Aseptic technique in a hospital setting: Key principles

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The term ‘asepsis’ means an absence of potentially pathogenic microorganisms (Loveday et al., 2014). The term ‘aseptic technique’ can be defined as a set of practices and procedures for ensuring asepsis and for preventing the transfer of potentially pathogenic microorganisms to a susceptible site on the body, or to sterile equipment/devices (Loveday et al., 2014). It can also be defined as the practice of carrying out a procedure using a method that minimises the risk of introducing contamination into a vulnerable area or onto an invasive device (Cattini & Kiernan, 2020). An aseptic technique ensures that susceptible body sites (such as an open wound or an insertion site for an invasive medical device) and the sterile parts of devices, which are in contact with susceptible sites, are not contaminated during procedures such as wound dressing, urethral catheterisation or intravenous cannulation (Loveday et al., 2014).

An effective aseptic technique requires strict application of guidance on hand hygiene and the correct use of personal protective equipment (for detailed guidance on these aspects, see the clinicalskills.net guides, “Routine hand hygiene” and “Standard infection control precautions: Use of personal protective equipment”). When deciding whether to wear sterile or non-sterile gloves for aseptic technique, assess the risk of your gloves coming into contact with non-intact skin or mucous membranes during the procedure, as well as the potential for exposure to blood, body fluids, secretions and excretions (Loveday et al., 2014). A clean rather than sterile procedure may be sufficient for dressing chronic wounds, which are likely to be colonised with bacteria (Denton & Hallam, 2020). However, you must use a sterile technique if the patient is immunocompromised or has undergone surgery, as they will have high risk of infection (Denton & Hallam, 2020; Ashton, 2014). When using a sterile technique, the equipment, fluids and dressings used are sterile, whereas for a clean technique, clean but non-sterile, single-use gloves are used with a suitable cleansing solution (follow local policy). (See the clinicalskills.net guide, “Cleansing chronic wounds”.)

The principles of aseptic technique can be applied to many different procedures. See, for example, the clinicalskills.net guides on urethral catheterisation and venous access devices; refer to the relevant guides for more specific guidance.

A report by the Royal College of Nursing (RCN) found widespread disparity in the way healthcare professionals define aseptic technique (RCN, 2020). This guide focuses on the key principles of aseptic technique. Note that individual organisations may have their own guidelines on aseptic technique: always follow local policy. Loveday et al. (2014) recommend that organisations should provide education to ensure that healthcare professionals are competent in aseptic technique. Contents of sterile packs vary according to the manufacturer, so you will need to adapt the procedure shown accordingly.

Explain the procedure to the patient

Explain the procedure to the patient and gain consent. Refer to the patient’s notes as necessary. For example, read the wound dressing plan.

Decontaminate your hands and put on an apron

Wash and dry your hands, or use an alcohol-based hand sanitiser if your hands are visibly clean. Dispose of the paper towel in the general waste (black) bag (see the clinicalskills.net guide, “Routine hand hygiene” for guidance on washing and drying hands). Put on an apron. Put the neck strap over your head and then tie the straps up at the back (see the clinicalskills.net guide, “Standard infection control precautions: Use of personal protective equipment”).

Do not undertake or attempt any procedure unless you are, or have supervision from, a properly trained, experienced and competent person. Always first explain the procedure to the patient and obtain their consent, in line with the policies of your employer or educational institution.
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**Clean the working area**

Clean and dry the trolley or other surface (such as a tray). Use detergent or alcohol-based wipes to clean all areas effectively, then allow the surface to dry. Work systematically: clean the top shelf first, then the poles and the bottom shelf. Alternatively, clean the surface according to local policy.

**Select and check equipment**

Select the equipment you will need, depending on the procedure. For example, the appropriate sterile pack (e.g., for wound care or catheterisation), sterile cleaning fluid if required, a sterile syringe if wound irrigation will be needed, and any other equipment (e.g., wound dressing or sterile scissors). Check the expiry dates of sterile packs and fluids, and check that the packaging is dry and intact. Make sure that any solutions contain no precipitate.

**Gather equipment**

Place the equipment on the lower shelf of the trolley (or on the tray, if using one). Sterile packs with different glove sizes may be available. If your glove size is not available, obtain a larger- or smaller-sized, individually wrapped pack of sterile gloves. Include a small waste bag, if one is not included in the pack. You will need access to alcohol-based hand sanitiser. You may also need non-sterile gloves for patient preparation before starting the aseptic procedure.

**Ensure the wound-cleansing fluid is not cold before use**

Healing is most effective at 37°C and may be delayed if the temperature falls below core body temperature (Brown, 2018). Ensure that the wound-cleansing fluid is at room temperature before use, or warmed according to local policy, in order to maintain the wound bed at a stable temperature (Brown, 2018). Change your apron before taking the trolley or tray to the patient’s bedside.

**Prepare the patient and environment: (a)**

Aseptic technique should be carried out in a clean, dust-free environment. To reduce contamination, ward-cleaning activities should be minimised in the immediate vicinity while wound dressings are performed (Ayliffe et al., 2000). You may be able to take the patient to a treatment room. If working at the bedside, take the trolley or tray to the patient and draw the curtains for privacy. Explain the steps in the procedure to the patient.

**(b) Maintain privacy and dignity**

Prepare the patient in a way that protects their privacy and dignity; how you will do this will vary, depending on the type of procedure or the anatomical location of a wound. Position the patient as required. Expose only the relevant body area, to maintain privacy and dignity.
Clean your hands by decontaminating with alcohol-based hand sanitiser or by washing with soap and water and drying with disposable paper towels. Open the outside of the sterile pack and let the inner sterile pack slide out onto the trolley surface with the folded sides uppermost. Avoid contaminating the clean surface of the trolley or sterile field with any part of your body.

Carefully open any other sterile equipment (e.g., wound dressing, catheter, wound swab, scissors and forceps) onto the sterile field, without touching the sterile field with the non-sterile outer packaging of the equipment.

Likewise, if changing a wound dressing, you can keep the sterile disposal bag over your hand to remove a soiled dressing, and then invert the bag so that the dressing is inside of it. Alternatively, if you used single-use forceps to arrange the sterile field, without touching the sterile field with the non-sterile outer packaging of the equipment, you can use these to remove the dressing and discard these with the dressing into the waste bag. If you need greater dexterity, you can wear non-sterile gloves to remove the dressing; having done so, remove your gloves and dispose of them; decontaminate your hands before proceeding.

Unfold the sterile paper, holding the paper by the corner edges only. If the sterile pack you are using does not contain a waste bag, attach a waste bag to the side of the trolley now (for the method on how to do this, see below).

Arrange the items on the sterile field using sterile forceps. Alternatively, if a plastic disposal bag is included in the pack, you can place your hand inside it to use it as a sterile ‘glove’ to arrange the items on the sterile field (Cattini & Kiernan, 2020).

Attach the bag to the side of the trolley between you and the patient so that you will not need to stretch across the trolley to dispose of waste. Pull the edge of the bag open so that you can easily drop in used items. If opening a saline sachet, clean the perforation area with an alcohol swab first, allowing it to dry; follow manufacturer’s instructions.
Pour the cleaning solution

Tear the perforation and pour the fluid into the sterile container on the sterile field. Avoid splashing. Do not touch the sterile container with the saline sachet/vial.

Put on sterile gloves

Put on sterile gloves using the correct technique: make sure that your skin touches only the insides of the gloves, starting at the wrist end (also see “Standard infection control precautions: Use of personal protective equipment”).

Avoid contaminating sterile gloves or other sterile items

Avoid contaminating your sterile gloves during the procedure; for example, do not touch any part of the patient’s body. Do not touch the bed, other furniture, your own face or hair, or any other non-sterile areas. If any sterile equipment becomes contaminated, discard it and do not return it to the sterile field. Decontaminate your hands and apply new gloves. Recreate the sterile field using new sterile equipment and repeat the preceding steps.

Clean your hands

Clean your hands using alcohol-based hand sanitiser. See the clinicalskills.net guide, “Routine hand hygiene”.

Use of a sterile towel

You can use the paper towel or the waterproof-backed dressing sheet enclosed in the sterile pack to surround the working area.

Carry out the aseptic procedure

Carry out the aseptic procedure following agreed guidelines. You can find useful guidance in the appropriate clinicalskills.net guides on, for example, catheterisation and wound care. Observe the patient throughout. Drop used items into the waste bag during the procedure so that the sterile field remains as clean as possible.
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Check that the patient is comfortable

When the procedure is complete, check that the patient is comfortable before leaving the bedside.

Dispose of waste

At the end of the procedure, put all remaining disposable items (including the sterile field) into the waste bag. Then dispose of the waste bag in the infectious waste (orange) bin.

Remove and dispose of the gloves

Remove your gloves using a glove-to-glove, skin-to-skin technique (see the clinicalskills.net guide, "Standard infection control precautions: Use of personal protective equipment"). Dispose of the gloves in the infectious waste (orange) bin. Decontaminate your hands.

Remove and dispose of the apron

Break the neck strap using both hands. Avoid pulling it against your neck. Let the bib of the apron fall down in front of you. Next, without touching your clothing, break the waist straps. Grasping the inner side, and avoiding touching your clothing or the outer side (which may be contaminated), roll it up into a ball. Dispose of it into the infectious waste (orange) bin (PHE, 2022).

Wash your hands

Wash your hands thoroughly using the correct technique.

Clean the trolley

Clean the trolley or tray using an alcohol-based wipe (or in accordance with local policy). Document the procedure and update the care plans appropriately in the patient’s records.

Do not undertake or attempt any procedure unless you are, or have supervision from, a properly trained, experienced and competent person. Always first explain the procedure to the patient and obtain their consent, in line with the policies of your employer or educational institution.