recommended. Finally, noncritical devices only come into contact with intact skin, and standard disinfection would suffice.

### 22.2.1 Methods of Sterilization and Disinfection

Both sterilization and disinfection can be achieved by physical or chemical methods (Figure 22.1). Sterilization by dry or moist heat is an adequate method for materials able to withstand high temperatures. Dry heat sterilization can be carried out by different methods such as treatment in a hot air oven, incineration, and infrared rays. Moist heat sterilization is usually performed by using an autoclave with temperatures above 100 °C and a pressure of 15 psi. Although most surgical devices are made of heat-stable material, some modern instruments require alternative sterilization techniques due to the presence of thermolabile materials used for their manufacture. The most common sterilizing agents used for heat-sensitive materials in healthcare facilities are UV rays, ethylene oxide (EtO) gas, hydrogen peroxide gas plasma, and liquid chemicals.

Disinfectant products can contain one or more active substances. In healthcare settings, objects are usually disinfected by liquid chemicals or wet pasteurization. For instance, a high level of disinfection can be achieved by using hot water, glutaraldehyde, ortho-phthalaldehyde (OPA), hydrogen peroxide, and peracetic acid. In contrast, other compounds like alcohols (ethyl alcohol, isopropyl alcohol, and methyl alcohol), aldehydes (formaldehyde, glutaraldehyde), phenolic compounds, and quaternary ammonium compounds can achieve an intermediate level of disinfection, eliminating non-enveloped viruses and some mycobacteria.

### 22.2.2 Factors Influencing Disinfection and Sterilization Efficacy

In order to improve the efficacy of disinfection and sterilization procedures, it is essential to understand the different factors that have an impact on the success of a given method. Perhaps, the three most relevant factors are the biological traits of the target microorganisms, their physical location, and the design of the application procedure.

Regarding the target microorganisms, there are three main features to be considered: (i) their intrinsic resistance to a given procedure or agent, (ii) the microbial load, and (iii) their location and spatial organization. For example, susceptibility to disinfection and sterilization processes varies depending on the developmental stage (e.g. bacterial spores are much more resistant than vegetative cells) or on the type of microorganism and species (Leggett et al. 2012). Moreover, high contamination levels generally require longer and/or more intense treatments, hence the importance of previous cleaning. The location and organization of microorganisms may imply a greater