 Department of Health Government of Nunavut		<b>NURSING POLICY, PROCEDURE AND PROTOCOLS</b>	
		<b>Community Health Nursing</b>	
<b>TITLE:</b>		<b>SECTION:</b>	<b>POLICY NUMBER:</b>
<b>Clean, Disinfect and Sterilize</b>		Infection Control	10-008-00
<b>EFFECTIVE DATE:</b>	<b>REVIEW DUE:</b>	<b>REPLACES NUMBER:</b>	<b>NUMBER OF PAGES:</b>
February 10, 2018	February 2021		8
<b>APPLIES TO:</b>			
Community Health Nurses			

#### **POLICY:**

**Environmental surfaces, equipment and instruments shall be appropriately cleaned, disinfected and sterilized. Staff shall receive training on the methods of cleaning, disinfecting and sterilization at time of hire or prior to performing these actions.**

#### **PRINCIPLES:**

Selecting the appropriate method of cleaning, disinfecting and sterilization reduces the transmission of microorganisms.

Spaulding's Classification of Medical Equipment:

1. Critical instruments or devices: any instrument that enters tissue (e.g. needles)
2. Semi-critical instruments or devices: contact with mucous membranes but do not enter tissue (e.g. laryngoscopes or specula)
3. Non-critical instruments or devices: instruments that touch only intact skin (e.g. stethoscopes or blood pressure cuffs)
4. Environmental surfaces (e.g. handles, carts, table tops)

#### **DEFINITIONS:**

**Sterilization:** the complete elimination or destruction of all forms of microbial life. Includes steam under pressure, dry heat, low temperature sterilization processes (ethylene oxide (ETO) gas, plasma sterilization) and liquid chemicals are the principal sterilizing agents used.

**Disinfection:** a process that eliminates many or all pathogenic micro-organisms, with the exception of bacterial spores, from inanimate objects. Generally accomplished by the use of liquid chemicals or wet pasteurization.

**High-level disinfection:** destroys all microorganisms with the exception of high numbers of bacterial spores. Used for cold processing of scopes and other instruments that comes into contact with mucous membranes and non-intact skin.

**Intermediate-level disinfection:** inactivates *Mycobacterium tuberculosis*, vegetative bacteria, most viruses and most fungi, but does not necessarily kill bacterial spores. Occasionally used for disinfection of non-critical client care equipment.

**Low-level disinfection:** kills most bacteria, some viruses, and some fungi. Routinely used for disinfection of non-critical client care equipment



**Cleaning:** the removal of all foreign material from objects. It is normally accomplished with water, mechanical action and detergents or enzymatic products. Failure to remove foreign matter from an object before disinfection or sterilization process is likely to render the process ineffective.

**RELATED POLICIES, GUIDELINES AND LEGISLATION:**

Policy 10-003-00	Infection Control
Policy 10-006-00	Housekeeping
Policy 10-007-00	Handling Used Equipment and Instruments
Guideline 10-008-01	Guidelines to Clean, Disinfect and Sterilize
Guideline 10-008-02	Cleaning and Disinfection of Client Care Equipment
Guideline 10-008-03	Levels of Disinfectants

**REFERENCES:**

BC Centre for Disease Control (2004). *Guidelines for Infection Prevention and Control in the Physician's Office*.

Health Canada (1999). *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*.

Qikiqtani General Hospital Infection Control Policy "Disinfection and Sterilization Practice"

Qikiqtani General Hospital Infection Control Policy "Handlings of Used Client Care Equipment / Instruments"



## GUIDELINE 10-008-01

### GENERAL PRINCIPLES

- All equipment should be cleaned regularly and stored in a means that it will not become contaminated.
- Equipment that will contact only intact skin requires cleaning and low level disinfection.
- Equipment having contact with mucous membranes requires cleaning and high-level disinfection, whereas instruments that penetrate skin or mucosal membranes must be cleaned and then sterilized.
- Instruments must be opened and/or disassembled before disinfecting and completely submerged for the required period of time. **Only those surfaces that come in contact with the germicidal solution are disinfected.**
- All items must be thoroughly rinsed and dried after disinfection. Care must be taken not to re-contaminate the item.
- The manufacturer's label/instructions, WHMIS and MSDS references should be read before using a chemical disinfectant.
- Gloves must be worn when handling disinfectants to protect the hands. If splashing is likely, safety glasses must also be worn to protect the eyes.

### Sterilization

**As sterilization equipment varies among health centres, these guidelines are intended for general application only. It is expected that the manufacturer instructions specific to your autoclave model be adhered to.**

1. Sterilization is accomplished by autoclave, dry heat, or gas. Items must be mechanically cleaned with soap and water to remove organic debris before autoclaving:
  - Steam autoclaving uses distilled water whose steam must reach a temperature of 121° to 133°C. Recommended exposure time varies with temperature, material and whether the instrument is wrapped or not. Follow the manufacturer's recommendations for exposure times. Unwrapped instruments should be used immediately or aseptically transferred to a sterile container.
2. As part of quality assurance, the sterilization of equipment should be monitored using various indicators to ensure that the process has been effective. Indicators include:
  - *Mechanical indicators* ensure that a machine reaches the correct temperature and pressure for the required time.
  - *Chemical indicators* show that the wrapped package has been exposed to the correct temperature or chemical conditions.
  - *Biological indicators* ensure sterility. A variety of indicator systems are commercially available. Rapid readout biological indicators can provide assurance of sterility within 60 minutes.



3. Follow the procedure recommended by the manufacturer to document sterility. At least weekly, results should be recorded and monitored.
4. Once the instrument pack has been sterilized, it should be stored in clean, dry area to minimize recontamination. Packs should be dated for the purposes of rotation and monitoring expiration dates.
  - Packs suspected of being compromised should not be used. If they are wet, torn, dusty, the seal broken or if they have been dropped or damaged they are compromised.
  - Packs should be inspected before use.

### **High-level Disinfection**

1. High-level disinfection is accomplished by two types of procedures:
  - a. *Boiling*: Instruments are cleaned and then placed in boiling water for at least 20 minutes. The vessel used for boiling should be cleaned daily.
  - b. *Chemical Disinfection*: Instruments are cleaned and then soaked in a chemical disinfectant such as Ortho-phthaldehyde (Cidex OPA), hydrogen peroxide, or sodium hypochlorite (bleach).
    - Manufacturer's recommended contact times must be followed to achieve disinfection.
    - Two percent glutaraldehyde solutions are not commonly used in the health centre as these products have potential toxicity if proper ventilation is not ensured. These solutions should not be used in health centres.
    - A 6% solution of hydrogen peroxide is safe and effective to use with most medical instruments.
    - A 1:50 dilution of sodium hypochlorite (bleach) is effective for disinfection.
    - WSCC safety regulations for ventilation must be observed.
2. After disinfection, instruments are rinsed with sterile water, air dried, and stored aseptically to avoid recontamination.

### **Intermediate-level Disinfection**

1. Intermediate-level disinfection is accomplished with ethanol and isopropanol, iodine and iodophors, phenols and phenolics, and 1:10 dilutions of sodium hypochlorite (bleach).
2. Manufacturer's recommended contact times must be followed to achieve disinfection.
3. Solutions must be mixed fresh each day (good for 24 hours)
4. Bleach may not be compatible and may cause damage to some surfaces

### **Low-level Disinfection**

1. Low-level disinfection is accomplished with disinfectants including phenols and phenolics, quaternary ammonium compounds, 1:500 dilutions of sodium hypochlorite, iodine and iodophors and 0.5% accelerated hydrogen peroxide (AHP).



2. Manufacturer's recommended contact times must be followed to achieve disinfection.
3. General cleaner used in health centres to can be used to clean stretchers and other furnishings. The wet surface must be allowed to air dry before use.

See Guideline 10-008-03 for a list of commonly used chemical disinfectants, their uses, advantages and disadvantages.

### **Antiseptics**

1. Antiseptics are chemical agents intended for use on skin or tissue.
2. Most skin preparation agents must be allowed to dry to provide effective antiseptics.
3. Skin preparation agents include isopropyl alcohol, chlorhexidine gluconate, iodine, and iodophors<sup>2</sup>.
4. Alcohol is the most commonly used skin preparation for immunizations and venipuncture.
5. Tincture of iodine, povidone iodine or chlorhexidine gluconate are commonly used skin preparation agents for invasive procedures, such as obtaining blood for cultures.
6. Contamination of antiseptics has been associated with outbreaks of infections. To prevent contamination of solutions, bottles of antiseptics should be dated, never refilled, and should be inspected and discarded if not used within 3 months after first opening.
7. Single use pads and swabs pre-moistened with antiseptics should be used whenever possible to eliminate the need for bottles of antiseptics.
8. Chemical agents formulated as antiseptics should not be used as cleaning agents for surfaces and instruments – they are not disinfectants.

### **REFERENCES:**

BC Centre for Disease Control (2004). *Guidelines for Infection Prevention and Control in the Physician's Office*.

Health Canada (1999). *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*.

Qikiqtani General Hospital Infection Control Policy "Disinfection and Sterilization Practice"



**GUIDELINE 10-008-02**

<b>Cleaning and Disinfection of Client Care Equipment</b>		
<b>EQUIPMENT</b>	<b>LEVEL OF DISINFECTION</b>	<b>FREQUENCY</b>
Surgical instruments Biopsy equipment All instruments used for foot care	<b><i>Critical Items:</i></b>  Clean and sterilize	<b>Between each use</b>
Endoscopes Laryngoscopes Respiratory therapy equipment Nasal specula Ear syringe nozzles Vaginal specula Sonographic vaginal probes Breast pump accessories Glass thermometers	<b><i>Semi-Critical items:</i></b>  Clean and high-level disinfection	<b>Between each use</b>
Environmental surfaces contaminated with Blood & body fluid Bedpans, urinals Stethoscopes Blood pressure cuffs Ear specula	<b><i>Reusable equipment:</i></b>  Clean and low-level disinfection	<b>Between each use</b>
Horizontal surfaces (work counters, baby scales, tables) Walls, curtains, blinds Floors Carpets, upholstery Toys Toilets	Clean and low-level disinfection	<b>Thorough regular cleaning and when soiled</b>

Source: Health Canada (1998). Handwashing, Cleaning, Disinfection and Sterilization in Health Care.



Disinfectant Uses, Advantages and Disadvantages		
DISINFECTANT/USE	ADVANTAGES	DISADVANTAGES
<b><u>Alcohols</u></b> <i>Intermediate level disinfectant</i> Disinfect thermometers, external surfaces of some equipment	Fast acting No residue Non staining	Volatile Evaporation may diminish concentration May harden rubber or deteriorate glues Intoxicating
<b><u>Chlorine</u></b> <i>Intermediate level disinfectant</i> Disinfect environmental surfaces (1:50 bleach) Following blood spills (1:10 bleach) used to decontaminate area after blood has been removed	Low cost Fast acting Readily available	Corrosive to metals Inactivated by organic material Irritant to skin and mucous membranes Use in well-ventilated areas Shelf life shortens when diluted
<b><u>Glutaraldehydes</u></b> 2% formulations <i>High level disinfectant</i> Used for heat sensitive equipment	Noncorrosive to metal Active in presence of organic material Compatible with lensed instruments Sterilization may be accomplished in 6-10 hours	Extremely irritating and toxic to skin and mucous membranes Shelf life shortens when diluted (effective for 14-30 days depending on formulation) High cost Monitor concentration in reusable solutions
<b><u>Hydrogen Peroxide</u></b> <i>Low level disinfectant (3%)</i> <i>High level disinfectant (6%)</i>	Strong oxidant Fast acting Breaks down into water and oxygen	Can be corrosive to aluminum, copper, brass or zinc Surface active with limited ability to penetrate
<b><u>Phenolics</u></b> <i>Low/intermediate level disinfectants</i> Used to clean floors, walls and furnishings	Leaves residual film on environmental surfaces Commercially available with added detergents to provide one-step cleaning and disinfecting	Do not use in nurseries Not recommended for use on food contact surfaces May be absorbed through skin or by rubber Some synthetic flooring may become sticky with repetitive use
<b><u>Quaternary Ammonium Compound</u></b> <i>Low level disinfectant</i> Used to clean floors, walls and furnishings	Generally non- irritating to hands Usually have detergent properties	<b>DO NOT</b> use to disinfect instruments Non-corrosive Limited use as disinfectant because of narrow microbiocidal spectrum

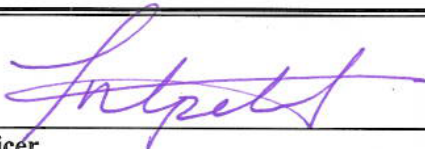

Source: Health Canada (1998). *Hand washing, Cleaning, Disinfection and Sterilization in Health Care*.



**GUIDELINE 10-008-04**

<b>Directions for Preparing and Using Chlorine-Based Disinfectants</b>			
<b>PRODUCT</b>	<b>INTENDED USE</b>	<b>RECOMMENDED DILUTION</b>	<b>LEVEL OF AVAILABLE CHLORINE</b>
<b><u>Household bleach</u></b> (5% sodium hypochlorite solution with 50,000 ppm available chlorine)	Cleanup of blood spills	Concentrations range from one part bleach mixed with 99 parts water (1:100) OR one part bleach mixed with 9 parts water (1:10) Depends on the amount of type and amount to be cleaned and disinfected	0.05% or 500ppm 0.05% or 5,000ppm
	To add to laundry water	One part (one 8 ounce cup) of bleach to be mixed with about 500 parts (28 imperial gallons) of tap water	0.01% or 100ppm
	Soaking of glassware or plastic items	One part (one 8 ounce cup) to be mixed with about 50 parts (2.8 gallons) of tap water	0.1% or 1,000ppm
<b><u>Sodium dichloroisocyanurate</u></b> (NaDCC) powder with 60% available chlorine	Cleanup of blood spills	Dissolve 8.5 g in one litre of tap water	0.85% or 5,000ppm
<b><u>Chloramines powder</u></b> with 25% available chlorine	Cleanup of blood spills	Dissolve 20 g in one litre of tap water	2.0% or 5,000ppm
PPM = parts per million Imperial gallon (4.5 litres)			

Adapted from Qikiqtani General Hospital Policy and Procedure *Disinfection and Sterilization Practice*

Approved by:	Effective Date:
 11 FEB 2011	April 1, 2011
Chief Nursing Officer	
Date	
 February 11, 2011	
Deputy Minister of Health and Social Services	
Date	

