

University of Louisville
University Committee for Animal Welfare

Recommended Disinfectants, Surgical Sterilants, and Suture Materials

Table 1. Recommended Hard Surface Disinfectants

To be used, for example, on tabletops, equipment, and other surgical areas.

Note: always follow manufacturer's instructions, particularly regarding contact times.

Name	Examples	Comments
Accelerated Hydrogen Peroxide	Rescue®, Peroxigard®	Broad spectrum of activity. Environmentally safe. 90-day shelf life once diluted. Dilution is non-toxic, non-irritating, and gentle on equipment. Concentrate is corrosive. Active breaks down in oxygen and water. Remove gross contamination prior to using.
Chlorine	Sodium hypochlorite (Clorox® 10% solution) Chlorine dioxide (Clidox®, Alcide®)	Corrosive. The presence of organic matter reduces activity. Chlorine dioxide must be fresh (<14 Days old); kills vegetative organisms within 3 minutes of contact. A rinse with water or alcohol is required after solid surface disinfection.
Quaternary Ammonium	Cetylcid®	Rapidly inactivated by organic matter. Compounds may support growth of gram-negative bacteria.
Phenolics	Lysol®, TBQ®	Less affected by organic material than other disinfectants. Corrosive, harsh, toxic with a pungent odor. Skin irritant.
Alcohols	70% ethyl alcohol 70%-99% isopropyl alcohol	Contact time required is 15 minutes, and the surface must remain wet with alcohol, which evaporates quickly. Contaminated surfaces take longer to disinfect. Remove gross contamination before using. Inexpensive. Flammable. May damage rubber and plastic items.

Table 2. Skin Disinfectants for Surgical Preparation of Skin

Alternating disinfectants is more effective than using a single agent. For instance, an iodophore scrub can be alternated 3 times with an alcohol, followed by a final soaking with a disinfectant solution. Scrubs should be rinsed thoroughly with sterile saline or water before application of disinfectant solutions.

Name	Examples	Comments
Chlorhexidine	Nolvasan®, Hibiclens®	The presence of blood does not interfere with activity. Rapidly bactericidal and persistent. Effective against many viruses. Excellent for use on skin.
Iodophors	Betadine®, Prepodyne®, Wescodyne®	Reduced activity in the presence of organic matter. Wide range of microbe-killing action. Works best at pH 6-7. Precautions should be taken as iodophors can affect thyroid function.

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Table 3. Recommended Instrument Sterilants

Note: always follow manufacturer's instructions, particularly regarding contact times.

Agents	Examples	Comments
Physical Agents:		
Steam sterilization (moist heat)	Autoclave	Effectiveness dependent upon temperature, pressure and time (e.g., 121°C for 15 min vs. 131° C for 3 min).
Dry Heat ¹	Hot Bead Sterilizer Dry Chamber	Fast. Instruments must be cooled before contacting tissue. No more than 5 sequential animal surgical procedures. No more than once for intra-gastric or bowel procedures.
Ionizing radiation	Gamma Radiation	Requires special equipment
Chemical Agents:		
Gas Sterilization	Ethylene Oxide	Requires 30% or greater relative humidity for effectiveness against spores. Gas is irritating to tissues; all materials require a minimum airing time prior to use.
Hydrogen Peroxide	(Sterad®)	Not useful for "delicate" items.
Chlorine ²	Chlorine Dioxide (Clidox®, MB-10, Exspor, Alcide®)	A minimum of 6 hours is required for sterilization, depending on concentration. The presence of organic matter reduces activity. Must be freshly made (<14 days). Use only for materials that cannot be sterilized with any other method.
Aldehydes ²	Formaldehyde (2% sol.) Glutaraldehyde	All aldehydes require many hours for sterilization. Corrosive and irritating. Asthma and carcinogen risk. Consult the safety representative on proper use. Glutaraldehyde is less irritating and less corrosive than formaldehyde. Carcinogenic. Use only for materials that cannot be sterilized with any other method.

¹Instruments must be cleaned and rinsed before being placed in the bead sterilizer.

²Instruments must be rinsed thoroughly with sterile water or saline to remove chemical sterilants before being used.

Table 4. Suture Selection

Material	Characteristics and Frequent Applications
Vicryl®, Dexon®	Absorbable (60-90 days). Ligate or suture tissues where an absorbable suture is desirable.
PDS® or Maxon®	Absorbable (6 months). Ligate or suture tissues especially where an absorbable suture and extended wound support is desirable.
Prolene®	Nonabsorbable. Inert.
Nylon	Nonabsorbable. Inert. Recommended for skin.
Silk	Nonabsorbable. Primarily used for long-term vessel occlusion or securing implanted materials. <i>Caution:</i> Tissue reactive and may wick microorganisms into the wound. Silk is very easy to use and knot. Not acceptable for suturing skin.
Chromic Gut	Absorbable. Versatile material. Causes mild inflammation but is absorbed more rapidly than synthetics. Not acceptable for suturing skin.
Stainless Steel Wound Clips, Staples	Nonabsorbable. Requires an instrument for removal from the skin.

Note: Suture sizes for most general purposes for mice are 3-0 or 4-0, and for rats is 2-0 or 3-0. All tissue layers can typically be closed using a similar-sized suture in rodents, but internal layers should be closed with absorbable suture while skin is closed with non-absorbable monofilament suture.

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Larger species range in size, but in general swine require a large suture ranging from 2-0 to 0. Deeper tissue layers, such as muscle or fascia are recommended to be sutured with absorbable sutures such as Vicryl, Dexon, PDS, or Maxon (or other similar products) of a larger size, such as 0. The body wall of large species should be closed/sutured with a simple interrupted pattern to prevent dehiscence. Simple continuous patterns are prone to dehiscence. More superficial layers of large animals, such as subcutaneous and intradermal layers, should be sutured with similar absorbable suture products of a smaller size (i.e., 2-0 depending on patient size). External skin sutures of large animals should be large nonabsorbable monofilament sutures, such as Nylon of a large size, such as 0. Sutures or staples must be removed from the skin after the incision is healed; this is generally 7-14 days. Veterinary consultation of suture type and size is recommended for those who are not familiar with suture options.

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