REPROCESSING OF ENDOSCOPE & BRONCHOSCOPES

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Scope of Endoscopy in Medical Sciences

1. Medical Gastro-Enterology
   – Upper GI; Lower GI; capsule (small bowel)
2. Pulmonology: Broncoscopy
3. Urology: cystoscopy, ureteroscopy
4. Gynecology: colposcopy; hysteroscopy
5. ENT: Oto-Rhino-Laryngology:
   – nose; larynx; ear; pharynx
6. Anesthesia: Laryngoscopy
7. Interventional endoscopy: ERCP, TURBT
8. Surgery: Thoracoscopy; Laparoscopy

Endoscopes and its types

- Medical Device
- Visualization of internal anatomy of a hollow viscera
- Types of endoscopes (by material/device type):
  - Rigid
  - Flexible (Fibre Optic)
- Types of endoscopes (by application)
  - Diagnostic
  - Therapeutic (interventional)
  - Screening (Prevention)

Endoscope reprocessing

- Why?
  - Patient safety
  - Infection Prevention
  - Re-usable medical devices
  - Inventory management
  - Short interval between procedures
  - Expense: cost in lacs of rupees
  - Availability : mostly imported

Endoscope reprocessing

- Basic principles and processes:
  - CLEANING
  - DISINFECTION
  - STERILIZATION
  - PACKAGING
  - STORAGE
  - TRANSPORT
  - HANDLING
  - MAINTENANCE AND REPAIR
  - CONDEMNATION

Endoscope reprocessing

- CLEANING
  - ALL> removes coarse dirt and debris
  - Facilitates disinfection/ sterilization
- DISINFECTION
  - ALL; primary; High Level
  - Advantage: Rapid; low cost;
  - used for clean-contaminated areas: upper and lower GI
- STERILIZATION
  - For aseptic techniques
  - Bronchoscope; thoracoscope; laparoscope; uro-endoscopes

Spaulding Classification

Item recommended	Comes in contact with	Type
Critical	Tissue, vascular space	Sterilization
Semicritical	Mucous membrane	High level disinfection
	Non intact skin	High level disinfection
Noncritical	Intact skin only	Intermediate or
	not mucous membranes	low level disinfection

Spaulding Classification

- **Earle Spaulding** of Temple University (Philadelphia, Pennsylvania) in a 1939 paper on disinfection of surgical instruments in a chemical solution proposed "a strategy for sterilization or disinfection of inanimate objects and surfaces based on the degree c risk involved in their use

Endoscope Reprocessing

- Manual
  - Cheaper
  - Training required
  - Variable quality (person to person variation)
  - Disinfectant exposure: potential health hazard
- Automated
  - Expensive
  - Standardized
  - Needs back up Washer disinfector
  - Equipment maintenance: AMC/ CMC

Endoscope Reprocessing

- Infrastructure required:
  - Dedicated area
  - rooms for cleaning, disinfection, storage
  - CSSD for sterilization of endoscopes
  - Human resource: endoscope cleaner/ technician
  - Clean water supply
  - Ventilation of the cleaning/ disinfection room
  - PPE: Personal Protective Equipment
  - Disinfectants
  - Drainage >> connected to ETP (Effluent Treatment Plant)
  - Washing instruments and wash basin

Endoscope Reprocessing

- Disinfectant selection:
  - MSDS: Material Safety Data Sheet
  - Microbiological Efficacy
  - Material Compatibility
  - Safety
  - Cost
  - Availability
  - Stability
  - User feedback
  - Recommendation of manufacturer of equipment

Endoscope Reprocessing

- Disinfectants commonly used:
  - Glutaraldehyde (e.g. CIDEX)
  - Orthopthaldehyde
  - Peracetic acid

- Endoscope cleaning agents
  - Enzymatic/ Acid/ Alkali solution
- Use manufacturer recommendations

Endoscope Reprocessing

- Microbiological efficacy ideally desired:
  - Bactericidal (Enterococcus; E. coli, Pseudomonas)
  - Virucidal (HIV; HBV/HCV/ SARS CoV-2; HAV; Enteroviruses)
  - Fungicidal (Candida; Aspergillus)
  - Parasiticidal (cyst/ spores: Entamoeba; Cryptosporidium)
  - Mycobactericidal (MOTT and MTB)
  - Sporicidal (e.g. Clostridium difficile)
  - Remove prions

Endoscope Reprocessing

- Water quality:
  - Low TDS (Total Dissolved Solids)
    - Less than 100 ppm; preferably less than 20 ppm
    - Check by conductivity meter
  - Low free chlorine
    - Less than 0.2 ppm
    - Check by chlorine meter
  - Free of microbes: e.g. Pseudomonas
    - Check by membrane filtration
  - Free of endotoxins
    - Check by LAL assay
  - Adequate flow rate and pressure
  - Adequate drainage

Endoscope sterilization in CSSD

- Rigid scopes (which are heat stable)
  - Can be autoclaved
- Flexible endoscopes (Heat sensitive)
  - Plasma sterilization (H2O2 plasma): 2 hours
  - ETO (Ethylene Oxide Sterilization): 12- 16 hours

OLYMPUS

OER-Elite
Automated Endoscope Reprocessor

OLYMPUS

STORZ

KARL STORZ — ENDOSKOPE

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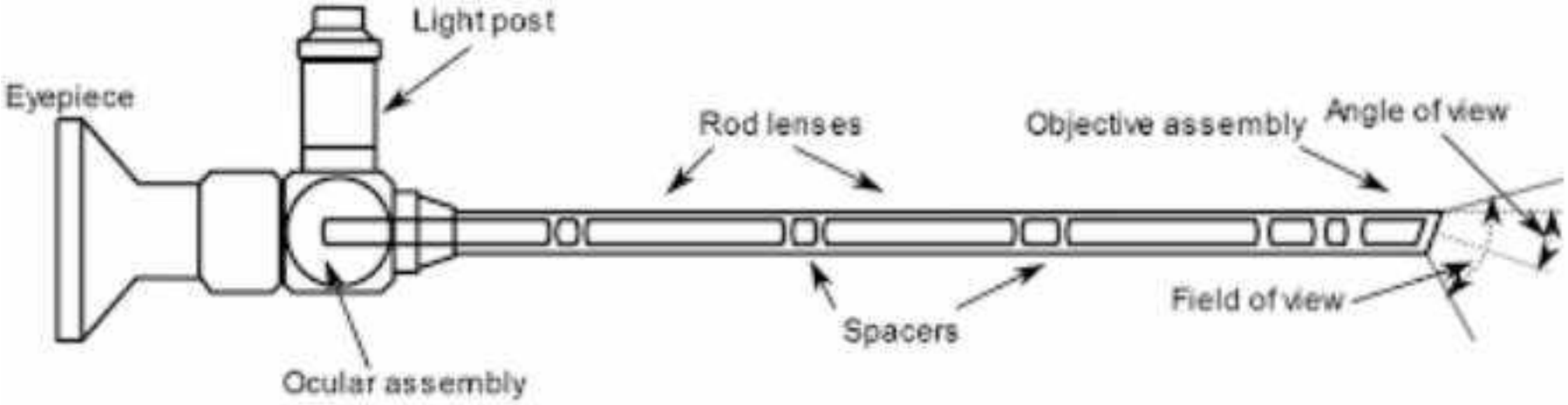
Your Vision, Our Future

Rigid Endoscope



Flexible Fiber Optic Endoscope