Universal Precautions : Prevention of Transmission of HIV, Hepatitis-B & Hepatitis-C in Dental Care Setup

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Abstract

Clinical applications of universal precautions should be familiar to every health care professionals providing dental, medical, or other patient care. Blood is the single most important source of HIV, HBV, HCV and other blood borne pathogens in the occupational setting. Infection control efforts for HIV, HBV, HCV, and other blood borne pathogens must focus on preventing exposures to blood as well as on delivery of HBV immunization and proper sterilization of instruments.

Introduction

Universal precautions are safety procedures established by the Centers for Disease Control and Prevention (CDC) and the American Dental Association (ADA). This longstanding set of routine infection control precautions was developed in 1985 to prevent the transmission of hepatitis B virus, human immunodeficiency virus, hepatitis C virus, and other blood borne pathogens during treatment procedures. These precautions are used in dental and medical settings to prevent the transmission of infectious diseases to patients and health care workers. These precautions are necessary because some patients do not disclose their infectious status, and many are unaware that they are infected because there may be no signs or symptoms as a result of incubation periods or subclinical disease. In addition, antibodies or other markers of infection may be undetectable during the "window period" immediately after infection. This is particularly relevant in HIV infections because the levels of circulating virus (viral load) and the maximum infectivity for HIV are highest during the "window period" and with disease progression in AIDS patients. The premise of universal precautions is that every specimen and patient should be handled as if infected with a blood borne pathogen. There is evidence that compliance with universal precautions among all health care workers is poor. Compliance with universal precautions reduces exposure to blood and blood-contaminated saliva. Universal precautions are intended to prevent parenteral, mucous membrane, and nonintact skin exposures of health-care workers to bloodborne pathogens. Universal precautions are intended to supplement rather than replace recommendations routine infection control, such as hand washing. In addition, immunization with HBV vaccine is recommended as an important adjunct to universal precautions for health-care workers who have exposures to blood.

Personal Protective Equipment

Protective equipment includes gloves, gowns, masks, and eyewear worn by health care workers to reduce the risk of exposure to potentially infectious materials.

Examination gloves should be used for procedures involving contact with mucous membranes. They reduce the incidence of contamination to the hands, but they cannot prevent penetrating injuries from needles or other sharp instruments. Gloves should be changed after each patient and discarded, and must never be washed or disinfected for reuse. Do not wash or disinfect surgical or examination gloves for reuse. Washing with surfactants may cause wicking (the enhanced penetration of liquids through undetected holes in the glove). Disinfecting agents may cause deterioration of the gloves. Petroleum jelly may also break down latex. Utility gloves may be used when handling contaminated instruments and cleaning of the treatment area or sterilization room.

Fluid-resistant gowns, laboratory coats, or uniforms should be worn when clothing is likely to be soiled with blood or other bodily fluids. Reusable protective clothing should be washed separately from other clothes, using a normal laundry cycle. Protective clothing should be changed daily or as soon as visibly soiled. They should be removed before personnel leave areas of the dental office used for laboratory or patient-care activities.

Masks and protective eyewear, or chin-length, plastic face shields should be worn when splashing or spattering of blood or other body fluids is likely. A mask should be changed between patients or during patient treatment if it becomes wet or moist. A face shield or protective eyewear should be washed with appropriate cleaning agents when visibly soiled.

Careful Handling & Disposal of Sharps

Most cases of health care workers acquire infection as a result of needle stick injuries. Considering the circumstances that result in needle stick injuries, it is obvious that adhering to the standard guidelines for dealing with sharp objects would result in decrease in this type of accident.

Sharp disposable items, such as needles, dental files, saliva ejectors, rubber prophy cups and scalpels that cannot be sterilized and are contaminated with blood or other body fluids need to be discarded in puncture resistant containers. Special biochemical waste management companies pick up the containers once they are full and replace them with empty containers.

- Wherever possible avoid the use of sharps.
- It is the responsibility of the person using any sharp item to always dispose of at the point of use in an appropriate container.
- Direct sharp needles and instruments away from own-dominant, or assistant's hand.
- Ensure that scalpels and sharp needles are not left exposed in the operative field, but always removed promptly.
- Ensure that dental burs and sonic/ ultrasonic scaling tips are removed from the hand pieces when not in use.
- Needles must not be bent or broken after

use.
- Needles should not be resheathed by hand, and use an instrument e.g. forceps.
- Use a pair of lockable forceps/needle holder to remove scalpel blades.
- Single use syringes/cartridges and needles should be disposed of intact.
- Sharps containers must comply with 'Specification for sharps containers'.
- Do not fill sharps containers above the manufacturer's marked line.
- Lock the used sharps container in accordance with manufacturer's instructions.
- Do not dispose of sharps with other clinical waste.
- Do not place used sharps containers in yellow bags for disposal.
- Ensure that sharps bins are safely positioned away from children/general public.
- Do not remove sharps from the clinical setting.

Careful Handling & Cleaning of Contaminated Equipment

Since the beginning of HIV epidemic, there have been reported instances where transmission of infection from health care worker to patients seemed highly probable. One cluster of infections involved an HIV infected dentist who apparently infected as many as six of his patients most likely through contaminated instruments, although the mechanism of transmission was not definitively identified.

Dental instruments must be cleaned and sterilized after each use. Recommended sterilization methods include autoclaving or using a dry heat oven or "chemiclave", a unit that cleans with the use of chemicals. Sterilization equipment is commonly found in a special area of the building away from the treatment areas.

Cleaning and disinfecting of all surfaces such as lights, drawer handles, and countertops is accomplished by a chemical solution formulated to kill infectious bacteria, spores, and viruses after each patient is seen. Plastic barriers cover items that are not easily disinfected should be treated by chemical spray, such as light handles, chair control buttons, and instrument trays. Many dental offices and hospitals have seamless floors with linoleum or a laminate surface so that spills can be contained and cleaned quickly.

Non-critical items that cannot be heat sterilized are sterilized by chemical immersion formulated to kill infectious bacteria and viruses.

Key Points

- Treat all blood/saliva and body fluids as infected.
- Use good hand hygiene.
- Cover any broken skin with a waterproof dressing.
- Wear protective clothing when dealing with body fluids.
- Use and dispose of sharps appropriately.
- Disinfect body fluid spillages correctly.
- Dispose of waste and excreta carefully.

Conclusion

It is not always possible to differentiate between normal patients and those capable of spreading harmful microorganisms. A broad and non-discriminatory protocol for prevention of the spread of disease called, **"Universal Precautions"** is the basic strategy for infection control. These precautions assume that all body fluids and tissues from all patients are treated as if they are known to be infectious.

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