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UTILIZATION OF ASEPTIC AND ANTISEPTIC STERILIZATION TECHNIQUES BY HEALTHCARE WORKERS

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Abstract: This article examines diverse sterilization techniques, including ultrasonic sterilization, membrane filtration, and the use of antiseptics and disinfectants. It highlights their advantages and disadvantages, as well as their impact on the materials being sterilized. The importance of carefully selecting the appropriate sterilization method based on specific conditions and requirements is emphasized.

Keywords: sterilization, ultrasonic sterilization, membrane filtration, antiseptics, disinfectants, pros and cons, processed materials, selection of sterilization method, conditions, sterility requirements.

Sterilization is the process of eliminating all forms of microorganisms, including bacteria, viruses, fungi, and their spores. This procedure is crucial in fields such as medicine, pharmaceuticals, food industry, and other areas where ensuring safety and preventing the spread of infections is essential. The fight against wound infections began long before our era and continues to this day. In 500 BC, it was known in India that smooth wound healing was only possible after thorough removal of foreign objects. In ancient Greece, Hippocrates always covered the surgical field with clean cloth and used only boiled water during operations. For centuries, traditional medicine used various substances like incense, chamomile, wormwood, aloe, rose, alcohol, honey, and others for antiseptic purposes. Before the introduction of antiseptic methods into surgical practice, postoperative mortality reached 80% due to various purulent-inflammatory complications. The history of surgery is closely linked to the fight against infection. The discovery and implementation of asepsis and antisepsis marked a new era in surgery. The development of physical, mechanical, chemical, and biological antiseptic methods allowed for significant success in preventing and treating purulent diseases. Undoubtedly, the discovery and clinical application of antibiotics created fundamentally new opportunities for preventing and treating surgical infections. Unfortunately, in recent years, surgeons have once again focused on the problem of infections in surgery. According to many authors, there has been an increase in the number of purulent complications after surgical operations. Therefore, infections in the surgical wound area are diagnosed in 2% of "clean operations" and 30-40% of surgeries for widespread purulent processes.Adhering to asepsis and antisepsis principles is fundamental in organizing surgical hospitals. Many hospitals

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are built in green, clean areas. Surgical departments should not be located on the ground floor of the hospital, and if possible, wards should be designed for 1-2 patients. The general surgical department should have a space of 6.5-7.5 m² per bed, with room heights of at least 3 meters and widths of at least 2.2 meters. Walls should be tiled or painted. Surfaces of walls, floors, and ceilings must be smooth, defect-free, and easy to clean and disinfect. Floor coverings should be securely attached to the base, with rounded wall and floor junctions, sealed joints, and covered with stone, poured material, or linoleum. Nowadays, special attention is given to parenterally transmitted infections (HIV, parenteral hepatitis). The problem of reinfection of wound surfaces by hospital strains from healthcare workers' hands, linens, sutures, and dressings is particularly significant for immobile patient groups (stroke, severe and multiple injuries). The development of purulent complications prolongs hospital stays, increases treatment costs, and reduces patients' work capacity and quality of life. Prevention and treatment of surgical infections are especially relevant now, making the "Asepsis and Antisepsis" section of general surgery vital for any medical specialist.Several sterilization methods exist, but two are particularly important: aseptic and antiseptic. The aseptic sterilization method is used to prevent contamination of clean objects by microorganisms. This method is applied in medical facilities, pharmaceutical, and food industries. Aseptic procedures involve using special tools, equipment, and protocols to avoid contact with microorganisms. The antiseptic sterilization method targets the destruction of microorganisms on the skin, mucous membranes, and other body surfaces. This method is widely used in medical procedures like injections, surgeries, and wound care to prevent infections.

Both sterilization methods play a crucial role in ensuring safety and preventing infections. They help prevent disease spread and protect human health. It is important to correctly apply these methods and follow expert recommendations to ensure effective sterilization and avoid potential complications. It should be noted that other sterilization methods also exist, such as heat sterilization (e.g., autoclaving), chemical sterilization (using specific chemicals), and radiation sterilization (using ionizing radiation). Each method has unique characteristics and is used depending on the specific situation.Heat sterilization, like autoclaving, is widely used in healthcare facilities for sterilizing medical instruments and equipment. Autoclaving is considered one of the most reliable sterilization methods, as high temperature and pressure destroy all microorganisms, including spores. However, not all materials can withstand high temperatures, requiring other methods for those. Chemical sterilization is often used for sterilizing medical instruments sensitive to high temperatures and for various items in laboratory settings. Ethylene oxide, for example, is used to sterilize heat-sensitive materials like plastics, rubber, and electronics but may leave harmful chemical residues. Radiation sterilization is used for medical instruments, food packaging, and

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other materials. This method is particularly useful as it penetrates difficult-to-reach areas and leaves no chemical residues. Radiation sterilization, such as gamma rays or electron beam irradiation, can penetrate packages without damaging materials but requires special equipment and can be expensive.Each sterilization method has its advantages and limitations, and the choice of method depends on the specific situation, sterility requirements, and the type of material being sterilized. Depending on the situation and sterility requirements, we may choose the optimal sterilization method or combine several methods to achieve the desired result. Other sterilization methods include the use of ultrasonic waves, membrane filtration, and antiseptics and disinfectants. Each of these methods has its pros and cons, and the choice of method depends on specific conditions and sterility requirements. For instance, ultrasonic sterilization may be effective for small medical instruments but not suitable for large volumes. Membrane filtration can be useful for removing microorganisms from liquids but may not ensure complete sterility. It is also important to consider the impact of sterilization methods on the material itself. Some methods may alter the structure and properties of the material, which can be undesirable in some cases.

Conclusion: Therefore, the choice of sterilization method should be rational and based on an analysis of specific conditions and sterility requirements, as well as the potential consequences for the processed material. Aseptic and antiseptic sterilization methods play an important role in ensuring safety and preventing the spread of infections. Correct application of these methods helps ensure safety and protect human health.

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