

AO CMF International Task Force Recommendations on Best Practices for Maxillofacial Procedures during COVID-19 Pandemic

Executive Summary

1. Surgical procedures involving the nasal-oral mucosal regions are high risk for infection of medical personnel due to aerosolization of the COVID-19 virus.
2. Asymptomatic patients may be infected with COVID-19 virus.
3. Elective procedures and routine ambulatory visits should be canceled.
4. Appropriate PPE should be worn during surgical procedures and urgent ambulatory visits, which includes N95/full face shield or PAPR.
5. Intra-operative measures which limit the generation of aerosolized virus are recommended.
6. Oncologic cases in which a worse outcome is expected if surgery is delayed more than 6 weeks should be performed with appropriate PPE.

Background

The COVID-19 pandemic is now a global problem that has significantly impacted the safe practice of Maxillofacial Surgery. We believe it is important to compile information and experiences that have been gained by colleagues worldwide and define a set of guidelines for best practice for staff performing these procedures, and for patients undergoing maxillofacial surgery procedures. As such, these recommendations should be treated as “expert opinion” and are based mostly on personal communication, guidelines put forth by various national and international societies, and peer reviewed data when possible.

Surgical procedures involving the nasal-oral-endotracheal mucosal region is high risk due to aerosolization of the virus which is known to be in high concentration in these areas when compared to swabs from the lower respiratory tract¹. Further it appears that if viral particles become aerosolized, they stay in the air for at least 3 hours, if not longer². Based on experience in Wuhan, China, and Northern Italy, N95 masks were not enough to control this spread of the disease and it was not until PAPRs (Powered Air-Purifying Respirators) were introduced that transmission of the virus was controlled among medical personnel. It has been reported that the entire staff (14 people) of an operating room in Wuhan were infected during an endoscopic transphenoidal pituitary procedure, and there was a significant mortality of otolaryngologists and ophthalmologists in the Wuhan region, thought to be related to exposure to aerosolized virus from the nasal and oral airway mucosa.

General Comments/Observations

All routine, elective procedures including dental should be cancelled and rescheduled when safe management strategies have been clearly identified. Ambulatory visits should be limited to those patients requiring urgent intervention or follow-up. N-95 with eye protection or PAPR should also be considered for urgent clinic procures. Non-urgent visits can be replaced by a telephone conversation, or videoconference if local regulations permit, and resources are available.

Procedures should be limited to those involving emergent airway management, epistaxis, surgical management of facial fractures which require ORIF, and oncologic procedures in which a delay in management could affect ultimate outcome.

All patients should be assumed to be infected and treated accordingly unless they have had 2 negative COVID-19 tests separated by at least 24 hours due to the possibility of false negative results. In most regions testing of asymptomatic patients is not possible and some trauma patients will not be able to provide a history to risk stratify the patient.

Consideration should be given to limiting patient contact in surgeons that are over 60 years of age, are immunosuppressed, have chronic pulmonary disorders, or multiple co-morbidities. The number of residents and ancillary staff should be limited as much as possible. Proper PPE and training for all members of the team is required.

Specific Recommendations

All procedures listed below are considered high risk, as they create aerosolization of viral particles. Specific tips or suggestions are provided to attempt to mitigate this risk as much as possible, however realize they remain high risk.

PPE recommended for all procedures below are minimum requirement N95 (FFP2) mask plus face shield (or mask/with attached shield over N95), gloves, nonporous gown, disposable hat. Scrubs worn during the procedure should be changed immediately afterwards. It is generally accepted that FFP3 or PAPR provides better protection and should be used in place of N95 mask if available. We realize that PAPRs may not be widely available, and other systems or strategies can be used such as the Stryker Flute system with a FFP3 mask, or and FFP2 or FFP3 mask combined with goggles and a hood.

Airway Management

Intubation should be performed by the most experienced member of the team. This is not the time for multiple attempts, and letting everyone have a turn. Paralysis should be considered to limit coughing. Limit the amount of mask/bag ventilation prior to intubation, and avoid jet ventilation, suctioning as much as is absolutely necessary to mitigate aerosolization. Intubation is preferred over placement of LMA.

For a surgical case, the OR team should be outside the door for 20 minutes following intubation before entering the OR. After this 20-minute delay, the team should enter with appropriate PPE

(N95 or PAPR). The reason for this is after an aerosol generating procedure (AGP), the virus could be present. Based on the OR air exchange per hour, 99% of pathogens should be clear in 14 minutes, and 99.9% by 21 min. All unnecessary personnel should be outside the room for extubation and an oxygen mask should be placed over the face after the tube is removed to mitigate aerosolization with coughing.

Tracheotomy in COVID-19 patients is performed for similar indications to non-COVID patients. Mortality in patients intubated for COVID-19 associated respiratory failure is greater than 50% and duration can be 3 - 6 weeks. The decision for percutaneous or open approach for the procedure is at the discretion of the surgeon. In general, in the hands of an experienced provider, an open approach may lead to less potential aerosolization, and therefore less risk. The patient should be paralyzed, preoxygenated, ventilation held before the trachea is incised to minimize aerosolization. Suctioning should be limited as much as possible, to avoid aerosolization. Bipolar cautery is preferred over monopolar. Advance the tube distally prior to incising the trachea, to avoid creating a hole in the ETT balloon. Closed suctioning systems are preferred for tracheotomy care.

Highlighted recommendations from the American Academy of Otolaryngology include:

<https://www.entnet.org/content/tracheotomy-recommendations-during-covid-19-pandemic>

- Decision-making in tracheotomy should take into consideration the surgical and ICU team's discretion as well as institutional policy.
- Avoid tracheotomy in COVID-19 positive or suspected patients during periods of respiratory instability or heightened ventilator dependence.
- Tracheotomy can be considered in patients with stable pulmonary status but should not take place sooner than 2-3 weeks from intubation and, preferably, with negative COVID-19 testing.
- Adhere to strict donning and doffing procedures based on institutional protocol.
- Limit the number of providers participating in tracheotomy procedure and post-procedure management.
- Perform entire tracheotomy procedure under complete paralysis.
- Rely on cold instrumentation and avoid monopolar electrocautery.
- Advance ETT and cuff safely below the intended tracheotomy site and hold respirations while incising trachea.
- Minimize tracheal suctioning during procedure to reduce aerosolization.
- Choose cuffed, non-fenestrated tracheotomy tube.
- Maintain cuff appropriately inflated post-operatively and attempt to avoid cuff leaks.
- Avoid circuit disconnections and suction via closed circuit.
- Place a heat moisture exchanger (HME) with viral filter or a ventilator filter once the tracheotomy tube is disconnected from mechanical ventilation.
- Delay routine post-operative tracheotomy tube changes until COVID-19 testing is negative.

CMF Trauma

Procedures should be performed by an experienced surgeon, with a minimal number of assistants possible. In general, closed procedures, if internal fixation is not required for stability of the reduction are favored. Specific recommendations follow based on the anatomical region.

Lower face/mandible fractures:

1. Consider closed reduction with self-drilling MMF screws
2. Scalpel over monopolar cautery for mucosal incisions
3. Bipolar cautery for hemostasis on lowest power setting
4. Self-drilling screws for monocortical screw fixation
5. When drilling is required, limit or eliminate irrigation
6. If drilling is required, consider a battery powered low speed drill
7. If a fracture requires ORIF, consider placement of MMF screws intra-orally, then place a bio-occlusive dressing over the mouth, and use a trans cutaneous approach rather than an extended intraoral approach
8. If osteotomy is required, consider osteotome instead of power saw

Midface fractures

1. Consider closed reduction alone if fracture is stable following reduction
2. Consider using Carroll-Girard screw for reduction, and avoid intra-oral incision, if two-point fixation (rim and ZF) is sufficient for stabilization
3. Scalpel over monopolar cautery for mucosal incisions
4. Avoid repeated suctioning/irrigation
5. Bipolar cautery for hemostasis on lowest power setting
6. Self-drilling screws preferred
7. If osteotomy is required, consider osteotome instead of power saw or high-speed drill

Upper face fractures/frontal sinus procedures.

1. Consider delay of non-functional frontal bone/sinus fractures
2. Endoscopic endonasal procedure, and the associated instrumentation (power micro debridors) carry a very high risk of aerosol generation and should be avoided if possible
3. When performing a frontal sinus obliteration or cranialization consider performing the mucosal stripping manually, and not using a burr or power equipment
4. Avoid repeated suctioning/irrigation
5. Bipolar cautery for hemostasis on lowest power setting
6. Self-drilling screws preferred
7. If osteotomy is required, consider osteotome instead of power saw

Oncologic Care (adapted from KP NorCal)

If non-surgical therapy is equivalent to surgery + radiation, non-surgical therapy is recommended.

1. Cases in which a worse outcome is expected if surgery is delayed more than 6 weeks. i. SCCA of the oral cavity, oropharynx, larynx, hypopharynx
2. Cancers with impending airway compromise
3. Papillary thyroid cancer with impending airway compromise, rapidly growing, bulky disease
4. High grade or progressive salivary cancer
5. T3/T4 melanoma (see new recommendations for treatment of melanoma)
6. Rapidly progressing cutaneous SCCA with regional disease
7. Salvage surgery for recurrent/persistent disease
8. High grade sino-nasal malignancy without equally efficacious non-surgical options

Advisement Concerning Dental Procedures (adapted from AAOMS 3/17/2020)

1. Emergency and urgent care should be provided in an environment appropriate to the patient's condition, and with appropriate PPE. Recall that any procedure involving the oral cavity is considered high risk.
2. Asymptomatic patients requesting removal of disease-free teeth with no risk of impairment of the patient's condition or pending treatment should defer treatment to a later date.
3. Asymptomatic patients, patients under investigation, (PUI), and patients tested positive for COVID-19, who have acute oral and maxillofacial infections, active oral and maxillofacial disease, should be treated in facilities where all appropriate PPE, including N-95 masks, are available.
4. Patients with conditions in which a delay in surgical treatment could result in impairment of their condition or impairment of pending treatment (e.g., impairment of the restoration of diseased tooth when another tooth that is indicated for removal prevents access to the diseased tooth) should be treated in a timely manner if possible.

This is an evolving and constantly changing situation, and these recommendations are based on the best available information at this time. Please remember, these are recommendations and not mandates and ultimately the decision of the treatment of patients still rests with the individual practitioner. Our primary goal is to provide safe and effective treatments for our patients, while minimizing the risk to the practitioner as much as possible.

Please send your inputs, comments and questions to: erich.roethlisberger@acmf.org

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References

1. Zou L, Ruan F, Huang M, et al. SARS-CoV-2 Viral Load in Upper Respiratory Specimens of Infected Patients. N Engl J Med. 2020 Mar 19;382(12):1177-1179. doi: 10.1056/NEJMc2001737. Epub 2020 Feb 19.
2. van Doremalen N, Bushmaker T, Morris DH, et al. Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. N Engl J Med. 2020 Mar 17. doi: 10.1056/NEJMc2004973. [Epub ahead of print]

Other Resources

- [University of Stanford Commentary on Nasal Procedures in the COVID-19 Era \(Stanford University SOM, Depts. of Oto-HNS & Neurosurgery, March 2020\)](#)
- [Integrated infection control strategy to minimize nosocomial infection of coronavirus disease 2019 among ENT healthcare workers \(Journal of Hospital Infection, February 22, 2020\)](#)
- [Guidance for Surgical Tracheostomy and Tracheostomy Tube Change during the COVID-19 Pandemic \(ENT UK, March 19, 2020\)](#)
- [British Association of Head & Neck Oncologists – Statement on COVID-19 \(BAHNO, March 17, 2020\)](#)
- [Guidance for ENT surgeons during the COVID-19 pandemic \(Australian Society of Oto HNS, March 20, 2020\)](#)
- [Managing Cancer Care During the COVID-19 Pandemic: Agility and Collaboration Toward a Common Goal \(Journal of the National Comprehensive Cancer Network, March 15, 2020\)](#)