

Dental Sedation Precautions and Recommendations during the COVID-19 Pandemic

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• Conflicts of interest: none declared.

Dear Editor,

The paper “Coronavirus disease 2019 (COVID-19): A preventive approach to Dentistry”¹ is timely and relevant; however, the recommendations on the relationship between dental sedation and COVID-19 are not clear in any protocol or guidelines. In this letter, we seek to direct the concepts presented in that review¹ and in the updated literature to systematize recommendations for the practice of sedation in the dental office during this pandemic.

Evidence on the dissemination of the new coronavirus

To date, April 3, 2020, at 18 hours and 36 minutes, 1,093,107 cases of COVID-19 and 58,729 deaths from the disease have been reported worldwide. In Brazil, the respective frequencies are 9,056 cases and 359 deaths. Based on current data, the lethality rate for the new coronavirus (SARS-CoV-2 - Severe Acute Respiratory Syndrome Coronavirus 2) is estimated at 3.4%.² These data are updated daily to follow the quickly-changing numbers.

As the number of cases has grown exponentially and is a worldwide problem, the World Health Organization (WHO) declared, on March 11, 2020, that COVID-19 is a pandemic because it is a new disease with worldwide spread and sustained transmission.³

A portion of the SARS-CoV-2-infected people are asymptomatic and 80% of those who develop symptoms have a mild form of the disease.² Therefore, a person might be an asymptomatic carrier of SARS-CoV-2 or symptomatic with acute respiratory disease that can evolve to pneumonia and death.⁴ Unidentified cases of COVID-19 are responsible for the infection of 79% of documented cases.⁵

COVID-19 transmission occurs through exposure of the ocular, nasal, and oral mucosa with droplets/aerosols that contain SARS-CoV-2 derived from secretions of airways, saliva, or blood.¹ Thus, COVID-19 also presents a high risk for health professionals in the perioperative environment – dental/medical offices, outpatient wards, emergency rooms, and intensive care units.⁶ The significant viral load concentrated in the upper airways has led to the great spread of the disease among professionals who deal

in the head and neck region, including ophthalmologists, otorhinolaryngologists, endoscopists, surgeons, and dentists, despite established precautionary measures.⁷ Therefore, it is imperative to adopt standard operating procedures to block the perioperative transmission of SARS-CoV-2.

General guidelines for respiratory aerosol management in health environments

It is well known that dental practice is associated with the generation of droplets and aerosols through the mist of the triple syringe, use of engine with spray, bicarbonate jet, and ultrasound, among other procedures, which favors the virus’ spread.¹

On March 31, 2020, the Brazilian national health surveillance agency (“Agência Nacional de Vigilância Sanitária” – ANVISA) updated The Technical Note GVIMS/GGETES/ANVISA number 04/2020, with support from the Federal Council of Dentistry, with the aim of guiding health services on prevention and control measures that should be adopted during care for suspected or confirmed cases of infection by SARS-CoV-2, including dental care.⁸ Among these guidelines, it is noteworthy that: the procedures that can generate aerosols should preferably be performed in a respiratory isolation unit with negative pressure and HEPA (*High Efficiency Particulate Arrestance*) filters; dentists should postpone elective procedures; and dentists should perform only urgent procedures or dental emergencies using measures that minimize the generation of aerosols and salivary and blood spatter.⁸

Therefore, it appears that dental care during the COVID-19 pandemic, although restricted to urgent treatment and emergency cases, presents a high risk of nosocomial transmission from patients to the dental team, even though dental teams are using individual protection equipment and other measures to minimize contact with and generation of aerosols.

As with general dentistry, anesthesia procedures may generate aerosols, such as in orotracheal intubation, noninvasive mechanical ventilation, and high-flow oxygen delivery.^{9,10} The same recommendations from ANVISA

also indicate that elective anesthesia procedures must be temporarily avoided during the pandemic phase.⁸ Additionally, the Brazilian Society of Anesthesiology recommends that: sedation and general anesthesia procedures, when necessary, must be performed through closed circuits; patients infected or suspected of being contaminated by COVID-19 are treated with anesthesia machines that are used specifically for such patients; and reusable anesthetic materials are processed according to orientations from the Hospital Infection Control Commission after each use and the tracheas must be disposable.⁹

It is suggested that patients with COVID-19 and acute respiratory failure be treated in negative pressure isolation rooms (if available) with low-flow oxygen via nasal catheter (up to 5 liters / minute) to minimize the spread of droplets and aerosols. However, if this therapy is not enough, patients are submitted to early intubation due to the potential for aerosolization and contamination of professionals. There is an unprecedented recommendation to clamp the distal end of the intubation cannula and avoid manual-assisted ventilation with a bag-valve-mask device, even with a drop in oxygen saturation, until connection to the mechanical ventilator. Non-invasive ventilation for these patients is extremely restricted and performed in intensive care units with human and physical resources that are properly prepared to control nosocomial contamination by the virus.¹¹

Therefore, sedation in the dental office deserves special attention during the COVID-19 pandemic. Inhalation sedation with nitrous oxide and oxygen, for example, generates aerosols by the flow of gases in a semi-closed circuit, which often exceeds the volume of 5 liters per minute, and easily reaches the environment because the nasal mask is not completely sealed.¹² Contamination by nitrous oxide and oxygen gases can reach up to 2 meters from the radius in which the nasal mask is installed; thus it can spread aerosols to the surfaces of furniture and equipment, in addition to direct contamination to the dentist and dental staff. Moreover, contamination may extend to the companions of pediatric or special care needs patients. Enteral or parenteral sedation would not lead to additional aerosols in the dental context when performed without supplemental oxygen. However, it must be considered that any procedure under sedation may require basic life support measures to control adverse cardiorespiratory events and would thus generate aerosols. In other words, sedation creates another source of risk of spreading SARS-CoV-2 in dentistry.

Ethical issues

In the context of health care in a pandemic phase, all people should be treated as suspected of having SARS-CoV-2 as the confirmation tests of this disease are insufficient and there are asymptomatic cases (or even cases in the early stage of infection) that can also transmit the virus.

The scarcity of resources to deal with the pandemic is also reflected in the insufficient amounts of essential drugs, ventilators, and beds in intensive care units, increased demand from patients in the health system, and illness of professionals working on the front lines in the fight against COVID-19.

Meanwhile, knowledge about the etiopathogenesis, prevention, and treatment of COVID-19 is under construction, given the novelty of the disease. Therefore, the health professional must be guided by the maxim “primum non nocere” – a Latin expression that means “first, do not harm,” as represented in the Hippocratic Oath professed by health professionals at the time of their graduation. In this sense, the dental surgeon must also be guided by avoiding unnecessary risks, damages, and costs to patients, health staff, and society, considering that “avoiding the transmission of COVID-2019 is still the most efficient public health effort for lessen its impact.”⁶

The practice of sedation in dentistry comprises, in addition to professional skills, the use of adequate infrastructure that involves the supply of medicinal gases and their respective conditioning cylinders, which may be necessary for hospitalized and severely infected patients in both public and private hospitals. Also, possible complications from sedation and, consequently, the need to refer patients to hospitals (secondary level of care) must be foreseen and, thus, can generate a possible burden for the public and private health services, whose scarce human and structural resources are temporarily focused on combating COVID-19.

Conclusion

For the management of patients with severe anxiety, or phobia, in urgent/emergency dentistry consultations, the following is recommended:

1. Use non-pharmacological techniques to control the patient's anxiety, e.g., those associated or not with protective stabilization (children and people with disabilities), and use minimal intervention dentistry techniques, when indicated.¹³
2. Perform, in severe cases, dental care under general anesthesia using resolutive techniques to solve the patient's dental problem that avoid returns or additional treatments in the short term.
3. **Do not** perform dental procedures under inhalation sedation with nitrous oxide/oxygen during the COVID-19 pandemic in order to mitigate aerosolization and virus spread and the potential risk of performing life support measures that involve handling of airways and the use of hospital resources.

4. **Do not** perform dental procedures under pharmacological sedation due to the need to provide oxygen and the potential risk of needing life support measures that involve the manipulation of airways and use of hospital resources.

References

1. Tuñas ITC, Silva ET, Santiago SBS, Maia KD, Silva-Júnior GO. Doença pelo Coronavírus 2019 (COVID-19): Uma abordagem preventiva para Odontologia. *Rev Bras Odontol.* 2020;77:e1766.
2. Worldometer's Covid-19 data. Disponível em: <www.worldometers.info/coronavirus/#countries> Acesso em: 03 de abr. de 2020.
3. World Health Organization. Coronavirus disease (COVID-19) pandemic. Disponível em: <<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>> Acesso em: 03 de abr. de 2020.
4. Lai CC, Liu YH, Wang CY, Wang YH, Hsueh SC, Yen MY, *et al.* Asymptomatic carrier state, acute respiratory disease, and pneumonia due to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2): Facts and myths. *J Microbiol Immunol Infect.* 2020;pii:S1684-1182(20):30040-2.
5. Li R, Pei S, Chen B, Song Y, Zhang T, Yang W, *et al.* Substantial undocumented infection facilitates the rapid dissemination of novel coronavirus (SARS-CoV2). *Science* 2020;pii:eabb3221.
6. Zucco L, Levy N, Ketchandji D, Aziz M, Ramachandran SK. Perioperative Considerations for the 2019 Novel Coronavirus (COVID-19). Anesthesia Patient Safety Foundation, Disponível em: <<https://www.apsf.org/news-updates/perioperative-considerations-for-the-2019-novel-coronavirus-covid-19/>> Acesso em: 03 de abr. de 2020.
7. Kulcsar MA, Montenegro FL, Arap SS, Tavares MR, Kowalski LP. Alto risco de infecção por COVID-19 para cirurgiões de cabeça e pescoço. Sociedade Brasileira de Cirurgia de Cabeça e Pescoço. Disponível em: <<http://sbccp.org.br/alto-risco-de-infeccao-por-covid-19-para-cirurgioes-de-cabeca-e-pescoco/>>. Acesso em: 04 de abr. de 2020.
8. Agência Nacional de Vigilância Sanitária. Nota Técnica GVIMS/GGTES/ ANVISA Nº 04/2020: Orientações para serviços de saúde: medidas de prevenção e controle que devem ser adotadas durante a assistência aos casos suspeitos ou confirmados de infecção pelo novo coronavírus (SARS-CoV-2). 31.03.2020. Disponível em: <<http://website.cfo.org.br/wp-content/uploads/2020/04/Nota-Tecnica-Anvisa-CFO-contra-covid-19.pdf>> Acesso em 03 de abr. de 2020.
9. Sociedade Brasileira de Anestesiologia. O coronavírus e o anestesiologista. 2. ed. Atualização em 19/03/2020. Disponível em: <<https://www.sbahq.org/ebook/>> Acesso em: 03 de abr. de 2020.
10. Chen X, Liu Y, Gong Y, Guo X, Zuo M, Li J, *et al.* Perioperative management of patients infected with the novel coronavirus: Recommendation from the Joint Task Force of the Chinese Society of Anesthesiology and the Chinese Association of Anesthesiologists. *Anesthesiology*. In press 2020.
11. Associação de Medicina Intensiva Brasileira. Orientações sobre o manejo do paciente com pneumonia e insuficiência respiratória devido a infecção pelo Coronavírus (SARS-CoV-2) - Versão n.03/2020*. Disponível em: <https://www.amib.org.br/fileadmin/user_upload/amib/2020/marco/29/Orientacoes_sobre_o_manuseio_do_paciente_com_pneumonia_e_insuficiencia_respiratoria_devido_a_infeccao_pelo_Coronavirus_SARS-CoV-2_-_Versao_n.032020.pdf>. Acesso em: 04 de abr. de 2020.
12. Organization for Safety Asepsis and Prevention. Nitrous oxide toolkit. Disponível em: <https://www.osap.org/page/Issues_NitrousOxide?page=SegmentEducators> Acesso em: 03 de abr. de 2020.
13. Mallineni SK, Innes NP, Raggio DP, Araujo MP, Robertson MD, Jayaraman J. Coronavirus Disease (COVID-19): Characteristics in children and considerations for Dentists providing their care. *Int J Paediatr Dent.* In press 2020.

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Submitted: 04/05/2020 / Accepted for publication: 04/07/2020

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