible to confirm

Prevents you from taking a specimen from the wrong patient. Never ask 'are you ...?' Always ask the patient to state their name and date of birth

Some patients may not wear wristbands, e.g. neonates, those living in care homes or those with amputated limbs - check your local policies for alternatives to wristbands

9 Ensure specimen is collected in line with local policy

Using an aseptic technique reduces the risk of contaminating the specimen

Further details relating to taking the following specimens are available within the following:

Sample type	Details
Wound swab	Skill 23.3
Faecal specimen	SAGE edge
Urine sample	SAGE edge
Blood sample	p. 379
Sputum sample	Skill 23.4
Nasal swab	Skill 23.5
Throat swab	Skill 23.6

10 Specimens for microbiological investigation should ideally be taken before antibiotic therapy is commenced

If the patient is already on antibiotics before a specimen is taken, this may have a significant impact on identification of the causative organism (bacteria). The laboratory must be informed on the laboratory form of all therapy the patient is receiving or has recently received. Where sepsis is suspected, patients should have specimens taken if possible before commencing treatment, however this should not delay the administration of antibiotics

11 Specimens for viral investigation can require special transport media

Viruses are generally quite fragile and die easily
Examples include chickenpox (varicella), chlamydia, influenza, norovirus

Where specimens are taken directly from lesions, such as vesicles of herpes or chickenpox, then the swab must be placed inside special viral transport media to preserve any viral particles during transport to the laboratory. Viral transport media may require refrigeration and will have an expiry date

Refer to local policies for more information

12 Label container and seal in the specimen bag along with the laboratory request form, in line with local policy

Ensures the specimen and laboratory form are retained together and avoids loss of either during transport

13 Specimens should be transported to the laboratory and processed as soon as possible

Once a specimen is obtained, any micro-organisms present have been removed from their 'natural' habitat; therefore in order to preserve micro-organisms, transport to the laboratory should take place as soon as possible. If there is a delay in transportation,

some specimens may be refrigerated in a designated refrigerator (do not put in a food fridge) until collection. This is preferable to leaving them at room temperature, which could interfere with the laboratory interpretation of results

For some specimens, delays of over 48 hours are considered unsatisfactory as the specimen will have deteriorated. Check local policy for further guidelines

- 14** After collecting the specimen, ensure the patient is in a comfortable position, with drinks and call bells available as necessary

Source: WHO (2009)

Promotes patient comfort and ensures they are well nourished and hydrated

- 15** Discard PPE, any single-use equipment and other used materials as per policy. Clean any equipment used as per the relevant policy and perform hand hygiene

Prevents cross-infection and maintains equipment in working condition

- 16** Document the specimen collection in the patient's notes

Maintains patient safety and accurate records

Collecting a blood sample

Nursing students in the UK would not take blood cultures or other blood specimens. However, knowledge of the process will enable you to support a patient when they are having a blood sample taken:

- Blood cultures are taken to determine the presence of bacteria or fungi in the blood (bacteraemia or fungaemia, respectively). Blood cultures should not be routinely taken, only when clinically indicated.
- Haematological investigations are undertaken to ascertain, for example, the patient's haemoglobin or platelet levels.
- Biochemical investigations are undertaken to ascertain, for example, the patient's potassium and sodium levels.

While blood cultures should be taken using a strict aseptic technique; there is less emphasis on this for routine blood tests (haematology or biochemistry). The other common steps and fundamental principles still apply, however, and there needs to be careful attention paid to prevent any sharps injuries. Many healthcare staff undertake **venepuncture** training but require additional knowledge and skills to be assessed as competent to provide this care.

ACTIVITY 23.4: CRITICAL THINKING

Jasmin is 3 years old and requires a blood sample to be taken:

- What might help Jasmin feel safe and comfortable so that the sample can be collected?
- Jasmin's mum is with her, and is very anxious and concerned about the blood test. How can you ensure that her worries do not impact on Jasmin's care?

STEP-BY-STEP CLINICAL SKILL 23.3: TAKING A WOUND SWAB

Wounds include surgical and traumatic wounds, burns, ulcers, folliculitis and invasive device insertion sites such as an intravenous cannula or wound drain.

☑ Indications for taking the specimen

Wound infection, cellulitis (in the presence of a break in the skin) and/or the presence of pus.

The presence of bacteria in a wound without signs and symptoms of infection reflects colonisation only, and is common in chronic wounds (such as leg ulcers in community settings).

WOUND SWAB GUIDELINES

1

Perform steps 1-8 of the common steps (see Clinical Skill 23.2)

To prepare the patient and yourself to undertake the task

2

Dip swab in transport media (if present with swab) or moisten with sterile saline

To preserve any bacteria present during transportation to the laboratory

Moisten swab to avoid **desiccation** of any bacteria present



3

If pus is present, collect pus (via aspiration) or use a moistened swab

To preserve any bacteria present during transportation to the laboratory

4

Take swab from the part of the wound exhibiting symptoms of infection

This area will produce the best results

5

Using an aseptic technique, perform a 'zig-zag' motion while gently rotating the swab between the fingers

To ensure good contact by the swab with the wound

6

Place the wound swab immediately back into the container

To prevent contamination

7

Perform steps 10-16 of the common steps (see Clinical Skill 23.2)

To ensure that:

- the patient is safe and comfortable
- the specimen has been correctly collected and documented in the patient's records
- the equipment is clean and in working order

Source: PHE (2016a)

STEP-BY-STEP CLINICAL SKILL 23.4: COLLECTING A SPUTUM SAMPLE

☑ Indications for taking the specimen

Upper and lower respiratory tract infections, including pneumonia.

Micro-organisms normally present in the upper respiratory tract can contaminate the usually sterile lower respiratory tract and cause infection.

Green sputum does not necessarily mean the patient has an infection!

SPUTUM SAMPLE GUIDELINES

1

Perform steps 1-8 of the common steps (see Clinical Skill 23.2)

To prepare the patient and yourself to undertake the skill

2

The patient is required to expectorate in order to produce a specimen of sputum - saliva is not suitable

Patients who have difficulty coughing or expectorating may need a physiotherapist to help them produce a sample



Source: PHE (2016b)

3

As necessary, place sample in specimen container, carefully avoiding contamination of the outside of the pot

A minimum of 1 ml of sputum is required

4

Samples should be sent to the laboratory as soon as possible (sputum may be refrigerated for up to 2-3 hours)

Some bacteria die easily and overgrowth of other bacteria occurs quickly at room temperature, which will produce false results

5

Perform steps 10-16 of the common steps (see Clinical Skill 23.2)

To ensure that:

- the patient is safe and comfortable
- the specimen has been correctly collected and documented in the patient's records
- the equipment is clean and in working order

STEP-BY-STEP CLINICAL SKILL 23.5: TAKING A NASAL SWAB

☑ Indications for taking the specimen

To detect clinically important bacteria in the nose, for example to determine if the patient is colonised with a bacteria such as meticillin-resistant *Staphylococcus aureus* (MRSA) or meticillin-sensitive *Staphylococcus aureus* (MSSA).

NASAL SWAB GUIDELINES

1

Perform steps 1-8 of the common steps (see Clinical Skill 23.2)

To prepare the patient and yourself to undertake the skill

2

Dip swab in transport media (if present with swab) or moisten with sterile saline
One swab can be used to swab both nostrils

To preserve any bacteria present during transportation to the laboratory
Moisten swab to avoid dessication of any bacteria present

3

Swabs must be taken from the anterior nares of the nose (see Figure 23.2).

4

The swab should be inserted just inside the nostrils and then directed gently upwards back towards the tip of the nose and rotated to ensure gentle contact with the mucosal surface

The anterior nares are the external part of the nostrils (see Figure 23.2)

Perform steps 10-16 of the common steps (see Clinical Skill 23.2)

To ensure that:

- the patient is safe and comfortable
- the specimen has been correctly collected and documented in the patient's records
- the equipment is clean and in working order

Source: Dougherty and Lister (2015); PHE (2015a)



Figure 23.2 Nasal swab

STEP-BY-STEP CLINICAL SKILL 23.6: TAKING A THROAT SWAB

☑ Indications for taking the specimen

To detect a throat infection or carriage of clinically important bacteria, such as MRSA, or occasionally for screening in outbreak or contact situations with, for example, Group A Streptococci, *N. meningitides*.

THROAT SWAB GUIDELINES

1

Perform steps 1-8 of the common steps (see Clinical Skill 23.2)

To prepare the patient and yourself to undertake the procedure

2

Depress the tongue to expose the fauces of the tonsils (see Figure 23.3) and gently and quickly rub the swab over the affected or inflamed area

Ensure you have good lighting present to enable you to see into the throat

The fauces or 'pillars of fauces' are two membranous folds which enclose the tonsils

3

Perform steps 10-16 of the common steps (see Clinical Skill 23.2)

To ensure that:

- the patient is safe and comfortable
- the specimen has been correctly collected and documented in the patient's records
- the equipment is clean and in working order

Rubbing the swab over the affected area may make the patient gag, obstructing the view of the tonsils

Avoid contact between the swab and other parts of the mouth (tongue and teeth) as this will contaminate the swab

Source: PHE (2015b)

CASE STUDY 23.2: MRS NEUMANN

Mrs Neumann is 58 and is undergoing a pre-operative assessment prior to a total hip replacement. As part of this, she requires a 'screen' for MRSA. This is local hospital policy. Mrs Neumann is very anxious about this and has read about 'superbugs' in the newspapers. She is worried that the fact she is having a screen means that she may have MRSA.

- How will you reassure Mrs Neumann regarding the need for an MRSA screen and gain her consent for the test (a nose swab)?
- What additional information can you provide for her while she awaits the result?

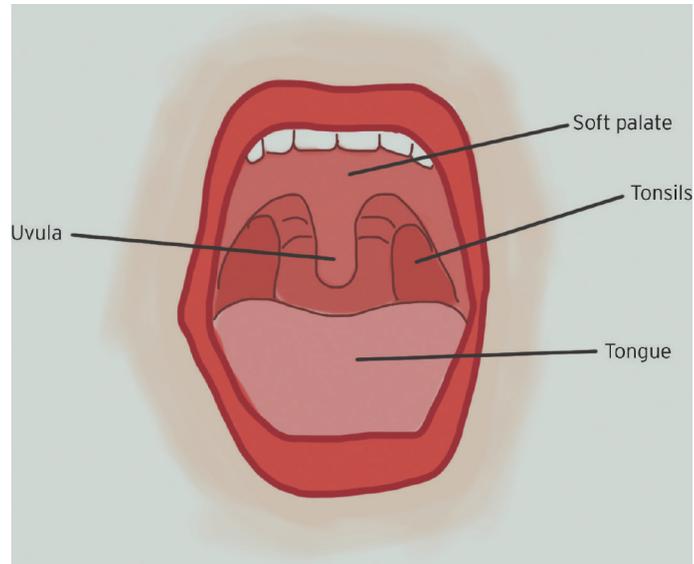


Figure 23.3 The fauces of the tonsils

Image © Robin Lupton

“

Fully prepare the patient about what you need to do so they are relaxed and can cooperate. Ensure you have all the equipment needed and you are very familiar with the procedure you are carrying out. If you are unsure about anything ASK. Don't worry and relax, the patient is usually more anxious than you are.

Julie Davis, LD nursing student

”

CONCLUSION

Maintaining asepsis and the accurate collection of specimens from patients are two skills fundamental to the role of the nurse.

It is most important when you are performing an aseptic technique to understand the principles, which you can then apply to any situation. This is a much safer way to work than just being able to follow a procedure without the ability to customise it to meet a patient's or their immediate environment's specific needs.

The 'chain of infection' describes a series of events that need to take place for infection to occur, regardless of whether this is caused by a virus, bacteria or fungi. For an infection to occur, all links in the chain must be present. An aseptic technique, when performed correctly, will 'break' the chain of infection and, by doing so, protect the patient.

There are numerous reasons why we would request a specimen from a patient, ranging from assisting in the diagnosis of disease or infection, through monitoring recovery from illness, to the need to take specimens outside of traditional healthcare settings, such as in professional sport. Always ensure that contamination is avoided whenever a specimen is collected, as this is critical to obtaining accurate results.

CHAPTER SUMMARY

- An aseptic technique protects the patient by preventing contamination of vulnerable body sites or contamination of specimens.
- Considerable confusion exists between the use of clean and aseptic techniques.
- It is important to understand the principles of asepsis, so you can apply them appropriately to the care required by patients.
- Specimens should only be sent when clinically indicated.
- Specimen or laboratory forms must be fully completed, with all relevant clinical information included.
- Storage, transport and time taken for specimens to reach the laboratory can impact on results.

CRITICAL REFLECTION

Holistic care

Maintaining asepsis and the appropriate and correct specimen collection are important in providing holistic care for a patient. Review the chapter and note down all the instances in which the care actions outlined can help you meet a patient's wider physical, psychological, social, economic and spiritual needs. Think of a variety of different patients across the fields, not just within your own field. You may find it helpful to make a list and refer back to it next time you are in practice, and then write your own reflection after your practice experience.

GO FURTHER

Books

Gould, D. and Brooker, C. (2008) *Infection Prevention and Control: Applied Microbiology for Healthcare*.

Basingstoke: Palgrave Macmillan. This book uses microbiology as the foundation for supporting knowledge and learning relating to infection prevention and control.

Wilson, J. (2006) *Infection Control in Clinical Practice*, 3rd edn. London: Elsevier. This book provides generic information relating to all areas of infection control utilising good use of the current evidence base.

SAGE journal articles

Go to <https://study.sagepub.com/essentialnursing2e> for free online journal articles for this chapter. If you are using the interactive ebook, simply click on the book icon in the margin to go straight to the resource.



FURTHER
READING:
JOURNAL
ARTICLES

Knell, C., Pellow, C. and Potter, J. (2009) 'Long-term urethral catheter audit in patients' own home', *Journal of Infection Prevention*, 10(2): 62-5. This article describes risks associated with infection and indwelling urinary catheters. It acknowledges the importance of focusing on care in settings outside acute healthcare facilities and describes a programme of audit in order to improve the care that patients receive who have these devices **in situ**. Issues relating to urine specimen collection were identified as an area of practice to improve.

Jones, P. (1995) 'Pioneers of the transition from antiseptic to aseptic surgery', *Journal of Medical Biography*, 3: 201-6. This article describes the historical development of asepsis within the theatre context.

Other journal article

Flores, A. (2008) 'Sterile versus non-sterile glove use and aseptic technique', *Nursing Standard*, 23(6): 35-9. This article explores the evidence base for glove use in aseptic technique. It acknowledges the lack of evidence regarding the benefits of sterile versus clean gloves to achieve asepsis.

Weblinks



Go to <https://study.sagepub.com/essentialnursing2e> for weblinks related to this chapter. If you are using the interactive ebook, simply click on the book icon in the margin to go straight to the resource.

FURTHER
READING:
WEBLINKS

NHS Choices (2012) Report following Publication of 2012 HPA HCAI Prevalence Report. Available at: www.nhs.uk/news/2012/05may/pages/mrsa-hospital-acquired-infection-rates.aspx. This report provides an overview for patients and the general public on the estimated prevalence of HCAI in 2012 and the types of micro-organisms causing concern.

NHS Choices (2014) How to Collect and Store a Stool Sample. Available at: www.nhs.uk/chq/pages/how-should-i-collect-and-store-a-stool-faeces-sample.aspx. Part of the health questions series, this web page provides information for patients and the general public on stool specimens.

NHS Choices (2014) How Should I Collect and Store a Urine Sample? Available at: www.nhs.uk/chq/Pages/how-should-i-collect-and-store-a-urine-sample.aspx?CategoryID=69&SubCategoryID=692. This is useful information for patients and the general public on specimen collection and storage of urine samples, one of the most common samples requested.

National Institute for Health and Care Excellence (NICE) (2014) Clinical Knowledge Summaries: Urinary Tract Infection - Children. Available at: <http://cks.nice.org.uk/urinary-tract-infection-children#!topicsummary>. This link provides key points regarding urinary tract infection in children.

National Institute for Health and Care Excellence (NICE) (2014) Quality Standard QS 61: Infection Prevention and Control. Available at: www.nice.org.uk/guidance/qs61. This NICE Quality Standard describes ambitious standards that organisations should aim to meet to support ongoing improvements in IPC and reductions in associated HCAI.

ACE YOUR ASSESSMENT



ONLINE
QUIZZES

Review what you have learned by visiting the book's online resources at: <https://study.sagepub.com/essentialnursing2e> If using your interactive ebook, just click on the icon in the margin to go straight there.

- Test yourself with multiple-choice and short-answer questions.
- Revise key terms with the interactive flash cards.

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