OSHA greatly affects reprocessing personnel through its regulation of occupational exposure to airborne contaminants, occupational exposure to bloodborne pathogens, and communication of workplace hazards. The relevant OSHA standards must be communicated to employees on their first day of work in the department, and copies of the standards must be made available to them. Also, as continuing education to update staff on current regulations, in-services on all OSHA standards must be provided to staff at least annually. All training must be documented.

**Occupational Exposure Limits for Chemicals in the Workplace:** OSHA has established occupational exposure limits for numerous chemical agents found in gaseous and liquid sterilants and HLDs. A general Air Contaminants Standard covers such sterilants and HLDs as glutaraldehyde, hydrogen peroxide, and ozone. All facilities using such agents must implement engineering and work-practice controls to ensure that employees are not exposed to these agents at levels above the “permissible exposure limits” (PELs).

**Occupational Exposure to Bloodborne Pathogens:** In 1991, OSHA issued a standard limiting occupational exposure to bloodborne pathogens. This standard was the first action that OSHA had taken concerning a microbiological hazard to workers. The provisions of this standard will be discussed in more detail in Chapter 4.

**Hazard Communication:** OSHA’s Hazard Communication (“Right to Know”) Standard requires facilities to obtain and make available to employees a Safety Data Sheet (SDS) for each chemical used in the workplace. This standard was recently revised.

According to the Occupational Safety & Health Administration: “New changes to the Occupational Safety and Health Administration’s (OSHA) Hazard Communication Standard are bringing the United States into alignment with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS), further improving safety and health protections for America's workers. Building on the success of OSHA's current Hazard Communication Standard, the GHS is expected to prevent injuries and illnesses, save lives and improve trade conditions for chemical manufacturers. The Hazard Communication Standard in 1983 gave the workers the ‘right to know,’ but the new Globally Harmonized System (2012) gives workers the ‘right to understand.’”

“The new hazard communication standard still requires chemical manufacturers and importers to evaluate the chemicals they produce or import and provide hazard information to employers and workers by putting labels on containers and preparing safety data sheets. However, the old standard allowed chemical manufacturers and importers to convey hazard information on labels and material safety data sheets in whatever format they chose. The modified standard provides a single set of harmonized criteria for classifying chemicals according to their health and physical hazards and specifies hazard communication elements for labeling and safety data sheets.”

“The SDS includes information such as the properties of each chemical; the physical, health, and environmental health hazards; protective measures; and safety precautions for handling, storing, and transporting the chemical. The information contained in the SDS must be in English.
(although it may be in other languages as well). In addition, OSHA requires that SDS preparers provide specific minimum information as detailed in Appendix D of 29 CFR 1910.1200. The SDS preparers may also include additional information in various sections.”

(https://www.osha.gov/Publications/OSHA3514.html)

“Sections 1 through 8 contain general information about the chemical, identification, hazards, composition, safe handling practices, and emergency control measures (e.g., fire fighting). This information should be helpful to those that need to get the information quickly. Sections 9 through 11 and 16 contain other technical and scientific information, such as physical and chemical properties, stability and reactivity information, toxicological information, exposure control information, and other information including the date of preparation or last revision. The SDS must also state that no applicable information was found when the preparer does not find relevant information for any required element.”

(https://www.osha.gov/Publications/OSHA3514.html)

“The SDS must also contain Sections 12 through 15, to be consistent with the UN Globally Harmonized System of Classification and Labeling of Chemicals (GHS), but OSHA will not enforce the content of these sections because they concern matters handled by other agencies.” (https://www.osha.gov/Publications/OSHA3514.html)

The major changes to the Hazard Communication Standard are as follows:

- **Hazard classification:** Chemical manufacturers and importers are required to determine the hazards of the chemicals they produce or import. Hazard classification under the new, updated standard provides specific criteria to address health and physical hazards as well as classification of chemical mixtures.

- **Labels:** Chemical manufacturers and importers must provide a label that includes a signal word, pictogram, hazard statement, and precautionary statement for each hazard class and category.

- **Safety Data Sheets:** The new format requires 16 specific sections, ensuring consistency in presentation of important protection information.

- **Information and training:** To facilitate understanding of the new system, the new standard requires that workers be trained by December 1, 2013, on the new label elements and safety data sheet format, in addition to the current training requirements.

As of June 1, 2015, all labels are required to have pictograms, a signal word, hazard and precautionary statements, the product identifier, and supplier identification. Supplemental information can also be provided on the label as needed. Figure 1-1 shows a sample label.

Employers must ensure that the SDSs are readily accessible to employees for all hazardous chemicals in their workplace. This may be done in many ways. For example, employers may keep the SDSs in a binder or on computers provided that the employees have immediate access to the information without leaving their work area and a back-up is available for rapid access to the SDS in the case of a power outage or other emergency. Furthermore, employers might want to designate a person(s) to be responsible for obtaining and maintaining the SDSs. If the employer does not have an SDS for a particular product, the employer or a designated person(s) should contact the manufacturer to obtain one.
PRODUCT IDENTIFIER

CODE _____________________________
Product Name _______________________

SUPPLIER IDENTIFICATION

Company Name ________________________
Street Address ________________________
City ______ State ______
Postal Code ______ Country ______
Emergency Phone Number _____________

PRECAUTIONARY STATEMENTS

Keep container tightly closed. Store in cool, well ventilated place that is locked.
Keep away from heat/sparks/open flame. No smoking.
Only use non-sparking tools.
Use explosion-proof electrical equipment.
Take precautionary measure against static discharge.
Ground and bond container and receiving equipment.
Do not breathe vapors.
Wear Protective gloves.
Do not eat, drink or smoke when using this product.
Wash hands thoroughly after handling.
Dispose of in accordance with local, regional, national, international regulations as specified.

In Case of Fire: use dry chemical (BC) or Carbon dioxide (CO₂) fire extinguisher to extinguish.

First Aid
If exposed call Poison Center.
If on skin (on hair): Take off immediately any contaminated clothing. Rinse skin with water.

HAZARD PICTOGRAMS

SIGNAL WORD
Danger

HAZARD STATEMENT
Highly flammable liquid and vapor.
May cause liver and kidney damage.

SUPPLEMENTAL INFORMATION

Directions for use_________________________
___________________________
___________________________
Fill weight: ______ Lot Number ______
Gross weight: ______ Fill Date: ______
Expiration Date: _____________

Figure 1-1 — Sample label for chemical
Emergency Eyewash Stations: OSHA requires that eyewash units be available for emergency use, and ANSI/AAMI ST79 states that “suitable eyewash/shower equipment must be available, with unobstructed access, for immediate emergency use in all locations where potentially damaging chemicals (e.g., cleaning solutions and disinfectants) are used.” The American National Standards Institute has set minimum standards for eyewash stations (ANSI Z358.1). They should provide at least 0.4 gallons of water per minute continuously for at least 15 minutes, permit hands-free operation, have a stay-open feature, and have the ability to flush both eyes at the same time. The eyewash unit should be connected to tepid—not hot—water (60°F to 100°F) to prevent burns to the eyes. It should be tested regularly to verify that it is operating properly; the prescribed frequency of testing is usually weekly, but the instructions of the eyewash unit manufacturer should be followed. This testing should be documented, including the temperature of the water. It should be noted that drench hoses and eyewash bottles are not acceptable according to the ANSI standard. If an eyewash unit is installed on a sink, it should be a handwashing sink, not a sink used for decontamination purposes. All emergency eyewash stations should be located within 10 seconds’ travel time (approximately 56 feet) of all chemicals used in the reprocessing area (ANSI Z358.1); they must be placed immediately adjacent to strong chemicals. The flexible endoscope reprocessing staff must know where eyewash stations are located and how to use them. A summary and illustration of ANSI Z358.1 requirements for emergency eyewash stations can be found at http://www.gesafety.com/ansi/ansi_eyewashes.shtml.

STATE AND LOCAL AGENCIES

In addition to federal regulations, there might be state and local regulations as well. Many states and communities have health, safety, and “right-to-know” regulations and ordinances that may apply to reprocessing activities, especially in regard to hazardous chemicals. If an applicable federal regulation is stricter than the corresponding state regulation, then it takes precedence. If the state regulation is stricter, then it takes precedence.

NFPA Diamonds: The National Fire Protection Agency (NFPA) is not a government agency, but its standards are commonly cited in state and local regulations. For hazardous chemicals, NFPA specifies a labeling code for types and severity of hazards. Hazards are color-coded:

- Blue diamond = health hazard
- Red diamond = flammability
- Yellow diamond = instability
- White diamond = special hazard information

A numerical rating is also provided in the blue, red, and yellow diamonds. This number indicates the severity of the hazard, with a 0 indicating no hazard and a 4 indicating the most severe hazard. All chemicals should be labeled with an NFPA diamond.

CENTERS FOR DISEASE CONTROL AND PREVENTION (CDC)

The CDC is not a regulatory agency, but it does publish widely respected recommendations and guidelines on such topics as hand hygiene (CDC, 2002), isolation precautions (CDC, 2007), environmental infection control (CDC, 2003), and disinfection and sterilization (CDC, 2008). Detailed information about the CDC can be found at http://www.cdc.gov.

The Joint Commission recognizes the CDC’s Health Care Infection Control Practices Advisory Committee (HICPAC) and AAMI as the two primary sources of practices that facilities should be following. HICPAC is a federal advisory committee made up of 14 external infection control experts who provide advice and guidance to CDC and to the Secretary of the Department of
Health and Human Services regarding the practice of healthcare infection control, strategies for infection surveillance, and the prevention and control of healthcare-acquired infections (HAIs) in U.S. healthcare facilities. One of the primary functions of the committee is to issue recommendations—in the form of guidelines, resolutions, and informal communications—for preventing and controlling HAIs.

Based on categories defined by Dr. Earl Spaulding (Spaulding, 1972), the CDC has classified medical devices according to their use (CDC, 2008):

- **Critical** devices are those that are exposed to normally sterile areas of the body. These devices should be sterile when used and thus require sterilization between uses. This category includes biopsy forceps.

- **Semicritical** devices come in contact with intact mucous membranes during use; they are to be either sterilized or high-level disinfected. This category includes endoscopes, which should be free of all microorganisms; however, small numbers of bacterial spores are permissible.

- **Noncritical** devices only touch skin or come into contact with persons indirectly. These devices can be cleaned and then disinfected with an intermediate-level disinfectant, sanitized with a low-level disinfectant, or simply cleaned with soap and water. An example of a noncritical device is a reusable blood pressure cuff.

There is some confusion about how to apply Spaulding’s classification of the necessary level of reprocessing required for a semicritical device (e.g., an endoscope) when it is used in conjunction with a critical instrument that contacts sterile body tissues (e.g., biopsy forceps). For example, an endoscope is used for an upper GI tract investigation and the endoscope itself only contacts intact mucous membranes (a semicritical application); however, a sterile biopsy forceps is needed to biopsy the patient or when the patient is bleeding heavily from esophageal varices (dilated blood vessels, usually in the esophagus or stomach, that sometimes rupture and bleed). The CDC recommends the following for these situations: “Provided that high-level disinfection is achieved, and all microorganisms except bacterial spores have been removed from the endoscope, the device should not represent an infection risk and should remain in the semicritical category. Infection with spore-forming bacteria has not been reported from appropriately high-level disinfected endoscopes.” (CDC, 2008)

The CDC’s *Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008* provides many recommendations for processing medical devices, including flexible endoscopes. In conjunction with FDA and the Veterans Administration, the CDC has also published additional recommendations on preventing cross-contamination in endoscope processing (FDA, 2009b). Among the key recommendations in that document are the following:

- Establish an institutional program for endoscope processing, along with written procedures for monitoring adherence to the program and a chain of accountability.

- Ensure that those responsible for endoscope processing understand the importance of this job and that they maintain proficiency in performing it for each type of endoscope they handle.

Other guidelines on flexible endoscope reprocessing practices are available, including ASGE/SHEA (2011), ASGE (2008), SGNA (2013), SGNA (2015), and AORN (2015a).
ACCREDITING AGENCIES

The Joint Commission (JC) is an independent, nonprofit organization that establishes accrediting standards and conducts extensive on-site inspections to evaluate a healthcare facility’s performance in areas that affect patient care. Institutions request JC accreditation, and JC’s inspection reports are publicly available. The JC has initiated patient safety programs to address wrong-site surgery, medication errors, HAIs, and other healthcare safety issues.

To maintain its accreditation and receive payments from insurance companies, a healthcare facility must pass the JC inspection. When a facility passes a JC inspection, it is accredited for a period of three years. In 2006, JC began conducting unannounced surveys of healthcare facilities. These surveys involve use of “tracer methodology.” When inspections are conducted using tracers, the surveyors visit any and all departments that have direct or indirect responsibility for patient care. If, for example, a surveyor discovers an issue with supplies or instruments in the OR, he or she might visit the department that produces those products. The GI/endoscopy suite should always be ready for an inspection. JC inspectors are now trained in all aspects of ANSI/AAMI ST79 (including cleaning, disinfection, and sterilization standards), CDC guidelines, and flexible endoscope reprocessing. They will ask questions regarding department processes, review the department’s policies and procedures, and request documentation showing compliance with those policies and procedures.

There are several other accrediting agencies for healthcare facilities, as well as other organizations recognized by the U.S. Centers for Medicare and Medicaid Services (CMS) as deemed accrediting organizations, but JC is the largest such organization. Other deemed accrediting organizations include the Accreditation Association for Ambulatory Health Care (AAAHC), the Accreditation Commission for Health Care (ACHC), the American Association for Accreditation of Ambulatory Surgery Facilities (AAAASF), the American Osteopathic Association/Healthcare Facilities Accreditation Program (AOA/HFAP), and DNV Healthcare. The AAAHC is a private, nonprofit organization formed in 1979. It develops standards to advance and promote patient safety and quality of care in ambulatory health care facilities by means of peer-based accreditation processes, education, and research. Accreditation is awarded to organizations that are found to be in compliance with AAAHC standards.

FACILITY AND DEPARTMENTAL POLICIES AND PROCEDURES

Healthcare facilities also have regulations, called policies. Facility policies apply to the entire facility; an example is attendance policy. Departmental policies apply to a specific department (e.g., a policy on high-level disinfection of flexible endoscopes). A policy defines what one must do, for example: “All flexible endoscopes shall be cleaned and high-level disinfected after each use and in compliance with all manufacturers’ instructions for use (IFU).” The procedure for a given policy defines the steps that must be followed to comply with the policy. For multi-facility systems, it is recommended that cleaning, disinfection, and sterilization policies and procedures be standardized for all of the system’s facilities.

Departmental policies and procedures are contained in a Policy and Procedure Manual. The manual is usually reviewed and updated periodically, at times specified by the facility or by state regulations. The policies and procedures for all reprocessing activities are usually reviewed and/or approved by the facility’s Infection Prevention and Control Committee. It is essential that reprocessing personnel be thoroughly familiar with facility and departmental policies and procedures and follow these policies and procedures at all times. Failure to comply with policies and procedures results in a different standard of care for patients, which is not acceptable.
SAFETY

Each year, thousands of occupational injuries occur in the workplace. These injuries can be incapacitating, disabling, or even fatal to employees. All facilities must make every effort to provide a safe and healthful workplace through programs designed to reduce the risks of injury and illness. However, the job of creating and maintaining a safe and healthy environment is a team effort shared by both the facility and its employees. Employees must do their part by participating in accident and injury prevention programs and by learning about the safety and health issues that affect them. The safety of both staff and patients is of paramount importance in all healthcare facilities.

FIRE SAFETY

Fire is an ever-present danger. Fire in any location is hazardous, but it can be particularly deadly in a healthcare facility. Because of treatment or illness, many patients cannot get out of their beds to vacate their rooms.

Fires occur when the three elements that support combustion come together. These three elements are called the “fire triangle”: an ignition source, a fuel source, and an oxygen source—all of which can be found in a GI/endoscopy unit.

It is the responsibility of each flexible endoscope reprocessing technician to maintain a fire-safe environment in the department and throughout the facility. Everyone must do his or her part. As discussed later, personal items brought into the department (e.g., radios, coffee pots, microwave ovens, and other such devices) should be safety-checked by the biomedical engineering department and an approval label attached before they are put into use.

In facilities where smoking is permitted, employees should smoke only in designated areas. Most hospitals today do not permit smoking on the premises, which reduces the potential for fire; however, fires can occur because of noncompliance with the smoking policy. In addition, there is the possibility of cooking fires in the kitchen, fires in the laundry because of flammable linens, fires in the laboratory because of the open flames used in microbiological testing, and fires caused by improper storage of combustible materials. Despite the fact that flammable anesthetics are no longer used in the United States, fires can also occur in the OR because of the increasing use of ignition sources such as lasers and electrocautery equipment.

Fire doors should be kept closed at all times; they should never be propped open for any reason. Hallways, passageways, stairways, and exit routes should be unobstructed for easy evacuation of personnel and patients (i.e., boxes, carts, and equipment should be kept out of passageways). The fire exits should be marked with working illuminated signs. All exit doors
Personnel should always be aware of the safest route for escape. Fire alarms should be easily accessible and unobstructed. All endoscopy personnel should know the locations of the fire alarm pull boxes within the department. In addition, they should know at least two different locations of fire alarm pull boxes outside the department in the event that it is necessary to activate the alarm after exiting the department. Endoscopy personnel should also know the types of all fire extinguishers within the department. During orientation training, employees should be shown the locations of the fire alarm pull boxes and fire extinguishers and be taught how to use them. (The use of fire extinguishers requires special training.) Fire extinguishers are categorized into five classes according to the type of fire they are designed to extinguish; i.e., the fuel (wood, liquid, metal, animal fat) or electrical hazard involved in the fire. See Table 1-1.

### Table 1-1 – Classification of Fire Extinguishers
(NYFD, 2014)

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Class A</strong></td>
<td>A fire extinguisher labeled with letter “A” is for use on Class A fires. Class A fires are fires that involve ordinary combustible materials such as cloth, wood, paper, rubber, and many plastics.</td>
</tr>
<tr>
<td><strong>Class B</strong></td>
<td>A fire extinguisher labeled with letter “B” is for use on Class B fires. Class B fires are fires that involve flammable and combustible liquids such as gasoline, alcohol, diesel oil, oil-based paints, lacquers, etc., and flammable gases.</td>
</tr>
<tr>
<td><strong>Class C</strong></td>
<td>A fire extinguisher labeled with letter “C” is for use on Class C fires. Class C fires are fires that involve energized electrical equipment.</td>
</tr>
<tr>
<td><strong>Class D</strong></td>
<td>A fire extinguisher labeled with letter “D” is for use on Class D fires. Class D fires are fires that involve combustible metals such as magnesium, titanium and sodium.</td>
</tr>
<tr>
<td><strong>Class K</strong></td>
<td>A fire extinguisher labeled with letter “K” is for use on Class K fires. Class K fires are fires that involve vegetable oils, animal oils, or fats in cooking appliances. This is for commercial kitchens, including those found in restaurants, cafeterias, and caterers.</td>
</tr>
</tbody>
</table>

The acronym “PASS” can be used as a reminder during training to enhance skill and confidence in operating fire extinguishers:

- P: Pull the pin.
- A: Aim the nozzle.
- S: Squeeze the handle.
- S: Sweep the stream over the base of the fire.
All electrical equipment should be grounded and in good repair. Electrical cords should be kept off the floor; if placing an electrical cord on the floor cannot be avoided, equipment should not be rolled over it. Extension cords should not be used. Electrical cords should be removed from outlets by pulling the plug, not the cord. All supplies must be stored at least 18 inches (48 centimeters [cm]) from sprinkler heads. Everyone must comply with departmental policies regarding the specific items at their facility. All combustible refuse should be deposited in a designated area.

Most facilities use the acronym “RACE” to help employees remember what to do in case of fire:

- **R**: Remove/rescue. Get everyone out of the department!
- **A**: Alarm. Pull the alarm box and then telephone to make sure the alarm was received.
- **C**: Contain. Contain the fire by closing all doors and ensuring that all fire doors are closed.
- **E**: Extinguish. Extinguish the fire if you have been trained in using the fire extinguisher.

The supervisor or acting supervisor should be the last one to exit and should account for all staff in the designated safe area(s). He or she should not allow anyone to reenter the department or building until the fire department allows reentry. An annual in-service should be held to review fire safety procedures, including the evacuation plan and route, and to confirm staff knowledge of specific protocols on how to initiate a fire alarm or “code red” and operate fire extinguishers.

Section 5(a)(1) of the Occupational Safety and Health Act, often referred to as the General Duty Clause, requires each employer to “furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees.” Section 5(a)(2) requires employers to “comply with occupational safety and health standards promulgated under this Act.” In addition, accrediting organizations (e.g., the Joint Commission) and state and local regulations require facilities to hold regular fire drills. Records of the participants in attendance and of the results are kept to demonstrate that the facility is in compliance with the regulations. The records address questions such as the following: Did everyone respond? Did everyone go to the designated safe place? Did the alarm work? Are the smoke detectors functioning? After a fire drill, the drill should be discussed with the staff and its effectiveness evaluated. This information can be used to identify strengths and areas for improvement. Fires can be prevented, and knowing the proper procedures to follow in the event of a fire can help minimize damage and injuries.

As noted earlier, NFPA specifies a color-coded labeling code for the types and severity of hazards associated with chemicals. Hazards are color-coded; the red diamond is for flammability. A numerical rating indicates the severity of the hazard, with a 0 indicating no hazard and a 4 indicating the most severe hazard. For flammability of chemicals, the severity of the hazard is ranked as follows:

- **4** = Will vaporize and readily burn at normal temperatures
- **3** = Can be ignited under almost all ambient temperatures
- **2** = Must be heated or at high ambient temperature to burn
- **1** = Must be preheated before ignition can occur
- **0** = Will not burn
ELECTRICAL SAFETY

Electrical hazards are present in the GI/endoscopy suite, where most of the equipment is electrical. Correct use of electrical equipment is essential. All electrical equipment must first be checked by the biomedical engineering department to make sure that it is safe and that it will not interfere with the facility’s/department’s electrical system. Radios, microwave equipment, coffee makers, and other such devices should be safety-checked and approved by the biomedical engineering department before they are brought into the department. Processing equipment (e.g., automated endoscope reprocessors) and patient care equipment are also safety-checked by the biomedical department upon purchase and on a preset routine basis (ANSI/AAMI EQ56). Each piece of equipment should have a label indicating the date on which it was last checked and the date on which the next check is due. If it is your responsibility to clean equipment, check the labels on the equipment as it is being cleaned. If a label is missing, if an inspection is overdue, or if an inspection is due within 30 days, the equipment should be cleaned, disinfected according to policy, and referred to the biomedical engineering department for the safety check.

During equipment cleaning, electrical cords and connections should be inspected. Any equipment with a cord that is cracked, frayed, or broken should be not used; the equipment should be sent for repair after it is cleaned and disinfected. Most healthcare facility equipment has a grounding plug (three prongs). If one of the prongs is missing, the equipment should not be considered safe and should be sent for repair.

DECONTAMINATION, SHARPS, AND BLOODBORNE PATHOGEN SAFETY

Personal protective equipment is required by OSHA and is intended to protect healthcare workers from exposure to bloodborne pathogens. Essential PPE is required to be made available to all employees performing tasks that could expose them to bloodborne pathogens. The use of PPE is not optional. Policies on the proper use of PPE must be enforced. Those who fail to follow PPE policies might be subject to disciplinary action.

“Sharps” are instruments or devices with points or blades. On occasion, flexible endoscope reprocessing personnel come into contact with sharps, including (but not limited to) knife blades, trocars, and reusable biopsy needles. It is important to practice sharps safety to prevent injury and exposure to bloodborne pathogens.

Biological hazards include the various microorganisms that can be present on devices being processed. OSHA requires that when reprocessing personnel are pouring out blood or body fluids from a medical device (e.g., emptying suction canisters), they must use PPE and engineering controls (e.g., splash guards) to prevent splashes and splattering of the fluids.

LATEX ALLERGY

According to OSHA (2008): “Allergy to latex was first recognized in the late 1970s. Since then, it has become a major health concern as an increased number of people in the workplace are affected. Health care workers exposed to latex gloves or medical products containing latex are especially at risk. It is estimated that 8-12% of health care workers are latex sensitive. Between 1988-1992, the Food and Drug Administration (FDA) received more than 1,000 reports of adverse health effects from exposure to latex, including 15 deaths due to such exposure.”

Latex refers to natural rubber latex, which is manufactured from a milky fluid primarily obtained from the rubber tree. Some synthetic rubber materials are sometimes referred to as latex, but they do not contain the natural rubber proteins responsible for latex allergy symptoms.
“Latex allergy is a reaction to certain proteins in latex rubber. The amount of latex exposure needed to produce sensitization or an allergic reaction is unknown. Increasing the exposure to latex proteins increases the risk of developing allergic symptoms. In sensitized persons, symptoms usually begin within minutes of exposure; but they can occur hours later and can be quite varied. Mild reactions to latex involve skin redness, rash, hives, or itching. More severe reactions may involve respiratory symptoms such as runny nose, sneezing, itchy eyes, scratchy throat, and asthma (difficult breathing, coughing spells, and wheezing). Rarely, shock may occur; however, a life-threatening reaction is seldom the first sign of latex allergy.” (CDC, 1998)

Reprocessing personnel are at risk of developing latex allergy if they use latex gloves frequently. Exposure to latex occurs not only through skin contact, but also through inhalation of the lubricant powder used in some gloves. Latex proteins can become fastened to this powder, which can become airborne when gloves are changed. Latex allergy can be treated. “Detecting symptoms early, reducing exposure to latex, and obtaining medical advice are important to prevent long-term health effects. Once a worker becomes allergic to latex, special precautions are needed to prevent exposures. Certain medications may reduce the allergy symptoms; but complete latex avoidance, though quite difficult, is the most effective approach.” (CDC, 1998)

There are other types of reactions to latex besides latex allergy. “The most common reaction to latex products is irritant contact dermatitis—the development of dry, itchy, irritated areas on the skin, usually the hands. This reaction is caused by irritation from wearing gloves and by exposure to the powders added to them. Irritant contact dermatitis is not a true allergy. Allergic contact dermatitis (sometimes called chemical contact dermatitis) results from the chemicals added to latex during harvesting, processing, or manufacturing. These chemicals can cause a skin rash similar to that of poison ivy. Neither irritant contact dermatitis nor chemical sensitivity dermatitis is a true allergy.” (CDC, 1998)

The National Institute for Occupational Safety and Health (NIOSH) recommends that health care personnel take the following steps to protect themselves from latex exposure and allergy in the workplace (CDC, 1998):

1) Use nonlatex gloves for activities that are unlikely to involve contact with infectious materials (e.g., routine housekeeping, general maintenance).

2) For barrier protection when handling infectious materials, personnel who wear latex gloves should choose gloves that are powder-free with reduced protein content. Such gloves reduce exposure to latex protein and thus the risk of latex allergy. So-called “hypoallergenic” latex gloves do not reduce the risk of latex allergy, but they might reduce reactions (allergic contact dermatitis) to chemical additives in the latex.

3) Use appropriate work practices to reduce the chance of reactions to latex: When wearing latex gloves, do not use oil-based hand creams or lotions (which can cause glove deterioration). After removing latex gloves, wash hands with a mild soap and dry thoroughly. Practice good housekeeping by frequently cleaning areas and equipment contaminated with latex-containing dust.

4) Take advantage of all latex allergy education and training provided by the health care facility and become familiar with procedures for preventing latex allergy.

Learn to recognize the symptoms of latex allergy: skin rash; hives; flushing; itching; nasal, eye, or sinus symptoms; asthma; and (rarely) shock.
OTHER SAFETY CONSIDERATIONS

Chemicals: Many chemicals used in the GI/endoscopy suite (e.g., disinfectants) can be toxic to personnel and patients if not used correctly. Reprocessing personnel should always read the labels of the chemicals they use and follow all instructions carefully, including those pertaining to proper disposal of empty chemical containers (e.g., the need to rinse containers before disposing of them).

Ergonomic Issues: Lifting, pulling, and pushing heavy objects (e.g., lifting heavy chemical containers, pushing or pulling carts) can also cause injuries. Back injuries are the most common injury to healthcare workers. It is important for reprocessing personnel to use good body mechanics at all times (e.g., bending at the knees when lifting a heavy object). Some facilities offer special classes on preventing back injuries. All workers should receive safety training on how to handle heavy carts and equipment correctly.

OSHA defines “ergonomics” as “the science of fitting the job to the worker. When there is a mismatch between the physical requirements of the job and the physical capacity of the worker, work-related musculoskeletal disorders (MSDs) can result. Ergonomics is the practice of designing equipment and work tasks to conform to the capability of the worker; it provides a means for adjusting the work environment and work practices to prevent injuries before they occur.” (http://www.osha.gov/SLTC/etools/hospital/hazards/ergo/ergo.html) Common sources of MSDs in reprocessing areas are repetitive brushing; lifting scopes and equipment; pushing and pulling heavy carts; continuously standing in one position while processing scopes and accessories; and resting wrists on hard counter surfaces, which can cause contact trauma.

OSHA suggests the following possible solutions to ergonomic issues (http://www.osha.gov/SLTC/etools/hospital/central/central.html):

- Redesign workstations so that equipment and supplies can be reached while maintaining the elbows close to the body.
- Use carts with large, low-rolling, low-resistance wheels that can easily roll over mixed flooring as well as gaps between elevators and hallways.
- Minimize prolonged overhead activity (e.g., lower stacking shelves to shoulder height).
- Use height-adjustable work surfaces or lift tables to minimize head tilt.
- Rotate workers through repetitive tasks.
- Pad the edge of work surfaces that come into contact with the elbow or forearm.
- Provide sit/stand stools at workstations.
- Use anti-fatigue mats.
- Where floor mats cannot be used, use shoes with well-cushioned insteps and soles.
- Provide a footrest bar so that employees can continually alter their posture by raising one foot.

Slipping: Slipping on wet floors is another cause of injury. The scope cleaning room and the high-level disinfection area are wet. To avoid injury, it is important that reprocessing personnel take precautions when walking on wet floors. Floors should be kept dry, and wet floors should
Tripping: Tripping over boxes, equipment, or furniture can cause injuries. It is important that the GI/endoscopy suite be kept neat and organized. All boxes should be stored in the proper area and be positioned correctly so that they don’t fall over. All aisles should be kept clear. Anything on the floor should be picked up. All equipment should be kept in its correct location.

Dress Code Infractions: Compliance with the dress code is important for the safety of employees. Loose-fitting clothing is not recommended because the clothing can catch on equipment and cause an injury. Open-toed shoes are also not recommended because they will not protect the feet from injuries from dropped items. (NOTE: This includes clog-type shoes with openings).

Emergency Carts: All facilities are required to have emergency carts to respond to a patient emergency. These carts are often referred to as “code” or resuscitation carts. Flexible endoscope reprocessing technicians do not usually restock these carts; however, if it is your responsibility, it is important to restock the cart exactly as required. There should be a master restocking list of the needed items. Code carts should be cleaned and restocked as soon as possible after use, and there should be a process whereby the carts are routinely checked for outdated product. Flexible endoscope reprocessing technicians must know how many code carts are available within their unit and the location of the carts. It might be your responsibility to transport the cart to the area where the patient has coded.

INCIDENT REPORTS

Any injury to an employee, no matter how slight, should be documented in an incident report. The healthcare facility’s policy on completion of incident reports should be followed. The report should be made immediately, no more than 24 hours after the incident. Failure to do could result in the injury not being covered by workman’s compensation. Incident reports are used to document patient safety issues as well (e.g., shortcuts were taken in the processing of a scope because of insufficient staffing). It is important to document any instance of noncompliance with a stated policy or procedure.

SEXUAL HARASSMENT

Sexual harassment is a form of sex discrimination that violates Title VII of the Civil Rights Act of 1964. Title VII applies to employers with 15 or more employees, including state and local governments. It also applies to employment agencies and to labor organizations, as well as to the federal government.

Unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitute sexual harassment when this conduct explicitly or implicitly affects an individual's employment, unreasonably interferes with an individual's work performance, or creates an intimidating, hostile, or offensive work environment.

Sexual harassment can occur in a variety of circumstances, including but not limited to the following:

- The victim as well as the harasser may be a woman or a man. The victim does not have to be of the opposite sex.
• The harasser can be the victim's supervisor, an agent of the employer, a supervisor in another area, a coworker, or a nonemployee.

• The victim does not have to be the person harassed but could be anyone affected by the offensive conduct.

• Unlawful sexual harassment may occur without economic injury to or discharge of the victim.

• The harasser's conduct must be unwelcome.

It is helpful if the victim informs the harasser directly that the conduct is unwelcome and must stop. The victim should use any employer complaint mechanism or grievance system available.

When investigating allegations of sexual harassment, the Equal Employment Opportunity Commission (EEOC) looks at the whole record: the circumstances (e.g., the nature of the sexual advances) and the context in which the alleged incidents occurred. A determination on the allegations is made from the facts on a case-by-case basis.

Again, prevention is the best tool to eliminate sexual harassment in the workplace. Employers are encouraged to take the steps necessary to prevent sexual harassment from occurring. They should clearly communicate to employees that sexual harassment will not be tolerated. They can do so by providing sexual harassment training to their employees, by establishing an effective complaint or grievance process, by taking immediate and appropriate action when an employee complains, and by monitoring the status of complaints. Emphasis should be placed on the consequences of failing to take advantage of preventive or corrective opportunities, failing to complain, and failing to follow complaint procedures (fear of retaliation).

It is also unlawful to retaliate against an individual for opposing employment practices that discriminate based on sex or for filing a discrimination charge, testifying, or participating in any way in an investigation, proceeding, or litigation under Title VII.

**DRESS CODE AND PERSONAL HYGIENE**

Personal hygiene is critical in all areas of the GI/endoscopy suite. When personal hygiene is maintained, the body sheds (releases) fewer bacteria into the environment, which is important in an area where products are being processed. Reprocessing flexible endoscopes is arduous and requires stamina, so reprocessing technicians should strive to maintain good health by eating a well-balanced diet and getting plenty of sleep.

All personnel entering the processing area should change into clean uniforms that are provided by and donned at the facility. Reusable uniforms should be laundered by a healthcare-accredited laundry (ANSI/AAMI ST65, ANSI/AAMI ST79, AORN 2015b).

Attire should be changed daily or more often as needed (i.e., when wet, grossly soiled, or visibly contaminated with blood or other body fluids). All head and facial hair (except for eyebrows and eyelashes) should be completely covered with a surgical-type hair covering. Personnel should remove and discard hair coverings whenever they leave the department. Upon reentry to the area, they should apply a new hair covering.

Jewelry and wristwatches should not be worn in the processing area. Shoes worn in the processing area should be clean, have non-skid soles, and be sturdy enough to prevent injury if an item drops on the foot. Liquid-resistant shoe covers should be worn if there is potential for
shoes becoming contaminated and/or soaked with blood or other body fluids (OSHA 29 CFR 1910.1030).

The use of cloth head coverings or specialty warm-up jackets is not recommended unless they are laundered by the facility like other scrub attire. At home, laundering cannot be standardized, which can negatively affect the control of microorganisms in processing areas. Also, the OSHA regulation on occupational exposure to bloodborne pathogens states that if a uniform becomes soiled with blood or body fluids, it must be laundered by the facility; the employee is not permitted to take the uniform home for laundering.

Whether employees should wear cover apparel when they leave the area to travel to other areas of the healthcare facility should be determined by each facility and should comply with state and local regulations. Employees should change into street clothes when they leave the healthcare facility or when traveling between buildings located on separate campuses. (ANSI/AAMI ST91)

Visitors to the reprocessing area (e.g., service representatives) should don a clean cover gown or jump suit, shoe covers, and a hair covering before entering the area.

The CDC does not recommend the wearing of artificial nails (CDC, 2002) because of the danger of fungal contamination under the nail, which can contaminate devices. Long finger nails can prevent thorough cleaning, puncture gloves or tear packs, or break off. Nails should be trimmed to one-quarter inch from the tip of the finger. In addition, the wearing of watches, bracelets, necklaces, and other jewelry (except for a simple wedding band) is not recommended. Jewelry can bring contaminants into and out of the reprocessing area; also, jewelry can puncture the gloves worn in the scope cleaning room and get caught on equipment. Earrings may be worn if completely contained within the hair covering.

ENVIRONMENTAL SANITATION

Because the reprocessing area produces high-level disinfected devices, the environment must be kept clean. The reprocessing staff is usually responsible for cleaning horizontal work surfaces (e.g., work stations, countertops, shelving), whereas other departments might be responsible for special cleaning. Cleaning and disinfection of work surfaces will inhibit microbial growth. It is important to identify which personnel are responsible for cleaning air ducts, floors, walls, ceilings, and other environmental areas. A schedule for all cleaning should be developed and monitored for compliance and should not interfere with the area’s operation. Floors should be damp-mopped nightly whenever the department is in operation.

QUALITY ASSURANCE AND CONTINUOUS QUALITY IMPROVEMENT

Obviously, considering all these regulations, the reprocessing area must monitor the effectiveness of its work. The “customers” of the GI/endoscopy suite are patients, physicians, nurses, and fellow employees. How the reprocessing technician acts and reacts to them greatly affects the outcomes of care. To be the best and remain the best, reprocessing technicians must continuously monitor how they are doing and continuously look for ways to improve. W. Edwards Deming, who is considered to be the “father of quality improvement,” published numerous books on how to establish quality programs in any environment.

Quality issues can be identified by anyone. Sometimes we need to analyze a process to help solve a problem. For example, the endoscopist complains that the reusable biopsy forceps are
sticking. Reprocessing personnel need to review the entire process, find the cause, correct the problem, and then monitor the results. This investigation should be documented.

Quality issues can also be identified by random audits. For example, cleaning effectiveness testing should be randomly performed (see Chapter 9). Any deficiencies should be discussed with the responsible employee. Mistakes are often made because of lack of staff, inadequate written procedures, or a sense of urgency to complete tasks quickly. An analysis of the problem helps to identify what needs to be changed.

Collection of data and identification of issues are only part of a quality assurance program. A plan of action needs to be developed, tested, and implemented. The results must be monitored. Even if the problem is resolved, audits should be performed periodically to review the ongoing improvement.

One of the most important aspects of process improvement is monitoring compliance with established policies. Employees should always comply with departmental policies and procedures. Noncompliance can result in a different standard of care for patients. For example, if only certain employees follow the device manufacturer’s processing instructions, devices processed by other staff members might not be properly cleaned or disinfected. Patients being treated or diagnosed with those endoscopes will not receive the same standard of care as the patients whose endoscopes were processed according to the IFU.

Continuously monitoring quality leads to fewer operational errors, increases employee and customer satisfaction, improves patient outcomes, and can lower operational costs.

Quality assurance and continuous quality improvement should not be considered negative processes. It is a positive process to improve the job you do, to make work easier for you, and to reduce costs (by reducing rework, employee injuries, and adverse patient outcomes).

**SUMMARY**

The endoscope reprocessing area is vital because it is there that many medical devices are processed for direct use on patients. The regulations, accrediting requirements, standards, and recommendations of many agencies and organizations affect the work of reprocessing personnel. The endoscope reprocessing technician must receive appropriate and thorough training to ensure the safety and reliability of medical devices processed in the department. This textbook will cover all the elements of flexible endoscope reprocessing to give reprocessing technicians the tools they need to provide cleaned, high-level disinfected, and inspected devices that are safe for use in patient care.

**REFERENCES AND SUGGESTED READING**


Occupational Safety and Health Administration. Air contaminants. 29 CFR 1910.1000.


Occupational Safety and Health Administration. Occupational exposure to blood-borne pathogens. 29 CFR 1910.1030.


Please click on the link below to go to the quiz.

[https://www.spdceus.com/modules/second/gi/module_1_2_quiz.htm](https://www.spdceus.com/modules/second/gi/module_1_2_quiz.htm)