

**ECHELON™**

# Reference Manual



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Hitachi Medical Systems America, Inc.

## **Cleaning/Disinfection Recommendations**

Each imaging facility's Infection Control Practitioner should develop specific cleaning and disinfection procedures for the facility in accordance with current infection control practices.

This cleaning and disinfection section reflects the Occupational Safety and Health Act (OSHA) Blood-Borne Pathogens Standard and is intended only as a supplement to the Exposure Control Plan of the imaging facility. The Exposure Control Plan is required by the OSHA Standard for employees who have occupational exposure to blood or other potentially infectious materials. These general cleaning and disinfection guidelines are based upon the concept of "Universal Precautions," in which all human blood and certain human body fluids are treated as if known to be infectious for human immunodeficiency virus (HIV), hepatitis B virus (HBV), and other blood-borne pathogens.

Before any patient is imaged, the imaging facility should clean and disinfect the Echelon MRI System and any other patient contact items following exposure to a source individual. The Echelon MRI System should always be cleaned and disinfected following any contact with blood or body fluids.

### **General Rules for Cleaning or Cleaning/Disinfection**

Follow these general rules when cleaning or disinfecting the Echelon MRI System:

- Always make sure that the power to the control console is off and the Echelon MRI System and patient table are turned off before starting any cleaning or cleaning/disinfection procedures.
- Do not use aerosol-can-based cleaning or cleaning/disinfection products. Aerosol cans usually are not MRI-compatible and, when near the magnet, may become projectiles, which could present a hazard to patients and other persons.
- Do not use aerosol sprays, solvents, or abrasives. These products may damage the finish of the equipment. In addition, aerosol or atomizer cleaning or cleaning/disinfection delivery systems create a mist that may be drawn into the equipment by air current convection. This mist may condense on sensitive electronics and present an electrical hazard or corrode the circuits.
- Do not use cleaning or cleaning/disinfection products that may evaporate to form potentially explosive atmospheres. Always provide adequate ventilation and allow adequate time for any vapors to disperse before using the equipment.
- Do not apply cleaning or cleaning/disinfection products at full strength or at high concentrations because these solutions may decrease the usable life of the plastics and other external surface materials.

- Clean the equipment exteriors with a damp (not wet) lint-free cloth, using a mild detergent solution. Do not allow liquids to enter any equipment openings, as this may cause an electrical hazard.
- A nonabrasive automotive polish may be used to preserve the finish of the equipment.
- Thoroughly clean before performing any disinfection procedures because germicides and hypochlorite solutions are substantially deactivated in the presence of blood and other organic fluids.
- Certain components of the Echelon MRI System, such as the patient mattresses and RF coil covers, may be difficult to disinfect due to their semiporous or porous nature. Take a preventive approach to minimize the contamination of these items by blood or body fluids.

Hitachi recommends the use of trauma pads or procedure pads to protect the patient mattresses and recommends the use of equipment or surgical drapes to protect the RF coils. These pads and drapes are readily available from a variety of laboratory suppliers.

### Cleaning/Disinfection Agents

The cleaning/disinfection agents listed below have been evaluated by Hitachi. When used according to the dilutions recommended by the Centers for Disease Control (CDC), the U.S. Department of Public Health, and OSHA, or according to the manufacturer's recommended dilution, they were found to have no harmful effects on the plastics and other external surface materials used in the Echelon MRI System.

This list is not intended to be all-inclusive, nor should it be considered as a product recommendation or endorsement by Hitachi.

Hitachi does not currently supply these decontamination agents because they are readily available from a variety of laboratory suppliers.

Common/Trade Name	Chemistry	Cleaning Usage
Chlorine	Hypochlorite	<ul style="list-style-type: none"> <li>• Daily</li> <li>• Weekly</li> <li>• Disinfectant</li> </ul>
Ethyl alcohol	Alcohol	• Daily
Isopropyl alcohol		<ul style="list-style-type: none"> <li>• Weekly</li> <li>• Disinfectant</li> </ul>
Hydrogen Peroxide	Hydrogen Peroxide	<ul style="list-style-type: none"> <li>• Daily</li> <li>• Weekly</li> <li>• Disinfectant</li> </ul>
Lysol® Brand I.C.™ Quaternary Disinfectant Cleaner	Quaternary Ammonium	<ul style="list-style-type: none"> <li>• Daily</li> <li>• Weekly</li> </ul>
Professional AMPHYL® Disinfectant Cleaner	Phenolic	• Disinfectant

The manufacturer of the Lysol® I.C.™ decontamination agents may be contacted directly at the following address:

Reckitt Benckiser Professional  
399 Interpace Pkwy.  
P.O. Box 225  
Parsippany, NJ 07054-0225  
800-677-9218

Lysol® is a registered trademark of Reckitt Benckiser.

I.C.™ is a trademark of Reckitt Benckiser.

- Solutions of chlorine (household bleach) in recommended concentrations achieve an intermediate-level disinfection and are recommended by the CDC, U.S. Department of Public Health, and OSHA for the disinfection of areas contaminated with blood or body fluids. Hypochlorite solutions are corrosive to metals, bleach fabrics, rapidly evolve into toxic chlorine gas when mixed with acid, break down in the presence of light, and are substantially deactivated in the presence of blood and other organic fluids.
- In recommended concentrations, ethyl and isopropyl alcohols achieve an intermediate-level disinfection because they are ineffective against bacterial spores. Isopropyl alcohol is ineffective against hydrophilic viruses (echovirus, coxsackie virus, poliovirus).
- Alcohols swell, harden, and bleach rubber and some plastics after prolonged and repeated use. Alcohols are flammable and must be stored in a cool, well-ventilated area; their rapid evaporation makes extended contact times difficult without immersion.
- In recommended concentrations, hydrogen peroxide achieves a high-level disinfection but is corrosive to copper, brass, and zinc.
- In manufacturer-recommended concentrations, quaternary ammonium chloride-based cleaners achieve a low-level disinfection and are commonly used for ordinary environmental sanitation. The quaternary-based cleaner should not be used for the disinfection of areas contaminated with blood or body fluids.
- Phenolic-based cleaners, in manufacturer-recommended concentrations, achieve an intermediate-level disinfection and are used for environmental, laboratory surface, and noncritical medical and surgical decontamination.
- Thorough cleaning must precede all disinfection procedures because germicides and hypochlorite solutions are substantially deactivated in the presence of blood and other organic fluids.

## General Cleaning

The Infection Control Practitioner for each imaging facility should develop general cleaning and disinfection procedures for the facility in accordance with current infection control practices. These procedures usually include the following steps.

## Daily Cleaning

1. Dress in appropriate personal protective equipment, including gloves, gown or laboratory coat, and face and eye protection.
2. Clean the patient table, auxiliary tabletop, and headrests in accordance with industry-accepted hygienic practices.
3. Disinfect the patient table, auxiliary tabletop, and headrests.
4. Clean the patient mattresses, VELCRO® straps, and RF coil covers in accordance with industry-accepted hygienic practices.
5. Disinfect the VELCRO straps.
6. Remove the RF coil covers from the RF coils and disinfect them by immersion soaking.
7. While the RF coil covers are removed, clean and disinfect the plastic housings of the RF coils. Do not immersion-soak the RF coils.
8. Following disinfection, thoroughly rinse the RF coil covers to remove any residual disinfectant.
9. Allow the RF coil covers to completely dry, then carefully reassemble the covers onto the RF coils.

VELCRO is a registered trademark of Velcro Industries B.U.

## **Weekly Cleaning**

Follow all daily cleaning instructions, as well as the following instructions for weekly cleaning:

1. Dress in appropriate personal protective equipment, including gloves, gown or laboratory coat, and face and eye protection.
2. Clean the equipment exteriors with a damp (not wet) lint-free cloth, using a mild detergent solution. Do not allow liquids to enter any equipment openings.
3. The monitor has a nonglare and anti-electrostatic treatment on the surface of the screen. Use water or alcoholic solvent with a soft cloth-like gauze to clean the surface of the screen. Never use abrasive glass cleaners containing highly concentrated ammonia and strong base chemicals; they damage the surface treatment. Clean the monitor screen and the operator's console display and control panels with a damp (not wet) lint-free cloth, using isopropyl alcohol or other products intended to clean high-resolution graphics displays. Do not spray the cleaner directly on the screens because the liquid might drip into the monitor, keyboard, or Operator's Console. Prepackaged screen wipes are available from many computer stores and other supply sources.
4. Clean the magnet gantry covers in accordance with general hygiene requirements.
5. Disinfect the magnet gantry covers.
6. Verify that patient accessories (such as patient VELCRO restraints and RF coil covers) are not damaged. Promptly replace all damaged items.

## Disinfection

The Infection Control Practitioner of each imaging facility should develop general cleaning and disinfection procedures for the facility in accordance with current infection control practices. These procedures usually include the following steps:

1. Dress in appropriate personal protective equipment, including gloves, gown or laboratory coat, and face and eye protection.
2. Restrict the access of other personnel to minimize or prevent contact with the area(s) or item(s) contaminated with blood or body fluids.
3. Thoroughly clean before conducting all disinfection procedures because germicides and hypochlorite solutions are substantially deactivated in the presence of blood and other organic fluids.
4. Absorb the excess blood or body fluid with an absorbent material. This material must be carefully transferred to a red bag or appropriate regulated waste container and handled as regulated waste.
5. Use an Environmental Protection Agency (EPA)-registered tuberculocidal disinfectant, using the appropriate strength and contact time as indicated in the directions for using the disinfectant. If no EPA-registered disinfectant is available, sodium hypochlorite or hydrogen peroxide in recommended concentrations may be used. Follow recommended contact times for effective disinfection.
6. After thoroughly disinfecting the affected area, wash and remove any further staining using appropriate personal protective measures.
7. Handle all absorbent material, cleaning materials, and used personal protective equipment as regulated waste, to be appropriately labeled and disposed of in accordance with U.S. federal, state, county, and local regulations.

## Training and Education

MRI is a sophisticated, multifaceted, rapidly changing imaging technique requiring specialized knowledge and training. It is essential that all personnel associated with the Echelon MRI System receive adequate training and education at an appropriate level for their normal duties and in the event of an emergency.