22.2 Disinfection and Sterilization: Methods and Factors Involved in Their Efficacy

Sterilization is a process that destroys or eliminates all forms of microbial life, including bacterial spores, while disinfection is intended to eliminate many or all pathogenic microorganisms, except bacterial spores. It must also be noted that each disinfectant has a distinct activity spectrum; therefore, it is important to select the most appropriate product depending on the target microbes. Additionally, proper surface cleaning is an essential prerequisite to maximize the efficacy of both sterilization and disinfection. Cleaning is regarded as the removal of visible organic and inorganic particles from objects and surfaces and is often accomplished manually or mechanically using water with detergents or enzymatic products (Rutala and Weber 2008).

In hospitals and healthcare facilities, the utilization of different disinfection methods to reduce the risk for the patients is mainly based on a classification scheme proposed by Spaulding (1957) (Figure 22.1). This classification defines the minimum level of disinfection required depending on the infection risk associated with using a particular medical device. Thus, instruments and items for patient care are categorized as critical, semicritical, and noncritical (McDonnell and Burke 2011). For example, critical devices are those in contact with a sterile area of the body and should be sterilized (e.g. cardiac catheters). In contrast, semicritical devices interact with mucous membranes or non-intact skin, and, therefore, a high level of disinfection (complete elimination of all microorganisms, except a small number of bacterial spores) is

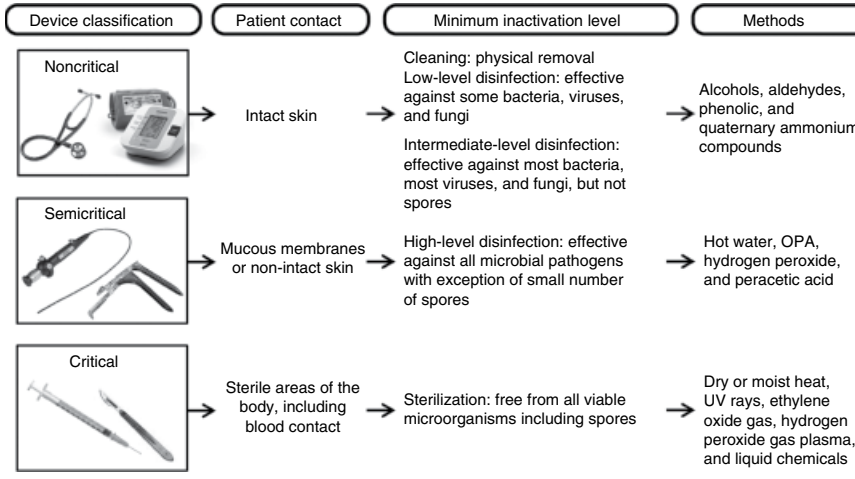

Figure 22.1 Methods of disinfection/sterilization according to the Spaulding's medical devices classification.