MINI REVIEW

STERILIZATION OF DENTAL IMPLANTS

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ABSTRACT
Sterilization is an essential step for reusing dental instruments that are contaminated, or are possibly contaminated, with saliva, blood or other fluids. The purpose of sterilization is to prevent cross-infection between patients by killing microorganisms, including spores. Various types of sterilization methods are practiced according to the type and usage of instruments. The aim of this literature review is to describe the various methods of sterilization and its clinical significance.

KEYWORDS
Sterilization, Contamination, Disinfection, Autoclave

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Introduction

Sterilization is any process that removes, kills, or deactivates all forms of life [in particular referring to microorganisms such as fungi, bacteria, spores, unicellular eukaryotic organisms such as Plasmodium, etc.] and other biological agents like prions present in a specific surface, object or fluid, for example food or biological culture media [1,2]

Classification of Sterilization:[3]

1.Physical methods of sterilization	1.Sunlight 2.Drying 3.Heat a.Dry heat-Flaming,Incineration,Hot Air oven b.Moist heat-Pasteurisation,Boiling,Steam under pressure 4.Filtration-Candles,Asbestos Pads 5.Radiation 6.Ultrasonic and Sonic vibrations
2.Chemical methods of sterilization	1.Alcohol 2.Glutaraldehyde 3.Dyes 4.Phenols 5.Metallic salts 6.Gases

Need for Sterilization:

Sterilization is an essential step for reusing dental instruments that are contaminated, or are possibly contaminated, with saliva, blood or other fluids. This includes dental handpieces. The purpose of sterilization is to prevent cross-infection between patients by killing microorganisms, including spores. Sterilization process does destroy Prion proteins. Hence, appropriate instrument cleaning is essential to physically remove contamination, including prion proteins, prior to sterilization.[4]

Types of instruments according to the Centers for Disease Control and Prevention[CDC] Given below

1.Autoclave

Standard cycle: 121°C @ 15 Psi for 20 mins
Flash cycle: 135°C @ 15 Psi for 10 mins
Flash sterilization cycle operates at a higher temperature for a

1.Critical	• Forceps, scalpels, bone chisels, scalers and surgical burs implant drills • Instruments that are for bone drilling/contouring purpose or to cut soft tissues or enter into or contact the bloodstream.	Heat-stable • Autoclaving • Hot air oven Non Heat-stable • Chemical vapor • UV light
2.Semi Critical	• Instruments that contacts mucous membranes or non intact skin • Mirrors, reusable impression trays and amalgam condensers	• Autoclaving • Hot air oven • High-level disinfection if sterilisation is not feasible
3.Non Critical	• Instruments that only contacts the intact skin • Relatively low risk of transmitting infection • External components of X-ray heads, blood pressure cuffs and pulse oximeters	• Intermediate chemicals. Phenolics, iodophors, and chlorine-containing compounds • Low-level chemicals: Quaternary ammonium compounds

shorter period of time than the normal sterilization cycle.[5]
Method for sterilization unwrapped instruments for immediate use.
Flash sterilization should not be used very frequently.
Sterilization control:
Bacillus stearothermophilus is used to monitor steam and unsaturated chemical vapor sterilizers.
Chemical indicators [in the form of tape, strips] indicate exposure to heat.

2.Hot Air oven
Slow Cycle: 160°C For 60 To 120 minutes
Rapidcycle:191° for 30 minutes
Sterilization Control
Bacillus subtilis used for monitoring the dry heat sterilizer.
Heat-sensitive chemical indicators change color after exposure.

3.Cold Sterilization[6]
Cold sterilization uses liquid chemical germicides to sterilize instruments.
Heat-sensitive instruments: Ten hours after exposure to a liquid chemical agent, instruments are sterilized.

4.Laminar Air Flow[7]
Infectious particles are eliminated even before the air enters the area.
Specially designed units are available for two zones:
Over the surface of the instrument area.
Over the surface of the operating table.

5.Fumigation
The process involves filling the operatory with formaldehyde fumes [8]
Nowadays formaldehyde is not commonly used due to its carcinogenic properties.
Bacillocid,VIRKON are newer non formaldehyde based solutions used as multipurpose disinfectants. [9]

6.UV Radiation
UV lights are fixed in the operatory which should be turned on 12-14 hours to achieve sterilization. [10]

Conclusion
Steam sterilizer is considered as the most efficient,effective and safe method of sterilizing dental instruments.The process used must be such that instruments are consistently sterilized using reproducible conditions.To get rid of the organisms, the instruments are exposed at a particular temperature for a particular holding period. It is preferable to use reusable instruments that can withstand both an automated cleaning/ disinfection process and steam sterilization or to use single-use instruments. Reusable instruments that cannot withstand steam sterilization must be decontaminated as recommended by the instrument manufacturer.[11]

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