

# Community

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## ***Occupation Hazards in Dentistry***

Dentists are exposed to a number of occupational hazards. They result in diseases and complexes in many cases. Close contact with the patients, their saliva and blood, exposes the dentist to occupational biohazards, many of them are contagious. Dental professionals are at risk for exposure to numerous biological, chemical, environmental, physical, and psychological workplace hazards.

We can define "Occupational hazard" as a risk to a person usually arising out of employment.

Many occupational health problems still persist in modern dentistry despite numerous technical advances in recent years. These include percutaneous exposure incidents; exposure to infectious diseases, radiation, dental materials, and noise, musculoskeletal disorders, dermatitis and respiratory disorders, eye injuries, and psychological problems.

### ***Major occupational hazards are:***

1. Biological health hazards
2. Physical hazards
3. Chemical hazards
4. Musculoskeletal disorders and diseases of the peripheral nervous system
5. Hearing loss
6. Radiation exposure
7. Stress
8. Legal hazards
9. Other risks

## **Biological Health Hazards**

Dentists constitute a group of professionals who are likely to become exposed to biological health hazards.

These hazards are constituted by infectious agents of human origin which include prions, viruses, bacteria and fungi. All of the dental team are at risk of exposure to hepatitis B virus (HBV), HIV infection, and other types of communicable infections. Several of the common viral agents that can cause hepatitis have been detected in body fluids like saliva and blood. A dentist can become infected either directly or indirectly.

**Direct infection** microorganisms can pass into organism, through a cut on the skin of his/her hand while performing a medical examination, as a result of an accidental bite by the patient during a dental procedure, or through a needle wound during an anesthetic procedure.

**Indirect infection** include: Aerosols of saliva, gingival fluid, natural organic dust particles (dental caries tissue) mixed with air and water, and breaking free from dental instruments and devices.

The main entry points of infection for a dentist are: epidermis of hands, oral epithelium, nasal epithelium, epithelium of upper airways, epithelium of bronchial tubes, epithelium of alveoli, and conjunctival epithelium.

## **Physical Hazards**

The dentist and the clinical staff are at risk of physical injuries during many dental procedures. Sources of physical injury can include debris from the oral cavity striking the eyes, cuts from sharp instruments, or puncture wounds from

needles or other sharp instruments. Those injuries can result in the transmission of serious infectious disease to the dental worker.

Percutaneous exposure incident (PEI) is a broad descriptive term that includes needle stick and sharp injuries, as well as cutaneous and mucous exposures to blood and serum. The most common of them is from needles and drilling instruments such as burs.

**Eye injuries may occur from**

**Projectiles** such as bits of calculus during scaling procedures

**Splatters** from body fluids (bacterial and viral aerosols) while using high-speed hand pieces.

Another potential source of eye injury is the **intense dental curing light**. Users of dental curing lights should be advised to employ protective eyewear during use. The use of protective eyewear is an important means of preventing occupational injury related to the use of dental curing lights and high-speed rotary instruments. Injury from splatters and projectiles including calculus and flying debris during cavity preparation is a common cause of damage to the eyes, and the use of protective eyewear should be emphasized.

**Chemical Hazards**

Many of these chemicals are among those whose health effects may not be known and may pose health problems taking years to manifest. Hazardous chemical agents used in clinical dentistry include mercury, powdered natural rubber latex (NRL), disinfectants, and nitrous oxide (N2O).

## **Mercury**

has the potential for continuous occupational exposure of a dental practitioner to mercurial vapor which can be absorbed via the skin and the lungs. It is advisable to conduct regular mercury vapor level assessments in clinical settings; receive episodic individual amalgam blood level tests; and use goggles, water spray, and suction during the removal of old amalgam restorations.

## **Latex Hypersensitivity**

Gloves and mask form an integral part of dentist's protective equipment. The gloves and the mask form an efficient barrier against most pathogens; they also constitute a very good barrier against viruses, provided they are intact. However, they may also be a source of allergies, primarily in those persons who use rubber products on a regular basis.

The continued use of powdered natural rubber latex (NRL) gloves and disinfectants has predisposed clinical dental workers to hand dermatitis, contact dermatitis, contact urticaria, and allergic dermatitis.

## **Cyanoacrylate (CA) Toxicity**

Cyanoacrylate (CA) and its homologues have a variety of dental applications as adhesives. The increasing use of CA in dentistry, particularly as adhesive and sealing glue, has raised concerns regarding its potential toxicity in humans. Reported toxicity of CA is uncommon in the dental workplace, but may manifest as conditions such as urticaria, contact dermatitis and other dermatoses.

Dental staff using CA adhesives should avoid direct contact with CA and use appropriate personal protective measures. Maintaining higher levels of humidity, optimizing room ventilation and using special air conditioning filters in the

working environment may be useful in minimizing the toxicity of volatile CA adhesives.

## *Musculoskeletal Disorders and Diseases of the Peripheral Nervous System*

At work, the dentist assumes a strained posture (both while standing and sitting close to a patient who remains in a sitting or lying position), which causes an overstress of the spine and limbs. The overstress negatively affects the musculoskeletal system and the peripheral nervous system; above all, it affects the peripheral nerves of the upper limbs and neck nerve roots.

The most common injuries reportedly experienced by the dental hygienist are musculoskeletal in nature.

### *Hearing Loss*

The noise of suctions, saliva ejectors, turbines, engines, amalgamators, compressors, etc. may causes impaired hearing. Still some dentist may be at risk especially where faulty or older equipment is used.

### *Radiation Exposure*

The radiation dose received by an individual is generally low and relatively few cells are damaged during an average radiological examination. Thus, the effect of even low levels of exposure to ionizing radiation over periods of time may accumulate and could represent a potential hazard to health.

Dental staff should take steps to protect themselves during exposure by standing behind protective barrier, use of radiation monitoring badges and regular equipment checks and maintenance. Use of safety shields and glasses are recommended as they are protective.

## *Legal Hazards*

There are relevant statutes and regulations which apply to the practice of dentistry in every country. The contravention of any of these may warrant that legal actions be brought against a dental practitioner particularly in developed countries where the citizens appear more aware of their rights. To help assure a safe work environment in dental treatment, the hazard awareness and prevention of legal risks should be made known to all clinical workers of the dental hospital/clinic.

## *Prevention of Occupation Hazards*

Health risks in dentistry may arise as new technologies and materials are developed. However, once identified and recognized as risk, new guidelines, precautions, and protocols are often rapidly instituted to greatly reduce or even eliminate the occupational hazard.

**Education.** The role of one's occupation as an important factor in maintaining personal health needs to be constantly emphasized so workers understand any possible negative health implications of their jobs and how to minimize them.

**Infection control** and proper handling of potentially infected materials. Barrier techniques include gloves, masks, protective eye wear, high power suction and good ventilation to reduce aerosols and vapor dangers.

**Hypoallergenic nonlatex gloves** are proposed can decline latex allergy

**prevent radiation hazard** Lead aprons, periodic maintenance of the X ray machine and radiation level sensors

## **Prevent musculoskeletal disorders**

Identify symptoms as soon as they become apparent

Consider ergonomic features for dental equipment

Modify working conditions to achieve optimal body posture

Achieve optimum access, visibility, comfort, and control at all times