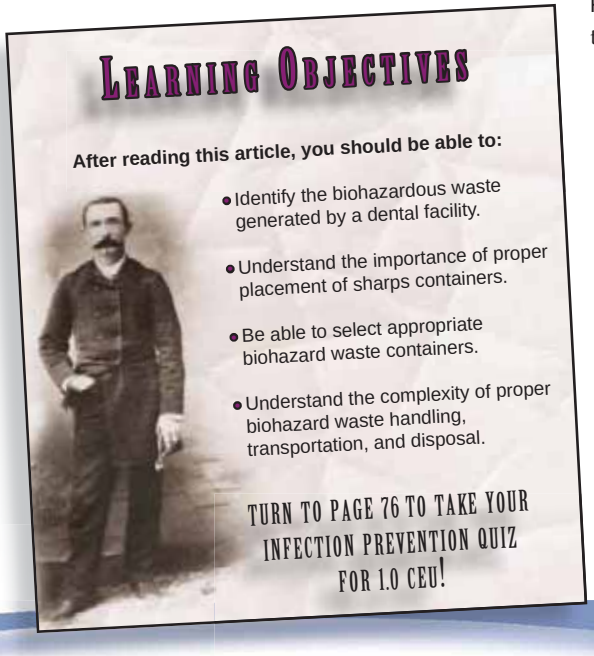
Infection Prevention Corner
by **KAY C. CARL, RN, BS**

Dental Biohazardous Waste

According to the U.S.

Environmental Protection Agency (EPA), the definition of biohazardous waste is: *"any wastes that may contain infectious agents of sufficient virulence and quantity that present a risk or potential risk to the health of humans, other animals, or plants, either directly through infectious or indirectly through disruption to the environment."*

In practice, we sometimes use the term "infectious waste" for biohazardous waste and "medical waste" as waste that comes from medical and dental facilities that can be disposed of in the general waste stream.



Infection Potential

Although there is no evidence to suggest that biohazardous wastes (Infectious, biological, pathological, contaminated) are any more hazardous than residential wastes and no evidence that improper disposal has caused diseases in the community, it is a matter of sound infection prevention practice to curb any potential of disease transmission. We must identify the relative risk of infectious material and then dispose of it properly.

Historical Perspective: No Regulation

For the better part of the twentieth century, dental practices were not regulated as to biohazardous waste disposal. The conscientious would place used sharps into used alginate or coffee cans, pour casting material into them, then throw the containers in the wastebasket. Others would throw sharps directly into wastebaskets. The janitorial staff was on their own as far as protection.

Advent of AIDS

AIDS changed all of that. Needlesticks were turning deadly. Blood in free-form was dangerous. What to do? The hospitals were a step ahead of dentistry as they were already incinerating their medical waste. Containers were manufactured for sharps, and then were included in the incineration process. But even when dentists obtained sharps containers, most were still dumping the containers into the regular trash. When compacted, the containers would break down and employees from the landfills were at risk from needlesticks and other sharps injuries to both hands and feet in the course of their work.

Public Awareness

In addition, lack of scientific knowledge led the media to sensationalize medical waste. How many of you remember the front-page headlines of the *Arizona Republic* announcing that the incinerator at Maricopa County Hospital was burning body parts? That was the standard for disposing of medical waste at the time but it sure sounded nasty. And of course, most of us remember the needles washing up on East Coast beaches. Not that we had any beaches in Arizona, but it was a heads-up to the

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public that healthcare was not being responsible for its generated infectious waste, so we had to get our act together.

Arizona Regulations

Historically the Department of Health Services (ADHS) regulated hospital medical waste in Arizona. It was not until the 1990's that the Arizona Department of Environmental Quality (ADEQ) was given the authority to develop medical waste rules for our state. Hearings were held and both members of the medical community and industrial waste companies attended. At that time not even the federal entities, the Centers for Disease Control and Prevention (CDC) and the EPA, could agree on what was considered infectious waste. Representatives from the Arizona Hospital Association (AzHA) and the Arizona Chapter of the Association for Professionals in Infection Control (APIC) worked with ADEQ to help establish definitions for our state. The definitions from ADEQ are what we need to abide by. If you practice in another state, it is your state environmental agency that sets the standards.

ADEQ

ADEQ's job is to protect public health and the environment in Arizona. By going to **http://www.azsos.gov/public_services/Title_18/18-13.htm** you can read the portion of the Arizona Administrative Code that defines Biohazardous medical waste in Arizona.

Under **CHAPTER 13. DEPARTMENT OF ENVIRONMENTAL QUALITY SOLID WASTE MANAGEMENT, ARTICLE 14. BIOHAZARDOUS MEDICAL WASTE AND DISCARDED DRUGS, R18-13-1401** you find:

Definitions

5. "Biohazardous medical waste" is composed of one or more of the following:
   a. Cultures and stocks: Discarded cultures and stocks generated in the diagnosis, treatment or immunization of a human being or animal or in any research relating to that diagnosis,treatment or immunization, or in the production or testing of biologicals.
   b. Human blood and blood products: Discarded products and materials containing free-flowing blood or free-flowing blood components.
   c. Human pathologic wastes: Discarded organs and body parts removed during surgery. Human pathologic wastes do not include the head or spinal column.
   d. Medical sharps: Discarded sharps used in animal or human patient care, medical research, or clinical laboratories. This includes hypodermic needles; syringes; pipettes; scalpel blades; blood vials; needles attached to tubing; broken and unbroken glassware; and slides and coverslips.
   e. Research animal wastes: Animal carcasses, body parts, and bedding of animals that have been infected with agents that produce, or may produce human infection.

So according to ADEQ, Biohazard Medical Waste is composed of the following categories:

- Cultures and stocks
- Human blood and blood products
- Human pathologic waste
- Medical sharps
- Research animal waste

Dental Waste

The three categories that relate to dentistry are:

- Human blood and blood products
- Human pathological waste
- Medical sharps

First let's clear up the human blood and blood products issue. According to ADEQ, it is *"discarded products and material containing free-flowing blood or free-flowing blood components."*

So that you know, it is perfectly acceptable and legal for blood to be disposed of in a sanitary sewer. In dentistry, we have the ability to suction blood away during procedures so that we do not have it remaining in a free-flowing form. If you have dripping, bloody gauzes, wrap them in a paper towel and then dispose of them in a lined wastebasket. The gauze will not be considered biohazard medical waste. It is not sharp, and the blood has been contained.

On to the human pathological waste. What do we deal with in that category? ADEQ says it is *"discarded organs and body parts removed during surgery."*

If you are an oral surgeon and are removing large parts of jaw and tissue, then you need to consider that as biohazardous waste and dispose of it into a lined biohazard box or heavy-duty plastic bags designed for just that purpose, usually at least 2 mils thick. In general dentistry, I would think that a soft tissue specimen that is large enough to be removed and too large to vacuum away would be a candidate for a pathology report. Teeth removed would be considered biohazard medical waste. They are not to be placed in

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sharps containers. The company that picks up your sharps containers does not want them in there. One might consider donating the extracted teeth to a dental school of his or her choice so that issue is handled correctly. You can also send the teeth home with the patient if they so desire, as it is their own body part. I suggest that the teeth be placed in straight bleach after removal, for at least ten minutes, then rinsed off before being given to the patient to take home.

Medical sharps as defined by ADEQ are *"discarded sharps used in animal or human patient care, medical research, or clinical laboratories. This includes hypodermic needles; syringes; pipettes, scalpel blades; blood vials; needles attached to tubing; broken and unbroken glassware; and slides and coverslips."*

In dentistry, this translates to:

- needles
- scalpel blades
- orthodontic bands/wires
- amalgam bands
- burs
- endo files/pluggers
- anesthetic carpules

Anything sharp that has blood on it would fit in this category. I would place bloody wedges in the sharps container; also discarded broken instruments if they are not cleaned and sterilized first. Think of what you use, either old or new technology, and evaluate it when you dispose of it. The secret is in the ability of the waste to cause injury. Cotton rolls and gauze pads are not sharp, therefore not hazardous. Even with saliva and blood on them, they can be placed in the same container in which you are placing other disposables such as patient bibs, barrier wraps, and used gloves. With the above criteria in mind, most general dental offices would only need sharps containers for their biological medical waste, excluding teeth.

Sharps Containers

According to OSHA Regulations, sharps containers should be as close as possible to the point of use. This way the sharps are not carried to another location with potential exposure to others.

I recommend the containers be placed in each operatory on the assistant side of the operatory so that as soon as the sharp is no longer needed, it can be placed into the container. A sharps container should also be placed in the instrument processing area for small items such as endo files and burrs that cannot be reused.

A good sharps container is one that has a wider opening and swings quickly to a closed position, like a mailbox, so one cannot reach into it. This is both an employee safety and risk management issue. The containers should be somewhat transparent so that one can see how full they are so as not to overfill.

This autoclave will process five of these carts filled with biohazardous waste at one time.

The mailbox containers cannot be overfilled. If you are using red opaque containers, you cannot observe how full they are, so they are not a good choice. Sharps containers that have large round openings into which one can reach, or tip over and material can fall out, are also not good choices. Clipping, recapping, bending, manipulating, and breaking of needles is not advised since this may result in the production of infectious aerosol and personal injury.

Waste Disposal

Once ADEQ decided on their definitions, industry rose to the occasion and started offering infectious waste disposal to small generators -- medical and dental offices. Due to the huge amount of medical and infectious waste now generated by hospitals, most of their waste disposal is outsourced and in most cases, we can utilize the same facilities for us.

In 1992, it was estimated that 90% of the waste was incinerated. Currently, the incineration of large amounts of biohazardous waste has been drastically reduced in the United States due to concerns over emissions and the implementation of the EPA air emission regulations for Hospital/Medical/Infectious Waste Incinerators (HMIWI). Most treatment has moved to noncombustion technologies such as steam sterilization of solid waste by autoclaving. The usual parameters are 273 degrees for one to 1.5 hours. These huge industrial autoclaves, like the one shown in the photo to the left, must be biologically monitored much like the way we monitor our dental sterilizers. After autoclaving, the waste is compacted and then sent to a landfill as regular waste. Some

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forward-thinking companies recycle sharps containers to reduce the amount of material going into the waste stream at the landfills.

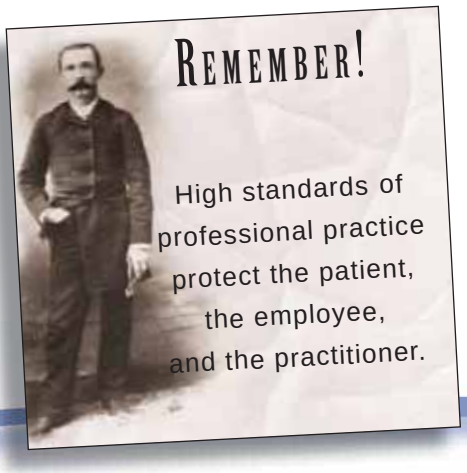
For our medical waste that can be disposed of in the general waste stream, we must be sensitive to the public's understandable unease when confronted with this type of waste.

The waste should be placed in lined containers that are emptied each day at the end of the day. The bags should be tied and contained in a secure waste container ready for pickup to prevent the public from the "ewwww!" factor.

For infection prevention, do not pick trash out of one container to save a bag, as you are pulling out waste and stirring it up and exposing it to the air to be spread around. Use a new bag each time for each wastebasket.

Regulations for Generators

In the United States, millions of tons of infectious waste are generated by hospitals and other healthcare facilities every year. Think of all of the waste, after being rendered non-infectious, going to the landfills. It is big business and it is heavily regulated.



A small generator, as most dental facilities are, would want to think twice to try to dispose of their own biohazardous medical waste. You must register and be approved by ADEQ. There are manifests to fill out and all kinds of red tape. If you chose to purchase the sharps containers that you add a chemical to when they are full, please reconsider. One must apply for ADEQ approval before you can legally use this process in Arizona. You cannot just place it in with your regular waste and you cannot transport it yourself without an ADEQ permit, so it would be best to contract with a company that does that for you.

Choosing a Waste System

When selecting a waste company for your needs, ask questions. A general dentist usually requires sharps pickup only twice a year so your charges should be moderate. Questions to ask:

- How much is the total cost?
  Do you pay each month?
  Do you pay for each pickup?
  Do you have to pay for the sharps containers?
- Is the company making any environmental efforts?
  Does it all go to the landfill after processing?
  Is anything recycled?
  What is the waste's final destination?

The bottom line: be conscientious and accountable. We have a responsibility to the public and our environment.

Okay, you know the drill -- I can't name the various waste companies that service Arizona dentists, but you can reach me at **Kay@azda.org** and I can give you information that can help you make your decision.

Kay Carl is board certified in infection control and epidemiology. She has over 35 years experience in infection control and has worked in collaboration with AzDA since 1991 to provide continuing education in OSHA, infectious diseases and infection control. She is an active member of OSAP, the national dental infection control association, and a prolific contributing author and editor for various industry print and electronic media.

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Infection Prevention Corner Quiz

To obtain CE Credit

For a score of at least 70% (seven out of ten) you will be issued one hour of CE credit through the Arizona Dental Association (AzDA). There is a $20.00 processing fee for each test submitted. A portion of the proceeds will go to the Arizona Dental Foundation. Incomplete tests will not be processed. All tests will be handled confidentially. AzDA is a Continuing Education Recognition Program (CERP) provider conducted under the auspices of the American Dental Association.

ADA C·E·R·P® Continuing Education Recognition Program

Complete the quiz online at AzDA.org/CE

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With online completion, you receive CE certificate electronically

OR:

Mail with $20.00 check (do not send cash)
payable to
Arizona Dental Foundation
to ADF CE Quiz
3193 N. Drinkwater Blvd.
Scottsdale AZ 85251

OR:

Fax (credit card only) to (480) 344-1442

Questions?

Call (480) 344-5777 or (800) 866-2732

A portion of the proceeds from "Infection Prevention Corner" CE quizzes will go to the Arizona Dental Foundation (ADF) whose mission is keeping Arizona smiling by connecting and mobilizing people and resources to provide education and statewide charitable dentistry to children, elderly and special needs populations. Processing fee is deductible only to the extent allowed by law; consult your tax advisor for details.

1. Dental employers are required by OSHA law to place sharps containers as close as possible to the point of use.
   ___ a. true
   ___ b. false

2. In a dental office, an extracted tooth is considered to be a biohazard waste; therefore it can be:
   ___ a. placed in the sharps container for disposal.
   ___ b. sent home with the patient.
   ___ c. placed in a red bag to be picked up by the biohazard waste removal company or donated to a dental school.
   ___ d. b and c.

3. An example of a good-quality sharps container is:
   ___ a. It is large enough to handle the sharps for the entire dental office.
   ___ b. It has a mailbox-type opening so it closes automatically and cannot be overfilled.
   ___ c. It has a large enough opening so one can reach in and pull out something that was placed in it by mistake.
   ___ d. It is opaque so a patient cannot see those nasty looking sharps and get upset.

4. Examples of dental biohazard waste sharps are:
   ___ a. Orthodontic wires
   ___ b. Endodontic files
   ___ c. Amalgam bands
   ___ d. All of the above.

5. The majority of solid biohazardous waste is now treated by:
   ___ a. application of a 1:10 solution of bleach.
   ___ b. incineration.
   ___ c. steam sterilization.
   ___ d. compaction only.

6. The following are legal ways to dispose of your dental biohazardous waste.
   ___ a. You may burn it and bury it in the desert.
   ___ b. You can apply for a permit from ADEQ and follow all the regulations for containment, decontamination, transport, and disposal.
   ___ c. You can contract with a reputable biohazardous waste disposal company.
   ___ d. b and c

7. Additional examples of dental biohazard waste sharps are:
   ___ a. Burrs
   ___ b. Scalpels
   ___ c. Amalgam waste
   ___ d. a and b

8. Another good example of a sharps container is:
   ___ a. It has a gadget on it so you can pull off the needles from the hubs.
   ___ b. It has a needle cutter.
   ___ c. It is very small so you can tuck it in a drawer or cupboard so that it is out of the way.
   ___ d. None of the above.

9. The best way to dispose of free flowing blood in the dental setting is to:
   ___ a. suction it into the sanitary waste system.
   ___ b. treat it overnight with a 1:5 solution of bleach.
   ___ c. treat it with a quaternary ammonium compound that is approved by the EPA.
   ___ d. place it in a glass container and steam sterilize for 30 minutes at 250 degrees and 20 PSI.

10. For cost savings consider the following:
    ___ a. Reuse disposables so you do not have to throw them away.
    ___ b. Evaluate the available waste companies for the best product/service to meet your needs.
    ___ c. Reuse trash bags.
    ___ d. None of the above.

Please send my CE certificate: ❒**Electronically** (*must provide email address*) ❒**By Mail**
Your Name _____ **ADA #** _____ **Email** _____
Street Address _____ **City, State, Zip** _____
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