Training on Medical Waste Management

in Collaboration with
Al-Essa Medical & Scientific Equipment Co. W.L.L

Treatment, Transportation and Disposal

Kuwait University
Health Science Center
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Waste Handling

- Use personal protective equipment (PPE) as dictated by the situation
  - Gloves
  - Shoes or boots with thick soles and good traction
  - Coveralls or aprons
  - Safety glasses
  - Face shields
  - Respirators
Waste Handling

Handling Sharps Containers

• When 3/4th full, close and remove container
• Check all sides for any holes or protruding needles before lifting the container
• If there are holes in the container, carefully place the container inside a larger puncture-resistant container
Transport Inside the Facility

• Use fully enclosed, wheeled carts
  – If not available, make sure all waste containers and bags are well sealed and secured to prevent spillage

• Healthcare carts should only be used for Healthcare

• Carts should be cleaned and disinfected routinely

• Waste transporters should use gloves
Storage

- Storage areas should be:
  - Protected from water, wind, and rain
  - Protected from rodents, insects, and other animals
  - Located away from patients and the public
  - An enclosure that can be locked when not in use
  - Accessible only to authorized personnel
  - Kept clean, free at all times of debris and standing water
  - Disinfected weekly and whenever a spill occurs

- Waste that can decompose and smell should not be stored longer than 2 days (will vary by location)
Transport Outside the Facility

• Healthcare should be packaged for transport outside the facility

• Packaging containers should be:
  – Rigid
  – Leak resistant
  – Resistant to tearing or bursting under normal use and handling
  – Sealed to prevent leakage
  – Labeled with the facility’s name and address
Contingency Planning

• Spill containment and cleanup procedures

• Exposure incident procedures
Contingency Planning

• Spill Containment and Cleanup Procedures
  – Determine nature and extent of spill
  – Evacuate and restrict access to spill area
  – If exposure occurred, provide medical attention
  – Put on appropriate personal protective equipment (e.g., coverall, gloves, boots, goggles, respirator)
  – Remove spilled material using appropriate tools (e.g., shovels for solids, absorbent material for liquids), place in proper container (e.g., bags, sharps container, etc.), and dispose of properly
  – Disinfect, rinse and clean the area
  – Remove and disinfect reusable protective equipment
  – Wash hands and all exposed skin thoroughly
Contingency Planning

Spill Clean-Up Kit

- Disposable gloves, face mask and safety glasses
- Small scoop or dust pan and brush, shovel
- Absorbent pads or powders
- Cleaning rags or paper towel
- Chlorine disinfectant (1:10 chlorine)
- Germicidal wipes
- Extra red bags
- Biohazard labels
- Aspirator bottle, spatula or mercury amalgam powder for mercury spills
Contingency Procedures

• Exposure Incident Procedures
  – If injured, provide first-aid immediately
  – Clean up any spillage following proper procedures
  – Provide additional medical attention and prophylaxis if necessary

• Reporting & record-keeping
  • Report incident to Waste Management Officer or Infection Control Officer
  • Maintain records for later evaluation
Training and Public Education

• Training of new staff
• Annual refresher seminar
• Public education
  – Posters, handouts and verbal instructions
    • Red bags/containers with the universal biohazard symbol means potentially infectious Healthcare
    • Do not place regular garbage into red bags or containers with the biohazard label
    • Do not open or handle Healthcare containers
    • Keep children away from Healthcare containers
    • Report any spills or accidents involving Healthcare immediately; avoid contact with spilled contents
Autoclave History

- Papin, Denis, 1647–1712: Invented a steam digester (forerunner of the autoclave) in 1679.

- Tyndall, John, 1820-1893: Showed spores resistant to boiling and that vegetative offspring could be killed by repetitive heating.

- Pasteur, Louis, 1822-1895: Demonstrated inactivation of bacterial spores in cultures at 115-120 °C.

- von Bergmann, Ernst, 1836-1907: Invents the autoclave in 1880, or was it Charles Chamberland 1851-1908?
Current Autoclave Uses

• Composite Curing
• Bonding
• Glass Manufacturing
• Cement Manufacturing
• Vulcanizing
• Food Processing
• Glass Laminating
• Production
• Research & Development
• Sterilization
• Waste Treatment
Autoclave Facts

- Range in size from small cassettes to 96 TPD
- Commonly used to decontaminate RMW at approximately 121 °C and 16 psig for 40 min.
- Sterilization parameters developed in the 1800’s are used today to treat RMW.
- Little research using these 100 year old parameters for the decontamination of RMW.
FIGURE 4-1
TEMPERATURE CURVES FOR STEAM STERILIZATION WITH AND WITHOUT COMPLETE REMOVAL OF AIR (71)

Operational Cycle
275-280 °F /60 minutes
Blow down followed by 15 minutes @ 275-280 °F

Start Time
12:00 pm

End of normal cycle 1:13 pm

End of 15 min cycle

Start of 15 min cycle

Cart 1 111 lbs.
Cart 2 111 lbs.
Cart 3 115 lbs.
Cart 4 117 lbs.

Total Weight 454 lbs.
Commercial Bacterial Spore Indicators

- Spore strips
- 3M ATTEST SCBI
- SterilAmp
- BloCl ALLKIL
Mesa Labs - Data Tracer
5 of 9 Biologicals indicators were Positive

Cycle parameters
300°F 60 minutes

Location and Pos BI

- Cart 1 Teflon 1 Bot Pos
- Cart 1 Teflon 2 Bot Pos
- Cart 2 Teflon 1 Bot Pos
- Cart 2 Teflon 2 Bot
- Cart 1 3 gal sharps
- Cart 2 3 gal
- Cart 3 8 gal Pos
- Ambient
- Cart 3 8 gal Pos
- Chamber T
- Chamber Pressure

Pos = Positive BI

Cart weight
1. 202 lbs.
2. 132 lbs.
3. 268 lbs.
Total - 602 lbs
DHMC 3000 2-21-07
Approx 309 lbs 60 min Retention Time
35psig 278°F One PreVac

Exposed to vessel Environment
Not in Waste

In liquid filled Medela Suction Canister in Center of load.

PreVac

1 additional set of 1e4 and 1e6 ampoules positive in Red Bag Middle/Front - No Data

4 of 10 Biological indicators Positive for growth
Provena Test 1 9/16/08

Cycle Parameters
Start time: 8:00 am
End time: 9:06 am
a. Vacuum/heat to 275°F (x3)
b. Hold at 275°F for 30 minutes
c. Post vacuum

Cart Weight
Cart 1. 104.63 lbs
Cart 2. 99.63 lbs
Cart 3. 101.63 lbs
Total = 305.89 lbs.

Biological indicators:
Raven Labs Spore strips - 1.5x10^6 cfu/strip
Prospore ampoules - 2.9x10^6 cfu/ampoule

NG/NG = No Growth for spore strip and spore ampoule
10e6 concentration of Geobacillus stearothermophilus
Waste Management is a Process Not a Technology.
Shukran!
Transporting Biological Materials

Use secondary containers when moving biological materials from one room or building to another.

A secondary container must be leak-proof, lidded, and labeled with biohazard stickers.
Infection control standard precautions in health care

Background

Standard precautions are meant to reduce the risk of transmission of bloodborne and other pathogens from both recognized and unrecognized sources. They are the basic level of infection control precautions which are to be used, as a minimum, in the care of all patients.

Hand hygiene is a major component of standard precautions and one of the most effective methods to prevent transmission of pathogens associated with healthcare. In addition to hand hygiene, the use of personal protective equipment should be guided by risk assessment and the extent of contact anticipated with blood and body fluids, or pathogens.

In addition to primary practice carried out by health workers when providing care, all individuals (including patients and visitors) should comply with infection control practices in health-care settings. The control of spread of pathogens from the source is key to avoid transmission. Among source control measures, respiratory hygiene/cough etiquette, developed during the severe acute respiratory syndrome (SARS) outbreak, is considered as part of standard precautions.

Worldwide escalation of the use of standard precautions would reduce unnecessary risk associated with health care. Promotion of an institutional safety climate helps to improve conformity with recommended measures and thus subsequent risk reduction. Provision of adequate staff and supplies, together with leadership and education of health workers, patients, and visitors, is critical for an enhanced safety climate in health-care settings.

Checklist

Health policy

- Promote a safety climate.
- Develop policies which facilitate the implementation of infection control measures.

Hand hygiene

- Perform hand hygiene by means of hand rubbing or hand washing (see overview for detailed indications).
- Hands should always be washed with soap and water if hands are visibly soiled, or exposure to spore-forming organisms is proven or strongly suspected, or after using the restroom. For other indications, if resources permit, perform hand rubbing with an alcohol-based preparation.
- Ensure availability of hand-washing facilities with clean running water.
- Ensure availability of hand hygiene products (clean water, soap, single-use clean towels, alcohol-based hand rub). Alcohol-based hand rub should ideally be available at the point of care.

Personal protective equipment (PPE)

- ASSESS THE RISK of exposure to body substances or contaminated surfaces BEFORE any health-care activity. Make this a routine!
- Select PPE based on the assessment of risk:
  - clean non-sterile gloves.
  - clean, non-sterile fluid-resistant gown.
  - mask and eye protection or a face shield.

Respiratory hygiene and cough etiquette

- Education of health workers, patients and visitors.
- Use of source control measures.
- Hand hygiene after contact with respiratory secretions.
- Spacial separation of persons with acute febrile respiratory symptoms.
Health-care facility recommendations for standard precautions

KEY ELEMENTS AT A GLANCE

1. Hand hygiene
   Summary technique:
   - Hand washing (40–60 sec): wet hands and apply soap; rub all surfaces; rinse hands and dry thoroughly with a single use towel; use towel to turn off faucet.
   - Hand rubbing (20–30 sec): apply enough product to cover all areas of the hands; rub hands until dry.
   Summary indications:
   - Before and after any direct patient contact and between patients, whether or not gloves are worn.
   - Immediately after gloves are removed.
   - Before handling an invasive device.
   - After touching blood, body fluids, secretions, excretions, non-intact skin, and contaminated items, even if gloves are worn.
   - During patient care, when moving from a contaminated to a clean body site of the patient.
   - After contact with inanimate objects in the immediate vicinity of the patient.

2. Gloves
   - Wear when touching blood, body fluids, secretions, excretions, mucus membrane, non-intact skin.
   - Change between tasks and procedures on the same patient after contact with potentially infectious material.
   - Remove after use, before touching non-contaminated items and surfaces, and before going to another patient.
   Perform hand hygiene immediately after removal.

3. Facial protection (eyes, nose, and mouth)
   - Wear a surgical or procedure mask and eye protection (face shield, goggles) to protect mucus membranes of the eyes, nose, and mouth during activities that are likely to generate splashes or sprays of blood, body fluids, secretions, and excretions.

4. Gown
   - Wear to protect skin and prevent soiling of clothing during activities that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions.
   - Remove soiled gown as soon as possible, and perform hand hygiene.

5. Prevention of needle stick injuries
   - Use care when:
     - Handling needles, syringes, and other sharp instruments or devices
     - Cleaning used instruments
     - Disposing of used needles.

6. Respiratory hygiene and cough etiquette
   - Persons with respiratory symptoms should apply source control measures:
     - Cover their nose and mouth when coughing/sneezing with tissue or mask, dispose of used tissues and masks, and perform hand hygiene after contact with respiratory secretions.
   - Health care facilities should:
     - Place acute febrile respiratory symptomatic patients at least 1 meter (3 feet) away from others in common waiting areas, if possible.
     - Post visual alerts at the entrance to health care facilities instructing persons with respiratory symptoms to practise respiratory hygiene/cough etiquette.
     - Consider making hand hygiene resources, tissues and masks available in common areas and areas used for the evaluation of patients with respiratory illnesses.

7. Environmental cleaning
   - Use adequate procedures for the routine cleaning and disinfection of environmental and other frequently touched surfaces.

8. Linens
   - Handle, transport, and process used linen in a manner which:
     - Prevents skin and mucus membrane exposure and contamination of clothing.
     - Avoids transfer of pathogens to other patients and the environment.

9. Waste disposal
   - Ensure safe waste management.
   - Treat waste contaminated with blood, body fluids, secretions and excretions as clinical waste, in accordance with local regulations.
   - Human tissues and laboratory waste that is directly associated with specimen processing should also be treated as clinical waste.
   - Discard single use items properly.

10. Patient care equipment
    - Handle equipment soiled with blood, body fluids, secretions, and excretions in a manner that prevents skin and mucus membrane exposure, contamination of clothing, and transfer of pathogens to other patients or the environment.
    - Clean, disinfect, and reprocess reusable equipment appropriately before use with another patient.

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1. For more details, see WHO Guidelines on Hand Hygiene in Health Care [Advanced draft], at: http://www.who.int/patientsafety/information_centre/highlights/download/index.html.
2. The SITRRA Alliance at: http://www.who.int/infection_safety/eng/