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Review of the Importance of Aerosol Reduction and Proper Infection Control in Dentistry

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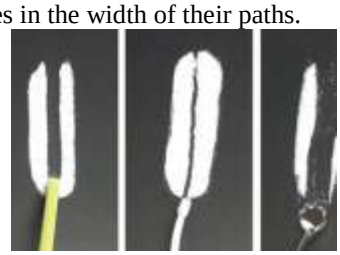
ABESTRACT
The goal of this article to educate dentists, hygienists, and assistants on the importance of aerosol reduction and proper infection control. During dental intervention with high-speed handpieces or ultrasonic, aerosols and spray can be produced. It can remain in the air for prolonged period of time.Aerosols consist of particles less than 10 microns and may contain bacteria and virus. During pandemic of COVID-19, the methods of aerosols reduction should be carefully reviewed.
KEY WORDS: aerosols, dentistry, COVID-19, masks, high-volume evacuator, low-volume evacuator.

INTRODUCTION

While treating the patients with ultrasonic or high-speed handpiece, aerosols, spray and droplets are formed. The bigger droplets settle down of the air within seconds to minutes, the smallest droplets can remain suspended in the air for minutes to hours. Aerosols can remain airborne for extended periods of time and may be inhaled. Aerosols consist of particles less than 10 microns in diameter and are not typically visible to the naked eye.About 95% of aerosols are 5 micrometers or less.Most aerosols lie within 1m in front of the patient. People release respiratory fluids during exhalation (e.g., quiet breathing, speaking, exercise, coughing, sneezing) in the form of droplets across a spectrum of sizes. These droplets might carry virus and transmit infection [1].

A high-volume evacuator (HVE) is a suction device that draws a large volume of air over a period of time and it is recommended to use this device when work with powered instruments. Comparing HVE with a low-volume evacuator (LVE), LVE pulls a significantly lower volume of air [2]. HVE devices usually have large, single-bore or multiple openings, while LVE devices have a much smaller bore size. HVE remove 90-98% of aerosols regardless of source. An HVE device (left), a saliva ejector (center), and an HV evacuation mirror (right) are used to draw up the salt particles at the same speed (pic.1). Note the differences in the width of their paths.



Picture 1. HVE device (left), a saliva ejector (center), HV evacuation mirror (right).

Dentists and hygienists have higher risk of exposure while using powered instrumentation such as ultrasonics, high speed handpieces, and air polishers. Aerosol particles can linger in the operatory for an hour or more while splatter lands on the surfaces immediately surrounding the treatment area. This poses a risk for the spread of the common cold and influenza viruses, herpes viruses, pathogenic streptococci or staphylococci, COVID-19, severe acute respiratory syndrome (SARS), and tuberculosis (TB) [6].

In order to provide the most protection, a combination of methods have to be used: personal protective equipment (PPE), preprocedural rinses, prepolishing, an advanced air filtration system, and an HVE offers the most effective and practical method of reducing the overall risk of infection.

The dental office required that clinicians use PPE, such as masks, gloves, eye protection, and proper lab coats; however, there are still many states in the U.S.A. do not require a HVE as recommended inthe Centers for Disease Control and Prevention(CDC) guidelines as a part of its safety protocol for working with powered instruments. Saliva ejectors and isolation devices offer no safety protection from contaminated aerosols. Only 24 out of 50 states in the U.S.A. follow CDC infection control guidelines [3].
Nowadays for additional precautions, extraoral aerosol suction (EOS) systems can be used. Particles are absorbed into the suction hood through the primary filter, smaller particles go through the sterilization filter and filtered through

HEPA filter before exhausting the air, additional sterilization can be reached by UV Plasma that is integrated into the system. The hood must be remaining close to the patient's face. After finishing the dental procedure that produces aerosols, most of the manufacturers require to keep EOS working for several minutes to clear the air [5].

When choose proper masks, only certain approved masks can filter COVID-19 virus and aerosols. For example, N95, N99 filter at least 95% of airborne particles. There are different styles for different face types available. Special fitting process are required before using N-95 mask [4]. For regular masks: change mask every 20 min in high aerosol environment, every patient, or every hour. Mask levels include 1-3: the higher the mask level, the more protection against aerosols, more filtration but less breathable. N-95 mask can be covered by regular mask in order to protect N-95.

REFERANCES:

[1]. Bloodborne Pathogens and Aerosols https://www.cdc.gov/oralhealth/infectioncontrol/faq/aerosols.htm

[2]. High-volume evacuation: Aerosols—it's what you can't see that can hurt you http://www.rdhmag.com/articles/print/volume-37/issue-7/contents/high-volume-evacuation.html

[3]. Licensing requirements. In: The Composite. 28th ed. Chicago, IL: American Association of Dental Boards; 2017: 68-69.1

[4]. The Dental Advisor. Translating the science. Face Masks: What to Wear and When. J.H.Molinari, P.Nelson // № 18 – October 2014.

[5]. NIOSH-Approved Particulate Filtering Facepiece Respirators. https://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/default.html

[6]. 6.Scientific Brief: SARS-CoV-2 Transmission. https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/sars-cov-2-transmission.html