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Providing Dental Care in the current COVID-19 Crisis

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ABSTRACT

Dental procedures typically generate aerosol. With the current COVID-19 crisis this is a serious problem for providers and patients. This article addresses some of the problems and possible solutions for providing dental care in the current COVID-19 crisis.

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Dental procedures generate a significant amount of aerosol, which has always been a topic of controversy and research;[1-8] however, the COVID-19 crisis has made dental aerosol a much more serious issue that needs to be addressed if we are to open dental practices for routine dental care until a cure or vaccine for COVID-19 is discovered. Current studies show that a large majority of patients infected with COVID-19 may be asymptomatic for fourteen days.[9] If these patients receive dental treatment in this time frame, there is a high risk of transmission not only from contact but from aerosol generation. This issue involves three aspects in a dental practice: clinical staff and provider protection, patient protection in clinical areas, and nonclinical staff and patient protection in nonclinical areas.

Based on current availability of current Personal Protective Equipment (PPE), one of the safest ways to avoid exposure to aerosols and airborne pathogens for practitioners, workers, and patients is to use Powered Air Purifying Respirators (PAPR) or Supplier Air Respirator (SAR) in a negative pressure setup room that is cleaned and disinfected after every patient encounter. While this is something that can be done in operating rooms and for larger surgical procedures, this approach has limitations in a dental setting. Firstly, it would be hard to provide dental care with PAPR and SAR due to the size and bulk of the equipment, face masks, and headgear. Secondly, even if the gear could be made more flexible, less cumbersome, and more user-friendly for dental procedures, the financial logistics would be difficult, if not impossible, for routine dental care of patients. An average dental practitioner may see over twenty patients a day, and hygienists may see another ten or more patients in the same practice. Most busy practices may have more than one dentist and two or more hygienists. This can translate into forty or more patient encounters in a day.

Even with hygiene procedures, aerosol can be an issue due to the use of ultrasonic cleaning devices. Dental appointments are usually short with quick turnover, and most dentists usually use more than one treatment room at the same time. Staff go between multiple rooms simultaneously. This creates a problem with cross-contamination for patients even if PAPR or SAR is used. If multiple treatment rooms are used simultaneously by staff, PPE and PAPR or SAR need to be changed or disinfected between each room. This would be practically impossible if

the dental provider needed to see a large volume of patients, as most dental practices were used to doing in the pre-COVID-19 era.

Negative pressure rooms could be a solution to help with aerosol exposure reduction. Coupled with high-speed evacuation and rubber dam use, along with appropriate PPE, this could be a more practical alternative for dental practices. The obvious problem is that most, if not all, dental practices do not have negative pressure treatment rooms or clinical areas. The cost of creating these areas in an existing practice or a new practice would be considerable.

Drainage from the suction in a dental practice is usually discharged into the community water after filtration, unlike surgical suctions that collect waste in a canister and are disposed of as biohazard. Ideally, high-speed evacuation waste will have to be discharged through a filter that can filter COVID-19 and use UV radiation to kill the virus prior to discharge. In the future, this could be the new standard of care. Flash UVC exposure of the room and equipment without exposure to staff may be an option but comes with its own limitations and risks. CDC and OSHA have current guidelines in place for all dental practices for infection control, sterilization, and PPE; however, they do not currently address the new hazard posed by COVID-19.

While current usage of gowns, hair covers, masks, and gloves, along with covers for equipment such as light handles and chairs, is a good measure for protection from bloodborne pathogens, it does not help with airborne pathogens, especially COVID-19. To compound this problem, there is the acute shortage of PPE and COVID-19 protective N95 masks since regular masks used in dental practices would be ineffective. One option to consider could be to use cloth gowns and hair covers that can be changed after every patient and washed after each use.

While the use of routine screening, social distancing, and hand washing may reduce the risk of transmission in nonclinical areas and waiting rooms, it is not feasible in clinical areas.

One solution which does not require some of the above-mentioned measures could be simply testing each patient for COVID-19 prior to treatment; this approach, however, has limitations. Currently, there is an acute shortage of tests and a long turnaround in getting results. Even with daily improvements in testing and shorter turnaround times, testing each patient prior to every dental procedure, especially for multiple appointment procedures, would be an inconvenience to patients. The ideal test will have to provide results within minutes to be usable in real-time. Additionally, the expense of testing will most likely have to be borne by the patient or the provider, thus adding to the overall cost of treatment. Currently, dental providers do not have the privilege of COVID-19 testing in their office. Furthermore, the providers and ancillary clinical staff would have to be tested daily to prevent transmission of infection from asymptomatic providers to their patients.

So where do we go from here? Currently, due to mandated cessation of elective dental procedures in most of the states in the U.S., the risk of transmission of COVID-19 from dental practices is low; however, as the mandate is lifted and dental practices are allowed to resume elective care, what will the standard of care be? This will depend upon the recommendations from the ADA or CDC and OSHA.

While we wait on this, we can use common sense and current recommendations to protect us and our patients for emergent and urgent procedures.

Screen every patient per CDC guideline9 before allowing them to enter the practice and only allow patients being treated into the treatment areas unless the patient is a minor and requires a parent present. Have patients wash their hands or use alcohol sanitizer before entering the treatment rooms. Limit patients in waiting areas as per social distancing guidelines. Encourage adult patients to come alone and without children. Clean waiting areas and furniture frequently between patients. Clean and disinfect any pens and clipboards provided to patients. Install Plexiglas screens at reception areas to protect staff and isolate any clinical areas from nonclinical areas with screens.

Since most dental practices have an open bay concept, treatment bays can be temporarily isolated

using vinyl curtains or Plexiglas shields that can be cleaned after each patient use. If the practice wants to go one step further, portable high-efficiency filtration units that can capture COVID-19 viruses can be used.

Screen staff every morning per CDC guidelines.[10] Instruct staff to come in street clothes and change to scrubs in the office. Staff should change back to street clothes before leaving and take the worn scrubs home in a sealed bag for washing. Encourage nonclinical staff to stay out of clinical areas. Staff should take their breaks outside or at their desks, and should not congregate in the kitchen area unless following social distancing guidelines. Try to provide treatment plans and estimates to patients in treatment rooms. Space patient appointments to provide more time for treatment and do not double book patients to avoid the risk of cross-contamination.

Use high-speed evacuation for every patient and rubber dams for restorative procedures. Since surgical procedures do not use high-speed evacuation routinely, use slow speed suction in the field and high-speed suction near the mouth to catch any aerosol being generated by sectioning of teeth and bone. Pre-rinse with 1% hydrogen peroxide[11] to reduce the viral count. Use PPE with N95 masks, especially with aerosol-generating procedures. If disposable gowns are not available, use washable gowns and change between patients.

Go over the CDC and OSHA guidelines[12-16] with staff again, especially instructions related to current COVID-19 transmission, and reiterate and monitor on a weekly basis. Monitor the inventory of PPE and try to keep at least two weeks' supply at hand. Inspect your N95 masks for wear per CDC guidelines. Remove all nonessential items from the treatment areas and clean and disinfect rooms after each patient use as usual.

To avoid cross-contamination, do not leave the treatment room or have the assistant leave the treatment room for any reason while treating the patient. If you are sedating patients, draw sedation medications outside the room unless you are using one-time-use medications. This is routine practice for JCAHO certified practices.

Although no single method can completely eliminate the risk of COVID-19 transmission, the combined use of all the current guidelines can reduce the risk of infection, keep transmission to a minimum and help us provide much needed dental care to our patients.

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REFERENCES

1. Kobza J, Pastuszka JS, Bragoszewska E. Do exposures to aerosols pose a risk to dental professionals? Occupational Medicine. 2018;68(7):454-458.
2. Zemouri C. de Soet H, Crielaard W, Laheij A. A scoping review on bio-aerosols in healthcare and the dental environment. PLoS One. 2017;12:e0178007.
3. Hallier C, Williams DW, Potts AJ, Lewis MA. A pilot study of bioaerosol reduction using an air cleaning system during dental procedures. Br Dent J. 2010;209:E14.
4. Szymańska J. Dental bioaerosol as an occupational hazard in a dentist's workplace. Ann Agric Environ Med. 2007;14:203-207.
5. Narayana TV, Mohanty L, Sreenath G, Vidhyadhari P. Role of preprocedural rinse and high volume evacuator in reducing bacterial contamination in bioaerosols. J Oral Maxillofac Pathol. 2016;20:59–65.
6. Pankhurst C. Summary of: a pilot study of bioaerosol reduction using an air cleaning system during dental procedures. Br Dent J 2010;209:408–409.
7. Checchi L, Montevecchi M, Moreschi A, Graziosi F, Taddei P, Violante FS. Efficacy of three face masks in preventing inhalation of airborne contaminants in dental practice. J Am Dent Assoc. 2005;136:877–882.
8. Thomas MV, Jarboe G, Frazer RQ. Infection control in the dental office. Dent Clin North Am. 2008;52: 609–628.

9. https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html
10. Centers for Disease Control and Prevention. Dental Settings. https://www.cdc.gov/coronavirus/2019-ncov/hcp/dental-settings.html.
11. American Dental Association. ADA adds frequently asked questions from dentists to coronavirus resources. https://www.ada.org/en/publications/ada-news/2020-archive/march/ada-adds-frequently-asked-questions-from-dentists-to-coronavirus-resources.
12. United States Department of Labor. OSHA and Dentistry. https://www.osha.gov/SLTC/dentistry/index.html.
13. United States Department of Labor. OSHA and COVID-19. https://www.osha.gov/SLTC/covid-19/.
14. Infection Prevention Checklist for Dental Setting CDC publication Basic Expectations for safe care pdf publication.
15. U.S. Department of Labor. Occupational Safety and Health Administration. OSHA. Guidance on Preparing Workplaces for COVID-19.
16. Centers for Disease Control and Prevention. Infection prevention and control in dental settings. https://www.cdc.gov/oralhealth/infectioncontrol/index.html.