Standard Operating Procedure (SOP): Surgical Instrument and Equipment Sterilization Procedures

This SOP details **surgical instrument and equipment sterilization procedures**, covering cleaning, disinfection, sterilization methods, handling and storage protocols, quality control checks, and contamination prevention measures to ensure the safety and effectiveness of surgical tools in clinical settings.

1. Purpose

To establish standardized procedures for the cleaning, disinfection, sterilization, handling, and storage of surgical instruments and equipment to minimize infection risks and ensure patient safety.

2. Scope

This SOP applies to all personnel involved in the handling and processing of surgical instruments and reusable medical equipment in clinical and surgical settings.

3. Responsibilities

- Sterile Processing Department (SPD) staff: Responsible for cleaning, disinfecting, and sterilizing instruments according to this SOP.
- Clinical staff: Responsible for initial instrument handling and timely transfer to SPD.
- Supervisors/Managers: Ensure compliance and provide necessary training.

4. Procedure

4.1. Collection and Initial Handling

1. Immediately after use, place instruments in designated containers with enzymatic detergent solution.
2. Transport instruments promptly to the decontamination area, minimizing exposure to air and potential contaminants.

4.2. Cleaning

1. Wear appropriate personal protective equipment (PPE).
2. Manually scrub instruments with brushes to remove debris, ensuring all hinges and lumens are cleaned.
3. Use ultrasonic cleaners if necessary for complex instruments.
4. Rinse instruments thoroughly with deionized water.
5. Inspect for visible debris; repeat cleaning if required.

4.3. Disinfection

1. Submerge instruments in approved disinfectant solution for the manufacturer's recommended duration.
2. Rinse thoroughly with sterile or filtered water after disinfection.

4.4. Sterilization Methods

Sterilization Method	Application	Parameters
Steam Autoclave	Most surgical instruments	121-134Â°C; 15-30 mins
Ethylene Oxide Gas	Heat-sensitive items	37-63Â°C; 2-5 hrs
Dry Heat	Metal instruments	160-180Â°C; 1-2 hrs
Hydrogen Peroxide Plasma	Heat/moisture sensitive items	Varies by manufacturer

1. Choose appropriate sterilization method based on instrument type and manufacturer instructions.
2. Package and label instruments with chemical and biological indicators before sterilization.
3. Operate sterilizers according to validated cycles and load capacities.
4. Allow sterile instruments to cool and dry before handling.

4.5. Handling and Storage

1. Inspect packaging integrity and indicator results before storage.
2. Store sterile instruments in designated clean, dry, and dust-free cabinets or shelves above floor level.
3. Record sterilization date, method, and load number for traceability.
4. Rotate stock to use oldest sterile items first (â€œfirst in, first outâ€).

4.6. Quality Control Checks

- Use chemical and biological indicators in each sterilization cycle.
- Document and review sterilization records regularly.
- Perform periodic audits and spot checks of instrument packaging and sterility.

4.7. Contamination Prevention

- Train all staff in aseptic techniques and proper instrument handling.
- Maintain strict separation between clean and contaminated areas.
- Promptly report and remove any compromised instruments from circulation.

5. Documentation

Maintain accurate records of cleaning, disinfection, sterilization cycles, biological indicator results, instrument tracking logs, and staff training.

6. References

- Manufacturer's Instructions for Use (IFU)
- CDC Guidelines for Disinfection and Sterilization in Healthcare Facilities
- AAMI ST79: Comprehensive guide to steam sterilization and sterility assurance in health care facilities

7. Review and Revision

This SOP must be reviewed annually and updated as necessary in response to new guidelines, technologies, or regulations.