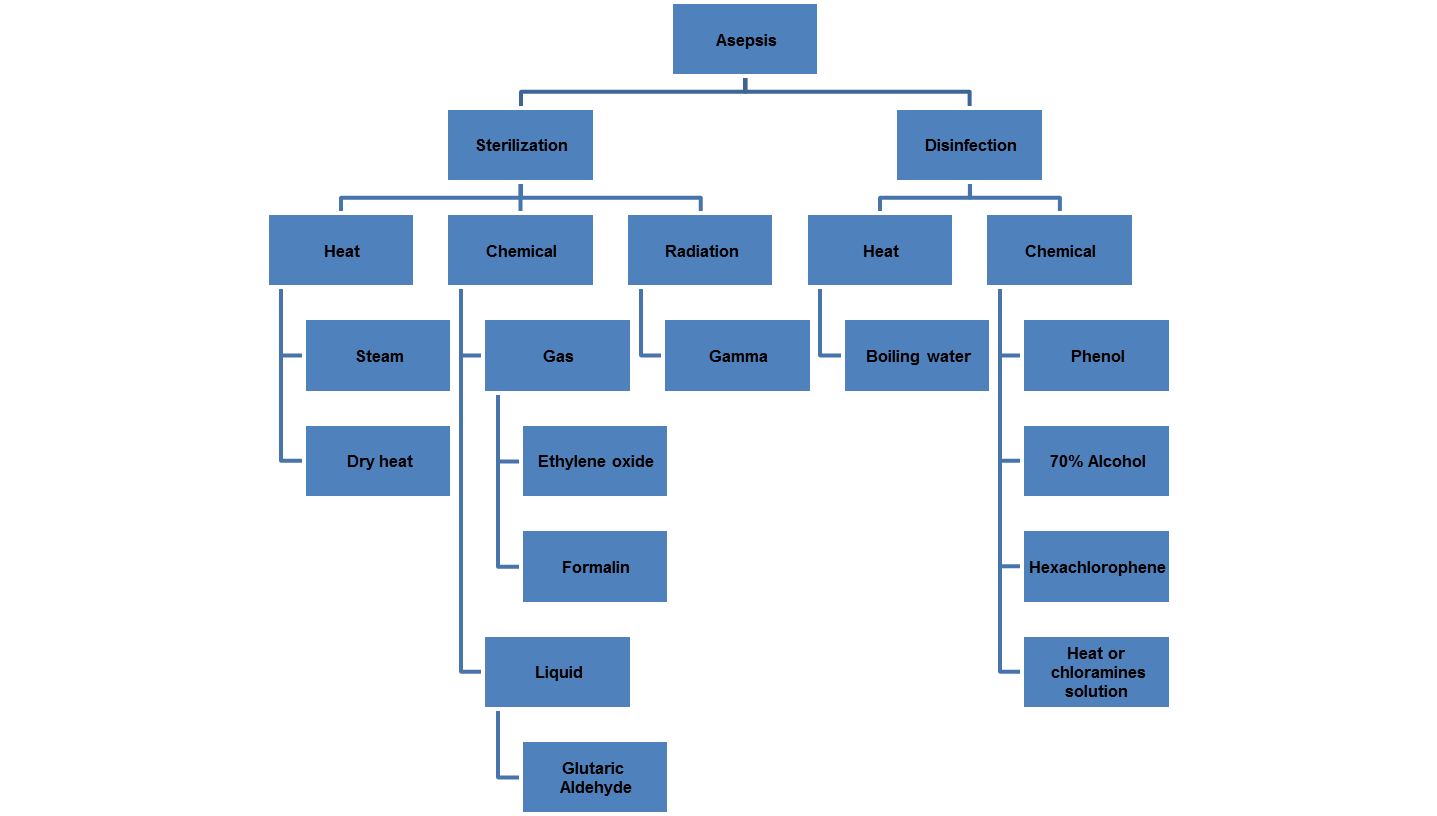
**Sterilization and disinfection**

**Sterilization:** process of removing microbes inclusive of bacterial endospore

**Disinfection:** process of removing microbes except bacterial endospore



**Tool, instrument &equipment**

**Loop**: use for transfer of bacterial cells from medium to another (as colony or drop 0.01ml), sterilized by the flame of burner after and before using.

**Slide**: use for the examination .placed on microscope stage.

**Cover-sips**: placed on the slide, the sample will be between the cover and the slide.

**Test tube**: use to place the broth, solid, or semi-solid medium for stabbing, or place as slant for bacterial culturing. The empty tubes or with uncultured broth sterilized by autoclave (15 min) but with cultured broth by autoclave (30 min.)

**Petri-dish (petri-plate):** use for place the solid medium in it. Glass petriplate use for many times &sterilized by oven or by autoclave. sterilized plastic plate use for one time.

**Flask**: used for place cultured or uncultured broth in it. Sterilized after plugs with cotton by autoclave.

**Beaker**: use for graduate the volume of fluid. Sterilized by oven.

**Cylinder (graduated cylinder**): use for graduate the volume of liquid. Sterilized by oven.

**Washing bottle**: use to filled with liquids (specially distilled water) for washing and homogenizing the glass wares and washing the slide during the staining, don’t need for sterilization.

**Burner**: may be gaseous or alcoholic, use for sterilization of the loop 'needle and other metal tools by the fame (dry heat sterilization(

**Autoclave:** equipment with high temperature, pressure and steam to sterilize the culture media and some of metal tools and glass wares.

Temperature=121 C⁰

Pressure=1 atm (15 pound/inch2)

Time=10-30 min.

10 min. for media with sugar

15 min for uncultured media

30 min. for cultured media &contaminated tools and glass wares

Sterilization by autoclave named (wet heat sterilization) the death of

bacteria take place by protein denaturation.

**Oven**: the sterilization is dry heat sterilization, the death of bacteria take place by oxidation, use for sterilization of glass wares and some metal tools.

Temp.=180c⁰

Time= one hour and half

**Incubator**: for the availability of suitable temperature for growth of microorganism by place the culture media in it, for example pathogenic -bacteria growth in optimal temperature 37c⁰ for 18-48 hours (the optimum 24hrs(.

**Refrigerator**: use to place the sterilized media and broth not use to avoid the contamination, and also to preserve the bacterial cultures for long time by preventing the growth in 4c⁰.