



Foreword

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The definition of health has evolved from the absence of disease or infirmity to that as a resource which gives people the ability to manage and even to change their surroundings (*WHO 1984*). In light of the current pandemic/endemic, efforts to manage and control COVID is still an ongoing concerted effort involving various ministries, stakeholders, businesses and people.

The principles of preventing oral disease, promoting oral health and improving the quality of health through the organised efforts of society remain the same as we navigate through this climate of uncertainty.

For this current CPD Bulletin, the Chapter of Public Health Dentists is pleased to present a curated selection of papers on COVID-19 & Dentistry, ranging from transnational transmission control to innovations in dental education during a pandemic.

Hope you will enjoy the readings. Stay safe & stay sane!



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ARTICLE

1 [Overview of transnational recommendations for COVID-19 transmission control in dental care settings](#) FULL ARTICLE ACCESS

Jamal M, Shah M, Almarzooqi SH, Aber H, Khawaja S, El Abed R, Alkhatib Z, Samaranyake LP.

Oral Dis. 2021 Apr;27 Suppl 3:655-664.

PMID: 32428372

On 11 March 2020, the World Health Organization (WHO) declared the coronavirus disease (COVID-19) caused by severe acute respiratory syndrome coronavirus (SARS-CoV-2) as a pandemic. Until an effective treatment or a vaccine is developed, the current recommendations are to contain the disease, and control its transmission. It is now clear that the primary mode of SARS-CoV-2 transmission is aerosol/droplet spread, and by contacting virus-contaminated surfaces acting as fomites (inanimate vectors). Furthermore, recent data indicate that the live virus particles are present in saliva, and, more alarmingly, asymptomatic individuals may transmit the infection.

By virtue of the nature of the practice of dentistry where intrinsically, a high volume of aerosols is produced, as well as the close proximity of dentists and patients during treatment, dentists and allied health staff are considered the highest risk health professional group for acquiring SARS-CoV-2 during patient management. Therefore, several organizations and specialty associations have proposed guidelines and recommendations for limiting the transmission of SARS-COV-2 from carriers to dentists and vice versa. This paper aims to provide a review of these guidelines and concludes with a brief look at how the practice of dentistry may be impacted by COVID-19, in the post-pandemic era.



PRACTICE-CHANGING UPDATES

ARTICLE

1 [Dental Mitigation Strategies to Reduce Aerosolization of SARS-CoV-2](#) FULL ARTICLE ACCESS

Vernon JJ, Black EVI, Dennis T, Devine DA, Fletcher L, Wood DJ, Nattress BR.

J Dent Res. 2021 Aug 2:220345211032885.

PMID: 34338580

Limiting infection transmission is central to the safety of all in dentistry, particularly during the current severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic. Aerosol-generating procedures (AGPs) are crucial to the practice of dentistry; it is imperative to understand the inherent risks of viral dispersion associated with AGPs and the efficacy of available mitigation strategies.

In a dental surgery setting, crown preparation and root canal access procedures were performed with an air turbine or high-speed contra-angle handpiece (HSCAH), with mitigation via rubber dam or high-volume aspiration and a no-mitigation control. A phantom head was used with a 1.5-mL min⁻¹ flow of artificial saliva infected with Φ6-bacteriophage (a surrogate virus for SARS-CoV-2) at ~108 plaque-forming units mL⁻¹, reflecting the upper limits of reported salivary SARS-CoV-2 levels. Bioaerosol dispersal was measured using agar settle plates lawned with the Φ6-bacteriophage host, *Pseudomonas syringae*. Viral air concentrations were assessed using MicroBio MB2 air sampling and particle quantities using Kanomax 3889 GEOα counters. Compared to an air turbine, the HSCAH reduced settled bioaerosols by 99.72%, 100.00%, and 100.00% for no mitigation, aspiration, and rubber dam, respectively. Bacteriophage concentrations in the air were reduced by 99.98%, 100.00%, and 100.00% with the same mitigations. Use of the HSCAH with high-volume aspiration resulted in no detectable bacteriophage, both on non-splatter settle plates and in air samples taken 6 to 10 min post-procedure. To our knowledge, this study is the first to report the aerosolization in a dental clinic of active virus as a marker for risk determination.

While this model represents a worst-case scenario for possible SARS-CoV-2 dispersal, these data showed that the use of HSCAHs can vastly reduce the risk of viral aerosolization and therefore remove the need for clinic fallow time. Furthermore, our findings indicate that the use of particle analysis alone cannot provide sufficient insight to understand bioaerosol infection risk.



FEATURED ARTICLES

ARTICLES

1

[Influence of maternal postpartum depression on children's toothbrushing frequency](#)

Tsuchiya S, Tsuchiya M, Momma H, Nagatomi R, Arima T, Yaegashi N, Igarashi K; Japan Environment, Children's Study Group.

Community Dent Oral Epidemiol. 2021 Jun 11.

PMID: 34117651

Abstract

Daily toothbrushing behaviour is very effective for the prevention of early childhood dental caries (ECC) but is mostly dependent upon parental management. Intrapersonal association between lower toothbrushing frequency and depression is well known; however, the impact of maternal postpartum depression on child toothbrushing behaviour within the mother-child dyad remains unknown. The aim of this study was to determine the association between the prevalence of maternal postpartum depression and lower toothbrushing frequency in children aged two years.

A secondary analysis of a data set from the Japan Environment and Children's Study was performed. A total of 104 062 fetuses were enrolled after obtaining informed written parental consent, in which 84 533 mother-infant pairs were included after applying exclusion criteria. The Edinburgh Postpartum Depression Scale (EPDS) was used to evaluate maternal postpartum depression (a total score of ≥ 9 in EPDS) at one and six months postpartum. Indeed, the participants were classified based on the persistence of postpartum depression: 'Resilient' (no prevalence); 'Improving' (prevalence only at one month postpartum); 'Emergent' (prevalence only at six months postpartum); and 'Chronic' (prevalence at both time points). The association between postpartum depression and a toothbrushing frequency in children (the reference group: more than once per day, the low group: once per day, and the very-low group: less than once per day) was examined using Poisson regression models with adjustments for maternal and child characteristics after multiple imputations for missing data. The prevalence of maternal postpartum depression at one and six months postpartum was 13.9% and 11.4%, respectively; the proportions of each persistence group were 81.1% ('Resilient'), 7.5% ('Improving'), 5.0% ('Emergent') and 6.4% ('Chronic'). Concerning children's toothbrushing frequency, 51.6% and 0.5% of participants self-reported frequencies of once per day and less than once per day, respectively. The association of maternal postpartum depression with a lower toothbrushing frequency in children consistently had higher relative risks (RRs). However, these associations were weakened when adjusting for whether the child could self-perform toothbrushing or whether this was done under parental supervision.

A key result is that participants with persistent postpartum depression at both one and six month(s) postpartum showed the highest adjusted RRs (95% CI) for lower toothbrushing frequency in children (1.08 [1.04-1.12] with a decrease in children's toothbrushing frequency). Maternal mental health provides valuable screening information for children with lower toothbrushing frequency for the purpose of preventing ECC.



2

[Sources of SARS-CoV-2 and Other Microorganisms in Dental Aerosols](#) FULL ARTICLE ACCESS

Meethil AP, Saraswat S, Chaudhary PP, Dabdoub SM, Kumar PS.

J Dent Res. 2021 Jul;100(8):817-823

PMID: 33977764

On March 16, 2020, 198,000 dentists in the United States closed their doors to patients, fuelled by concerns that aerosols generated during dental procedures are potential vehicles for transmission of respiratory pathogens through saliva. Our knowledge of these aerosol constituents is sparse and gleaned from case reports and poorly controlled studies.

Therefore, we tracked the origins of microbiota in aerosols generated during ultrasonic scaling, implant osteotomy, and restorative procedures by combining reverse transcriptase quantitative polymerase chain reaction (to identify and quantify SARS-CoV-2) and 16S sequencing (to characterize the entire microbiome) with fine-scale enumeration and source tracking. Linear discriminant analysis of Bray-Curtis dissimilarity distances revealed significant class separation between the salivary microbiome and aerosol microbiota deposited on the operator, patient, assistant, or the environment ($P < 0.01$, analysis of similarities). We also discovered that 78% of the microbiota in condensate could be traced to the dental irrigant, while saliva contributed to a median of 0% of aerosol microbiota.

We also identified low copy numbers of SARS-CoV-2 virus in the saliva of several asymptomatic patients but none in aerosols generated from these patients. Together, the bacterial and viral data encourage us to conclude that when infection control measures are used, such as preoperative mouth rinses and intraoral high-volume evacuation, dental treatment is not a factor in increasing the risk for transmission of SARS-CoV-2 in asymptomatic patients and that standard infection control practices are sufficiently capable of protecting personnel and patients from exposure to potential pathogens.

This information is of immediate urgency, not only for safe resumption of dental treatment during the ongoing COVID-19 pandemic, but also to inform evidence-based selection of personal protection equipment and infection control practices at a time when resources are stretched, and personal protection equipment needs to be prioritized.



3

[Evaluating aerosol and splatter following dental procedures: Addressing new challenges for oral health care and rehabilitation](#) FULL ARTICLE ACCESS

Allison JR, Currie CC, Edwards DC, Bowes C, Coulter J, Pickering K, Kozhevnikova E, Durham J, Nile CJ, Jakubovics N, Rostami N, Holliday R.

J Oral Rehabil. 2021 Jan;**48(1):61-72.**

PMID: 32966633

Dental procedures often produce aerosol and splatter which have the potential to transmit pathogens such as SARS-CoV-2. The existing literature is limited. To develop a robust, reliable, and valid methodology to evaluate distribution and persistence of dental aerosol and splatter, including the evaluation of clinical procedures. Fluorescein was introduced into the irrigation reservoirs of a high-speed air-turbine, ultrasonic scaler and 3-in-1 spray, and procedures were performed on a mannequin in triplicate.

Filter papers were placed in the immediate environment. The impact of dental suction and assistant presence were also evaluated. Samples were analysed using photographic image analysis and spectrofluorometric analysis. Descriptive statistics were calculated and Pearson's correlation for comparison of analytic methods.

All procedures were aerosol and splatter generating. Contamination was highest closest to the source, remaining high to 1-1.5 m. Contamination was detectable at the maximum distance measured (4 m) for high-speed air-turbine with maximum relative fluorescence units (RFU) being: 46,091 at 0.5 m, 3,541 at 1.0 m and 1,695 at 4 m. There was uneven spatial distribution with highest levels of contamination opposite the operator. Very low levels of contamination ($\leq 0.1\%$ of original) were detected at 30- and 60-minutes post-procedure. Suction reduced contamination by 67-75% at 0.5-1.5 m. Mannequin and operator were heavily contaminated. The two analytic methods showed good correlation ($r = 0.930$, $n = 244$, $P < .001$).

Dental procedures have potential to deposit aerosol and splatter at some distance from the source, being effectively cleared by 30 minutes in our setting.



4

[Innovation of dental education during COVID-19 pandemic](#) FULL ARTICLE ACCESS

Chang TY, Hong G, Paganelli C, Phantumvanit P, Chang WJ, Shieh YS, Hsu ML.

J Dent Sci. 2021 Jan;16(1):15-20.

PMID: 32839668

The impact of the COVID-19 pandemic has a certain influence on various walks of life around the world. Because of this pandemic, social life has changed a lot globally.

Keeping social distances between human beings to prevent infection is the most important strategy for all countries. Many dental schools have been locked down to minimize the spread of this coronavirus infection. Close contact between human beings is required in the learning process in traditional dental education. Learning methods should be innovated to continue the learning process but away from being infected for dental education during a pandemic.

The purpose of this manuscript is to exchange the information and experiences of various dental educators from different countries to prepare for the future demand for dental education during a pandemic. By means of three online symposiums; dental educators from different countries were invited to give presentations and discussions regarding to the information and experience in the innovation of dental education during the pandemic.

The results showed that the impact of the COVID-19 pandemic affects dental education a lot. Intelligent technology has certain benefits for the learning process of dental education during the pandemic. The model of dental education should be innovated to suit different situations and novel intelligent technology should be applied for future dental education.

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