Coronavirus disease 2019 pandemic: An opportunity for transformation, innovation, and advocacy

1 CLINICAL TRANSFORMATION

Clinical training is one of the essential aspects of oral health professional education because it is a fundamental component generating practice-ready graduates. In general, clinical training occurs in two types of clinical locations: intramural, within the school clinics, or extramural, within community-based clinics. It is well known that routine dental procedures create aerosols from spattering resulting from the use of high-speed handpieces and ultrasonic scalers.1 Severe acute respiratory syndrome coronavirus 2 virus (SARS-CoV-2), a respiratory virus having the potential to be transmitted via aerosol-generating procedures, such as using ultrasonic scalers, created justifiable concerns during the pandemic. Most schools of dentistry operate clinics with an open bay concept with approximately 40 or more chairs. Therefore, as the pandemic emerged oral health professional workers, including students and residents, were potentially at risk for being exposed to and or transmitting coronavirus disease 2019 (COVID-19).2

In order to mitigate these risks, regulatory agencies (Centers for Disease Control and Prevention and Centers for Medicare and Medicaid Services) and local municipalities logically provided guidance to delay elective inpatient and outpatient dental procedures.3 During this time, several investigations were performed to evaluate the pattern of aerosol transmission and the impact of mitigation devices.4 As oral health educators complied with these guidelines, they also began to strategize, create, investigate, and transform clinical aspects of oral health education.5

The combination of local executive orders and agency guidelines resulted in institutions modifying clinical space and clinical flow to ensure the safety of practitioners and students/residents. These measures included ensuring operatories were six feet apart, evaluating airflow and filtration, requiring practitioners to wear fit-tested N-95 respirators and face shields, installing Plexiglas-like barriers, and adding external evacuation systems and high-efficiency particulate air-based air purification units. Although oral health clinical environments were not found to be a source of virus transmission, throughout the country one takeaway from these experiences is the need for design modifications to increase our ability to reduce and capture aerosolized particles. Several investigators provided data to provide a better understanding of the clinical environment, such as the study from Zhu et al., who evaluated aerosol generated from high-speed handpieces and among other things concluded that plastic barriers reduce aerosolized particles in adjacent operatories and supplemental external evacuation system could not capture all aerosols.2 Caution is warranted with the placement of plastic barriers, as clinical ceiling heights limit some facilities’ ability to install plastic barriers, as it potentially restricts airflow and air exchange. Ou et al., evaluated the spatter from ultrasonic scaling and revealed the use of high-volume evacuation and extraoral local extractors considerably reduced aerosols.4 There is a continuous need for educators and researchers to investigate how patient care can be safely performed in large open bay clinics. What is the optimum air exchange for our clinics? Maybe larger clinics could be designed to accommodate multiple smaller clinics and facilitate quicker operatory turnover. The pandemic has given new knowledge and presented an opportunity to advocate for the redesign of spaces our students and faculty work in on a daily basis.

2 HEALTH SYSTEM ENGAGEMENT

On August 3, 2020, the World Health Organization advised “…routine non-urgent oral health care…be delayed until there has been sufficient reduction in COVID-19…” Although, I understand the surge that occurred worldwide justified this recommendation, and it was critical for us to mitigate viral transmission. However, there was a failure to integrate into this decision information learned in the previous months. After the immediate stoppage of routine dental care and other routine health care, based upon uncertainty and stay-at-home mandates, practicing dentists and school-based clinics implemented protocols allowing care to be provided. Clinics modified schedules, incorporated testing protocol, installed plastic barriers, extraoral evacuation devices, and air filtration units to...
create a safer clinical environment. The World Health Organization’s (WHO’s) recommendation negated these modifications, minimizing the importance of oral health and insufficiently appreciating the role oral health has on overall health.6

Considering the care provided by students and residents at dental institutions, there is a significant amount of care benefiting underserved populations, underinsured, and patients on public insurance. During the initial surge of the SARS-CoV-2 pandemic, these groups were disproportionately impacted and changes in employment resulted in the loss of insurance coverage for many.7,8 The closure of dental and dental hygiene students’ clinics disrupted preventive and ongoing care for patients most in need. Providing ongoing periodontal therapy for diabetic patients is extremely beneficial to helping regulate their diabetes and it is not uncommon for oral cancer and other pathologies to be diagnosed during a routine dental visit. Therefore, the blanket recommendation by the WHO was short-sighted regarding the essential nature of oral health.

The pandemic has confirmed for oral health professionals that advocacy is imperative. We experienced the benefits of such advocacy as state after state recognized what we already knew: we are very capable of giving injections and should be allowed to provide COVID-19 vaccinations. Organizations such as the American Dental Association, American Dental Education Association, American Association for Dental, Oral, and Craniofacial Research, and the Santa Fe Group have all been viable advocates for oral health. The pandemic demonstrated that it is critical for our profession to advocate for our role in the health system. Our graduates should be trained with the competencies and skills allowing them to be partners with other health professionals to improve population health. This is an opportune time to reignite our collaborations in the interprofessional and collaborative practice landscape reinforcing that the mouth is the gateway to the body.

3 INSTRUCTIONAL CONTENT DELIVERY

Most of you, like me, have never experienced an educational disruption immediately removing the familiar, traditional, and planned format for instructional content delivery. The adaptation necessary to reshape didactic and preclinical instruction was more easily facilitated by some, as it required either an expansion of online and remote didactic instruction or the introduction into our curriculum. Maybe your experience was similar to ours, with the University providing guidelines but may not have considered the need for preclinical teaching and not fully appreciated the challenges to facilitating remote learning. Fortunately, as the new knowledge was released, our ability to use physical distancing facilitated our return to in-person instruction.

For decades, we have appreciated the ease and efficiency of large cohort instruction. We have preclinical spaces that facilitate the delivery of instruction, training one hundred plus learners at the same time. Although no aerosol-generating procedures are performed in this environment, we learned having one hundred individuals in a single space may not be advisable when trying to mitigate the spread of an airborne virus when other protections, such as vaccines are unavailable. As we consider the possibility of ongoing COVID-19 transmission and infection, we must consider the possibility of additional disruptions and be prepared to transition the format of instructional content delivery including preclinical training.

How can we partition preclinical laboratory space or ensure appropriate air exchange and filtration to facilitate multiple small groups within a larger space? Are there effective ways to provide remote feedback for preclinical experiences? Are there reasonable units that students can use remotely to perform preclinical tasks that are cost-effective? Is it safe for students to perform some of the tasks in their homes? Are faculty able to evaluate and mentor students in their learning process? When considering preclinical instruction there are many questions to be answered. The pandemic has shown us the need to create flexible learning environments for the next unknown disruption.

4 AN OPPORTUNITY

Oral health professional educators have demonstrated commitment, flexibility, ingenuity, and resilience since March of 2020 ensuring that educational programs were able to continue. During this time, some of us have learned new ways to deliver content and train learners. Some of these modifications were driven by necessity, like the introduction of evacuation systems and air filtration units into the clinical environment. There is still a need for further research to evaluate the best air exchange rates and filtration rates for our large open clinic format and determine the benefits of mitigation devices such as auxiliary air filtration units and external evacuation units. One of the most positive outcomes from the many transitions during the pandemic was the shift to manikin-based licensure examinations.9 These examinations resulted in the similar passage and failure rates and the agency developed processes that were efficient and effective. This pandemic has certainly demonstrated to us the time to move away
Oral health professionals have always understood the need for advocacy, and the last 2 years have reinforced the need for dentistry to be at the table. It has been exciting to see dentists engaged in vaccine distribution and administering COVID-19 testing. As the consideration for greater oral health coverage in Medicare and Medicaid, our advocacy is extremely vital. Whether by necessity or creativity, there is an opportunity for us in this season. The question is, will we boldly envision how to move into the future embracing new thinking or will we fall back into the comfort zone of normal and familiar?

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**REFERENCES**

1. Bentley C, Burkhart N, Crawford J. Evaluating spatter and aerosol contamination during dental procedures. *J Am Dent Assoc*. 1994; 125: 579-584.
2. Zhu M, Medina M, Nalliah R, et al. Experimental evaluation of aerosol mitigation strategies in large open-plan dental clinics. *J Am Dent Assoc*. 2021. https://doi.org/10.1016/j.adaj.2021.07.030
3. State of Minnesota Executive Order 20-51–requiring facilities to prioritize surgeries and procedures and provide safe environment during COVID-19 peacetime emergency. Accessed January 30, 2022 https://mn.gov/governor/assets/EO%2020-51%20Final%20%28002%29_tcm1055-431183.pdf
4. Ou Q, Placucci R, Danielson AG, et al. Characterization and mitigation of aerosols and spatters from ultrasonic scalers. *J Am Dent Assoc*. 2021; 152(12): 981-990. https://doi.org/10.1016/j.adaj.2021.06.007
5. Ruona K, Mosenge D, Trieu A, Saeed S. Consolidating clinical care during the COVID-19 pandemic. *J Dent Educ*. 2020; 85(Suppl): 1090-1091.
6. Mays KA. The ability of oral health professionals to significantly influence improving overall health. *J Dent Educ*. 2021; 85: 7-10. https://doi.org/10.1002/jded.12338
7. Luck AN, Preston SH, Elo IR, Stokes AC. *The Unequal Burden of the COVID-19 Pandemic: Capturing Racial/Ethnic Disparities in US Cause-Specific Mortality*. SSM-Population Health; 2022. https://doi.org/10.1016/j.ssmph.2021.101012
8. Choi SE, Simon L, Riedy CA, Barrow JR. Modeling the Impact of COVID-19 on dental insurance coverage and utilization. *J Dent Res*; 100(1): 50-57. https://doi.org/10.1177/0022034520954126
9. Chu TMG, Makhoul N, Silva DR, Gonzales T, Letra A, Mays KA. Live patient licensing examinations: two viewpoints. *J Dent Educ*. 2018; 82(2): 246-251.