Beyond the Unit

Infection Prevention Strategies for the OR, Endoscopy & Central Processing

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Meet our Subject Matter Experts

Lauren Musil BSN, RN

Lauren is an Infection Preventionist with a background as Registered Nurse. She has a wide variety of healthcare experience having worked in neurology, neurosurgery, ambulatory surgery, home health and with the Nebraska Biocontainment unit. As an IP, her primary focus has been in critical care, oncology, VAE prevention and as the IP to the Nebraska Biocontainment Unit. Her recent work has been spent in a grant funded role to develop innovative tools to aid IPs in rural and remote settings.

Alisha Sheffield BSN, RN CIC

Alisha is an Infection Preventionist and Registered Nurse with 21 years of experience in a variety of healthcare settings including ambulatory, acute care, and surgical areas. Over the past 13 years, she has worked as an Infection Preventionist in outpatient surgery as well as at a large academic medical center. Her recent work has focused on utilizing her IPC expertise to develop infection control tools and resources to assist Infection Preventionists in under-resourced settings.

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Disclosure Declaration

- We have no financial disclosures or conflicts related to this presentation.
- The views and opinions expressed during this webinar are those of the presenters and do not necessarily reflect those of the University of Nebraska Medical Center or The Nebraska Medical Center.

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IPC Program Objectives

- Describe the core workflows and infection prevention considerations unique to the OR, Endoscopy, and Central Processing departments.
- Identify high-risk practices, common compliance gaps, and “red flags” IPs should recognize in procedural areas.
- Apply practical oversight strategies, tips, and tools to confidently support and assess procedural areas as an IP.

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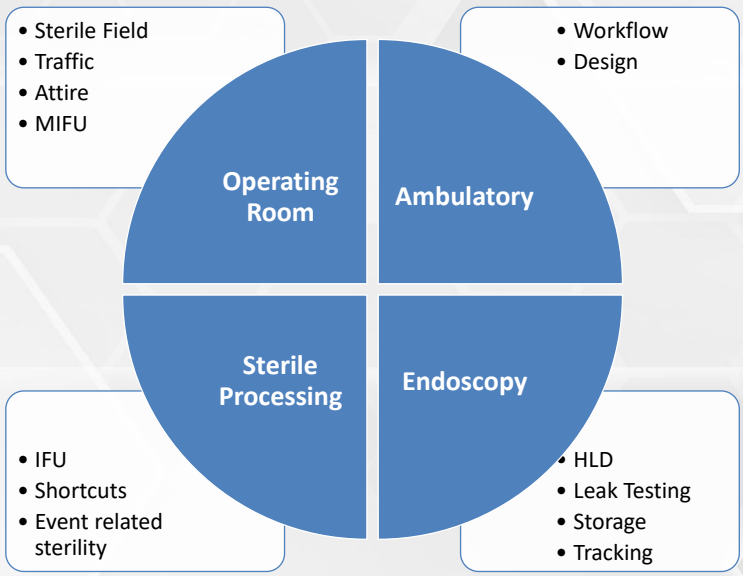
Unique Areas for the IP



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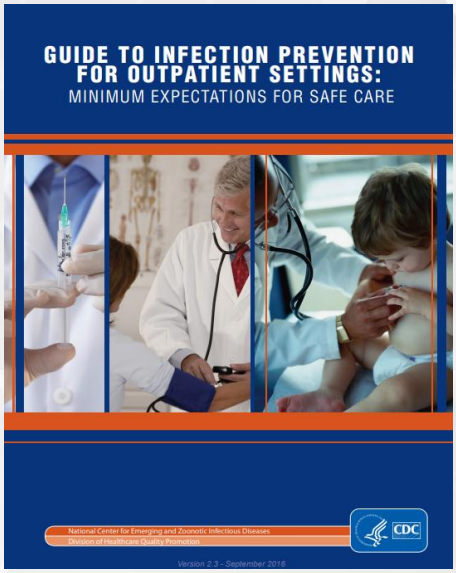
Ambulatory



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Ambulatory

Co-Mingling	• Shared spaces/waiting room • Well and sick patients • Visitors
First Point of Contact	• Patient screening
High patient turnover	• Rapid environmental contamination
Limited on-site resources	• Staff • IP workflows • Specialized staff
Facilities not set up for processes	• Sinks • Clean/dirty areas • Device reprocessing

What makes Ambulatory Unique?

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Waiting Areas

- **Triage of patients and visitors**
- **Hygiene station**
- **No touch waste receptacles**
- **Cleaning**
- **Spatial separation**
  - ➢Respiratory infection?
  - ➢Diarrhea?
  - ➢Rash?

Source: MCL

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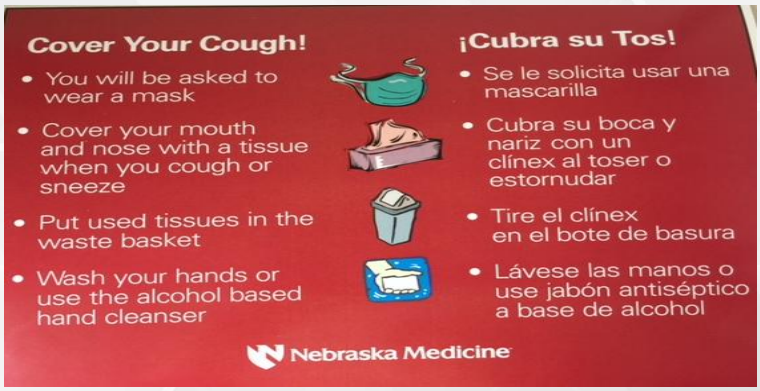
Waiting Areas

Visual Alerts

- Post at the entrance to your clinic- check in desk



Source: MCL

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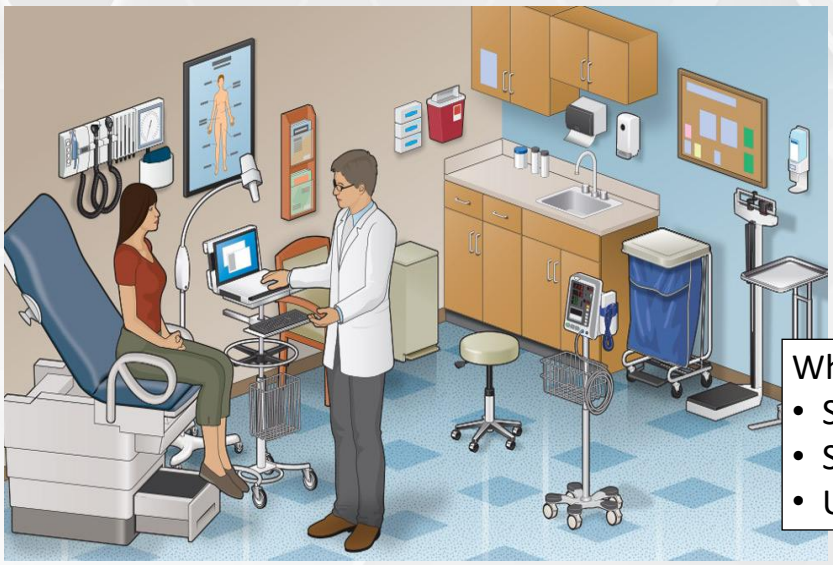
Patient Turnover



Who disinfects equipment?

Which equipment gets disinfected?

What is stored in cabinets?
- Single Dose Vials
- Supply Expiration Dates
- Under Sink Storage

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How Are We Cleaning? [6, 9]

Cleaning
- Removal of soil and organic material
- Before disinfection

Disinfection
- Destroy microorganisms on surfaces

Product Selection!!!

Equipment Low Level Disinfection Process:

One Step Method (no visible soil)	Two Step Method (Visible soil)
Don gloves	Don gloves
Use germicidal wipe per IFU • Clean & disinfect all surfaces with wet wipe • Surface remains wet full dwell time, air dry	Use germicidal wipe per IFU • Clean all surfaces, visible soil removed • Disinfect all surfaces with wet wipe • Surface remains wet full dwell time, air dry
Doff gloves, perform hand hygiene	Doff gloves, perform hand hygiene
Transport device to clean storage	Transport device to clean storage

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Disinfectant Contact time

Kill time=Contact time = Dwell time = Wet time

- Evidence-based label claims
- Is it realistic in the setting?
- Do staff know what it is?
- Does the product remain "wet" for the duration

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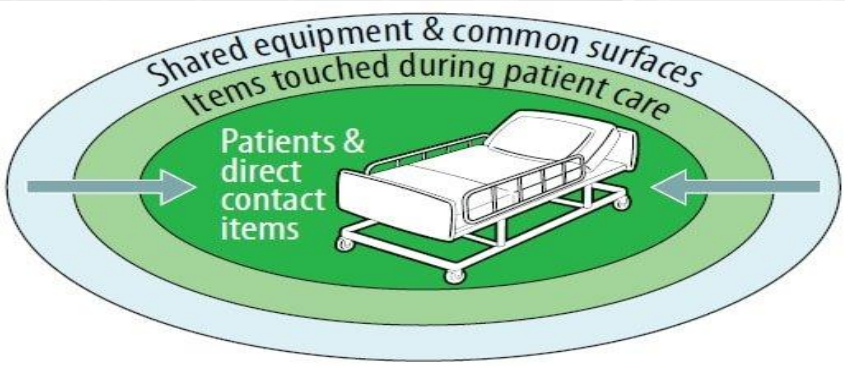
Methods



- ✓ Clean to dirty
- ✓ High to low
- ✓ One direction (clockwise)
- ✓ Methodical

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Communicating Clean

- **How to identify what has been cleaned?**
  - Tagging system
    - *e.g., clean tag on a telemetry box*
  - Flagged room
    - e.g., colorful tag attached to the door handle
  - Designated storage areas

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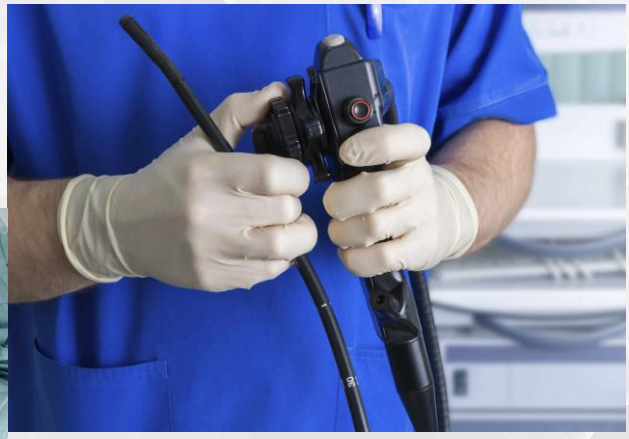
Endoscopy

- High Level Disinfection
  - Cleaning
  - Leak Testing
  - Storage
  - Tracking



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Spaulding Classification

Patient Contact	Device classification	Minimum Inactivation Level	Examples
Intact Skin	Non-Critical	Low/Intermediate level disinfectant	Glucometers Wheelchairs Blood Pressure Cuffs Environmental Surfaces ~Bedrails, Call light, door handles
Non-intact skin or mucous membranes	Semi-critical	High-level disinfection	Endoscopes, speculums, laryngoscopes, respiratory therapy equipment, anesthesia equipment, etc.
Sterile areas of the body, including bloodstream	Critical	Sterilization	Surgical instruments, IV cannula

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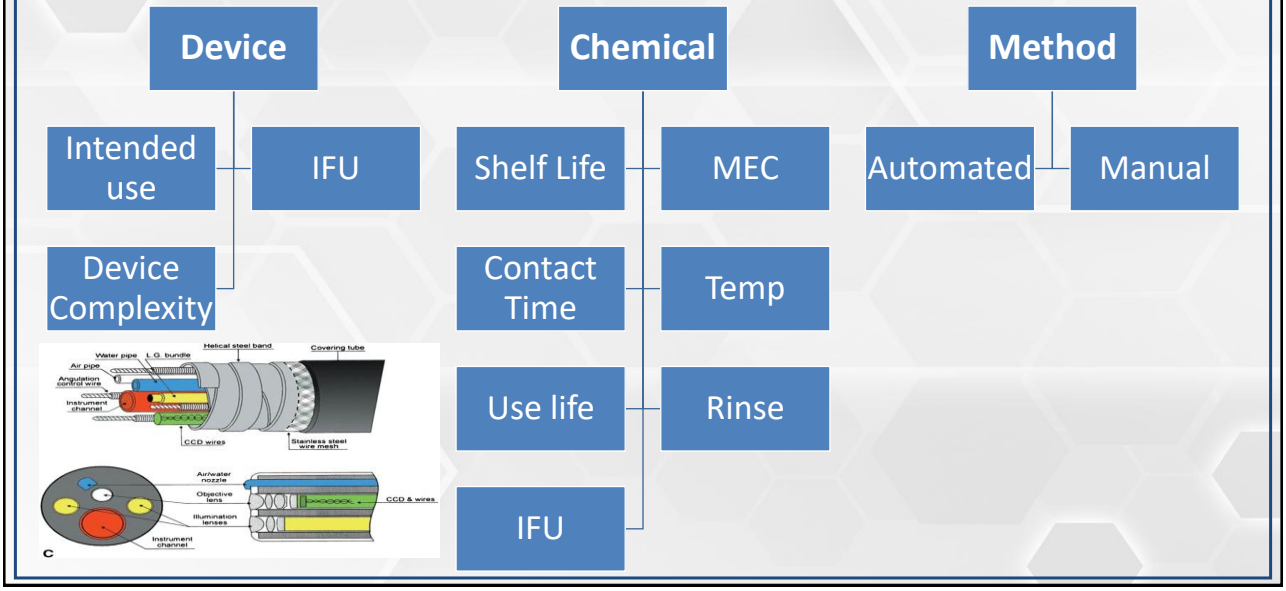
High Level Disinfection



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HLD Overview

Procedure room	Pre-Clean	Remove visible soil (at point of use) Reduce bioburden
Reprocessing room	Transport	From point of care to reprocessing area OSHA approved and labeled container
	Leak Test	Wet or dry Before cleaning
	Clean	2 sinks Enzymatic solution
	Inspection	Lighted magnification Soil marker tests (optional)
	Disinfection	Manual, automated
	Rinse	Remove debris and chemicals
Drying and storage area	Drying & Storage	Thoroughly dry Protect from contamination
	Validation Monitoring	Culturing protocols Audit and feedback
	Transport & Patient Use	Aseptic Transport

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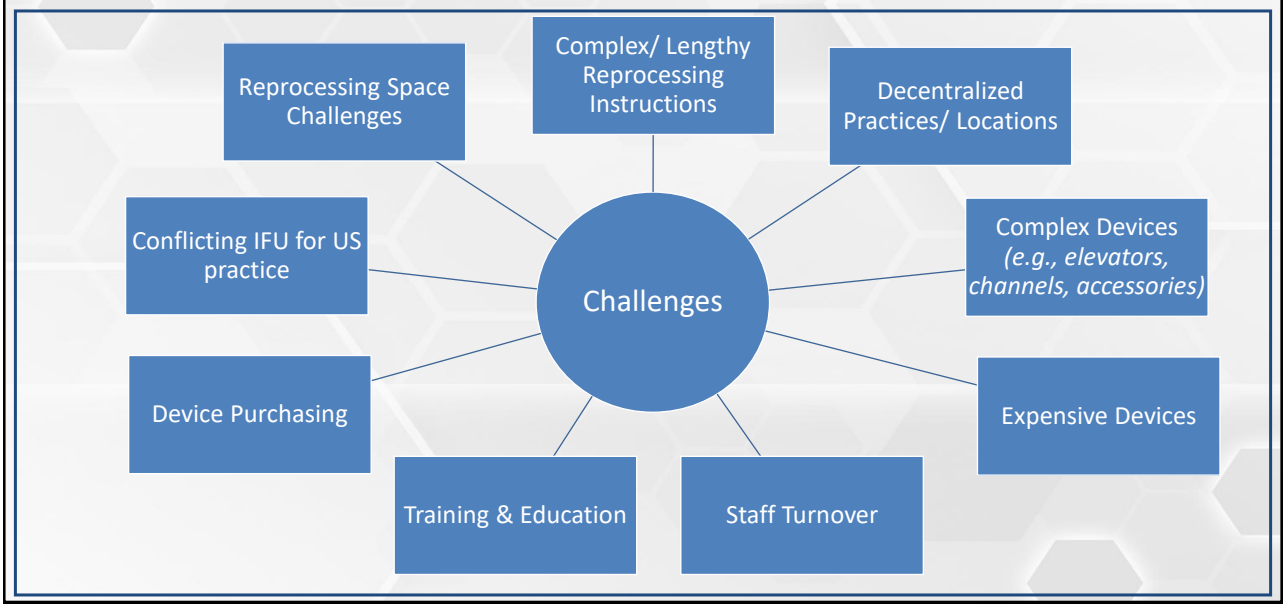
Common Challenges



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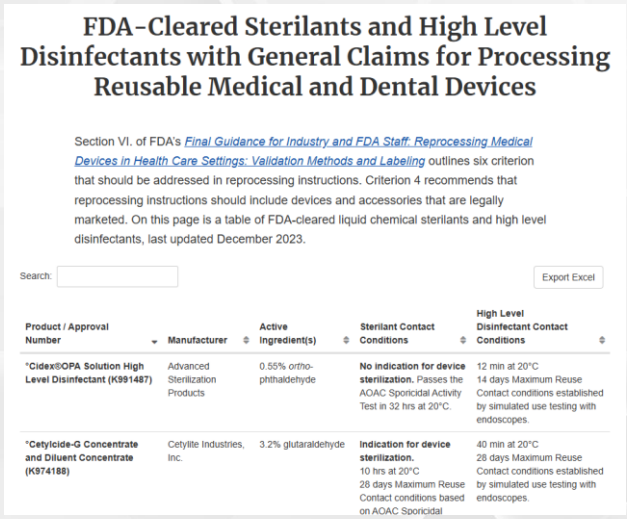
Common HLD Disinfectants

- Glutaraldehyde
- Hydrogen peroxide
- Sodium hypochlorite- hypochlorous acid
- Ortho-phthalaldehyde (opa)
- Combinations of peracetic acid

Emerging Products

- ULT Wipes (Chlorine dioxide)



FDA-Cleared Sterilants and High Level Disinfectants with General Claims for Processing Reusable Medical and Dental Devices

Section VI. of FDA's *Final Guidance for Industry and FDA Staff: Reprocessing Medical Devices in Health Care Settings: Validation Methods and Labeling* outlines six criterion that should be addressed in reprocessing instructions. Criterion 4 recommends that reprocessing instructions should include devices and accessories that are legally marketed. On this page is a table of FDA-cleared liquid chemical sterilants and high level disinfectants, last updated December 2023.

Search: Export Excel

Product / Approval Number	Manufacturer	Active Ingredient(s)	Sterilant Contact Conditions	High Level Disinfectant Contact Conditions
*Cidex®OPA Solution High Level Disinfectant (K991487)	Advanced Sterilization Products	0.55% *ortho*-phthaldehyde	**No indication for device sterilization.** Passes the AOAC Sporicidal Activity Test in 32 hrs at 20°C.	12 min at 20°C 14 days Maximum Reuse Contact conditions established by simulated use testing with endoscopes.
*Cetylcide-G Concentrate and Diluent Concentrate (K974188)	Cetylite Industries, Inc.	3.2% glutaraldehyde	**Indication for device sterilization.** 10 hrs at 20°C 28 days Maximum Reuse Contact conditions based on AOAC Sporicidal	40 min at 20°C 28 days Maximum Reuse Contact conditions established by simulated use testing with endoscopes.

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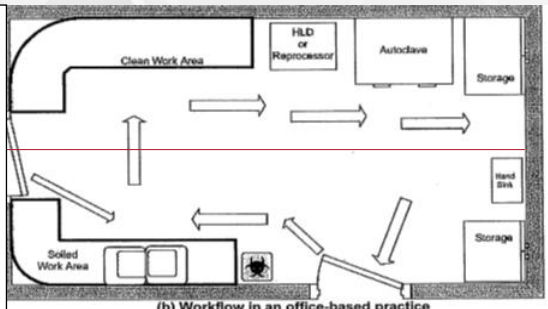
Workstation Design

Ideal Room Set Up
- Dirty to clean workflow *(unidirectional)*
- Separation of clean and dirty *(Ideally 2 rooms)*
- 2 Sinks (or 1 sink with divider)
  - *Plus a sink dedicated for hand hygiene alone*

Partner with Safety Department:
- Ventilation supportive of chemicals used *(e.g., glutaraldehyde, OPA)*
- Eyewash station within 10 second travel from chemicals
- Spill kits readily available
- SDS & IFUs readily available to staff



(b) Workflow in an office-based practice

Figure 2—Workflow

Common Challenges
- Small spaces
- Workflow
- Cross-contamination during reprocessing
- Complex reprocessing requirements

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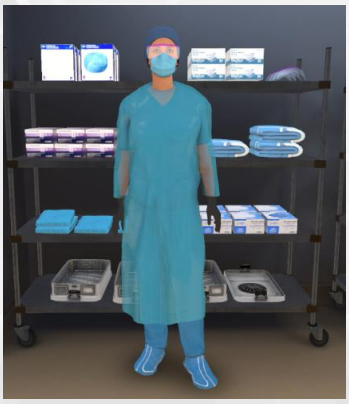
Personal Protective Equipment

Minimum PPE required to safely perform HLD includes:

- ✓ Fluid-resistant face mask
- ✓ Eye protection *(full-length face shields or goggles)*
- ✓ Disposable procedure gloves
- ✓ Fluid-resistant gowns
- ✓ Shoe covers



*Additional PPE may be recommended on the Chemical Safety Data Sheet provided by the manufacturer *(e.g., aprons, gowns with thumb loops, etc.)*

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Common HLD Errors

Common Errors

- Container labeling
- Contact time
- Temperature
- Device tracking
- Missing chemical lot number
- MEC
- Rinsing
- Drying
- IFU
- Training and competency

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Leak Testing

Typical leak testing procedure

1. **Test leak tester**
2. **Dry leak test**
   - *Pressurize leak tester to prescribed amount*
   - *Monitor for fall in pressure*
3. **Wet leak test**
   1. *Pressurize leak tester to prescribed amount*
   2. *Immerse endoscope into clean water*
   3. *Articulate the endoscope*
   4. *Observe for continuous bubbles*
   5. *Remove from water*
   6. *Depressurize*

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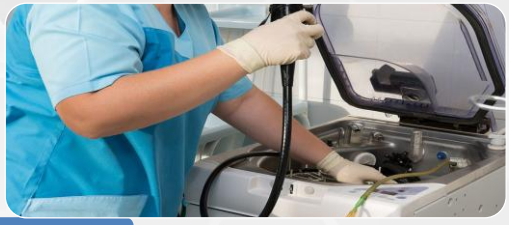
Cleaning Methods



Benefits

- Validated settings and process
- Reduce human error
- Many choices

Drawbacks

- Compatibility with devices/hook-ups
- $$$
- Ongoing maintenance
- Still need back up processes

Benefits

- Repeatable
- Cost effective

Drawbacks

- Risk for failure
- Steep learning curve
- Increased contact with chemicals and BBP

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Manual Cleaning

- ✓ Not a disinfectant!
- ✓ Temperature
- ✓ Soak time
- ✓ Dilution
- ✓ Measurement

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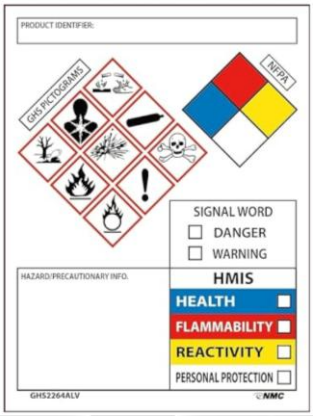
High Level Disinfection

Soaking Container

OSHA requirements: Hazard warnings, chemical identity



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Expiration Dates

Know your expiration dates!

Poured Chemical	Opened Bottle	Unopened bottles and chemicals	Test Strips
• Time chemical is in the soaking container • Test before each use • Discard earlier if needed (MEC)	• Calculate date of opened bottle per manufacturers opened expiration date	• Ensure expiration date is not beyond use date	• Label bottle with open date and expiration date • Store away from moisture, heat, light • Close cap • Discard earlier if needed

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Chemical Expiration

Disinfectant	Use life
Ortho-phthalaldehyde (OPA)	14 days
Hydrogen peroxide	21 days
Glutaraldehyde	Up to 28 days
Peracetic acid	Single-use only
Chlorine	Variable`

1	2	3	4	5	6	7
8	9	10	11	12	13	14

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21

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Chemical Contact Time

Disinfectant	Contact time	Temperature	Use life
Ortho-phthalaldehyde (OPA)	12 minutes	20–25°C	14 days
Hydrogen peroxide	8-30 minutes (varies)	20–25°C	
Glutaraldehyde	20-90 minutes	20–25°C	Up to 28 days
Peracetic acid	~12 minutes	50–56°C (in AERs)	Single-use only
Chlorine	10-30 minutes (varies)	20–25°C	

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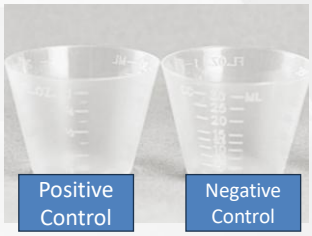
Quality Control Testing

Quality control (QC) testing strips

- Verify the minimum effective concentration (MEC)

Test the test strips
- ✓ When opened
- ✓ Periodically

Test the chemical
- ✓ With each use



Test strips opened: 1/1/2025
90-day shelf life: 3/31/2025
Bottle expiration date: 3/8/2025

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Final Rinse

Purpose:
Removes chemical residual

Aseptic technique

- Fresh PPE

Verify

- Type of water needed for each rinse
  - Often critical
- Time for each rinse
- Amount of water required for each rinse (2 gallons)
- Number of required rinses
- Channels or lumens

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After HLD

Final Rinse- Remove chemical residue

- Type of water (critical), time, amount, #, lumens

Drying-Prevent microbial growth from moisture

- Type of air (filtered, HEPA)
- Lint-free cloth
- Alcohol

Storage- Protect from damage or contamination

- Hang straight- no kinks
- No contact
- Distal tip hanging freely
- Cabinet clean
- Length of time
- Closed cabinet
- Labeled with reprocessing date and initials

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Documentation

Test Strip	Solution	Device	HLD Details	Storage	Maintenance
• Test strip lot number • Expiration date • Result of test strip QC	• Date opened • Expiration • Lot number • Date tested • Test pass/fail	• Device identifier	• Date and time • Person performing • Chemical used • MEC pass/fail • Solution temp • Exposure time	• Scope tagging	• Daily/routine maintenance • Calibration records • Temperature logs

WARNING: IFUs FOR DEVICE, DISINFECTANT, AND TEST STRIPS MUST BE FOLLOWED

Test strip bottle first opend:	Do not use test strips after this date:
Test strip QC date:	QC test performed by:
QC test results: Negative ___ ___ ___ Positive: ___ ___ ___	Test strip bottle lot #:

Solution opened Date	Solution test Date:	Device identificaiton	Date of HLD	Patient identifier
Solution expires Date	Time:	Temp / Exposure time	Time of HLD	
	Pass / Fail			
Solution lot number:			Initials of Reprocesor:	

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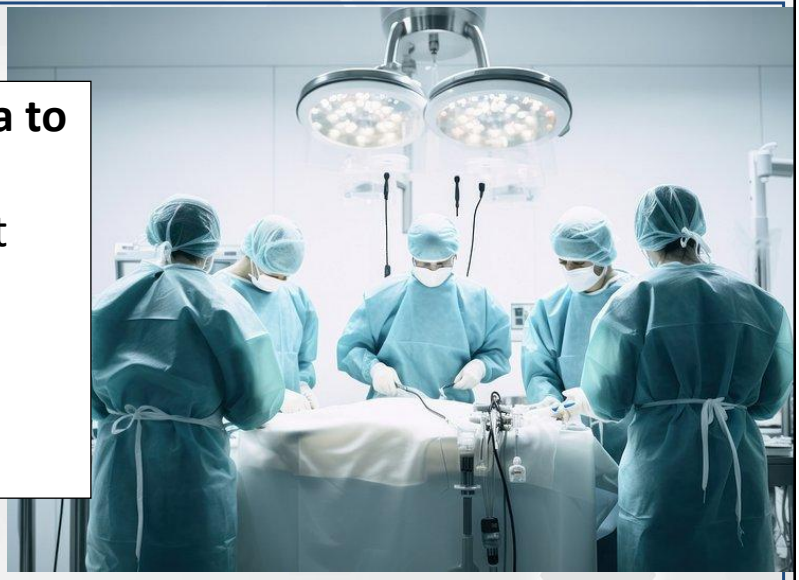
Operating Room

Highly controlled area to prevent infection

- ✓ Sterile environment
- ✓ Traffic/workflow
- ✓ Stringent protocols



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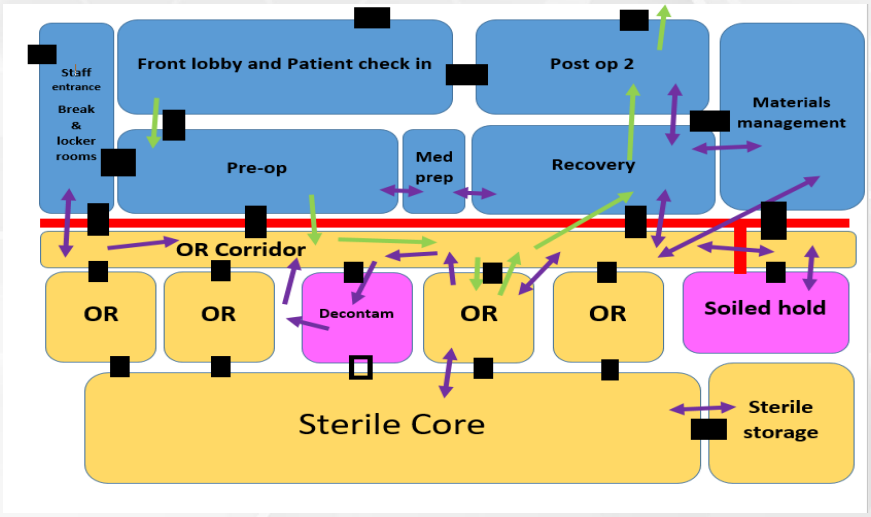
OR/Procedural Workflow



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Surgical Core/OR Hallway

- ❑Surgical Scrub
- ❑Storage of Equipment
- ❑Eyes on Field
- ❑Foot pedals
- ❑Lint free towels

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Sterile Field Management

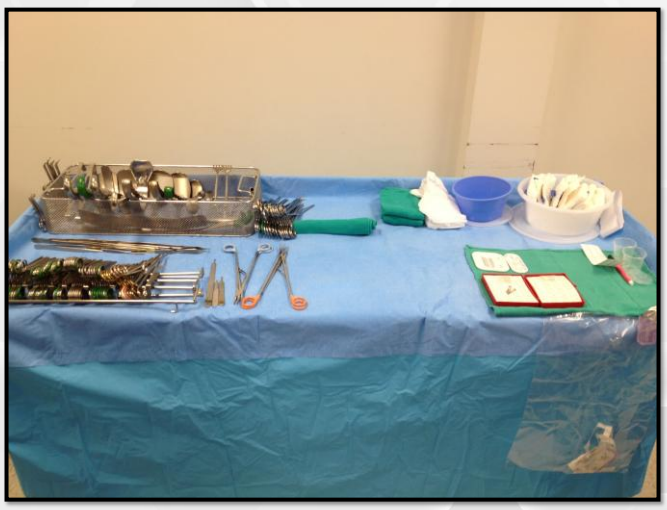
Sterile field boundaries
- 1” around the edge of the drape
- Below waist
- Below table

Sterile sets
- CI/BI
- Wraps

Never turn back on sterile field

Intact packaging

No non-sterile items over field



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Anesthesia

- Who cleans their equipment?
- How do you clean it?
- Hand hygiene
- Medication outdates
- Safe injection practices

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Surgical Attire

CDC

- Masks in OR (1B)
- Fully cover hair (1B)
- Laundering (U)
- Shoe covers
- Surgical gowns and drapes (1B)

Your Facility's Policy

AORN

- Tie masks tightly
- All clothing covered
- Launder with approved company
- Cover head, sideburns, nape of neck
- Clean, low lint head cover

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OR Temperature and Humidity

Space	Pressure Relationship	ACH-Outside air	ACH-Total	Recirculated	Humidity	Temp
OR	Pos	4	20	No	20-60%	68-75
Endoscopy	Pos	2	15	No	30-60	68-73
Bronchoscopy	Neg	2	12	No	30-60	68-73

- ✓ Patient safety
- ✓ Surgical team comfort
- ✓ Infection control
- ✓ Equipment reliability

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Manufacturer's Instructions for Use

Purpose of MIFU

- How to properly clean/disinfect devices
- Level of disinfection required
- Frequency of disinfection
- Compatibility
- Required by FDA

Issues with MIFU

- Challenging to implement
- Incompatible disinfectants
- Unclear instructions
- Minimal resolution
- Common citation
- Difficult to keep track of

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OR Cleaning Practices

1st clean of the day

- Remove overnight dust
- Dust horizontal surfaces
- Wipe high touch surfaces

Between Cases/Turnover

- Remove contamination
- Remove trash/linen
- Wipe high touch surfaces
- Wipe tables, mayo
- Possible mopping

Terminal

- Turnover cleaning PLUS
- Wipe ALL surfaces
- Move equipment
- Mop
- Walls
- Wheels, cords

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Sterile Processing Department

Source: MCL

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Small Space

Source

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Medium Space

Source: STERIS

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SPD Short Cuts

Decontam	Inspection	Sterilization	Environment	Documentation
Skipping Point of Use Cleaning	Skipping Inspection	IUSS for convenience	Poor cleaning	Missing documentation
Inadequate Manual Cleaning	Skipping magnification	Overloading sterilizers	Lack of one-way flow	Unable to trace to patient
Overlaoded Washers	No lighting	Ignoring cooling times	Improper storage	
Improper Enzymatic				

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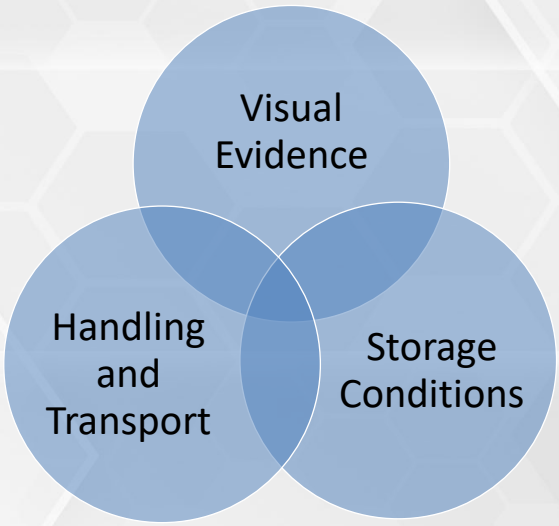
Event Related Sterility



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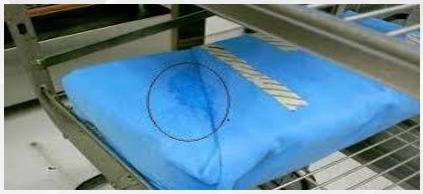
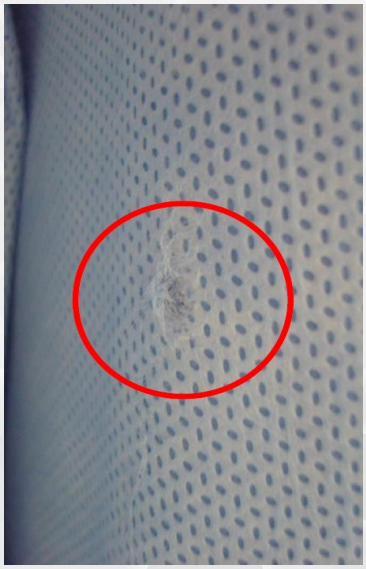
Visual Evidence of Sterility- Packaging



Visual Evidence of Sterility

- ✓ Intact packaging
  - No holes
  - No tears
  - No wetness
- ✓ Sealed packaging
- ✓ Chemical indicators
- ✓ Labeled



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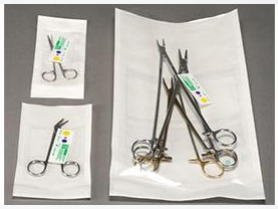
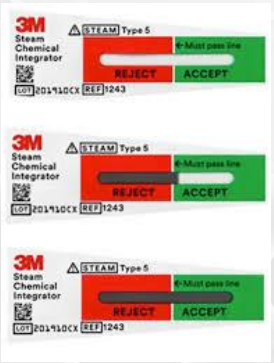
Visual Evidence of Sterility- CI





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Common Findings

Storage Conditions
- ✓ Temperature
- ✓ Humidity
- ✓ Proper storage
  - 8-10” from floor
  - 18” from ceiling
  - 2” from outside walls

Handling and Transport
- Package Integrity
  - Dropping
  - Compression
  - Environmental exposure

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Appropriate Storage

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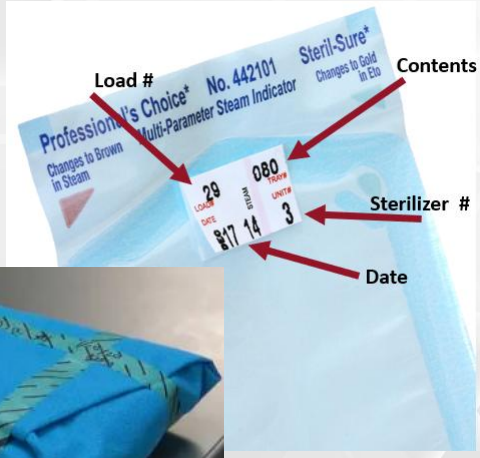
Sterilizer Records

Allow full traceability of item to patient

Every package must have:
- ✓ Sterilizer number
- ✓ Cycle and load number
- ✓ Date of sterilization
- ✓ Contents
- ✓ Person who packaged
- ✓ An indicator (internal and external)



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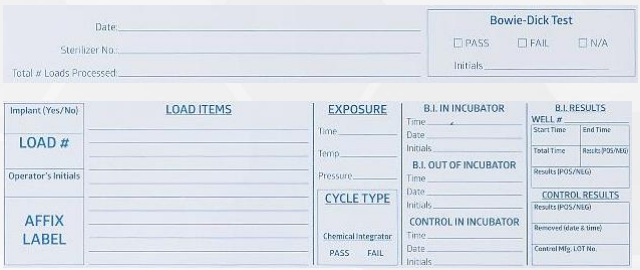
Sterilizer Records

Allow full traceability of item to patient



Sterilizer records
- Load number
- Contents of the load
- Exposure time and temperature
- Operator
- Results of BI
- Results of Bowie-Dick
- Results of CI

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Closing Thoughts

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References

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