



## Hearing Loss and Protection in Dental Practice: A Review

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### Abstract

Dentistry is a perfect blend of art, science, medicine as well as engineering skills. The practice of dentistry requires not only soft but also the hard skills. This mainly includes meticulous armamentarium to successfully complete any dental procedure. The armamentarium used in the operatory involves heavy noise, which can be damaging to the ears and can cause hearing loss, if not dealt with carefully. The noise exposure in the dental practices is generally intermittent in nature. This article provides a sneak peek into the mechanism of hearing loss along with the various methods to prevent the same in the dental practices.

**Keywords:** Dental Surgeons; Dental; Dental Practice; Earplugs; Hearing Loss; Hearing Protection Devices

### Introduction

Noise is one of the major environmental pollutants across the globe. This exposure to such noises particularly during the office hours and otherwise could be harmful. In reference to the dental profession, there has been a buzz about the Personal Protective Equipment (PPE). This had been into the picture, before, during and post-COVID times. One of the major components of the PPE includes the hearing protection to prevent the damaging noises causing hearing issues and subsequently the hearing loss. Such devices are known as hearing protection devices (HPDs) or ear

protection devices. They are worn in or over the ears so as to prevent the hearing loss due to the insidious noise. Dental practitioners are commonly exposed to various noises particularly during their clinical hours. Such noises can vary from 85 decibels or above and can be potentially harmful for the ears if not treated well.

There can be a number of ways to prevent hearing problems which include; mass awareness campaigns in relation to educate the dental personnel regarding the ill effects of noise and its prevention, periodic monitoring of hearing through baseline tests and use of hearing protection devices as a part of the PPE.

## Discussion

According to the Occupational Safety and Health Administration, there has been an exposure of 85 dB or higher for eight hours, continuously. In dental offices, such exposure to the various noises could be because of a number of devices namely high speed handpieces, suction - high and low speed and ultrasonic scalers. Noise from these sources over a longer period can prove to be harmful. The evolution of handpieces describes the cutting noise technology. The primitive drills produced lot of noise, which over a period of time reduced in the newer high speed handpieces. The salivary ejectors/suction generally produce noises in the range of 70 - 75 db. In addition to this, ultrasonic scalers produce noises in the range of 80 - 110 db. The noise inside the dental offices seem to be minimal but such intermittent noises continuously may pose hearing issues in long run. Care must be taken in regards to the type of equipment, treatment schedule etc. when dealing with noise as an occupational hazard in the dental practice.

The exposure to noise is not only inside the dental operatory but can be from outside. The noises outside can be dangerous as they may be of various decibels. There have been a number of sources which can cause noise pollution and can directly or indirectly pose a lot of risk to the dental professional.

The sources of noise both inside and outside the dental operatory thus mandate the use of ear protection using the hearing protection devices i.e. earmuffs, earplugs, electronic hearing protection, canal caps and dual hearing protection. Generally, the ear protection devices are categorized under active and passive sound control. Active sound control, which protects against dangerous noise levels while also allowing for HPD decompression when the noise level is safe, allowing for effective communication without muffled sounds; and passive noise control, which protects against dangerous noise levels but does not allow for clear hearing, which is required for effective communication. Earplugs, an important component of the ear protection devices, provide a passive noise control and are quite potent in protecting the ears from the damaging noises. The only limitation of these devices is the ineffective communication between the dental surgeon and the patient. Earplugs can be made of a number of materials and can be pre-fabricated or customized. They have the tendency to reduce the noise to a greater capacity.

The advanced modalities include the Smart ear technology using batteries to provide hearing protection. This proves to be boon

in the clinical practice as it allows effective communication as well as hearing protection [1-11].

## Conclusion

Dentistry is a very demanding and skilful profession. The dental professionals generally face various occupational hazards in their routine clinical practices. One of them involves the exposure to the noise, a common environmental pollutant. Such exposures from inside or outside the operatory can prove to be dangerous, if ignored. Hearing protection, awareness regarding noise pollution, selection of the dental equipment and baseline examination/periodic monitoring of the individuals are some of the measures to be undertaken to prevent occupational exposures. Noise protection or noise cancellation using ear protection devices are to be taken into due consideration. So, let's take a pledge on the National Audiology Awareness Month that we will be well aware and we will make our dental community well aware on the harmful effects of noise and methods to prevent using the hearing protection.

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