Aseptic Technique Guidelines

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1.1 List of Abbreviations

1.1.1 **ABHR**: Alcohol-Based Hand Rub

1.1.2 **AMR:** Antimicrobial Resistance

1.1.3 **CDC:** Centers for Disease Control and Prevention

1.1.4 **HIV:** Human Immunodeficiency Virus

1.1.5 **HAIs:** Healthcare-Associated Infections

1.1.6 **IPC:** Infection and Prevention Control

1.1.7 **IV:** Intravenous

1.1.8 **PPE:** Personal Protective Equipment

1.1.9 **WHO:** World Health Organization

1.2 Glossary

1.2.1 **Antisepsis:** The process of preventing infection by inhibiting the growth and multiplication of infectious agents. This is usually achieved by applying a germicidal preparation known as an antiseptic to living tissue.

1.2.2 **Aseptic technique:** Refers to a practice/procedure designed to minimize the risk of contamination from microorganisms into a wound, on insertion or ongoing care of a medical device such as a vascular access device or urethral catheter or during surgical procedures.

1.2.3 **Invasive procedure:** A medical/healthcare procedure penetrating or breaking the skin or entering a body cavity.

1.2.4 **Key-Part:** Parts of the procedure equipment or solutions that must remain aseptic throughout clinical procedures, in order to protect the patient from contamination or infection. e.g. a wound dressing, catheter lubrication, syringe tip, needle etc. In IV therapy, key parts are usually those that come into direct contact with the liquid infusion - for example needles, syringe tips and exposed central line lumens.

1.2.5 **Key-Site:** Susceptible open / broken wounds, surgical or IV access sites.

1.3 Aseptic Techniques Executive Summary

Aseptic technique refers to the practices performed during various medical procedures designed to maintain related sterile body locations maximally free from microorganisms that helps in the prevention of infections that may be device- or procedure-related.

Aseptic technique practices should always be performed during insertion of devices related to sterile body compartments or during any invasive procedure. This includes using appropriate attire, hand hygiene, skin antisepsis, appropriate use of sterile supplies etc….

Serial	Recommendations
1.	For standard aseptic procedures, clean hands effectively with soap and water or ABHR (**Strong recommendation**)
2.	Wear clean gloves, rather than sterile gloves, for the insertion of peripheral intravascular catheters, if the access site is not touched after the application of skin antiseptics. (**Conditional recommendation**)
3.	Wear either clean or sterile gloves when changing the dressing on intravascular catheters. (**Strong recommendation**)
4.	Non- touch technique is required at all times to maintain asepsis (**Strong recommendation**)
5.	If it is necessary to touch key parts or key sites directly, sterile gloves are used to minimize the risk of contamination. (**Conditional recommendation**)
6.	Only sterile items contact the key site (**Strong recommendation**)
7.	For surgical aseptic procedure a surgical hand scrub is required. (**Strong recommendation**)
8.	Sterile gloves are used for surgical aseptic procedures and contact with sterile sites (**Strong recommendation**)
9.	Non-sterile gloves are typically the gloves of choice for standard aseptic procedures. (**Strong recommendation**)
10.	Wear a surgical mask when placing a catheter or injecting material into the spinal canal or subdural space (i.e., during myelograms, lumbar puncture and spinal or epidural anaesthesia) (**Strong recommendation**)

1.4 Introduction

1.4.1 Aseptic techniques are fundamental practices designed to prevent infection by ensuring that aseptic conditions are maintained during all invasive procedures. The primary goal of aseptic techniques is to protect patients from healthcare-associated infections (HAIs), which can lead to complications, prolonged hospital stays, increased healthcare costs, and even life-threatening conditions.

1.4.2 The aim of aseptic technique is to maintain sterile body areas undergoing medical procedures free from contamination proper hand hygiene, and wearing protective gear to minimize risks of infections related to different medical interventions

1.4.3 Infection Prevention: Strict compliance to aseptic techniques during different medical interventions reduces significantly rates of HAIs, which can take place due to introduction of microorganisms to the body during invasive procedures, such as surgical site infections, bloodstream infections, pneumonia etc……, which subsequently can lead to severe complications, delayed recovery, and even death.

1.4.4 Patient Safety: Protecting patients from infections is a core responsibility in healthcare. Using aseptic techniques during invasive interventions promote faster recovery, improve treatment outcomes and reduces morbidity and mortality.

1.4.5 Reduction of Antimicrobial Resistance (AMR): By adhering to aseptic techniques, healthcare providers participate in reducing infection rates thus reduction of use of antibiotics, which can help in combating AMR and limiting the spread of drug-resistant infections.

1.4.6 Successful Surgical Outcomes: Strict application of aseptic techniques in surgery is fundamental for the successful surgical outcomes , decrease rates

of post-surgical infections, and prevention of complications such as wound dehiscence (reopening of the wound) or systemic infections like sepsis etc….

1.4.7 Lower Healthcare Costs: Preventing infections through the use of aseptic techniques reduces the need for additional treatments, extended hospital stays, and readmissions. This helps healthcare facilities save on costs associated with managing infections, such as expensive antibiotics, surgical interventions

1.4.8 Compliance with Healthcare Standards: Aseptic techniques are part of standard infection prevention and control policies mandated by National healthcare regulatory bodies, (ministry of health) as well as international health concerned organization as the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO). Adhering to these protocols ensures that healthcare facilities meet accreditation and safety standards.

1.5 Scope and Purpose

Aseptic technique is a series of practices designed to prevent the introduction of infectious agents into sterile patient body location through medical procedures and interventions.

1.5.1 Scope of Aseptic Technique

1.5.1.1 Aseptic technique must be applied in various healthcare settings, whenever invasive procedures are performed or any medical intervention related to a sterile body area, this includes:

1.5.1.1.1 Hospitals: e.g. During surgeries, catheter insertions, intravenous (IV) therapy, and wound care.

1.5.1.1.2 Clinics: e.g. injections, dressing changes, and minor surgeries.

1.5.1.1.3 Community settings: In home care, nursing homes, and hospice care.

1.5.2 Purposes of Aseptic Technique

1.5.2.1 The primary purposes of aseptic technique are to:

1.5.2.1.1 Prevent infections: By minimizing risks for infection due to medical procedures. minimizing the presence of microorganisms on surfaces, equipment, and healthcare workers' hands, aseptic technique helps prevent the transmission of infections to patients.

1.5.2.1.2 Protect patients: Patients with weakened immune systems or those undergoing invasive procedures are particularly vulnerable to infections. Aseptic technique helps safeguard their health.

1.5.2.1.3 Maintain a sterile environment: This is essential for many medical procedures, such as surgery, where the introduction of microorganisms could lead to complications.

1.5.2.1.4 Improve patient outcomes: By reducing the risk of infections, aseptic technique can contribute to better patient outcomes and recovery.

1.6 Target Audience

1.6.1 Healthcare workers providing patient care (All clinical staff –Nurse and Nurse Assistant.

1.6.2 IPC leads/focal persons and teams in health care facilities.

1.6.3 Laboratory personnel- technicians.

1.6.4 Medical students and new graduated to experienced practitioners.

1.6.5 Policy maker and health care manager.

1.6.6 Other stakeholders, such as those responsible for health care quality improvement, patient safety, health facility accreditation/regulation infectious disease.

1.7 Methodology

A comprehensive search for guidelines was undertaken to identify the most relevant guidelines to consider for adaptation.

Inclusion/ exclusion criteria followed in the search and retrieval of guidelines to be adapted:

- Selecting only evidence-based guidelines (guideline must include a report on systematic literature searches and explicit links between individual recommendations and their supporting evidence)
- Selecting only national and/or international guidelines
- Specific range of dates for publication (using Guidelines published or updated in 2013 and later)
- Selecting peer reviewed publications only
- Selecting guidelines written in English language
- Excluding guidelines written by a single author, not on behalf of an organization to be valid and comprehensive, a guideline ideally requires multidisciplinary input.
- Excluding guidelines published without references as the panel needs to know whether a thorough literature review was conducted and whether current evidence was used in the preparation of the recommendations.

The following characteristics of the retrieved guidelines were summarized in:

- Developing organisation/authors
- Date of publication, posting, and release
- Country/language of publication
- Date of posting and/or release
- Dates of the search used by the source guideline developers.

All retrieved Guidelines were screened and appraised using AGREE II instrument (www.agreetrust.org) by at least three members. The panel decided on a cut-off point or ranked the guidelines (any guideline scoring above 50% on the rigor dimension was retained). The committee decided to adapt from

1. Centres for Disease Control and Prevention (CDC). "Guidelines for the prevention of intravascular catheter-related infections “Centres for Disease Control and Prevention, 2024”
2. World Health Organization (WHO). "Infection prevention and control." World Health Organization, 2009
3. Principles of aseptic technique: Information for healthcare workers, Australian Commission on Safety and Quality in Health Care; 2021.

Evidence assessment

According to WHO Handbook for Guidelines, we used the GRADE (Grading of Recommendations, Assessment, Development and Evaluation) approach to assess the quality of a body of evidence, develop and report recommendations. GRADE methods are used by WHO because these represent internationally agreed standards for making transparent recommendations. Detailed GRADE information is available on the following sites:

- GRADE working group: http://www.gradeworkingroup.org
- GRADE online training modules: http://cebgrade.mcmaster.ca/
- GRADE profile software: http://ims.cochrane.org/revman/gradepro

Table (1) Quality and Significance of the four levels of evidence in GRADE

Quality	Definition	Implications
High	The guideline development group is very confident that the true effect lies close to that of the estimate of the effect	Further research is very unlikely to change confidence in the estimate effect
Moderate	The guideline development group is moderately confident in the effect estimate: the true effect is likely to be close to the estimate of the effect, but there is a possibly that it is substantially different	Further research is likely to have an important impact on confidence in the estimate of the effect and may change the estimate
Low	Confidence in the effect estimate is limited: the true effect may be substantially different from the estimate of the true effect	Further research is very likely to have an important on confidence in the estimate of effect and is unlikely to change the estimate
Very low	The group has very little confidence in the effect estimate: the true effect is likely to be substantially different from the estimate of the effect	Any estimate of the effect is very uncertain

Table (2) Factors that determine How to upgrade or downgrade the quality of evidence.

Downgrade in presence of	Upgrade in presence of
Study limitations. 1- Serious limitations 2- Very serious limitations	Dose- response gradient. +1 Evidence of a dose-response gradient
Consistency 1- Important inconsistency	Direction of plausible bias + All plausible confounders would have reduced the effect
Directness 1- Some uncertainty 2- Major uncertainty	Magnitude of the effect +1 Strong, no plausible Confounder, consistent and direct evidence
Precision 1- Imprecise data	+2 very strong, no major threats to validity and direct evidence
Reporting bias: 1- High probability of reporting bias	

The strength of the recommendations

The strength of a recommendation communicates the importance of adherence to the recommendation.

- **Strong recommendations**

With strong recommendations, the guideline communicates the message that the desirable effects of adherence to the recommendation outweigh the undesirable effects. This means that in most situations the recommendation can be adopted as policy.

- **Conditional recommendations**

These are made when there is greater uncertainty about the four factors above or if local adaptation has to account for a greater variety in values and preferences, or when resource use makes the intervention suitable for some, but not for other locations. This means that there is a need for substantial debate and involvement of stakeholders before this recommendation can be adopted as policy.

When not to make recommendations?

When there is lack of evidence on the effectiveness of an intervention, it may be appropriate not to make a recommendation.

1.8 Recommendations

Serial	Recommendations
1.	For standard aseptic procedure, clean hands effectively with soap and water or ABHR (**Strong recommendation, High grade evidence**)
2.	Wear clean gloves, rather than sterile gloves, for the insertion of peripheral intravascular catheters, if the access site is not touched after the application of skin antiseptics. (**Conditional recommendation, Moderate grade evidence**)
3.	Wear either clean or sterile gloves when changing the dressing on intravascular catheters. (**Strong recommendation, Moderate grade evidence**)
4.	Non- touch technique is always required to maintain asepsis (**Strong recommendation, High grade evidence**)
5.	If it is necessary to touch key parts or key sites directly, sterile gloves are used to minimize the risk of contamination. (**Conditional recommendation, Moderate grade evidence**)
6.	Only sterile items contact the key site (**Strong recommendation, High grade evidence**)
7.	For surgical aseptic procedure a surgical hand scrub is required. **(Strong recommendation, High grade evidence)**
8.	Sterile gloves are used for aseptic procedures and contact with sterile sites (**Strong recommendation, High grade evidence**)
9.	Non-sterile gloves are typically the gloves of choice for standard aseptic procedures. (**Strong recommendation, High grade evidence**)
10.	Wear a surgical mask when placing a catheter or injecting material into the spinal canal or subdural space (i.e., during myelograms, lumbar puncture and spinal or epidural anaesthesia) (**Strong recommendation, Moderate grade evidence**)

1.8.1 Rationale

1.8.1.1 The clean hands break any potential transmission of infection from the clinical ward environment to the clean preparation area/room.

1.8.1.2 Effective hand cleaning is vital to reduce the risk of contaminating Key-Parts and Key-sites. The same technique of hand cleaning (covering all surfaces of the hand) should be used when both soap and water or alcohol gel is being used.

1.8.1.3 Wet hands more easily transport bacteria

1.8.1.4 Risk assessment will ensure the correct choice of glove type. (See notes below).

1.8.1.5 Gloves protect the user from exposure to drugs and blood products.

1.8.1.6 In the event the HCW unknowingly touches a Key-part, non-sterile gloves also act as a safety net as gloves will typically be cleaner than skin.

1.8.1.7 A non-touch-technique is the most important aspect of aseptic technique as even if other aspects have been compromised a non-touch technique can still ensure the ultimate aseptic procedure

1.8.1.8 Use a non-touch technique at all times.

1.8.1.9 Identify Key-Parts and remove equipment from packaging carefully.

1.8.1.10 Assemble equipment to be arranged in an organized manner in the aseptic field according to the order of procedures.

1.8.1.11 Ensure Key-Parts are protected at all times.

1.8.1.12 Key-Parts are the critical elements of a piece of equipment that will come into contact with any liquid infusion, Key-Site or other Key-Part connected to the patient or directly involved with the procedure. Contamination of these parts will directly compromise patient safety by providing a direct route of transmission for micro-organisms between healthcare worker and patient.

1.8.1.13 Standard Aseptic Technique

Standard AT practices are utilized during procedures such as:

- venipuncture
- insertion of a peripheral vascular catheter
- maintenance of vascular access devices, including line or dressing changes, or medicine administration through these devices
- blood culture collection.
- urinary catheterization
- emptying or changing drainage bag.
- nasogastric tube insertion / management
- simple dressings
- collecting of swabs and other specimens.

1.8.1.14 Surgical Aseptic Technique

Surgical aseptic technique practices are required when key-parts / sites are large and numerous or cannot be protected easily using covers / caps or managed with a non-touch technique.

Surgical aseptic technique practices include surgical procedures and/or complex or large dressings, including invasive procedures performed in the operating room, procedure room and in clinical areas, and insertion of vascular access devices such as central lines or epidurals.

Table (3): Types of aseptic technique

	Standard AT - Promotes asepsis	Surgical AT - Ensures asepsis
Procedure	Technically simple. Short duration < 20 minutes. Few key sites.	Technically complex. Takes > 20 minutes. Large open key sites.
Aseptic Field	Use general aseptic field and/or critical micro aseptic field.	Use a critical aseptic field and critical micro aseptic field.
PPE	Non-sterile gloves to remove dressing. Sterile gloves if key part at risk of being touched. Apron / face protection as per standard precautions.	Sterile gloves, sterile gown, mask, hair covering, sterile drapes.
Environment	Work surface cleaned with detergent before and after the procedure. e.g. dressing trolley. Cleaning / bed making activities in close proximity are to be avoided.	Work area and surfaces cleaned with detergent before and after a procedure. HCW activity strictly controlled. Environmental risk removed or avoided.

1.9 Indicators for Monitoring

To ensure the effectiveness of aseptic technique practices in hospitals and reduce the risk of HAIs, specific indicators should be monitored regularly. These are some indicators which can provide measurable data to assess compliance, identify areas for improvement, and guide interventions. Here are some key indicators that can be included in hospital guidelines for monitoring aseptic techniques and care bundles implementation:

1.9.1 Overall Aseptic Bundle Compliance Rate: Bundle compliance is an effective approach for monitoring and improving the adherence to aseptic techniques in infection prevention and control. A bundle consists of a set of evidence-based practices that, when performed collectively and consistently, improve patient outcomes.

- **Definition:** Percentage of clinical procedures in which all elements of the aseptic technique bundle are followed.
- **Target:** Each organization should set its target according to the strength of recommendation and gap analysis.
- **Method of Measurement:** Audits of procedures to ensure all bundle components are applied.

1.9.2 Compliance with Aseptic Techniques in Clinical Procedures*

- **Definition:** Percentage of procedures where aseptic techniques are properly followed (e.g., during catheter insertions or wound dressing).
- **Target:** Each organization should set its target according to the strength of recommendation and gap analysis.
- **Method of Measurement:** Direct observation and review of procedure checklists.

*Additional analysis: this can be done for each individual component of the bundle to evaluate points for improvement as Hand Hygiene Compliance Rate, PPE Adherence Rate, Sterile Field Integrity Compliance, Equipment Sterilization Compliance, etc….

1.9.3 Education and Training as Part of Bundle Implementation

- **Definition:** Percentage of staff trained on the aseptic technique bundle within the last 12 months.
- **Target:** Each organization should set its target according to the strength of recommendation and gap analysis.
- **Method of Measurement:** Review of training logs and competency assessments.

1.9.4 Training and Competency Compliance Rate

- **Definition:** Percentage of healthcare workers who complete aseptic technique training and competency assessments annually.
- **Target:** Each organization should set its target according to the strength of recommendation and gap analysis.
- **Method of Measurement:** Training records and competency assessment results.

1.9.5 Reporting and Documentation Accuracy

- **Definition:** Percentage of aseptic technique monitoring activities and results accurately documented.
- **Target:** Each organization should set its target according to the strength of recommendation and gap analysis.
- **Method of Measurement:** Review of audit and monitoring records.

1.9.6 Reduction in Infection Rates from Bundle Implementation

- **Definition:** Percentage reduction in infection rates linked to compliance with the aseptic technique bundle.
- **Target:** Each organization should set its target according to the strength of recommendation and gap analysis.
- **Method of Measurement:** Analysis of infection rates before and after bundle compliance.

1.9.7 Infection Rate Reduction Linked to Aseptic Breaches

- **Definition:** Reduction in healthcare-associated infection rates associated with breaches in aseptic technique.
- **Target:** Each organization should set its target according to the strength of recommendation and gap analysis.
- **Method of Measurement:** Analysis of infection control reports and infection trend data.

1.9.8 Environmental Hygiene Audit Score

- **Definition:** Average score from audits evaluating the cleanliness and disinfection of clinical environments in which procedures are carried out and can impact the procedure.
- **Target:** Each organization should set its target according to the strength of recommendation and gap analysis.
- **Method of Measurement:** Routine environmental hygiene audits.

1.10 Plan to Update this National Clinical Guideline

1.10.1 This guideline will be reviewed and updated at least every three years, or when new evidence emerges that is likely to influence the recommendations.

1.11 Reference

- Centres for Disease Control and Prevention (CDC). "Guidelines for the prevention of intravascular catheter-related infections “Centres for Disease Control and Prevention, 2024”
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