

Housekeeping in Other Venues

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CHAPTER OBJECTIVES

After studying the chapter, students should be able to:

1. Identify all terms and definitions related to hospital and nursing home housekeeping.
2. Identify common pathogenic organisms, types of soil, and common disinfectants.
3. Describe methods of handling infectious linen and other contaminated articles, and how to dispose of infectious waste.
4. Describe how to properly administer pest control operations.
5. Describe the role of the Joint Commission on Accreditation of Health Care Organizations in the establishment of standards for environmental services departments.
6. Describe the role of housekeeping in meeting environmental challenges in the twenty-first century.
7. List and describe other employment and business opportunities for executive housekeepers.

Environmental Services: Nature of the Profession

The **International Executive Housekeepers Association (IEHA)** has long recognized the similarity in responsibilities of persons performing housekeeping functions in hospitals, hotels, and nursing homes. The association draws its membership not only from hotels, retirement centers, and contract cleaning establishments, but also from hospitals and nursing homes. In addition, the movement of management personnel between these fields is well documented.

When asked how difficult it is for a manager to make the transition in either direction, Don Richie, **Director of Environmental Services**, University Medical Center, Las Vegas, Nevada, stated that, “The main function of housekeeping in both areas is to clean rooms and public areas, and to dispose of trash and rubbish. There is only one major difference, however, and that is in hospitals we know exactly what we are walking into, and in hotels, we don’t know what we may be dealing with.” Herein lies the primary difference in technical training between the executive housekeeper and the environmental services director of a hospital or nursing home.

Although the environmental services director may benefit equally with the hotel executive housekeeper by understanding the principles of planning, organizing, staffing, directing, and controlling set forth in the earlier chapters of this book, the **Joint Commission on Accreditation of Health Care Organizations (JCAHO)** has stringent requirements that must be met in the field of environmental services for hospitals and nursing homes. This chapter is devoted to the terminology and definitions encountered in this unique environment and to the requirements set forth by the various agencies that control these issues.

Grateful appreciation is extended to Ms. Janice M. Kurth, Vice President of Operations, Metropolitan Hospital, New York City, and to Aspen Publications for allowing the use of its publication *Hospital Environmental Services Policy and Procedure Manual* as a framework for this chapter. Thanks also to the Desert Springs Hospital of Las Vegas, Nevada, for its assistance and access to its procedural manuals.

Hospitals and Hotels Require Similar Professional Skills

In most cases, the actions required of persons working in hospital environmental service departments are very much the same as the actions required of persons working in hotel housekeeping. After studies are made of the work that must be performed, job descriptions are prepared, indicating the proper divisions of work; then step-by-step guidelines are prepared in the form of *standard operating procedures (SOPs)*. These documents *formalize* procedures that must be performed by workers assigned to specific routines. The uniqueness of hospitals and health care institutions becomes evident, however, when one investigates the special care and consideration that must be taken when dealing with the following:

- The daily and terminal **disinfection** of patient rooms
- The **terminal cleaning** of hospital surgical suites (operating rooms)
- The disposition of used **needles, syringes, and sharps**
- The disposal of infectious waste

Each of these procedural tasks will be dealt with in detail; but first, a proper groundwork must be laid regarding basic knowledge of **microbiology** and the **chemistry of cleaning and disinfecting**.

“Bloodborne Pathogens”: The Newest Connecting Link

In December 1991, the lodging and hospital professions were brought closer together when the Occupational Safety and Health Administration (OSHA) published a new standard relating to “Occupational Exposure to Bloodborne Pathogens.” What at one time had been primarily a concern of hospitals and health care institutions had now entered the lodging industry as well.

First, some basic definitions: *blood* refers to human blood, blood components such as plasma and transfusional blood, and products made from human blood. *Bloodborne pathogens* are microorganisms present in blood that can cause disease. *Other potentially infectious substances* may be other human body fluids, such as semen, amniotic fluids, and other body fluids that may be hard to differentiate, and HIV, and HBV cultures.

Other governmental agencies have been involved with the issue of employee exposure to infectious materials for some time. For a number of years, the Department of Health and Human Services has written and published *Guidelines for Prevention of Transmission of Human Immunodeficiency Virus and Hepatitis B Virus, That Could Affect Health Care and Public Safety Workers*. Concerns have been varied. First, the publicity of recent years regarding the HIV virus and AIDS awakened concerns among the public and legislators alike regarding the transmission of infectious diseases. In addition, increased attention to employee safety and health has caused the concern regarding exposure to hepatitis B to increase. Finally, OSHA began work preparing a Bloodborne Pathogen Standard. This *standard* became law in 1991, and regulations for industries and professions that might become exposed to HIV and HBV viruses were to have been in compliance with the law by March 1992. The law has defined certain words in the lexicon, as follows:

Contaminated

- having potentially infectious materials on an item or surface

Regulated Waste

- liquid or semiliquid blood or other potentially infectious materials
- contaminated items that would release infectious materials if compacted
- items that are caked with dried infectious material
- contaminated sharps (needles)
- waste containing infectious materials

Source Individual

- an individual whose potentially infectious materials may be a source of exposure

Universal Precautions

- the practice of approaching all human blood and other body fluids as if they contain bloodborne pathogens

HIV—(human immunodeficiency virus)

- spreads rapidly
- has no known cure
- has no vaccine
- generally leads to the development of AIDS
- may not show symptoms for some time

HBV

- hepatitis B (the most prevalent form of liver disease)
- results in inflammation of the liver, cirrhosis, and liver cancer
- there is a vaccine that prevents infection

Parenteral Exposure

- infectious material entering the body through cuts or abrasions, needle sticks, or bites

All lodging facilities that have departments with a propensity for exposure (housekeeping departments through soiled linen), engineering departments (cuts and abrasions), and security departments are required by law to have an *exposure control program*. This program must address limiting/eliminating exposure through *Universal Precautions* (use of equipment and handling of contaminated waste), *personal work practices*, the use of *protective equipment*, and good housekeeping practices. The program must also deal with the use of warning labels/signs and exposure procedures, and must also establish an HBV vaccination program (which is free to employees). Finally, compliance with the law must be substantiated through good record keeping. As of this writing, the effects of AIDS have been reduced through certain medications, but the basic problems are still with us.

Basic Microbiology*

Microbiology is a natural science that began with the discovery of the microscope, which led, in the seventeenth century, to the dramatic realization that living forms exist that are invisible to the naked eye. It had been suggested as early as the thirteenth century that “invisible” organisms were responsible for decay and disease. The word *microbe* was coined in the last quarter of the nineteenth century to describe these organisms, all of which were thought to be related. As microbiology eventually developed into a separate science, microbes (small living things) were found to constitute a very large group of extremely diverse organisms—thus the subdivision of the discipline into three parts, known today as bacteriology, protozoology, and virology.

Microbiology, therefore, is the study and identification of **microorganisms**. Such study encompasses the

*Adapted with permission from the introduction to “Microbiology,” Encyclopaedia Britannica, 15th Edition, (c) 1979, by Encyclopaedia Britannica, Inc.

study of bacteria, rickettsiae, small fungi (such as yeasts and molds), algae, and protozoans, as well as problematic forms of life such as viruses. Because of the difficulty in assigning plant or animal status to some microorganisms—some are plant-like, others animal-like—they are sometimes considered to be a separate group called **protists**. Microbes can also be divided into prokaryotes, which have a primitive and dispersed kind of nuclear material—such as the blue-green algae, bacteria, and rickettsiae—and eukaryotes, which display a distinct nucleus bounded by a membrane. These are the small algae other than the blue-greens, yeasts and molds, and protozoans. (All higher organisms are eukaryotes.)

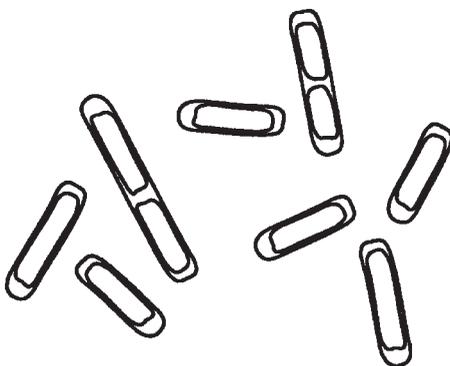
The daily life of humans is interwoven with microorganisms. They are found in the soil, in the sea, and in the air. Although unnoticed, they are abundant everywhere and provide ample evidence of their presence, sometimes unfavorably, as when they cause decay in objects valued by humans or generate disease, and sometimes favorably, as when they ferment alcohol to wine and beer, raise bread, flavor cheeses, and create other dairy products. Microorganisms are of incalculable value in nature, causing the disintegration of animal and plant remains and converting them into gases and minerals that can be recycled in other organisms.

It might be said that approximately 90 percent of all microorganisms are good and essential to nature and humankind. Our concern in this text, however, is the 10 percent that are not.

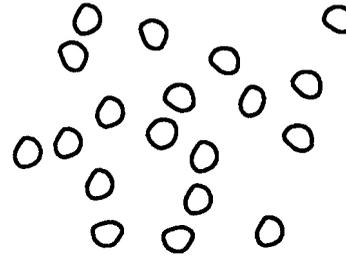
Terminology Appropriate to the Subject of Microbiology

What follows is a list of specific microorganisms worthy of our concern. Some are represented here as if they were properly stained and seen under a microscope at 500× magnification.

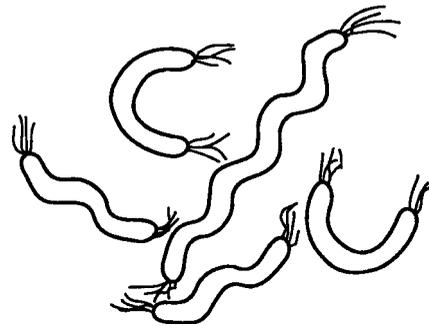
- Bacteria** Used to refer to microorganisms in general; also, the same as germs and/or microbes.
- Bacillus** A bacterium that is rod-shaped.



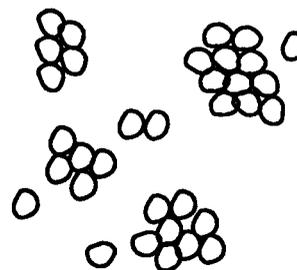
- Coccus** A bacterium that is round-shaped.



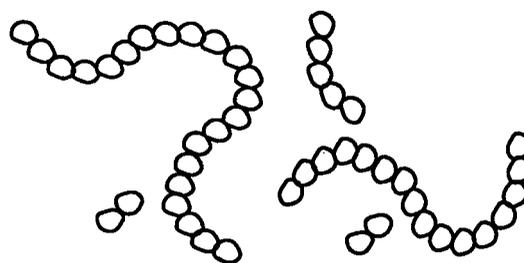
- Fungi** Simple plants lacking chlorophyll; bread mold is an example.
- Spirochete** Corkscrew-shaped microorganism.



- Spores** Microorganisms that are in a restive, protective shell
- Staphylococcus** A grape-like cluster organism that can cause boils, skin infections, purulent discharge, and/or peritonitis.



- Streptococcus** Chainlike round organism that causes the strep throat infection.



Virus	The smallest of all microorganisms.
Other words significant to the study of microbiology include the following:	
Aerobic	Bacteria that must be exposed to, and require, air (oxygen) to survive and grow.
Anaerobic	Bacteria that can live without exposure to air (oxygen).
Antisepsis	A process whereby chemicals are used on the skin for bacteriostatic and germicidal purposes.
Asepsis	To be free from germs and infection.
Asepsis (medical)	A method used to prevent the spread of a communicable disease. Handwashing and isolation are examples.
Asepsis (surgical)	A method using sterile equipment, supplies, and procedures when entering the “sterile” interior of the body.
Autoclave	An ovenlike machine, using steam under pressure, in which supplies are subjected to intense heat for a specified period of time. It is also called a sterilizer.
Chemical agent	A chemical added to a solution in the correct dosage that will kill bacteria, or at least stop their growth.
Disinfection	Process whereby chemicals are used on floors and equipment for bacteriostatic and germicidal purposes.
Disinfection (concurrent)	Process used while disease is still in progress.
Disinfection (terminal)	Process used when disease is ended.
Gram (positive/negative)	Refers to the color staining of test samples for certain bacteria. <i>Gram positive</i> is a “blue” test result when certain bacteria are treated with testing reagents. <i>Gram negative</i> is a “red” test indication.
Intermediate host	One who transmits a disease but is not affected by it. Also known as an “im-

mune carrier.” An example is the anopheles mosquito, which bites a person infected with malaria, then bites another person, thus transmitting the disease.

Micron
A unit of measure—1/25,000 of 1 inch. (Bacteria are usually found in the range of 1 to 300 microns.)

Pathogenic
Disease-causing or disease-producing.

Physical agents
Nonchemical agents that will affect the growth of bacteria or will destroy them. Examples of nonchemical agents are sunlight, temperature, heat, moisture, and pressure.

Reagents
A group of testing solutions used to identify certain bacteria and their properties. Such tests can help determine which chemicals should be used to kill certain bacteria.

Sterilization
A process whereby all bacteria are killed by heat.

Micron**Pathogenic****Physical agents****Reagents****Sterilization****Several Specific Microorganisms and Their Characteristics**

The following is a list of 11 common microorganisms with which one might come in contact while working in a hospital, nursing home, or hotel. The phonetic pronunciation of the name and several characteristics are also given.

Staphylococcus aureus (staff-ill-i-COCK-us OAR-ea-us). Gram positive (blue stain). Major cause of infections (boils, carbuncles, ear infections), food poisoning. Size: 0.8 to 1 micron. Is resistant to antibiotics. Best cure is heat.

Mycobacterium tuberculosis (my-co-back-TEER-ee-um too-BER-cue-LOW-sis). Gram negative (red stain). Acid-fast (cannot be killed with acid).

Salmonella choleraesuis (sal-moe-NELL-a coll-er-ah-SUE-iss). Gram negative. A form of food poisoning. Body can usually tolerate and throw off. The bacteria are used to test germicides.

Pseudomonas aeruginosa (sue-doe-MOAN-us air-o-gin-O-sa). Gram negative. Very resistant to disinfectants. Major problems are public restrooms. Disease is more prevalent in women. Bacteria will grow in standing water.

Streptococcus pyogenes (strep-tow-COCK-us pie-O-jeans). Gram positive. Bacteria found in public places; cause wound and throat infections. Also associated with scarlet fever and rheumatic fever.

Diplococcus pneumoniae (dip-lo-COCK-us new-MOAN-ee-a). Gram positive Lobar (lung) pneumonia. Also walking pneumonia. Treatable with antibiotics.

Mycobacterium diphtheria (my-co-back-TEER-ee-um dif-THEE-ree-ah). Gram positive. Transmitted in milk. Not very prevalent, because of vaccination.

Escherichia coli (ee-shear-EEK-ee-ah COAL-i). Gram negative. Can grow in soap. Never use bar soap in a public washroom. Bacteria can be spread through animal droppings.

Clostridium perfringens (clos-TRID-ee-um per-FRIN-gins). No gram stain. An anaerobic spore. “Botulism.” Found in feces, sewers, improperly sterilized milk, or sealed foods. Also found in untreated wounds (gaseous gangrene).

Tricophyton interdigitale (tn-CO-fi-ton inter-digit-ALL-ee). No gram stain. A fungus (athlete’s foot). The fungus can be used to evaluate a germicidal.

Virus A part of the protist kingdom. Includes influenza, (flue virus), herpes simplex, Vaccinia (cowpox), adenovirus type 2, Norovirus, SARS, and HIV.

The Five Types of Soil

There are five types of soil that present the environmental service manager, or anyone with the responsibility to “clean,” with a challenge. Not all soils are directly and solely bacteria-related, but we shall keep bacteria on the list. Each soil, regardless of whether it is organic or inorganic, is a compound capable of being altered by chemical reaction.

The following are the five types of soil:

- 1. Mineral** A solid homogeneous crystalline chemical element or compound, having a specific chemical composition, that results from the inorganic processes of nature.
- 2. Organic** A substance consisting only of matter or products of plant or animal origin. Chemically, such substances are compounds containing strings of carbon molecules attached to one or more hydrogen molecules.
- 3. Osmological** Relating to soils of organic or inorganic matter that emit an (unpleasant) odor.
- 4. Bacterial** Soils or compounds containing active (live) bacteria.
- 5. Entomological** Soils involving insects, especially those that can cause or carry diseases.

The Chemistry of Cleaning*

To understand the chemistry of cleaning, the student must first accept the fact that he or she need *not* become a chemist to do a cleaning job well. Having a layperson’s understanding of what is happening as we apply a disinfectant or detergent can give us respect for the value of using products for the purposes for which they are designed. Too often, employees “assume” that something *red* will clean better than something *blue*, that a *thick* solution must be better than a *watery* one, or, most often, that *more is better*. This section, although presenting no **chemical formulas**, does require the student to master a new group of terms and, it is hoped, to develop a respect for what has gone into the several products currently in use in the world of cleaning and disinfecting. The chemistry of cleaning is most appropriate in this section because we are not only cleaning, we are also killing bacteria (disinfecting).

What follows is a brief discussion of lay chemistry for the professional, who might then better understand the history and significance of product development:

Atom. According to the Periodic Table of Elements, the smallest combination of nucleus (center core of protons and neutrons) and surrounding electrons associated with a given named **element**. For example, an atom of sulfur (S), oxygen (O), hydrogen (H), or carbon (C) is the smallest particle that is recognizable by that name. All atoms have different “weights,” hydrogen being the lightest and uranium one of the heaviest, because of their respective atomic structures. More than 106 elements have been discovered in the universe. Some of them do not even occur naturally but have been created by humans in only the last century.

Molecule. A compound created by combining a certain group of atoms. Many of the atoms described here *when found in nature* are seen as molecules that will combine with other molecules to form more complex chemical compounds. For example: Chemically speaking, atoms of hydrogen (H) or oxygen (O), in nature are found as gaseous molecules of hydrogen (H₂) oxygen (O₂). The associated suffix number or describes certain characteristics as to how they react chemically when combined with each other or with other elements. Their “chemical” reactions are based on many different phenomena, but primarily on how many free electrons are found in their outer rings of electrons. A molecule having the same number of protons in its nucleus as it has electrons in orbit around the nucleus would have an electrical charge of 0 (zero **valence**). If there is an excess of protons in the nucleus, a positive charge of +1 or

* Adapted with permission of the Administration, Desert Springs Hospital, Las Vegas, Nevada.

+2 exists (positive valence); if there are more electrons than protons, then the charge would be negative (-1 or -2, negative valence). The combination of valence plus the “type” of atom being considered determines how difficult, easy, violent, or modest the reaction will be as we try to combine molecules of atoms with other molecules to form more elaborate compounds. Each single molecule of *water* is made up of two atoms of *hydrogen* and one atom of *oxygen*. The smallest atom of hydrogen found in nature is a gaseous molecule of hydrogen (H_2). The smallest molecule of oxygen found in nature is gaseous oxygen (O_2). Under certain conditions, igniting hydrogen in the presence of oxygen causes a violent explosion, with a by-product of water. To keep the accounting correct, one molecular formula is mentioned to show that things do balance. For example: Two molecules of gaseous hydrogen, $2H_2(g)$, will chemically combine with one molecule of gaseous oxygen $O_2(g)$, to form two molecules of liquid water, $2H_2O(l)$.

Some molecules, particularly those in biological systems and plastics, are very large and contain thousands of atoms.

Chemical Compounds

Chemical reactions are also called chemical transformations. They entail the conversion of one or more substances into one or more different substances called **compounds**. The substances that react are called **reactants**, and the results of the reaction are called **products**.

In a chemical reaction, atoms are regrouped to form different substances; atoms are not destroyed or converted into atoms of other elements (as one might find in **atomic reactions**). Cleaning chemicals are designed to chemically combine with specific types of soil. The chemical products are then removed chemically, clinging to the soil to be removed.

The following is a list of some basic terms relevant to chemical reactions:

Radical: a group of atoms that do not dissociate during a chemical reaction but stay together. The following are common radicals.

(OH) Hydroxide	(NO ₃) Nitrate
(SO ₄) Sulfate	(PO ₄) Phosphate
(NH ₄) Ammonium	(CO ₃) Carbonate

Organic compounds: compounds made up of carbon, hydrogen, and oxygen.

Ion: an atom or group of atoms that has acquired an electrical charge by a gain or loss of electrons.

Anion: an atom containing a negative electrical charge.

Cation: an atom containing a positive electrical charge.

Acid: a compound in which a majority of anions, either atoms or radicals, are combined with the cation hydrogen (H^+).

Alkali: a cationic metal combined with the anionic hydroxyl (OH) radical known chemically as a hydroxide of the metal. Alkalis combine with acids to form *water* and *salts*.

Salts: result when the hydrogen ion of an acid is replaced with a metal.

Water: the **universal solvent** (usually the first liquid tried when testing a substance to see if it can be dissolved into a solution)

pH: a measure of the acidity or alkalinity of a substance. A scale from 0 to 14 is used. The number 7 is the neutral point. All substances with a measured (pH) more than 7 are **alkaline**; less than 7, and the product is **acidic**.

R: the letter used to identify a long carbon group of some known chain length or configuration of a chemical compound.

Disinfectant: compound that kills bacteria. Most chemical agents that have been created for use in cleaning and disinfecting fall into the *quaternary ammonium* or the *phenolic* category. They both destroy pathogenic bacteria.

Quaternary ammonium compounds: A class of disinfectants that are cationic surface-active agents containing nitrogen, long carbon chains (Rs), and an anion, usually chlorine.

Phenol: carbolic acid.

Phenolic: derivations of phenol widely used as disinfectants. Long carbon chains are attached to a precise position on the phenol molecule. One thousand times more active than pure phenol.

Hydrogen peroxide: an unstable compound, H_2O_2 , used as an oxidizing and bleaching agent, an antiseptic, and a propellant. It breaks down into water and oxygen, making it a very environmentally friendly product.

Iodine: a highly reactive element, which makes it a highly effective disinfectant with a broad spectrum of efficiency.

Alcohols: methanol, ethanol, isopropanol; function similarly to quaternary ammonium compounds in method of action.

Detergent: a synthetic organic soap, either oil or water soluble, derived from hydrocarbons, petroleum, alcohols, amines, sulfonates, or other organic compounds.

Antiseptics: substances that slow bacterial growth; includes both iodine and alcohols.

Bacteriostat: prevents bacteria from multiplying. An antibiotic (not for consumption, but for use in such places as laundries).

Sanitizer: normally used in food areas and to chemically treat filters in air-handling units.

Preservatives: used in foods to inhibit bacterial growth.

Familiarization with the various aspects of chemical usage in both health care institutions and hotels requires a basic understanding of chemicals and of the chemical process. The wise director of environmental services knows and understands the chemical products being used at his or her facility and how to use them.

Product Testing

There are several tests that can determine the efficiency and effectiveness of a product. The Association of Analytical Chemists (AOAC) can also test products both for the manufacturer and the user.

A typical test is to prepare several **petri test dishes** (small flat, round dishes with a nourishing gelatin [host]), which can be daubed with a swab containing the bacteria to be tested. First the bacteria are given a period of time to grow. Then the bacteria are treated with differing dilutions of a germicidal product. The goal of the test is to determine at what **dilution ratio** the product kills a bacterium. Further tests might be done to determine how long it takes for a given germicidal to kill bacteria at a set dilution, or to determine the effects of adding certain products to increase the efficiency of a certain germicidal.

The Product Manufacturer and the Chemical Challenge

The challenge to the product manufacturer becomes obvious: to determine what product can first clean, then disinfect. Inorganic cleaning can be as simple as sweeping dust from the floor, picking it up, and disposing of it in such a way that it will not find its way back into a space. The products available in supermarkets most often exploit certain chemicals that will loosen “soil,” hold it in **chemical suspension**, and then pick up the suspension by a number of different means and dispose of it.

A disinfectant, however, adds an additional challenge: not only to clean, but to enter the membrane of the bacterial cell and kill the bacterial nucleus.

Carbolic Acid (Phenol)

Carbolic acid (phenol) was, for years, the best killer of bacteria available for disinfecting an area. However, the compound required extended periods of contact with the area to be disinfected. In addition, whereas phenol would kill bacteria, it was not a good cleaning agent.

With the development of phenolic (a derivative of phenol), the disinfectant became 1000 times more effective at entering the protective membranes of bacteria and killing them. However, it continues to be a poor cleaning agent, and it is a highly **toxic** material. The nor-

mal dilution ratio for this product is 256 to 1 (1/2 ounce in one gallon of water).

Quaternary Ammonium Compounds

In addition to being effective antibacterial agents, quaternary ammonium compounds are good cleaning agents. They are also highly toxic, however, and for years these compounds had one additional drawback as a disinfectant: they were ineffective against the tuberculosis bacteria. Recent progress in the development of quaternaries has conquered the tuberculosis problem, and these compounds have since become the disinfectants of choice in hospitals. However, when diluted, they have been shown to support certain bacterial growth, such as pseudomonas.

Hydrogen Peroxide

Hydrogen peroxide, or H_2O_2 , has long been recognized as an effective oxidant and has occupied a place in almost every home's bathroom as a hair bleaching agent and a topical antiseptic. Recent research has significantly improved its stability and disinfectant properties. In high concentrations, hydrogen peroxide can be toxic, but the beauty of hydrogen peroxide is that it will eventually break down to harmless water and oxygen. One day, this may be the chemical of choice for sanitizing and disinfecting surfaces.

Nonchemical Agents That Kill or Slow Bacterial Growth

Light is an excellent killer of bacteria as long as they are on the surface of an object or on the skin. Sunlight and ultraviolet light are excellent sanitizers but do not penetrate beyond the surface of an object or the skin.

Cold does not kill but slows and inhibits growth; in some cases bacteria will go dormant because of cold.

Heat kills bacteria. A steam sterilizer is vital sterilizing equipment. In cases where human tissue is involved, contact time of heat is important.

Physical removal. Use of air filters and electrostatic filters is significant. Also, vacuuming and simply wiping can remove bacteria.

A Controlled Bacterial Environment

A controlled bacterial environment is an environment that is kept clean and bug-free and has garbage properly disposed of. In addition, covered storage is needed, garbage handlers should wear gloves, and steps should be taken to prevent all forms of pollution.

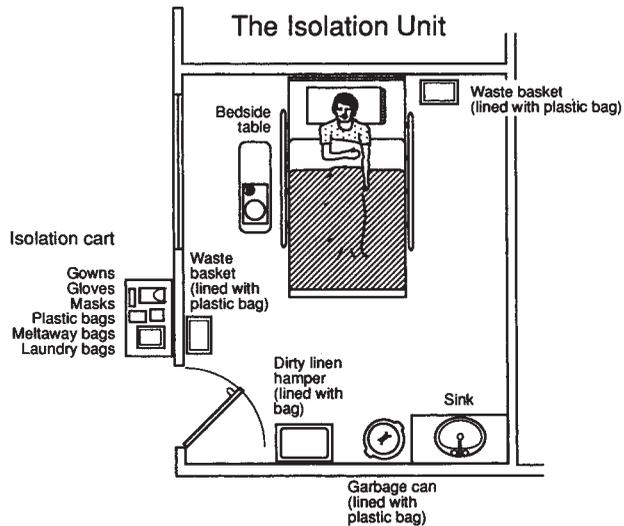


Figure 13-1 Layout of an isolation unit.

To prevent the spread of infection, facilities must be kept clean and healthy. Disease is spread through **bacteria trails**. The following chain of events is seen as the bacteria trail. The **chain of infection** starts with a *pathogenic causative agent*. Next is the *reservoir*, or place for the **pathogen** to live, followed by the *mode of escape, method of transmission*, and *mode of entry into the host*. The person is the host who passes the pathogen, and the chain continues. Break the chain of events at any point, and the infection is stopped.

The Isolation Unit

Figure 13.1 shows the layout of an **isolation unit** in a major hospital. Note how the isolation cart contains a supply of gowns, gloves, masks, plastic bags, meltaway bags, and laundry bags. Inside the unit are various methods and locations to dispose of isolation clothing prior to coming out of the room.

Contaminated Articles and Excreta

For some patients in isolation, it is necessary to take special precautions with articles contaminated by urine or feces. For example, it may be necessary to disinfect (or discard) a bedpan with the excreta.

Terminal Cleaning and Disinfecting the Surgical Suite

The purpose of cleaning and disinfecting a surgical suite is to reduce the number of microorganisms present and thereby maintain a clean, safe environment for patients, staff, and visitors.

The necessary equipment must first be assembled:

- A 10-quart plastic bucket for washing furniture
- Cloths for damp wiping, wet and dry
- Disinfectant/detergent
- Spray tanks for applying solution to floors
- Water vacuums to pick up solution
- Floor machine with scrub pad
- Wall-washing equipment (includes bucket, wringer, mop handle, and mop heads)

The suite-cleaning procedure would then include the following:

1. Prepare, clean, and check all equipment.
2. Prepare disinfectant solution and place in the spray tank, wall-washing unit, and 10-quart bucket.
3. Proceed to the first assigned surgical suite; clean and disinfect the bed/table and damp wipe every surface with the disinfecting/cleaning agent.
4. Using a similar technique, disinfect all furniture (ring stands, kick buckets, tables, and other pieces of rolling equipment), moving them to the middle of the room around the table/bed. Rinse each item with a hand cloth after damp wiping.
5. Disinfect all wall-hanging fixtures, being careful not to get solution inside or behind humidistats, thermostats, x-ray screens, sterile cabinet doors, or electrical outlets.
6. Spray disinfectant solution on the floor; use a water vacuum to pick up solution. Leave a 12-inch wet strip close to and around the furniture that is still in the middle of the room.
7. Replace the furniture, being sure to roll the wheels through the 12-inch wet strip to disinfect them. Then roll the bed/table through the solution to one side of the room.
8. Clean the light fixture in the same way the furniture was cleaned.
9. Spray solution on the floor in the middle of the suite. Use the wet vacuum to pick up all remaining solution.
10. Return the table/bed to its proper place.
11. Retire from the suite and thoroughly clean all equipment with disinfectant/detergent. Store equipment properly or proceed to the next surgical suite and repeat the procedure.

Special Concerns

1. There should be no spraying of solutions close to sterile carts.
2. Corridors, ceilings, and walls should be disinfected monthly. Spot wash as needed.
3. Cubicle curtains in the recovery area or elsewhere in the surgical theater should be changed monthly, or sooner as needed.

In the following short article, David Holsinger offers two simple steps that are necessary to ensure a success-

ful infection control program in a number of different environments, ranging from hospitals to schools.

Two Steps to a Safe Work Environment

by David Holsinger This article is presented through the generosity of ProTeam Inc., a Boise, Idaho, manufacturer of backpack vacuum systems and sponsor of Team Cleaning Seminars.

Accumulation of microbial contaminants on environmental surfaces is a major concern in maintaining a safe environment in hospitals, clinics, dental offices, nursing homes, child day care centers and schools. The build up of microorganisms on desktops, phones, chairs, door knobs, light switch plates, beds and bedside tables creates a potential source of nosocomial infections (an infection that was not present or incubating at the time of admission to a health care facility).

A crucial tool in any cleaning program is a hospital approved germicidal detergent. The primary purpose of this product is to disinfectant and stop the spread of microbes that cause life-threatening disease such as HIV (human immunodeficiency virus), Hepatitis, MRSA (Methicillin Resistant Staphylococcus Aureus) and VRE (Vancomycin Resistant Enterococcus).

Two steps are vital to a successful infection control program:

- Step #1. Following appropriate guidelines in selecting a germicidal detergent.
- Step #2. Ensuring an environment that does not inactivate the disinfecting process or contribute to the spread of microorganisms.

When selecting a germicidal detergent consider its use, efficacy, acceptability and safety for the intended environment. The following guidelines will help you in this process:

1. Ensure the product has been Registered with the Environmental Protection Agency (EPA) and has a registration number on the label.
2. The product must be Germicidal or effective against *Staphylococcus aureus*, *Salmonella choleraesuis*, *Pseudomonas aeruginosa*, VRE and MRSA; Fungicidal or effective against *Trichophyton entagrophytes*; Mycobactericidal or effective against *M. Tuberculosis*; and Virucidal or effective against Influenza, Herpes simplex and Vaccinia.
3. It must be effective against stated organisms when diluted with hard water to a level of 400

ppm calcium carbonate. The product must also work in either hot or cold water.

4. The germicide must be effective against target organisms in the presence of some organic matter, specifically 5% blood serum (organic substances tend to deactivate disinfectants).
5. It should have a pH factor between 7–9. A pH of 10.5 or more is highly alkaline and may damage floor finishes and other surfaces.
6. Determine the safety of the product by reading the Material Safety Data Sheet (MSDS) for the following information:
 - a. Name of chemical
 - b. Health and other hazards
 - c. Exposure cautions
 - d. What to do when exposure occurs
 - e. How to safely handle and store
 - f. What to do if a spill occurs
 - g. What personal protective equipment (PPE) to wear
 - h. How to properly dispose of the chemical

After selecting an appropriate germicidal detergent, consider the environment in which it will be used. Do facility cleaning methods and frequencies prevent the build up of dust and soil on environmental surfaces? This is extremely important for proper disinfection. Dust and soil particles can shield microbes from contact with disinfectants and react with (i.e., inactivate) the cleaning agents. Failure to remove foreign (especially organic) matter from a surface before attempting to disinfect can render germicides ineffective. Plainly, successful disinfecting requires an efficient *cleaning* program.

Of the many cleaning systems utilized in the cleaning industry today, team cleaning (cleaning using specialists) is one to consider. It has proven to work extremely well under intense regulatory scrutiny and meets industry expectations for cost effectiveness. Using specialized cleaning positions focused on specific tasks, team cleaning yields consistent daily cleaning and disinfecting of offices, exam rooms, classrooms, play rooms, restrooms, carpets and tile floors. Team cleaning uses carefully selected tools to optimize the specialist approach. For example, backpack vacuum cleaners raise productivity, and units with four-stage filtration help facilitate the disinfecting process.

An efficient vacuum filtration system is extremely important in removing dust, soil and microorganisms from the environment. A vacuum equipped with a HEPA filter (99.97% efficient in filtering particles .3 micron and larger in size) in a four-stage configuration will minimize the dispersal of fine dust from the vacuum exhaust. Why is this important? Dust contains dirt, textile fibers, pollen, hair, skin flakes, residue from cleaning chemicals, decaying organic matter, dust mites, bacteria, fungi and viruses. Microorganisms can travel through the air on dust particles. The removal of airborne fungal spores such as *Aspergillus* is especially important because they can cause fatal infections in patients with weakened immunity.

Proper vacuum systems will reduce the potential for cross contamination and also minimize allergic reaction to dust in sensitive individuals. Powerful suction-only units such as backpacks not only clean carpet but also allow cleaning hard and resilient

floors without using dust mops or brooms which tend to stir contaminated dust into the air.

Effectively managing the modern cleaning function positively affects the health and well-being of all building occupants. It's very easy to wrongly assume your current germicidal detergent and cleaning program is doing its job. To assure you are meeting customer needs, use appropriate guidelines in selecting a germicidal detergent and review your cleaning program to assure consistent daily cleaning by the environmental services staff. You will be two steps closer to a safer, healthier environment for your employees and customers.

(David Holsinger and Michael Wilford are cofounders of Midas Consulting in Redlands, California. They have 37 years of experience in the health care industry and pioneered the seven-specialist team cleaning model at a large Southern California medical center. They may be reached at 888-310-7133.)

*Resources:
Association of Professionals in Infection Control and Epidemiology*

Disposition of Used Needles, Syringes, and "Sharps"

It is essential to ensure that used sharp objects such as needles, syringes, and sharps (sharp plastic cases in which needles and disposable scalpels are placed for disposal) are carefully and safely removed from the hospital and safely disposed of in such a manner that unsuspecting persons coming in contact with them run little risk of becoming contaminated. The hospital nursing service has primary responsibility in preparing such objects for disposal.

The following procedures should be used:

1. Nursing service personnel—place used syringes found in patient floor care areas into the plastic disposal containers designated by Nursing Service as "for sharps disposal."
2. Sterilize all sharps containers from patient floor care areas and send to Central Service for collection and disposal.
3. Sterilize containers from Surgery, Emergency Room, Isolations, Respiratory Care, Pulmonary Function, and Nuclear Medicine, and send to Central Service for collection and disposal.
4. Central service personnel—send all sterilized sharps to the laboratory for final disposition.
5. Laboratory personnel—place all needles and sy-

ringes into the proper containers; seal them, place in a red plastic bag, and sterilize before final disposal.

6. The laboratory must then ensure that Environmental Services personnel pick up the sterilized sharps and dispose of them with normal refuse.

OSHA announced changes to its Bloodborne Pathogens Standard 1910.1030, which took effect April 18, 2001. These changes were mandated by the Needlestick Safety and Prevention Act. The revisions clarify the need for employers to select safer needle devices as they become available and to involve employees in identifying and choosing the devices. The updated standard also requires employers to maintain a log of injuries from contaminated sharps.

Disposal of Refuse from Antineoplastic Agents

The purpose of safe removal and disposal of waste associated with the preparation and disposal of antineoplastic agents is to ensure that unauthorized or unsuspecting personnel will not become contaminated by coming in contact with such agents.

The following procedures should be used:

1. Environmental Services will be responsible for the removal of the sealed trash receptacles marked with

a green label as **chemotherapy drugs**. These containers are usually found in the soiled utility rooms on floors where antineoplastic agents are administered.

2. The environmental technician, aide, nurse, or unit secretary will notify Environmental Services when containers are full.
3. A full container will be sealed before it is removed from the soiled utility room by the assigned environmental services technician, who will replace it with an empty container.
4. The full container will be taken to the temporary storage area designated for antineoplastic agents refuse.
5. Containers will be removed periodically by a properly licensed firm authorized to remove such waste.

These procedures are subject to review and periodic inspection by an agent of the Joint Commission. Unsatisfactory results of such inspections could form the basis of a “Warning,” with notification of action required to maintain “Certification.” Unheeded warnings or lack of action to correct may ultimately lead to the suspension of certification.

Pest Control

Insects have been on this earth for millions of years, and most have “weathered the storm” better than any other species. Most have short life spans; they propagate over short spans of time and die, yet the species live on and on.

Figure 13.2 shows 12 of the “garden variety” pests that should be kept under control as much as possible, but not all necessarily for the same reasons. Some insects sting, others live in damp contaminated areas or in human and food waste and can contaminate the human environment. All insects are capable of transmitting bacteria by picking them up on their bodies and legs and then traveling through their domains and infecting everything they touch, whether human or otherwise.

A True Scenario

The ordinary “wood tick” provides a good example of all the elements of the chain of infection. The tick normally originates (propagates) in damp, heavily wooded or vegetated areas. It lies in wait for a warm-blooded animal to pass close enough for it to sense body heat. It then hops (and/or flies) 10 to 15 feet and firmly attaches itself to the animal and begins to siphon blood. This activity continues over a period of several days, during which time the host animal may travel long distances. While a passenger, the tick is exposed to areas heavily contaminated with bacteria through contact with feces and other decomposing tissue (**causative agent**). After several days the tick grows to the size of a human thumbnail (the

Green Tips

Disinfectants kill germs, but if they are not used properly, they can harm people too. When selecting a disinfectant, read the precautionary statements and the Material Safety Data Sheet first. Make sure it is safe to humans if used as directed and will not harm the surfaces you intend to clean. It should be soluble, stable (bleach is not), nontoxic, hypoallergenic, and not a skin or mucous membrane irritant. It should not smell bad, and it should work fairly quickly at low concentrations. It should continue killing pathogens for a reasonable time after it has been applied.

The bad news is that nothing on the market will meet all these requirements, but some are better than others.

reservoir). The wound area created by the tick’s attachment now grows purulent and weak, allowing the weight of the tick to cause it to drop to the ground (**mode of escape**), possibly thousands of miles from its initial location. It winds up carrying not only its supply of blood, which it digests over a period of several days, but also a plethora of bacteria on its body shell (**immune carrier**). Eventually the tick returns to its original size and again takes up the stalk, lying in wait for the next exposure to the heat of animal warmth (**method of transmission**). Suppose that this time it is a human who becomes the target for the bite of the long-jumping tick (mode of entry into the new **host**). Ten days to two weeks later, the human notices a rash developing on the extremities and commencing to radiate inward to the torso, giving the appearance of measles. What appeared to be measles, however, is not, inasmuch as the recovery time for measles is within ten days from the onset of the rash. Suppose further that upon close examination, a tick is discovered in the hair of the human and the diagnosis is changed to “Rocky Mountain spotted fever” (tick fever). One day later, the young girl dies in her home in Florida. This true scenario clearly demonstrates how the first animal and the tick may both be immune carriers, and the chain of infection may be discovered thousands of miles from where the sickness is readily suspected—discovered too late for effective treatment.

Keeping Pests under Control Means Manipulating the Environment

Persons working in environmental services must set goals regarding tasks related to pest control:

1. Keep the area clean.
2. Remove and dispose of all trash frequently and completely.

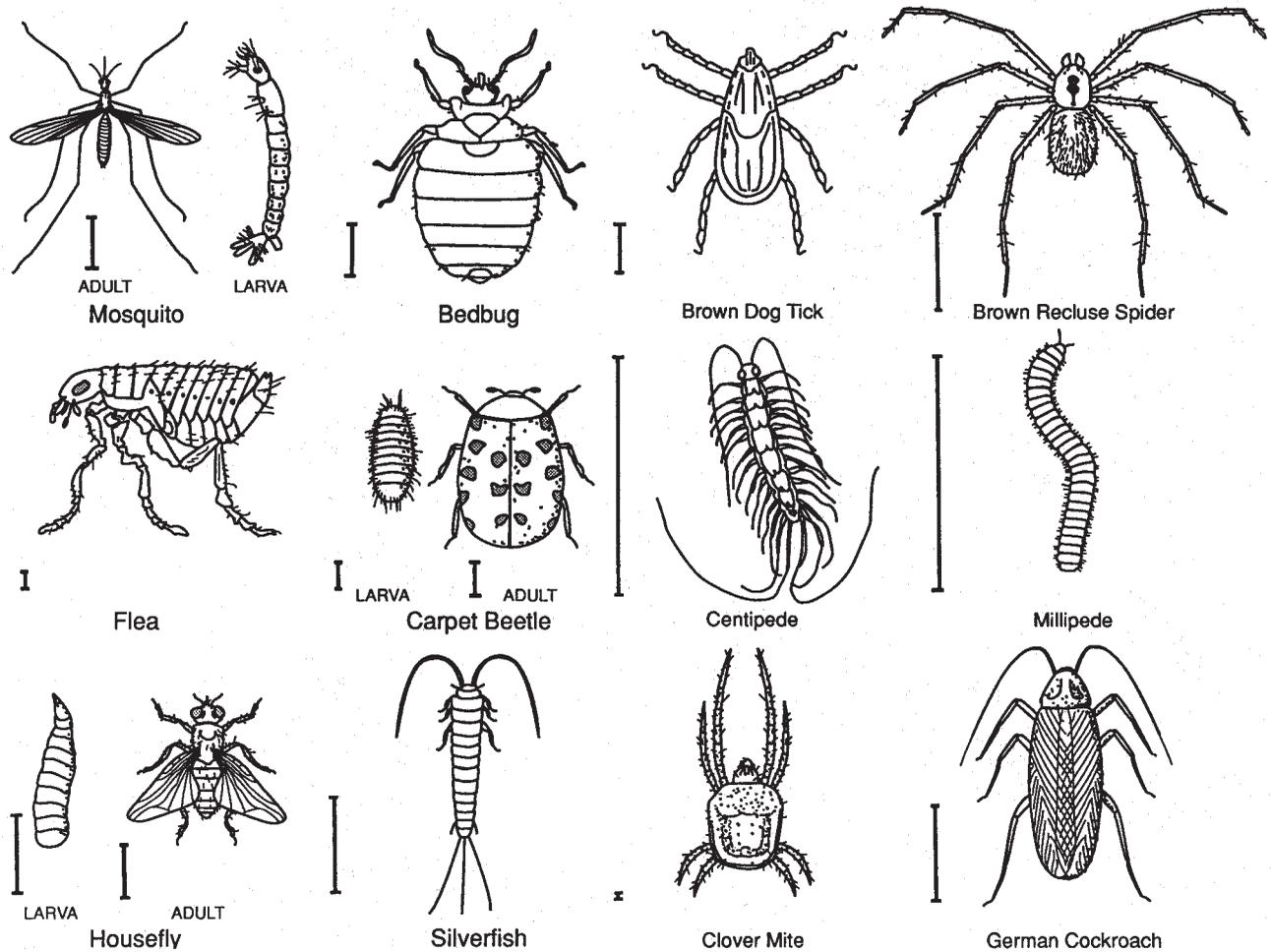


Figure 13-2 Twelve common household pests. The line adjacent to each illustration indicates approximate size.

3. Use screens in areas where insects are prevalent.
4. Keep facilities in a good state of repair.
5. Have a program of chemical pest control to rid *all* the property of all insects.

Application of Pesticides

The application of pesticides must be closely monitored and controlled. Only those personnel properly trained in the storage, dilution, and application of pesticides, and properly licensed by the appropriate state agency should be authorized to apply pesticides. Records should be maintained as to the licensing of specific personnel.

When outside agencies are contracted to do pest control work, credentials should be checked and contracts let for no more than a one-year time period. This will allow the facility manager to have quick access to a new outside contractor if pests are not being kept under control.

Types of Pesticides

Pesticides may be classified in a number of ways:

1. By their effectiveness against certain kinds of pests:
 - insecticides versus insects
 - herbicides versus weeds
2. By how they are formulated and applied:
 - dusts
 - fogging oils
 - granular powders
 - wettable powders
3. By the chemistry of the pesticide:
 - chlorinated hydrocarbons (chlordane)
 - organic phosphates (Malathion)
 - natural organic insecticides (Pyrethrum)

Effectiveness against a particular pest species, safety, clinical hazard to property, type of formulations available, equipment required, and cost of material must all be taken into account when choosing a pesticide for a

particular job. Recommendations change with experience, the development of new materials, and new governmental regulations. It should be kept in mind, however, that these are not the only materials that will work, but they are standard products that will work if properly used.

Malathion is an organophosphate-type, broad-spectrum insecticide that has a very low hazard threshold when used according to directions. Although only slightly toxic to humans and other mammals, it is highly toxic to fish and birds. It is effective against the two-spotted spider mite. Premium grade, 2 to 3 percent Malathion residual sprays can be used against most household pests; there is less chance of an odor problem with the premium rather than the regular grade. Malathion may be purchased as a 57 percent emulsion concentrate or a 25 percent wettable powder. It is recommended for use by nonprofessionals.

Methoxychlor (Marlate) is a chlorinated hydrocarbon-type, slightly toxic insecticide that is being used as a replacement for DDT. Methoxychlor is not accumulated in human body fat and does not contaminate the environment as does DDT. It is available as a 50 percent wettable powder and is commonly sold as Marlate. It is safe for use by nonprofessionals.

Other pesticides. There are many other pesticides available. In commercial, hospital, or nursing home settings, however, pest control is best left to competent experts in the field, properly licensed and experienced to do the job of pest control. Contracting out pest control also removes the necessity of storing pest control products and equipment.

The environmental concern with insects (pests) is primarily **preventive** in nature. Clean-out and cleanup will probably do more to control insects in areas where they are not wanted than any other prevention that can be adopted.

Waste Disposal and Control

There are nine classifications of **waste**, each presenting a slightly different disposal requirement. The term *waste* is associated with that which is useless, unused, unwanted, or discarded. Classifications are as follows:

Type 0—Trash. Primarily paper. After incineration there is less than 5 percent residual solid remaining.

Type 1—Rubbish. 80 percent type 0, 20 percent restaurant waste; 10 percent is incombustible. This term includes all nonputrescible refuse except ashes. There are two categories of rubbish: combustible and noncombustible.

a. Combustible: This material is primarily inorganic—it includes items such as paper, plastics, cardboard, wood, rubber, and bedding.

b. Noncombustible: This material is primarily inorganic and includes tin cans, metals, glass, ceramics, and other mineral refuse.

Type 2—Refuse. 50 percent type 0, 50 percent type 1. Has a residual moisture content of 50 percent. Requires firing at a higher heat. Leaves 10 percent solids after firing.

Type 3—Garbage. All food waste. 70 percent water. Designates putrescible wastes resulting from handling, preparing, cooking, and serving food.

Type 4—Residue. Includes all solid wastes. In practice this category includes garbage, rubbish, ashes, and dead animals.

Type 5—Ashes. Residue from fires used for cooking, heating, and on-site incineration.

Type 6—Biologic wastes. (includes human and animal remains). Wastes resulting directly from patient diagnosis and treatment procedures; includes materials of medical, surgical, autopsy, and laboratory origin.

a. Medical wastes: These wastes are usually produced in patient rooms, treatment rooms, and nursing stations. The operating room may also be a contributor. Items include soiled dressings, bandages, catheters, swabs, plaster casts, receptacles, and masks.

b. Surgical and autopsy wastes (pathologic wastes): These wastes may be produced in surgical suites or autopsy rooms. Items that may be included are placentas, tissues and organs, amputated limbs, and similar material.

c. Laboratory wastes: These wastes are produced in diagnostic or research laboratories. Items that may be included are cultures, spinal fluid samples, dead animals, and animal bedding. Eighty-five percent of this type of waste is released to morticians for incineration.

Type 7—Liquid by-product wastes. Usually toxic and hazardous. Must be treated with germicidal/disinfectant prior to disposal in sanitary sewers.

Type 8—Solid by-product wastes. Toxic, hazardous; capable of being sterilized, packaged, and discarded with normal trash.

Any of the preceding categories can produce **infectious waste**. It is the method of handling, however, that allows for safe disposal. Each environmental service center will develop its own procedures for disposal of all types of waste. (See procedures previously mentioned for disposal of “needles, syringes, and sharps” and for “antineoplastic agents.”)

The Joint Commission (JCAHO)

The Joint Commission on Accreditation of Health Care Organizations (JCAHO) is the prime **certifying authority** for hospitals and nursing homes in this country. This

Green Tips

Cleaning with less caustic chemicals is more than just a health and safety issue. It's a matter of protecting a company's investment.

So says Kaivac Inc. President Bob Robinson Sr., who noted that the restroom is the highest priced per square foot room to construct in most facilities, taking into account the cost of fixtures, ventilation, pipes, ceramic walls and other related accompaniments.

Using chemicals, such as "standard" toilet bowl cleaners with a high hydrochloric acid base, can not only damage the fixtures they are applied to, but other restroom fixtures, said Robinson.

When a "standard" acid-based cleaner is sprayed on a fixture, it creates a mist that seeks out moisture, notably the condensation on restroom fixtures and even the privacy dividers.

"This eats away at the metals. Once it gets past the chrome, it rusts away the pipes," said Robinson.

Robinson recommends a "one-stop" restroom cleaner that combines mild acids that together, won't corrode fixtures, and at the same time clean tough stains such as mineral buildup.

—by Michael McCagg, *Managing Editor*
(This tip first appeared in the May 2002 edition of *Cleaning and Maintenance Management* magazine and is presented here through the generosity of CM B2B Trade Group, a subsidiary of National Trade Publications, Inc.)

organization sets the standards for hospital and health care administration and for housekeeping standards within the institutions.

Each institution is initially and annually surveyed to ensure that departments are organized to carry out their functions properly and that standards of operations and cleanliness are being maintained.

The Facility Survey in Housekeeping

In its survey of a facility's housekeeping, the JCAHO usually begins with a review of all written policies and procedures. Documentation of a continuing education program for housekeeping personnel is required. Contracts or written agreements with any outside sources providing such documentation are also required.

The individual who has primary responsibility for the environmental services department as designated by the chief facility administrator must complete certain sections of a written facility survey questionnaire.

The following conditions must be met in the survey:

1. The director's responsibilities must include participation in the development of department procedures, training and supervising personnel, scheduling and assigning personnel, and maintaining communications with other department heads.
2. Written departmental procedures must relate to the use, cleaning, and care of equipment; the cleaning of specialized areas; the selection, measurement, and proper use of housekeeping and cleaning supplies; the maintenance of cleaning schedules; infection control; and personal hygiene.
3. Participation of housekeeping personnel in a relevant continuing education program must be documented.
4. The extent to which outside housekeeping services are used must be documented. (If housekeeping services are provided by outside sources, a written agreement must require that the company meet JCAHO standards of such services. If such services have been terminated in the past year, the reasons for such termination must be stated.)

Linen and Laundry

There are also strict controls and procedures associated with collection, processing, and distribution of linen and laundry. The **JCAHO standards** in this regard require that:

1. A statement is made as to which organization (internal or external) is responsible for linen and laundry.
2. There is an adequate supply of clean linen.
3. Clean linen is handled and stored so that the possibility of its contamination is minimized.
4. Soiled linen is placed in bags or containers of sufficient quality to functionally contain wet/soiled linen during the time required to collect it and remove it from the patient care area.
5. Linen is placed in bags or containers that, when filled, are properly closed prior to further transport.
6. Linen is identified when originating from isolation and septic surgical cases.
7. Soiled linen is kept separated from clean linen.
8. Functionally separate containers are used for the transportation of clean and soiled linen.
9. The hospital laundry is functionally separate from the patient care facility.
10. The laundry ventilation system has an adequate intake, filtration, exchange, and exhaust system.
11. Quality assurance procedures are in effect for both outside services and in-house laundries.
12. The participation of linen and laundry personnel in relevant continuing education programs is documented.

Green Tips

If you choose to work with hazardous chemical products, then be sure to follow all the safety requirements and recommendations.

Workers should NEVER apply or use an aggressive acid toilet bowl cleaner without wearing appropriate gloves and goggles.

Corrosive acids and alkalis can produce acute and/or chronic injury to eyes and skin.

Some volatile solvents and glycol ethers can absorb through our skin or cause respiratory problems.

It is important to wear the appropriate personal protection equipment required or recommended on the product label and/or the MSDS.

(This tip by Roger McFadden first appeared in the May 2002 edition of *Cleaning and Maintenance Management* magazine and is presented here through the generosity of CM B2B Trade Group, a subsidiary of National Trade Publications, Inc.)

Environmental Pollution

It would be improper to dissociate the topic of environmental services from a discussion of the topic of pollution; it is a major concern of all mankind, especially for those of us in the profession where so much pollution is generated. First, here is a layman's look at the environment.

Elements of the Environment

The *earth's crust* is composed of **oxides** of the following elements:

Silicon	SiO ₂	66.4%
Aluminum	Al ₂ O ₃	15.5%
Calcium	CaO	3.8%
Sodium	Na ₂ O	3.5%
Potassium	K ₂ O	3.3%
Iron	FeO	2.8%
Magnesium	MgO	2.0%
Iron	Fe ₂ O ₃	1.8%
Manganese	MnO	0.1%
Phosphorus	P ₂ O ₃	0.3%
All other elements	(rare earth)	0.5%

Water (oceanic) is composed of the combination of hydrogen and oxygen (H₂O), sodium chloride (NaCl) common table salt, and numerous trace minerals. The *fresh water element* of total water is derived from seawater evaporating and condensing into clouds and precipi-

tation and thereafter finding its way into underground water tables, lakes, and rivers.

The *earth's atmosphere*, commonly called air, consists of layers of gases, water vapor, and solid and liquid particles.

The air near the earth's surface (0 to 15 kilometers [km]) is known as the troposphere. This is an area of well-defined gases of two different groups, as follows:

Principal

Nitrogen	N ₂	78%
Oxygen	O ₂	21%
Argon	Ar	1%

Minor

Carbon dioxide	CO ₂
Nitrous oxide	N ₂ O
Carbon monoxide	CO
Ozone	O ₃
Methane	CH ₄
Nitrogen monoxide	NO ₂
Hydrogen	H ₂
Helium	He

The *middle layer* (15 to 500 km) is known as the stratosphere. This is where a mixing of atomic gases is taking place, forming the molecular gases.

The *ionosphere* (greater than 500 km) is a part of the atmosphere where free atoms of oxygen (O), helium (He), and hydrogen (H) exist in a free state, hydrogen (H) being the lightest and most distant layer of gas in the atmosphere.

The Earth's Protective Shield

The earth is constantly being bombarded by **ultraviolet radiation** from the sun. Molecular oxygen (O₂) is being photodissociated into atoms of oxygen (O), immediately leading to the production of ozone (O + O₂ = O₃). Ozone (O₃) becomes a barrier that restricts the amount of ultraviolet radiation reaching the earth's surface. This barrier protects land and plant and animal life from ultraviolet destruction. Because ultraviolet radiation has little penetrating effect, plant and animal life in the oceans is readily protected; this explains why such life was the first to occur on earth. Life on land, however, could not occur until oxygen that was created from the sea ultimately became a part of the creation of ozone in the atmosphere, which was then to protect life on the land.

Ecology

Ecology, as a branch of biology, is a study that is concerned with the relationship of plants and animals to their environment and to each other. It is our interest in

ecology that, it is hoped, will bring about a major concern for what we are doing to ourselves by abusing our environment. The pollution we are generating today must be recognized and stopped if life as we know it on this planet is to continue. The time of life of humankind on earth in relation to the time of life on the earth is so infinitesimally small, it is difficult to realize how foreshortened the human life span can become unless we realize in the very near future what we are doing to our planet. The aim here is not “to save the planet”; the planet will survive and adapt—it is to save ourselves.

Air Pollution

Air pollution occurs both naturally and unnaturally. Natural air pollution includes volcanic ash, blowing dust, and smoke from forest fires. These forms of air pollution have existed for millions of years and are not a major concern.

Unnatural air pollution, however, consists of filling the atmosphere with carbon monoxide, hydrocarbons containing sulfurs such as sulfur dioxide, nitrous oxide, **chlorofluorocarbons**, carbon dioxide, and particulates. Most of this pollution results from the burning of fossil fuels (e.g., coal, oil, natural gas, etc.); energy conservation and the reduction of air pollution go hand in hand.

The two most significant problems associated with the burning of fossil fuels are (1) the **photochemical reaction** that takes place in the atmosphere that leads to **smog** and **acid rain** and (2) **global warming**, which is caused by the release of too much carbon dioxide and other **greenhouse gases** (e.g., methane, nitrous oxide, ozone, perfluorocarbons, hydrofluorocarbons, and sulfur hexafluoride) into the air.

Smog occurs in bright sunlight when nitrogen oxides, hydrocarbons, and oxygen interact chemically to pro-

duce powerful oxidants like ozone (O_3) and peroxyacetyl nitrate (PAN). These secondary pollutants are damaging to plant life and lead to the formation of photochemical smog. PAN is primarily responsible for the eye irritation so characteristic of this type of smog. Smog has caused lung ailments and even death in some metropolitan areas. The catalytic converter in automobile exhaust systems reduces air pollution by oxidizing hydrocarbons to CO_2 and H_2O and, to a lesser extent, converting nitrogen oxides to N_2 and O_2 .

Global warming occurs when greenhouse gases absorb and send infrared radiation back to the earth, causing the “greenhouse effect.” This condition will ultimately change climatic conditions and weather patterns.

Chlorofluorocarbons chemically react with ozone in the stratosphere, creating **holes in the ozone layer**, increasing ultraviolet radiation. Since the signing of the Montreal Protocol in 1987 that banned the production of these chemicals, much progress has been made, showing the world that governments and corporations can positively impact the environment.

Water Pollution

There are an incredible number of pollutants and sources of pollution that negatively affect the world’s oceans, lakes, rivers, and aquifers. Mine runoffs, oil leaks, factory wastes, pesticides, even the chemicals we pour down the sewers in housekeeping have an adverse impact on water supplies. In many areas of the world, nature’s ability to process these toxins has been overwhelmed, resulting in the loss of our natural resources and human life.

Solid Waste

Hotels and hospitals are tremendous generators of solid waste. Not only is waste an environmental concern, it is also a cost to the operation. Even the word “waste” connotes a loss. Waste must be collected at the property (a cost), it must be transported from the property (another cost), and it must be disposed of in some manner (a third cost). For years, we had only one solution for the problem of solid wastes—**landfills**. Some waste must be landfilled, but we have come to realize that landfills are problematic. Landfills can contribute to the pollution of underground aquifers that are the only source of water for some communities. Landfill space is rapidly being depleted in many areas of the country, thus driving up waste disposal costs.

Given that some of our waste must be landfilled, what are the other options open to us? What can we do in our operations to diminish our dependence on landfilling?

The Environmental Protection Agency (EPA) has developed a strategy called **integrated waste management**, which incorporates the use of landfills plus the

Green Tips

Bleach is a less than perfect solution (pun intended) to our housekeeping needs. It loses its strength quickly. A bleach/water solution left on a shelf for any period of time will lose its effectiveness. It also “gasses off” quickly when applied, losing its strength. It can damage floor finishes, textile fibers, and carpets. It will corrode and discolor hard surfaces such as metals. It will even hide soil. The bleach can make some soil transparent, leading a cleaner to think he or she has actually cleaned a surface when, in fact, the soil remains. Finally, and most important, it can harm the health of your staff and the occupants of the building.

following: **source reduction, reuse, recycling, and waste transformation.** By incorporating all of these in an organization's waste management program, the EPA contends, we can effectively reduce our dependence on landfills.

Source reduction is the most compelling strategy. It reduces the waste stream by preventing items from entering it in the first place. Buying in bulk to reduce packaging, or simply deciding to do without something that isn't really necessary to the enterprise, are examples of source reduction. Source reduction generates the greatest savings and should be practiced whenever it is practical to do so.

Reuse is the next best strategy. By giving an item a second life (sometimes even more lives), it can significantly reduce our waste stream. Recycling implies that a product will be broken down to its elements and remade into another product—sometimes the same product, sometimes not. This is far better than burying an item in a landfill, but it isn't without costs. There is the cost of collecting the item, the cost of transporting it, and, of course, the cost of making the item into a new product. However, the cost of recycling for most items is usually less than the cost of burying it in a landfill.

Waste transformation includes several options. Items can be compacted, using less space in the dumpster and the landfill; they can be turned into energy in a waste-to-energy plant, and they can be processed by shredders and pulpers that reduce the mass of the waste. However, these are considered by many to be less than desirable options, for either they create new forms of pollution (e.g., air pollution) or the product's ultimate destination is still the landfill.

Other Forms of Pollution

Other forms of pollution include radioactive waste, noise, and even light pollution.

The Housekeeper's Role in Environmental Management

A sound waste management and pollution reduction program should be a major goal for all of those involved in housekeeping operations. Regardless of the type of facility, all must make the environment a part of their professional concern.

Some of the specific activities a housekeeping department may employ include buying their guest amenities in bulk and putting up dispensers in the guestrooms. They should also buy their supplies in bulk whenever possible and instruct vendors to omit needless packaging.

As discussed earlier, housekeepers should buy the most environmentally benign chemicals that will still do the intended job, and they should eliminate chemical use

whenever possible. Buying microfiber cleaning products and softening the facility's water will both serve to reduce chemical use.

Avoid polluting the air in your facility by eliminating aerosols; have dust collectors on the burnishers; and purchase only those vacuums that meet Carpet and Rug Institute certification requirements.

Set up a linen reuse program for your guests; give them the option of using their sheets for more than one night and using their bath linen for more than one service. You will save labor, chemicals, water, energy, and linens.

Appendix K includes several fine articles on housekeeping and the environment from National Trade Publications, Inc. There is an article on chemicals in the restroom by Roger McFadden. Pay close attention to the Hazard Value Chart in the article. There is an interview with Stephen Ashkin on the subject of mold, a very topical subject. There is also an interview with Michael Berry on indoor air quality (IAQ). Odors can be a vexing problem in any building, particularly in bathrooms; for possible solutions look to the article from Cleaning and Maintenance Distribution Online. A third article on IAQ by Stephen Ashkin contains some sound advice for all housekeepers. Finally, a letter from a reader of Cleaning and Maintenance Distribution Online, Arthur B. Weissman, president of Green Seal, explains the role of his organization in assisting housekeepers everywhere in their efforts to improve the environment.

Other Opportunities for Housekeepers

The executive housekeeper rarely makes it into the general manager's suite. Advancement in this profession is often through relocation to larger and more prestigious properties. It has been shown that executive housekeepers can move into environmental services departments fairly easily, but hospitals and nursing homes are not the only options available. There are also opportunities in a host of different facilities, including schools, colleges, arenas, airports, convention centers, stadiums, malls, and office buildings, to name a few. For the entrepreneur, there is contract cleaning; with a mop in one hand and a bucket in the other, you too can become your own boss.

There are many opportunities in related areas as well. For instance, in property management, one will work with tenants and manage all aspects of the building, inside and out. Then there is the building engineer, who keeps a large facility up and running, handling everything from the air-conditioning to decorating. The opportunities are tremendous; housekeeping is far from a dead-end position. The following sections explore a few of these career opportunities.

Airplanes

In the following article, the experts at Pro-Team® take us behind the scenes to glimpse a highly specialized area of cleaning—aircraft.

Behind the Scenes in Aircraft Cleaning

by Pro Team This article is presented through the generosity of ProTeam Inc., a Boise, Idaho, manufacturer of backpack vacuum systems and sponsor of Team Cleaning Seminars.

Among commercial cleaning jobs, cleaning aircraft is surely one of the most unusual. It is performed not only under tight deadlines between flights, but also in tight quarters. There's little room for error, and no room for maneuvering cumbersome equipment.

A Defining Tool

Although the original backpack vacuum was designed specifically for more conventional applications, it turns out to be ideally suited to cope with the narrow aisles and cramped under-seat areas of aircraft.

"Backpack vacs are lightweight, have good suction, and are very efficient," says Michael Pulli, Manager of Contract Administration for OneSource, one of the largest service and maintenance companies in the world. The OneSource Aviation Division is one of the largest companies servicing aircraft and airports in the world.

"Backpack vacuums are versatile. The floor tools move easily between seat tracks and under aircraft seats, and the units are quiet," Pulli continues. "They do an excellent job for us."

The One Source Aviation Division is a full-service operation for ground-handling, cargo and ticketing functions, and cleaning, including hangars, offices, terminals, and aircraft. This division cleans aircraft in both the U.S. and Europe, including locations such as O'Hare, JFK, and Atlanta International airports.

Before Pulli joined OneSource, he was district marketing manager for Delta Airlines, where he had worked his way up the system—including a stint at the cleaning function early in his career. On the ground, turnaround is crucial in aircraft cleaning, he says. In a limited amount of time, the plane must be cleaned from stem to stern. "The plane is on the ground 35 or 40 minutes in total," Pulli says, "and we have about 20 minutes to clean the interior."

In that 20 minutes, galleys and tray tables are wiped down, trash removed, floors vacuumed, and

literature restocked and properly arranged. "If the plane looks clean, the passengers feel comfortable," Pulli says.

"Cleaning is choreographed," Pulli emphasizes. A four-person cleaning team descends on the space: one specialist for the lavatories, one for galleys, and one vacuuming/detail specialist works from forward to the rear while another works from rear to forward, meeting in the middle. Such focused specialization increases cleaning efficiency, Pulli says.

Trying Something New and Different

Pulli says that when his company tested the backpack unit they "liked that it was small and light. It moved easier, and the vacuum operator was in full control."

In cleaning aircraft, Pulli says, "we follow the exact specifications of each airline." Details include placing emergency cards and literature in seat pockets, crossing seat belts neatly across seats, folding blankets, placing pillows in specified compartments, and vacuuming the floors.

While airlines sometimes provide their own equipment, OneSource prefers to use backpacks extensively in three of its locations, including Little Rock. "Before the backpack vac, we used a bullet tank-type model. It was difficult to drag down the aisle of the aircraft," Pulli says. The bullet would catch on seat tracks, slowing the workers down.

Les Payne, Manager of OneSource operations in Little Rock, who oversees a staff of 21, concurs. With a backpack, he says, "we get more done in less time. It does the job as well or better than conventional vacs and can be used on hard flooring as well as on indoor/outdoor carpeting," he says. "Our workers like the portability of the backpack. They just strap it on. It's easier to use since they don't have to drag it," Payne reports.

"Backpacks do a good job. I know because I inspect each plane after it has been cleaned," confides the 32-year veteran airport worker, who was a ticket agent and ramp agent for 25 years before joining OneSource. Payne's crews clean 737s, 727s, and DC-9s for TWA and Southwest Airlines at Little Rock Regional Airport.

Extensive training of cleaning personnel is imperative, Pulli says, because of time constraints. Cleaning must be precise and systematic or it cannot be performed in the allotted time. OneSource's cleaning team members attend airline cleaning classes for eight hours, plus more hours provided by OneSource.

Since the favorable experience in cleaning aircraft with backpack vacuums, OneSource has adopted backpacks for additional uses in the company's worldwide Building Maintenance Division. For example, in airport concourses and other buildings, he explains, "Day Porters on call use a backpack to tidy up dry material spills, such as debris from planters and accidental ashtray dumps."

In-Depth Customer Service

Besides on-the-ground aircraft cleaning between flights, OneSource also provides overnight aircraft cleaning in many locations. Overnight cleaning is more extensive, Pulli says, requiring about 8 to 10 personnel hours. In other words, a team of four cleans a 727 in 2.5 hours or the slightly smaller MD-80 in 2 hours. Pulli says that the backpack vac is used for overnight cleaning, too. Its portability and maneuverability make it the machine of choice. After each overnight cleaning, Pulli says, the flight crew is given a quality control postcard checklist so OneSource can receive customer feedback on the work it is performing for airlines.

Separate OneSource crews are responsible for exterior cleaning of aircraft. Typically, the exterior is washed every eight days and waxed once a month.

Contracts vary, depending on the RFP (request for proposal). For example, the Airport Authority asked for competitive bids on the entire Atlanta International Airport, OneSource was awarded the contract for the whole airport, including janitorial services at the gates, offices, and terminals. Typically, 7 to 10 major companies vie for the cleaning contract at the largest airports.

In other situations, airlines may individually request bids. And sometimes the cleaning service that performs between-flight cleaning is not the same company that cleans the aircraft overnight.

Those in the business of cleaning aircraft often have a special affinity for airport facilities. Pulli, for example, has been around planes and airports all of his life. "It's in my blood," he acknowledges. "My uncle was lead pilot and Employee #4 at California's Pacific Southwest Airlines. I would have been a pilot, too, if I didn't need to wear glasses since age six," says the 48-year-old aviation services executive.

Like the work of flying aircraft, the work of cleaning them is demanding, rewarding for those who make the grade, and no place to wing it.

Arenas and Stadiums

Don Rankin, president of Facilities Maintenance Services at Houston, has a wealth of knowledge about the specialty cleaning area of arenas and stadiums. He, with the support of the staff at ProTeam, shares his considerable expertise with us.

Arena and Stadium Cleaning: The Team Specialist Approach

by Pro Team This article is presented through the generosity of ProTeam Inc., a Boise, Idaho, manufacturer of backpack vacuum systems and sponsor of Team Cleaning Seminars.

Today's arenas and stadiums seat anywhere from 15,000–75,000 people and cleaning up after a concert or major sports event is no small matter. Facility Maintenance Services (FMS) of Houston, Texas, believes that using teams of cleaning specialists is the best way to optimize labor while ensuring cleaning quality and value for its clients.

Meeting the Challenges

FMS provides contract cleaning and maintenance for three major facilities: Arena Theater in Houston, Texas, Baltimore Arena in Baltimore, Maryland, and Pro Player Stadium in Miami, Florida.

In arena/stadium cleaning—unlike an office building where cleaning costs and procedures are standardized based on square footage—the size of the task, logistics, and corresponding billing are based on each day's attendance. The number of people attending an event and the time constraints dictated by the next scheduled event dictate the number of cleaning personnel needed, and the number of hours in which the job must be completed. For example, was the stadium filled or only partially filled? Were most of the people on the lower level or the upper level? How many hours are available to clean between one event and the next? If a stadium has an 8 p.m. game on Saturday night and a 2 p.m. game the next day, the facility must be thoroughly cleaned by 11 a.m. Sunday.

A well-trained maintenance supervisor is able to quickly calculate the number of specialists and number of teams needed to accomplish the cleanup in the most efficient way possible. For example, specialists may be allocated based on a predetermined ratio of cleaning workers to attendance, such as one worker per 500 seats filled, etc., contingent on the tasks to be accomplished.

Weather, too, can be a challenge in maintaining open-air sports facilities, depending on their location and time of year. From Milwaukee County Stadium (Wisconsin), where baseball is sometimes played in the snow, to Pro Player Stadium (Florida), which hosts more than 100 events annually and hardly a day passes without a rain shower, team specialists pull on ponchos, boots or whatever additional clothing is necessary to face the elements and complete their appointed tasks. “We work in everything but lightning and hurricanes,” says Rick Elbon, FMS vice president of operations.

Arena/stadium maintenance contracts, like the job itself, are event-driven. This means contract employees may work seven consecutive days and then not work for another seven, or they may work practically nonstop from March through October and then find themselves with nothing to do the rest of the year. Under those conditions, retaining a staff of cleaning specialists isn’t easy. Fortunately, using specialists means that each worker has a narrow repertoire of tasks to learn, so training replacements is simpler.

How Do They Do It?

Between 40–200 workers are needed to clean an arena or stadium, and team specialists are cross-trained to provide maximum flexibility. FMS’ cleaning staff is divided into three groups; those who work during an event (“event attendants”), those who clean up after (“post-event staff”), and those who provide regular maintenance (“daily staff”) for the facility.

The job begins with a pre-event walk-through of the facility’s offices, executive suites (Pro Player Stadium has 220 of these), restrooms, and concourse by event attendants who perform needed touch-ups.

Throughout the event, attendants police the concourse for trash and spills, monitor restrooms (Pro Player has 66) and restroom supplies. Surgical gloves and a special deodorant/disinfectant are required for cleanup of bodily fluid spills.

Once the event is over and the fans have left the facility, the post-event staff moves in. Depending on the facility’s size and that day’s attendance, there may be six or seven different cleaning teams—totaling approximately 40–50 people for an arena, 150 or more for a stadium. All post-event work is broken down into defined tasks. Each team handles a specific task and the bulk of the work is done in about six hours.

A team of “pickers”—allocated at a ratio of one specialist to 1,000 persons attending an event—moves through the stands, picking up any large debris left behind including souvenirs, paper bags, and beverage containers. This group of specialists is followed by a team of “sweepers” who remove medium-sized trash such as candy wrappers, paper cups, etc. Trash is first swept in a lateral direction to a set of concrete stairs and then down the stairs to a collection point at the bottom. A team of “blowers” follows, using gasoline-powered blowers to clear the area of the smallest trash.

While this is happening, a “concourse team” completes the same tasks on the arena or stadium concourse. When the initial group of specialists is about halfway finished removing large items of trash from the concourse, part of the team diverts to collect restroom trash. After all the trash has been collected, “follow-up teams” sweep and blow the concourse. Once all of this is finished, a “pressure-washing team” washes down the facility’s concrete, nonskid aggregate, rubber floors, aisles and stairwells, using hot water and a water-based degreaser to remove chewing gum, beer and soda stains. Concourse floors are given a final deep cleaning with a walk-behind automatic scrubber.

A “restroom team” cleans the facility’s restrooms, showers, locker rooms and dressing rooms. The team divides into groups handling sub-specialties such as fixtures, floors, etc. Restroom floors and showers are pressure-washed with an odor counteractant/disinfectant. Special attention is given to floor drains where disinfectant chemicals are used to reduce bacteria and odor. Specialists keep drain/sewer traps filled with liquid to keep sewer gas traps functioning properly and to prevent the backup of sewer gases.

A special “suite crew” concentrates on the carpeted offices and glass-enclosed executive suites—dusting and wiping down surfaces, cleaning the glass and vacuuming. FMS’ specialists use backpack vacuums designed to easily reach into corners and under and around furniture. Vacuums equipped with four-stage filtration systems improve indoor air quality and reduce dusting.

Detail cleaning of fabric seats and armrests, metal seating frames and bleacher risers, along with periodic carpet extraction, is performed by the facility’s regular maintenance staff between home game stints while professional athletic teams and/or performers are on the road.

Specialty Equipment Leverages Labor

FMS utilizes backpack vacuums, pressure washers, and autoscrubbers to optimize labor. Vacuuming with backpack units which have greater access and mobility in carpeted suites, has reduced cleaning times by as much as 50 percent compared to more traditional equipment. Pressure washers increase productivity in heavy-duty cleaning applications fourfold over older methods such as rotary scrubbing. Autoscrubbers are five to ten times faster than manual methods for deep cleaning floors. All of these tools make more effective use of labor, producing higher quality at lower cost to customers.

Keeping Score: Quality

Cleaning teams—like their professional sport counterparts—tend to be self-monitoring, focused, and goal-oriented—yielding optimum performance levels more easily. With a strong quality benchmarking program in place and proper training, service excellence increases automatically.

However, quality should never be left to chance. FMS maintenance supervisors conduct regular walk-through inspections of suites, offices, and seating areas. Clients also conduct periodic formal inspections. At least once a year, FMS clients submit written evaluations that cover everything from individual job performance to the attitudes of FMS managers, to workers' uniforms and decorum issues.

Most telling—and gratifying—are personal client comments such as, “This place is *clean*—your company has made a real difference.” Clients are a valuable source of input. We make it a priority to utilize our clients' service comments to structure the most effective teams possible, and to determine with certainty that our cleaning program is customized to fit our clients' needs.

Don Rankin, author of this article, is president of Facility Maintenance Services (FMS), a full-service janitorial firm in Houston, Texas. FMS has extensive experience in cleaning arenas, theaters, and ballparks. The 40-year-old company employs about 1500 workers.

Contract Cleaning

Contract cleaning is the entrepreneurial side of our industry. If executive housekeepers want to become their own bosses, all they have to do is run a classified ad in the newspaper and have a few business cards printed. Actually, it is a little more involved than that; there are a number of steps to be taken first. You will need a federal

tax ID number and a state sales tax number. You will need licenses and permits from the state, county, and city, including commercial vehicle licenses. Then there is state unemployment tax, state withholding, and workmen's compensation insurance. Your business will need more insurance than just workmen's comp, however; you will need accident and health insurance, public liability insurance, property damage insurance, and disability insurance. And then there are the unions to contend with.

If you are still interested in becoming your own boss at this point, you will have to decide what is going to be your specialty. But first you must decide whether you are going to serve the commercial or the residential market. Typically, there are higher profit margins in the residential end, but on the commercial side the contracts are much larger. Most contract cleaning businesses had their start in commercial cleaning.

The next step is to decide what will set you apart from the rest—what is your specialty. Carpet-cleaning services are very common. One estimate is that there are more than 25,000 of these services in the United States already. This does not mean that there isn't room for one more exceptional service. You will need a truck (van) and a **truck mount**; this is a tank/heater/pump system that sends a cleaning solution through a hose from a van to the operator inside the residence. The solution comes out the wand and is then vacuumed up by the wand attachment and transported back to the dirty solution tank in the van.

Other specialties include disaster cleanup (e.g., floods and fires), drapery or furniture cleaning, construction cleanup, finishing and sealing floors, pest extermination, window cleaning, and swimming pool maintenance; you may even want to be a chimney sweep. One of the most specialized cleaning services around is featured in the following article from *Cleaning and Maintenance Online*, the **bio-recovery service**.

You may even want to be a generalist, but attempting to perform too many services may make you a “jack-of-all-trades and master of none.” A final word of advice on contract cleaning is, “Start small.” If you start small, you may be able to get started with an investment of only a few thousand dollars. Those who start big (particularly those who purchase large cleaning businesses that are for sale) often live to regret it.

From Carpet Cleaner to Crime and Trauma/Bio Cleaning Specialist: Essentials

Don M. McNulty This article first appeared in *Cleaning and Maintenance Management Online 2003* and is presented through the generosity of CM B2B Trade Group, a subsidiary of National Trade Publications, Inc.

KANSAS CITY, MO—In most US states, just about anyone can get into bio cleaning or crime scene clean up with little or no training.

Consider, however:

- The federal government through OSHA regulates the bio cleaning industry by means of, the Blood-borne Pathogen Rule (1910.1030). This regulation states that each company engaging in such a service as to where the employees have a “reasonable anticipation” of coming into contact with blood or other potentially infectious material (OPIM), . . . must have a written “exposure control plan.”

That plan will set the perimeters of conduct through certain engineering controls, and training in every aspect with a thorough understanding of this plan needs to be accomplished, and documented before the technician goes into the field.

Since there are things lurking in blood that can be fatal, the crime scene/biohazard cleaner needs to receive a Hepatitis B vaccine (at company expense for all employees). This vaccine is a series of three shots and each individual needs to have the first shot at least 10 days before entering a scene. If the employee refuses to have this vaccine, that employee needs to sign a declination form and have it further explained, through this form, that the offer for a vaccination is open to him at any time in the future, should he change his mind.

- Training in epidemiology, specifically disease transference. Knowledge of the different kinds of pathogens and bacteria that can be lying in wait for the right opportunity to set up shop in a host, namely the carpet/biohazard cleaner.
- Familiarity with waste disposal regulations. Joe (or JoAnne) Carpet Cleaner shouldn't be trying to suck up blood into a truckmount. Every state does have regulations as to how medical waste needs to be disposed of, and everyone should be familiar with and follow such state regulations. Contaminated carpet cleaning equipment can transfer disease sources into the next space to be cleaned; liabilities loom great in the bio cleaning business.

The carpet cleaner has knowledge about cleaning processes; which is often a step above many people working in medical or first responder (police, fireman, etc.) fields who want to get into the bio cleaning industry and lack knowledge of basic cleaning techniques.

- Basic knowledge of construction. Crime scene/biohazard cleaners need to know, . . . if a portion

of a wall or ceiling needs to be removed, what may be on the interior of that wall or what could be above that ceiling. Cutting into a live electrical wire or cutting into a water pipe can have disastrous results.

- Deodorization techniques should be in the bio-hazard cleaner's knowledge base. Knowing how to deodorize from decomposing bodies is paramount.

Other pertinent regulations:

- Hazard Communications Standard 1910.1200.
- Respiratory Protection Standard 1910.134.
- Confined Space standard.
- Fall Protection standard.

Marketing Strategies

Send your marketing information to coroners, funeral homes, police agencies and any other first responder groups you can think of.

Getting out and making face-to-face contact and designing appropriate mail pieces is essential.

Department policy prohibits most police officers and coroners from giving out referrals, but you can give them ways to offer help without giving a specific referral.

—D.M.

Stress and the Crime Scene/Biohazard Cleaning Pro

The cleaning pro tackling this work should not be the type of person who thinks, “I can see that stuff and never get sick.”

Visual “shocks” are just one area affecting the cleaner in this specialty: The cleaner needs to know that it's going to be felt and smelled—and it isn't the same as a deer killed on a hunting trip.

Every tech I've had—including myself—has suffered from “stress dreams.” These dreams have weird story lines and usually deal with blood and gore. This comes from “Critical Incident Stress Syndrome” (CISS), or what some call “Secondary Post Traumatic Syndrome.” These dreams and the stress that comes from doing this work can lead to grave psychological disorders for people who can't handle these stresses.

The carpet pro turned crime scene/biohazard cleaner must learn how to defuse or debrief this stress in him/herself and employees. This stress doesn't just come from seeing and handling the physical scene, it comes while dealing with grief

stricken individuals. The professional should develop the coping, emotional, and social skills necessary to help these individuals while maintaining a sense of detachment; there is a need to learn to listen while various stories are recounted, and what to say and not say in response.

Cleaners will need to explain the work order and obtain the proper signatures while people are struggling with grief and disbelief, often times bursting into tears when they feel overwhelmed; “compassion” is the watchword.

There is other work within the bio cleaning field Joe may have to respond to. One would be “unsanitary dwellings.” This is what some people call “pack rats.” The dwelling gets so stuffed with garbage and trash you usually have to walk through the house or apartment through paths. Many times buckets and jars of human waste accumulate, sometimes drug paraphernalia, and if people die in this mess, . . . it can lead to quite the job.

Bio cleaning is more than death and trauma and most carpet cleaners would welcome the revenue. Most “bio cleans” bring in an 85 percent gross profit margin; it is possible to earn up to \$200 per man hour.

Bio cleaning is not the type of business Joe can just walk into and start one day, however. It takes planning, a certain amount of training and a special kind of preparation.

Don McNulty of Bio Cleaning Services of America, Inc., based in the Kansas City area, is an author and speaker throughout the United States. McNulty wrote the American Standard for Bio Technicians and currently teaches a seminar called “The Basic Bio Technician Course.”

Convention Centers

The meetings and conventions industry has evolved into a tremendous business during the last 25 years. Almost every U.S. city of any size has built a convention center, and every one of them needs cleaning specialists to service them. The following article highlights some of the unique duties and responsibilities of the professional provider of services to this industry.

Convention Services

by Blane Blood We are indebted to Blane Blood, Customer Services Shift Supervisor at the Las Vegas Convention and Visitors Authority (LVCVA), for his contribution.

The cleaning of a facility that has many variables is a major challenge. Such challenges are best addressed by looking at how a facility operates. In this article, we will use the Las Vegas Convention Center as our example.

The Las Vegas Convention Center (LVCC) is a 3.2 million square foot facility with more than two million square feet of exhibit space; it also has 144 meeting rooms (more than 290,000 square feet) with seating capacities ranging from 20 to 2,500. In addition, the facility has a grand lobby and registration area (more than 225,000 square feet), administrative offices, and more than 46 sets of restrooms (men’s and women’s) and 16 family restrooms.

So, how do you maintain a facility of this size with a visitor volume of approximately 9 million delegates per annum? In order to accomplish this, it takes many dedicated people, from the custodial staff, which does the actual cleaning, to the Board of Directors who approves the final budget.

The cleaning and maintaining of the facility falls within the Client Services Department, which is the largest within the Facilities Division. We will focus our attention primarily on this department. The mission statement for this department is as follows:

To maintain the facilities and grounds of the LVCVA in a clean and presentable condition. Provide, in a professional manner, the highest standards of service to both our internal as well as our external customers.

With this mission in mind, we will first examine the shift supervisor position. The shift supervisor is responsible for three primary job duties: identify, assign and inspect.

Identify

The Supervisor must identify what tasks need to be accomplished for that shift or within the near future. This is an ongoing duty. It is not just done at the beginning of a shift but continuously. A good supervisor will not only identify duties that are noticeable and need to be done right away, but will also identify tasks that are not done frequently and not always within public view. Table 13.1 lists basic examples of each.

Table 13.1

Daily Tasks	Less Frequent
<ul style="list-style-type: none"> • Trash and debris • Vacuum carpets • Cleaning windows and floors 	<ul style="list-style-type: none"> • Cleaning light fixtures • Stripping and waxing floors • Extracting carpets

There are a host of other duties too numerous to mention here such as the cleaning of doorjambs and thresholds, kick plates, and cleaning behind furniture.

Assign

It is the duty of the supervisor to assign an employee to each of the identified duties. A good supervisor will ensure that job assignments are rotated among the staff to allow each staff member the opportunity to learn and be efficient in all duties to which they will be assigned and within their posted classification. It is also vital that the supervisor understands the various strengths and weaknesses of each staff member. When assignments are made, employees who may not be as adequate in some tasks should be assigned these tasks when time allows for them to be trained or coached on these tasks. However, during a critical time, it is important that the person with the greatest skills be assigned to that task. It is also important that every employee needs to be trained in all jobs since the most skilled individual might not be on duty.

Inspect

This is probably the most critical aspect of the three. This step will ensure the work is done to the standards you have set. It sends a positive message that we are all measured on outcomes, not just good intentions. An employee's abilities and a positive attitude toward the job are important, but they are meaningless if the job does not get done correctly. Inspection should not just be done when an assignment is completed, but also during the process. The supervisor needs to determine if the job is being done safely, efficiently, and within company identified operating procedures. This also allows the supervisor to determine an employee's strengths and weaknesses.

If a supervisor does not observe the staff performing their job duties, the supervisor will not be able to conduct a fair and proper annual evaluation. Furthermore, the supervisor will not have any credibility with the staff if the staff does not believe that the supervisor knows and understands their jobs.

These three job duties are intertwined, no one aspect can function without the others. Remember, these duties cannot be done from behind a desk, or with just a few staff members. Staff members hold their supervisor at a higher standard. A supervisor is more than a manager, a supervisor is a leader who must set an example. When staff members are working, supervisors should be working. A supervisor should always provide support and counseling for the staff. All legwork for a task or project should be

done prior to the implementation. For example, if the task identified is to clean the upper windows in an area, the supervisor should determine the best time this task is to be performed, and will also make sure that the area is accessible and all tools and the needed equipment are available. It should not be up to the staff member to make these arrangements.

Custodial Activities

Custodial tasks specific to the convention industry fall within three primary categories; they are rest-room maintenance, preparation of common areas and cleaning offices. When duties are performed will be determined by the activity within the building.

Activities are defined as follows:

Pre-event: Prior to an event or tradeshow, the facility must be "show ready." Each lease agreement specifies that the client will receive its leased space in a clean and presentable condition. This means that the carpets will be clean and free of spots and debris, tables and chairs will be clean and set to specifications required for each meeting or event, restrooms will be cleaned and fully stocked with supplies, common areas will be clean and swept, and the facility will be free from hazards. In short, the building will be given to the client in a clean and safe condition and suitable for it to conduct business.

Pre-event cleaning is not as easy as it may appear; there are many factors involved. First, independent contractors who have been awarded the contract of setting up and tearing down the show have a negative effect on Client Services ability to ready the facility. For example, these contractors will utilize restrooms and common areas, which limits our ability to adequately clean these areas. It is not a good idea to clean these areas to "show ready" standards too early since they will just have to be redone. Instead, by breaking the restrooms into sections and blocking off access to portions of the area, detail cleaning can then proceed in these areas.

With regards to common areas, these areas cannot be blocked off; the subcontractor is then required to lay a protective plastic covering over the carpet and hire a subcontractor to clean up any debris that may be left behind in the areas where they are working.

Most detail cleaning is done within 24 hours prior to show opening. It is the supervisor's responsibility to inspect all common areas to ensure they are clean. Emphasis is placed on highly visible areas such as:

- Elevators
- Escalators
- Trash receptacles
- Entrances
- Stairwells
- Meeting rooms

- Windows
- Restrooms
- Phone banks
- Parking lots

How these tasks are scheduled is critical to ensure labor and materials are not wasted. For instance, restrooms were once locked down to ensure there was no activity in them during cleaning. This ensured a thorough, systematic cleaning, and eliminated any risk of accident to the client or another staff member. After the restroom had been detailed and stocked, it was ready to reopen. This was the standard method for restroom cleaning for many years.

To meet our customers' demands, we have had to rethink how we do business. We now realize that closing an entire restroom was as much for our convenience, as it was for our customer's safety. This practice is now obsolete. In addition, more events being scheduled has resulted in a commensurate increase in demand for restrooms and a shrinking window of opportunity in which to clean them. We have had to rethink and re-engineer our approach. We now cordon off sections, allowing for part of the restroom to be used while we detail clean the rest of the unit.

Event: When an event is progress, it can be very challenging to maintain a restroom. This, of course, will depend on the size of the event. Smaller events [20,000 to 60,000 attendees] can still be challenging, but the traffic is light and restocking stalls and paper products is easily accomplished. Debris on the floor can quickly be cleaned and trash is light. In an effort to maintain a clean environment, trash is removed as often as possible; this is done by placing several liners in the trash can so they can just be pulled and the next one is ready to go. During larger events [80,000 to 200,000 attendees] maintaining a restroom takes more time. Product is depleted quickly so the restroom attendants are responsible for fewer areas. Trash removal and cleanliness becomes an ongoing issue. It is not uncommon for advertisements that are not approved by show staff to be left in a restroom area. The attendant will remove the literature and give a copy to the supervisor. This is important since the authority for the display of any advertisements is solely reserved by the Las Vegas Convention and Visitors Authority.

During these heavy events break schedules are adjusted so that not all staff members are on break at the same time and all are present during peak times. This is also important during shift change. Staff members are required to stay on the show floor until just before shift change and are encouraged to apprise the next crew of the present status of the area.

Post-Event: Post-event is the time for restoration of the facility to its former state. All supply closets are filled and cleaning supplies replenished. Post-event is not necessarily when the total show ends and move out begins, but when the event is done for the day. Restrooms are cleaned and everything is brought back to show ready standards, and all fixtures are sanitized.

Sanitation of fixtures is a vital aspect of the restroom function. The LVCVA is an international destination that brings delegates from across the globe to conduct business. The threat of a foreign illness is very real and taken seriously. Not only must we protect our clients from incoming foreign illnesses but we also must protect foreign clients from illnesses that are domestic to our region.

The cleaning of common areas is done on a regular basis with people in place to monitor them before, during and after events. It is the responsibility of the staff members to walk the assigned area prior to an event and make sure that everything is show ready. As the event progresses, the staff members will note problem areas where debris may have collected and make sure more trash receptacles are in place for the next day. They will also monitor for any unsafe conditions. If a problem is identified like a broken door handle, they will mark the door and take it out of service and request a supervisor to put in a work order so that it can be fixed as soon as possible. This may be done during the event if at all possible. If not, it will be done before the opening of the next show day. It is important to note that not all of the common areas are the responsibility of the staff members. If a booth or display area is present, then the show staff will contract an outside cleaner to handle these areas. This is done for security reasons.

Parking lots are monitored as well to ensure that the facility is clean on the outside as well. This is vital since this is the first impression delegates get when they enter the property. A sweeper truck is used in the evenings when all traffic has left the property and it can operate safely. The outside staff is responsible for the entrances of the facility. This includes all trash receptacles, ash urns, walk-off mats and seating areas. All the planter boxes, tree wells and grass areas are also part of their cleaning duties. The custodian position is a union position so full-time staff members are guaranteed forty hours a week. However, during larger events it may be required to bring in staff members on overtime. Overtime is used primarily on the opening day of the show since there are many variables and this is

the heaviest traffic day. As the show progresses, attendance drops and overtime is generally not needed.

Unlike the hotel industry, convention centers are not open 24 hours a day, but they are open seven days a week. The facility does have some dark periods when extensive cleaning can be done. When an event is in progress it is important that the client's needs are being met even when it may not know what its needs are. It is also extremely important that the client does not learn at the wrong time that what it needs most of all is toilet paper.

Schools and Colleges

There is a correlation between cleanliness and learning. The education of our next generation is one of our society's greatest responsibilities. How can we expect learning to take place in an environment where there are cockroaches running under the desks, the floor is filthy, and the classroom smells of excreta? Unfortunately, these and other abysmal conditions are not isolated instances in the United States. States are operating in a crisis environment; there is simply not enough money to fund our public institutions. The worsening of the economy has exacerbated this situation. Policymakers and even educators have attempted to implement stopgap measures to see them through these difficult times. A widely practiced tactic is that of **deferring maintenance**, which has almost become a buzzword on the campus. Substantial short-term savings can be realized by not cleaning floors or emptying the trash. This shortsighted policy has two long-term results: (1) The government ends up spending more money in the long run to save a few dollars in the short run, and (2) students and their education suffer in the interim.

Deferred maintenance ultimately wears buildings out faster, dramatically increasing capital expenditures, and may also negatively impact safety, occupant health (see the Ashkin interview in Appendix K), and security. It destroys the morale and hope of the building occupants. It may also drive up costs for the institution in the form of lawsuits when building occupants sue for compensation for injuries and illnesses resulting from these cutbacks. Mold cases are now particularly common.

These conditions were once thought to exist only in K–12 schools. Now we have seen them spread up to the most prestigious universities in the land. The effect is the same—there is a deadening of the spirit. Tragically, these conditions have given some unscrupulous building ser-

vices managers justification for doing less than they ought. Some have seen this as an opportunity to “retire in place.” As the deferred maintenance figure rises, so does the justification to do even less.

What is so desperately needed are managers who have the resolve to meet these challenges and the ability to rethink and re-engineer how we conduct our business. Improved methods of operation must be found and implemented. The author once heard President Bob Suzuki of Cal Poly Pomona address this very subject. His building services department was faced with a one-third cut in operating budget. The challenge he gave his staff was how to do more than they had done in the past, but with less money. Doing less with less was not an option. His staff went to work re-tooling how they conducted their business, and by the end of the planning period they were able to develop a plan that would meet the challenges before them.

Managers entering this field who wish to be successful must bring with them some extraordinary talents. They must understand the complexities of the budget process. They must be aware of all of the very latest techniques and trends in the JanSan and housekeeping industries. They must be able to sell members of a workforce (often unionized) on the need to reinvent themselves. Finally, they must have, at the core of their beliefs, a love and respect for those whom they serve, their students.

Summary

The work of those involved in environmental services in hospitals and health care institutions is not unlike that of the hotel housekeeping employee. Both have policies and procedures that are documented. Both have job descriptions capable of setting forth the various jobs that must be done, and there is a hierarchy of supervision similar to that found in hotel housekeeping. The knowledge of “what one might be dealing with,” however, is far more detailed for the environmental services worker. Yet it would also be wise for the hotel housekeeper to be aware of the hidden dangers that can abound in hotel housekeeping.

Diseases are caused by microorganisms. The spread of pathogens is reduced by keeping everything clean. Being extra careful to avoid contamination is a way of keeping the hospital (and hotel) environment safe.

Isolation techniques in hospitals are especially important. Each step in every isolation procedure must be done carefully and completely.

Pest control was addressed in this chapter, and examples were given of the various types of pests that can create a contamination problem. Types of insecticides were presented, along with recommendations for their use.

Change Agents

Dan Bornholdt, President

GREEN SUITES INTERNATIONAL

Dan Bornholdt, president and founder of Green Suites International, has more than 20 years of experience in environmental issues and equipment. As an innovative entrepreneur, he has made Green Suites International® the preeminent provider of environmentally sound products and services to hotels worldwide. The company was founded in 1997 as Ecorp, Inc., a unique and dynamic environmental marketing and distribution company.

While still a student at the University of California at Berkeley, Bornholdt founded Bornholdt Transportation, Inc. in 1979, specializing in the expedited handling and transport of environmentally unsafe materials. After selling this company in early 1991, he went on to found Risk Assessment Services, an environmental consulting company, where he utilized his expertise in environmental issues to provide his clients with profitable solutions to corporate environmental problems. Bornholdt is an active member of the Association of Environmental Professionals and has served on the American Hotel and Lodging Association’s Engineering Committee for the past five years. Green Suites International has introduced the hotel industry to countless environmentally responsive products through the years, including Project Planet’s™ guestroom brochures (Figure 13.3) that encourage guests to save water and energy by reusing their bath and bed linens during their stay.

Dan Bornholdt, President



Figure 13-3 These brochures encourage guests to participate in the hotel’s linen reuse program.

Executive Profile

Marilyn Rajski *Embracing the Challenge of Change*

by Andi M. Vance, Editor, *Executive Housekeeping Today*

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Place yourself in the following scenario: You're an interior decorator. Your forte lies in fabric selection and paint. One day, your boss approaches you with a hammer in hand and asks you to build a house for his son-in-law.

"A HOUSE?!" you ask him, dumbfounded at his request. You know nothing about lumber or building. The only thing you know about nails is that you (or your wife) make an appointment to get them done once every few weeks.

So how do you handle his request? Do you tell him, "Sorry, that's not my area of expertise." Or do you accept the challenge?

As a lifelong resident of South Bend, Indiana, Rajski was very familiar with Saint Mary's College. She appreciated the all-female environment at the college and was very interested in the support of its operations. That college has a reputation for its great treatment of . . . faculty and staff. Saint Mary's is an all-women's liberal arts institution with a strong spiritual foundation. She started working at the college in 1975 as the Assistant to the Director of Publications, a position that was in line with her course studies. Maintaining the college's commitment to excellence for its students stayed at the top of her agenda. When she ascended into the personnel department, she was better able to execute these goals. Calling upon her education in public relations, Rajski assisted the Director of Personnel in a human resource capacity. Through the recruitment and training of numerous employees, conduction of salary analysis and other developmental programs, Rajski's credibility spread throughout the college's administration.

In 1991, the college had decided not to renew the contract of the service organization that had maintained custodial operations for years, and wanted the services to be brought in-house. It was looking for a strong manager with a background in human resources and psychology so he/she would be capable of dealing with situations that arose. Rajski pondered the new opportunity. She then decided to pick up the metaphorical hammer by submitting her candidacy for the Director of Building Services at Saint Mary's College. She was ultimately chosen for the position.

While she tackles new challenges with earnest dedication, the decision to make a complete 180-degree turn in her career path wasn't the easiest decision of her life. "I thought about it long and hard," she recalls, "Obviously, when you change professions, it's difficult to return. But I had a really special feeling for the folks [in Building Services]. In the Human Resources department, I'd seen a lot of the situations this staff had endured with the contract cleaning company. I understood how often times, people in this industry are considered subservient to the rest of the staff. My objective became to change these notions and ideals."

When she began her new position, staff was the only tool she was provided in the construction of an entirely new department. Even more challenging was the fact that attrition had yielded a rather sparse amount for the number of FTE's [full-time employees] required at Saint Mary's. Forced to start from scratch, Rajski not only looked to acquire the skills and resources necessary for her own personal development, she had to construct a building services department from the ground up. New equipment had to be purchased, policies and procedures implemented, and staff workloads and shifts assessed in order to get things running—and that was just the framework.

She took a close look at the resources available to her before doing anything. In order to gain accountability with her staff, Rajski looked to both vendors and peers for industry knowledge. "I knew nothing about the custodial industry," she admits. "They [the staff] also knew this, but they also understood that I was anxious to learn. I think that was something they took to heart, because they were extremely helpful throughout the learning process.

"I also went to a good friend of mine who (at the time) was the Director of Facilities at a college in Ohio. I went there to work alongside the staff and obtain an independent overview of the facilities duties in a college atmosphere. To really learn the equipment, you really have to do everything hands-on. I ran scrubbers, buffers—everything that was necessary to make it work."

To acquire compliance and regulatory information through agencies such as OSHA, Rajski attended as many seminars as possible. A year after stepping into her position, she joined I.E.H.A., which also afforded her another vehicle for education and resources. She studied hard and attained her (C.E.H.) [certified executive housekeeper] status in 1995.

Upon her return to Saint Mary's, Rajski developed certain objectives for her department. Constructing a departmental mission statement, strategic plan and vision was one of her primary goals. Their mission statement now reads: To provide a clean, healthy and safe environment for students to live, learn and socialize; for faculty to teach; and staff to work. The goal of the department remains consistent with the objectives of the college: To foster the highest standard of custodial operating procedures through skilled professionalism, integrity, conduct and competence.

Developing a staff capable of executing these goals followed next on Rajski's agenda. While some workers had made it through the years under the supervision of the contract cleaning service, Rajski felt it important to foster a sense of pride and achievement amongst them.

"Before I started," she recalls, " I talked to the staff and asked them for ideas of ways I could make them feel better about their jobs."

Changing uniforms was one of the ideas brought to the table. Rajski had the uniform tops changed from the smocks that read "Housekeeping," to blue and white types that proudly bear the Saint Mary's logo.

Rajski strives to provide as much education as possible to her staff so they are able to communicate situations and solutions to other departments. Staff members are strongly encouraged to strengthen their work knowledge by attending a minimum of two (2) educational training sessions annually. This education comes in the form of off-campus seminars provided by vendors, or seminars and/or workshops brought in-house by the college. This is expected of all the employees, not reserved just for the supervisors. When staff members reach their educational goals, they are presented with a personal certificate that recognizes them at their annual review. Rajski also makes all industry-related trade publications available to the staff in her office, so they can keep up to date on industry trends and information.

Establishing a working staff schedule was another consideration Rajski made when she began as Director. The contractor had implemented only two shifts, which resulted in countless interruptions throughout the staff's duties. "When I took over in 1991," she notes, "I took a look at how we could best service the college by providing additional service and gaining productivity. That's when we instituted the night shift. Of course, there were some problems at first as people adjusted their biological clocks, but ultimately we have been very successful. Even today, we had some openings on the afternoon and day teams, but the night staff don't want to change their hours."

Recently, she worked with vendors to institute a program that enables Rajski and her administration to critically evaluate the department's operations. It provides factual and concise custodial reports including: total square feet by building and floor type, total labor costs and quantity of cleaning supplies, cost per square foot, routine task list by area. Most importantly, the program documents the number of FTE's needed to provide quality cleaning service.

"Everyone in our industry needs solid information to present to finance and administration when asking for additional employees," says Rajski.

One of the remaining significant challenges Rajski faced in the department's development was obtaining new equipment. "Equipment was almost nil," she remarks. "We didn't have automatic scrubbers or anything at all, really. We needed to look at ways we could make work more productive and easier for the staff. We went from mops and buckets to automatic scrubbers. We increased our fleet of equipment with carpet extractors, portable upholstery cleaners, etc. We changed over our entire cleaning system. We had a Heinz 57 of products that we were able to streamline, which enhanced the familiarity of materials amongst the staff. Ultimately, this affects their productivity.

"Aesthetics over practicality seem to have become a priority in today's architectural world," says Rajski. "It's these aesthetics that hinder an effective custodial operation. Light fixtures are being placed in unreachable areas; light, solid color carpet being installed in heavy traffic areas; lack of electric outlets; windows not reachable for cleaning, the list goes on." Because of repeated hounding by Rajski, Building Services has now been

given an active role in advising on much of the new construction renovation happening around campus and a handbook she developed for architects that includes things to keep in mind during the process to keep the building sustainable and maintainable for years to come.

The Perpetual Vision

Since the initial challenges she encountered in the developmental stages of the Building Services Department at Saint Mary's College, the breadth of Marilyn Rajski's knowledge has extended tenfold. And when she was last seen at convention in Saint Paul, Minnesota, she was still smiling. However, some of the dilemmas presented when she began her position still exist today.

"I continue to stress the credibility of a service entity within any facility," she asserts. "All service entities are put at the back burner, while other departments receive new computers, etc., rather than buying other capital items such as equipment. Without that state of the art equipment, we can't provide the quality of service. We need to have people realize the importance of our department's needs."

Marilyn Rajski has gained ground in helping to develop the attitudes of both the staff and the faculty in regard to the Building Services Department at the college for the better, but the challenge remains to continue garnering respect to the profession as a whole. Not only has she taken the challenge of learning an entirely new profession, but she's found her way in a difficult and extremely visible industry. "Everything we do is seen," she remarks. "We certainly can't hide anything. One thing we always say: Secretaries can make a mistake in a letter, and only the recipient views it. In Building Services, if you forget to clean something, put out paper products or change a light, . . . everyone knows about it!"

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There was a strong recommendation to use qualified contract people to perform pest control work.

Different types of wastes were identified and categorized, and information was presented on how to dispose of the several classifications of waste.

The Joint Commission on the Accreditation of Health Care Organizations is the agency that establishes the standards whereby such institutions are maintained and operated.

The **washing of hands** before and after contact with patients is probably the most important item to remember that will serve to protect the people—personnel as well as patients.

The subject of pollution and the environment was explored. Here is a truly win-win opportunity. By paying attention to the needs of the environment both indoors and out, housekeepers can do what is right and save money at the same time. A healthier environment means greater productivity, with a corresponding decrease in costs.

Finally, other career situations for the professional housekeeper were explored, including work in such diverse areas as the airlines, arenas and stadiums, contract cleaning, convention centers, and schools and colleges. This should clearly help to reinforce the widely held belief that the housekeeping profession is one of opportunities, and not a dead-end job.

KEY TERMS AND CONCEPTS

International Executive Housekeepers Association (IEHA)	Sterilization	Preservatives
Director of Environmental Services	Mineral	Petri test dishes
Joint Commission on Accreditation of Health Care Organizations (JCAHO)	Organic	Dilution ratio
Disinfection	Osmological	Chemical suspension
Terminal cleaning	Bacterial	Carbolic acid (phenol)
Needles	Entomological	Toxic
Syringes	Chemical formulas	Bacteria trails
Sharps	Atom	Chain of infection
Microbiology	Element	Pathogen
Chemistry of cleaning and disinfecting	Molecule	Isolation unit
Microorganisms	Valence	Chemotherapy drugs
Protist	Compounds	Causative agent
Bacteria	Reactants	Reservoir
Bacillus	Products	Mode of escape
Coccus	Atomic reactions	Immune carrier
Fungus	Radical	Method of transmission
Spirochete	Organic compounds	Host
Spore	Ion	Preventive
Staphylococcus	Anion	Waste
Streptococcus	Cation	Infectious waste
Virus	Acid	Certifying authority
Aerobic	Alkali	JCAHO standards
Anaerobic	Salts	Oxides
Antisepsis	Water	Ultraviolet radiation
Asepsis	Universal solvent	Chlorofluorocarbons
Asepsis (medical)	pH	Photochemical reaction
Asepsis (surgical)	alkaline	Smog
Autoclave	acidic	Acid rain
Chemical agent	R	Global warming
Disinfection	Disinfectant	Greenhouse gases
Disinfection (concurrent)	Quaternary ammonium compounds	Holes in the ozone layer
Disinfection (terminal)	Phenol	Landfills
Gram (positive/negative)	Phenolic	Integrated waste management
Intermediate host	Hydrogen peroxide	Source reduction
Micron	Iodine	Reuse
Pathogenic	Alcohols	Recycling
Physical agents	Detergent	Waste transformation
Reagents	Disinfectant (germicides)	Truck mount
	Antiseptics	Bio-recovery service
	Bacteriostat	Deferred maintenance
	Sanitizer	Washing of hands

DISCUSSION AND REVIEW QUESTIONS

- Mr. James from Houston, Texas, checked into the University Inn in late afternoon. He was feeling feverish and nauseated after his flight from Los Angeles. He called the front desk and asked for some ice, drank a glass of water, and went directly to bed. He noticed a red swelling on the back of his neck, which had been draining onto his shirt collar. He used a wash cloth to rinse it off.
When Mildred, the housekeeper, came to turn down the bed, she found Mr. James very ill. She gave him some water from his glass at the bedside and asked Mr. James, "Do you want me to call you a doctor?" to which he answered, "Yes."
 - What kind of policy should be written that would help Mildred know what to do in this situation?
 - What specific items in the room are contaminated?
 - When the doctor arrives, he has Mr. James transported to the hospital. What kind of step-by-step procedure should Mildred use to clean up this room?
- Upon admission to the hospital Mr. James's temperature was 102°, the red swollen spot on his neck was draining, and he was having difficulty breathing.

- a. What type of isolation would be best for him?
 - b. What specific steps should the housekeeper take in the isolation unit?
 - (1) For handling trash?
 - (2) For handling laundry?
 - c. What articles must be cleaned, removed, or sterilized in the unit when Mr. James leaves?
3. What do you see as the pluses and minuses of contract cleaning? Make a list of positives and negatives. Now do the same for arenas and stadiums, convention centers, hospitals, nursing homes, schools and colleges.