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MGM Eye Institute



Prevention of post-operative endophthalmitis after intra-ocular surgery is a challenge which all ophthalmic surgeons encounter daily. One important area of preventing endophthalmitis is disinfection of the operation room, and sterilization of instruments used during surgery. Significant developments have been made in this regard over the decades. Today's modern ophthalmic operation theater utilizes various disinfection and sterilization methods to make ocular surgery safe. This newsletter describes the various techniques of disinfection and sterilization.

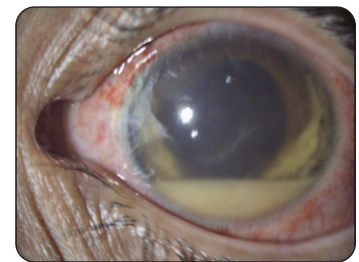
Dr Samrat Chatterjee
HIC Chairman, MGM Eye Institute

STERILIZATION AND DISINFECTION IN OPERATION THEATER

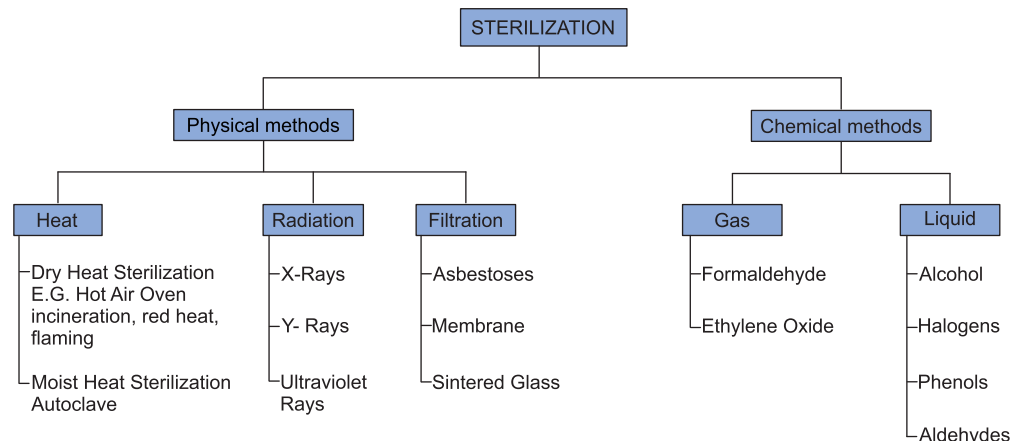
DEFINITION- Sterilization can be defined as any process that destroys or eliminates all forms of microbial life both in vegetative and sporing states such as fungi, bacteria, viruses and prions, from a surface, equipments, medications or biological culture medium.

IMPORTANCE OF STERILIZATION

- To prevent contamination in sterile products which in turn prevent the growth and spread of disease.
 - Failure to do so can lead to Health Care–Associated Infection (HAI)
- Surgical site infection (SSIs) are the commonest HAI infections that occur in the OT due to faulty preventive protocols. These infections are difficult to treat and sight threatening also.
- In ophthalmology most common SSI is post operative endophthalmitis.
- Acute postoperative endophthalmitis (within 6 weeks of surgery) results most commonly due to contamination of the intraocular structures with normal bacterial flora of the adnexa or from contaminated instruments.



METHODS OF STERILIZATION



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CLEANING

4 SINK / BOWL TECHNIQUE



Tray 1 (5 min)

Tray 2 (10 min)



Tray 3 (10 min)

Tray 4 (10 min)

After the case is finished, blades are cleaned and cannulated instruments are flushed at point of use to remove organic matter and visible soils, that interferes with the action of disinfectant. Cleaning by 4 bowl= Instruments are double dipped in chlorhexidine + cetrimide solution (2 trays; cleaning) and then in Distilled water (2 trays; rinsing)



ULTRASONIC CLEANER

- Cleaning of micro surgical instruments and instruments with hinged areas and serrated edges.
- High frequency sound waves dislodge tissue and other particles adhering to instruments, while it is soaked in DW or recommended solution.
- While keeping the instruments in the basket, make sure they do not touch each other

METHODS OF CHEMICAL STERILIZATION

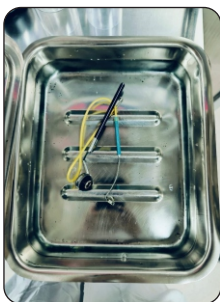
ETHYLENE OXIDE GAS STERILIZER



- It is used for sterilization of disposable surgical blades, trephines, Retinal probes, Lenses, Eye drapes, eye shields. Other plastic items can be sterilized by EO Gas.
- It is toxic and potentially explosive. Due to its toxic nature, an aeration period of minimum 72 hours for the sterilized items is a must before they are put to use.
- A microbiological control (biological indicator) is mandatory.



Korsolex - Instrument disinfectant



Instruments dipped in Korsolex solution

- **Glutaraldehyde(2%)**
 - Suitable for instruments that cannot be autoclaved. Sharp cutting instruments, plastic and rubber items, lenses, endoscopes.
 - Instruments should be thoroughly rinsed serially 2-3 times in trays with sterile water after disinfecting with glutaraldehyde solution to prevent ocular surface irritation.



Formalin bin having pores where rubber items and lenses kept in for sterilization.



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STEAM AUTOCLAVE



MATERIALS	NORMAL SPEED TIME (in min)	HIGH SPEED TIME (in min)
Surgical packs, normal size , in muslin covers	30	
Dressing Drums, with muslin liners	45	
Instruments in tray in muslin cover	15	3
Instrument wrapped for storage	30	5
Utensils in Muslin cover	15	9
Rubber gloves in Muslin wrappers	20	
Glassware ,empty, inverted	15	3
Syringes, unassembled in muslin or paper covers	30	5
Sutures, silk, cotton or Nylon	15	

Autoclave Mode	Pressure		Temperature	Time
Normal Speed	1.2 Kg/cm ²	20PSI	121 ° C	~ 20 min
High Speed	2.1 Kg/cm ²	32 PSI	134 ° C	~ 3 - 4 min

Autoclave: Dependable, nontoxic, in-expensive, and sporicidal and can penetrate fabrics well. Autoclaved instruments should not be used after 48 hours.

FLASH STERILIZATION



Used in between cases; For immediate use only. Not recommended as a routine sterilization method because of the lack of timely biological indicators to monitor performance.

DISINFECTION AND FUMIGATION



Formaldehyde fumigation-commonly used to sterilize the OR

Disinfectant - Usually a chemical agent which destroys disease causing pathogen or other harmful microorganism, but might not kill bacterial spores.

Properties of an ideal disinfectant -

- Have a wide spectrum of activity
- Be active in the presence of organic matter
- Have speedy action
- High penetrating power
- Not be toxic
- Not corrosive
- Inexpensive



Bacillocid- surface and environmental disinfectant

General Principles -

- Minimize the Operation theater traffic and keep OT doors closed.
- Visually inspect the OT for cleanliness and keep minimum storage of equipments in theater.
- Use approved cleaning products and ensure availability of safety data sheets.
- Ensure OR Theaters are clean/disinfected as required after each patient.
- Clean and disinfect from least contaminated to most contaminated and top to bottom.



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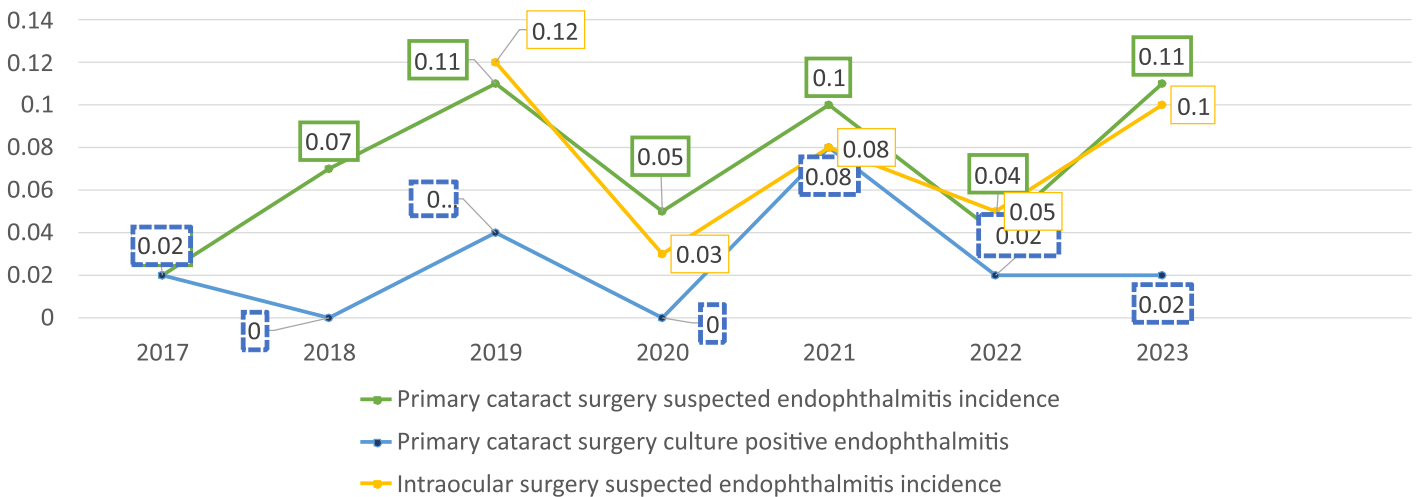


ANTIBIOTIC SENSITIVITY PATTERN AT MGMEI 2023

Antibiotics Name	<i>S. aureus/ Staph sp</i> N=13	<i>Strepto.sps</i> N=12	<i>S. pneumoniae</i> N=17	<i>S. pyogenes</i> N=4	<i>P. aeruginosa</i> N=4	<i>Pseudomonas Sps</i> N=1	<i>Bacillus</i> N=16	<i>Nocardia sps</i> N=2	<i>Other speciec</i> N = 5
	Sensitivity %	Sensitivity %	Sensitivity %	Sensitivity %	Sensitivity %	Sensitivity %	Sensitivity %	Sensitivity %	Sensitivity %
Amikacin	69	83	58	100	100	100	87	100	25
Chloramphenicol	92	92	100	75	50	100	50	50	80
Cefuroxime	92	66	95	100	0	100	37	100	100
Caftazidim	50	60	87	100	25	100	50	50	80
Ceftriaxone	69	60	95	100	0	100	50	100	25
Ciprofloxacin	40	75	75	75	100	100	81	100	60
Cefoxatin	76	83	69	75	0	100	44	100	60
Colistin	NA	NA	NA	NA	75	100	NA	NA	60
Gentamicin	76	100	62	75	100	100	81	100	80
Gatifloxacin	43	83	46	50	50	0	44	100	40
Imepenem	NA	NA	NA	NA	50	100	NA	NA	NA
Meropenem	NA	NA	NA	NA	50	100	NA	NA	NA
Linazolid	84	64	100	75	25	NA	37	100	80
Ofloxacin	50	83	62	100	75	NA	56	100	0
Oxacillin	50	36	NA	100	25	100	NA	NA	NA
Moxifloxacin	59	83	58	80	50	0	62	100	40
Piperacillin	40	83	81	80	50	100	68	100	100
Tobramycin	76	92	50	100	75	100	NA	100	60
Vancomycin	59	75	95	100	25	100	88	100	0

HOSPITAL INFECTION RATE

Trends: In-house endophthalmitis



Incidence Report of acute postoperative endophthalmitis:

A. Total cataract surgeries from Jan 1 to 31 Dec 2023 = 9158
 No. of suspected endophthalmitis cases: 10 (0.11/all cataract cases).
 No. of culture positive endophthalmitis: 02 (0.02/all cataract cases).
 B. Total intraocular surgeries from 1 Jan to 30 Jun 2023 = 11188
 (Total-oculoplasty-strabismus-cornea-office)
 No. of suspected endophthalmitis cases: 11 (0.10/all intraocular surgeries)
 No. of culture positive endophthalmitis: 02 (0.02/ all intraocular cases).

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