RICHMOND
ENDODONTIC CENTRE

WHAT'S THE SPATTER?

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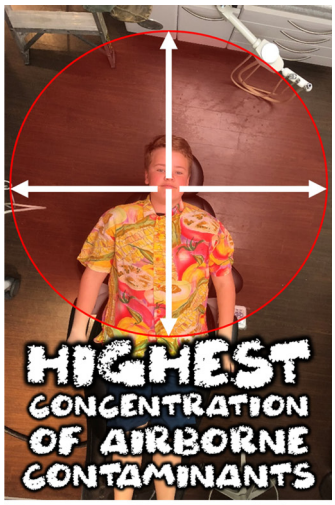

Between 1990 and 2005 the most common, self-reported, reason for a dentist to miss work was a respiratory infection. Seroprevalence studies demonstrate antibodies to bacteria, fungi, and viruses found in saliva are more common in dentists and increase with experience. Many paid scant attention to dental aerosols, spatter, and splatter until the devastatingly negative impact of the SARS-CoV-2 virus befell us all.

Most dental procedures have the potential for creating contaminated bioaerosols, spatter, and splatter. An aerosol (aka droplet) is a suspension of extremely fine (≤50 µm in diameter) airborne particles of liquid, solid, or a combination thereof. Evaporation will decrease the size of the droplet to less than 10 µm. These are called droplet nuclei and they have an enhanced ability to remain afloat in the air, by-pass barriers, and enter respiratory passages. Aerosols and droplet nuclei are considered primary infection vectors for the coronavirus.

Spatter consists of larger airborne particles (>50 µm in diameter). They do not remain airborne for long. They behave in a ballistic manner, arcing quickly downwards as the kinetic energy that projected them dissipates. If enough spatter droplets unite they will form splatter which is, by definition, visible to the naked eye.

Viruses are small (0.02 to 0.4 µm) in comparison to bacteria (0.2 to 10 µm). Oral bacteria have been detected up to two metres from the procedural field. Because of its smaller size, the contamination potential of a bioaerosol is believed to be manyfold higher than that of spatter. Even in the absence of water or a visible spatter 'cloud', dental procedures produce aerosols contaminated with bacteria, viruses, fungi, protozoa, parasites, blood products, soft and hard tissue remnants, tooth débris, and dental material fragments. The main sources for these contaminants are:

- The patient: saliva, blood, soft and hard oral tissue, gingival/oronasal pharyngeal secretions, plaque, caries, pulp, and tooth structure
- Dental material fragments from a bur, rubber dam, filling material, cement, gutta-percha, post, etch, bond, haeme-control products, topical gel, etc…
- Dental water unit line (microflora)
- Forced air (ventilation system, fans, handpieces, and syringes), recycling of potentially contaminated air
- Instruments contaminated during treatment and exposed to forced air

Not only is the composition of a droplet unique for each person, on any particular day, but it also varies depending on the treatment site and procedures performed. During treatment, the highest concentration of airborne contaminants is within 30 to 90 cm of the mouth. This is the domain of the dentist and assistant who need the highest level of protection. Universal precaution dictates our protective measure need to be effective against the most virulent 'cloud' of contaminated droplets. Additional measures should be considered for protecting other patients and staff beyond the confines of the operatory and for extended periods, including postoperatively. Before the coronavirus pandemic, this may have been a blind spot for dental regulators.

Knowledge of the characteristics of the various carriers of contamination will aid the development of effective barrier devices and protective protocols. However, the force majeure that is the coronavirus pandemic may lead to a torrent of peremptory writs of mandamus for wantonly extravagant, non-evidence based, infection protocols from our governing bodies. Equanimity must prevail to ensure the barriers against aerosols, spatter, and splatter matter.

Regards,

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