

Occupational Hazards in Dentistry

Mitushi Mittal¹, Rajiv Ahluwalia^{2,*}, Parvinder Bindra³

Department of Orthodontics & Dentofacial Orthopedics, Santosh Dental College, Santosh University, Ghaziabad

***Corresponding Author:**

Email: drrajivahluwalia@gmail.com

ABSTRACT

Dental professionals are susceptible to a number of occupational hazards. These include exposure to infections, percutaneous exposure incidents, hazardous dental materials, radiation, and noise; musculoskeletal disorders; psychological problems and dermatitis; respiratory disorders; and eye insults. This article discusses selected occupational hazards. Once identified and recognized as a risk, new guidelines, precautions and protocols are rapidly instituted to greatly reduce or even eliminate the occupational hazard.

Key Words: Dental staff, Dentist, Occupational disease**INTRODUCTION**

A substantial risk to a worker's physical or mental well-being which is present in a certain task, job, or profession is called as occupational hazard. Dentistry is considered by the practitioners and most of the public as being extremely hazardous. The hazards include infectious, psychological, allergic, physical, mercury health-hazard, ionizing and non-ionizing hazard and anesthetic gas hazard. Because all infected patients cannot be identified by medical history, physical examination, or laboratory tests, Centers for Disease Control and

prevention (CDC) recommend that blood and body fluid precautions be used consistently for all patients.

Barrier utilities such as gloves, masks, protective eye wear, high power suction, and good ventilation reduce aerosols and vapor hazards¹. Hypoallergenic non-latex gloves can decline latex allergy. Lead aprons, periodic maintenance of the X-ray machine and radiation level sensors deal with radiation dangers^{2,3}. The current paper reviews studies relating to occupational health problems in dental practice.

Table 1: Common Transmissible Infections in Dentistry

Category	Name	Transmission to Humans	Effect on Humans
Viruses	Hepatitis B (HBV)	Directly (cut, infection), through blood, blood serum and other human body fluids, especially wound exudate, saliva, semen, vaginal secretion; through sexual intercourse, from mother to foetus	hepatitis, frequently in the form of a chronic cirrhosis; hepatic carcinoma
	Hepatitis C (HCV)	Directly (cut, infection), through blood, blood serum and other human body fluids	Hepatitis, frequently in the form of a chronic cirrhosis; hepatic carcinoma
	Hepatitis D (HDV = Delta + HBV)	Directly (cut, infection), through blood, blood serum and other human body fluids	Hepatitis, frequently in the form of a chronic cirrhosis;
	Hepatitis G (HGV)	Directly (cut, infection), through blood, blood serum and other human body fluids	Hepatitis
	<i>Herpes simplex virus (HSV)/Simple herpes virus (type 1 and 2)</i>	Directly: through kissing (most frequently – type 1), through sexual intercourse (most frequently – type 2), through a cut in the skin, through hand contact	herpes: vesicular inflammation oral cavity and urinary – sexual organs, skin inflammations, keratitis, encephalitis
	<i>Viruses of influenza (type A, B, and C)</i>	Air-droplet	influenza, pneumonia
	<i>Virus of hepatitis A (type 72 of human enteroviruses)</i>	Faeces-food, directly	hepatitis A, gastritis enteritis (mostly in youth)
	<i>Human Immunodeficiency Virus (type HIV-1, HIV-2)</i>	Directly (through blood, sexual intercourse – homo- and heterosexual), through placenta to foetus.	AIDS (acquired immunodeficiency syndrome),
Bacteria	<i>Actinomyces</i>	Orally, directly (cuts)	actinomycosis, nodular suppurative lymphadenitis
	<i>Neisseria</i>	Air-droplet, directly	meningitis, septicaemia
Fungi	<i>Candida</i>	Directly	candidiasis of skin, nails, oral cavity, vagina, rarely internal organ

Table 2: Categories of Task in Relation to Risk

Category	Tasks	Performed by
I	That involves exposure to blood, body fluids and tissues	Dentist, dental hygienist, dental technicians and laboratory workers
II	Does not involve routine exposure to blood, body fluids and tissues. Unplanned category tasks may be required.	Clerical or nonprofessional workers who may help clean up the office, handle instruments or impression material.
III	No exposure to blood, body fluids and tissues	Receptionist, bookkeeper or insurance clerk.

IMMUNITY:

Immunity is the state of having sufficient biological defenses to avoid infection, disease, or other unwanted biological invasion.

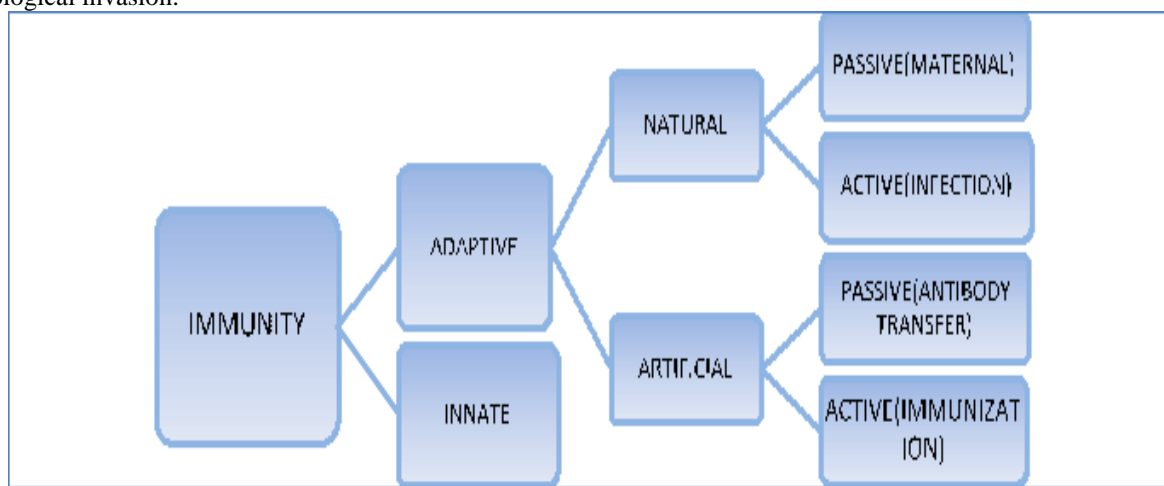


Table 3: Vaccination Recommendations

Vaccine	Recommendations in brief	Brand names
Hepatitis B	Give a three-dose series (first dose now, second in one month, third approximately 5 months after second dose). Give intramuscular. Obtain anti-HBs serologic testing 1-2 months after third dose.	Sci-B-Vac, Engerix-B, Recombivax HB, Elovac B, Genevac B, Shanvac B, Twinrix, Comvax, Pediarix, Pentabio
Influenza	Give one dose of TIV** or LAIV*** annually. Give TIV intramuscularly or LAIV intranasally.	FluMist, Fluzone, Influvac, Vaxigrip, Fluarix, Fluvirin, FluLaval, Agriflu, Flubio
MMR	For HCP* born in 1957 or later without serologic evidence of immunity or prior vaccination, give two doses of MMR, 4 weeks apart. For HCP born prior to 1957, see below. Give Subcutaneous(sc)	Priorix, MMR II, Tresivac, Trimovax, ProQuad
Varicella (chickenpox)	For HCP who have no serologic proof of immunity, prior vaccination, or history of varicella disease, give two doses of varicella vaccine, 4 weeks apart. Give SC.	Varivax, Zostavax, ProQuad, Priorix Tetra
Tetanus, diphtheria, pertussis	Give all HCP a TD booster dose every 10 years, following the completion of the primary three-dose series. Give a one-time dose of Tdap**** to all HCP younger than age 65 years with direct patient contact. Give IM	Boostrix, Adacel, Decavac, Tenivac, Daptacel, Infanrix, Tripedia, Kinrix, Pediarix, Pentacel
Meningococcal	Give one dose to microbiologists who are routinely exposed to isolates of N. Meningitidis.	Bi Meningo

*HCP-healthcare personnel,

**TIV-Trivalent influenza vaccine,

***LAIV-Live attenuated influenza vaccine,

****Tdap-tetanus, diphtheria and acellular pertussis

MUSCULOSKELETAL

During dentistry procedure, the dentist's posture is strained (while standing and sitting close to a patient who remains in a sitting or lying position), which induce stress injury on musculoskeletal system. This occurs in 37.7% of work time⁴. Severe chronic back pain is reported in more than 25% of dentists with back pain⁵. Hand/wrist complaints among dentists and especially dental hygienists are highly prevalent^{5,6-10}. Dentists should follow regular exercises regime, and should maintain proper posture during work.

LATEX

The routine use of latex gloves and other personal protective equipment significantly reduced the chance of HIV/blood-borne disease transmission; however, as more and more Healthcare Workers (HCWs) were exposed to latex-containing products on a regular basis, problems began to be reported. This decline is related to the use of a better quality of latex gloves with lower allergen content^{11,12-14}. Hevein-like protein domains are a possible cause for allergy. Synthetic rubbers such as elastane, neoprene, and artificially synthesized polyisoprene latex gloves can thus be used to prevent allergy.

EYE

Visual field constriction related to mercury exposure is reported¹⁵. Color vision examination has been shown as a sensitive indicator of subtle neurotoxic effects from exposure to solvents and heavy metals^{16,17}. Because the majority of dental procedures are accomplished with instruments being passed over or near the patient's face and with aerosols and chemicals frequently in close proximity, both patients and dentists should wear eye protection. Curing lights are also a potential hazard to those who place restorative resins due to phototoxic and photo allergic reactions originating from absorbed radiation¹⁸.

EAR

The sources of dental sounds inducing hearing loss that can be diminished are high-speed turbine handpieces, low-speed handpieces, high-velocity suction, ultrasonic instruments and cleaners, vibrators and other mixing devices, and model trimmers. Although hearing loss may not be symptomatic, the first complication and the reason for seeking a hearing evaluation may be tinnitus¹⁹. Wear hearing protectors like earplugs and earmuffs to protect ears from noise.

PREVALENCE OF OCCUPATIONAL HAZARDS

In India, an investigation among Navy dentists revealed that 47% of them experienced an injury from a sharp instrument during the past six months and backache was the commonest hazard in 70.6% of the personnel following the past six months and backache

was the commonest hazard in 70.6% of the personnel followed by occasional anxiety and wrist ache.²⁰

CONCLUSION

The review of the above described hazards to which dentists are exposed in their everyday work, indicates the need for special medical care for this professional group. The aim of infection control is to control iatrogenic, nosocomial infections among patients, and potential occupational exposure of care providers to disease causing microbes during provision of care. Disease transfer to the dentist and dental staff during dental care is considered an "occupational exposure" to a given pathogen while disease transfer from one patient to another in the dental clinics is considered "cross-infection". Therefore, the dental health care provider must be knowledgeable about the diseases commonly encountered in the dental operator and must follow high standards of infection control for the safety of the patients and the dental health care workers

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