ADVISORY No. 2

ADVISORY ON PERFORMING EMERGENCY NEUROSURGICAL PROCEDURES DURING THE COVID-19 PANDEMIC

As a continuation of AFN Advisory No. 1, the following are additional recommendation for doing neurosurgical procedures during this time of the COVID-19 PANDEMIC:

1. The AFN supports the PCS general advisories in performing surgery during the covid19 pandemic please refer to the PCS Advisories dated March 22, 2020 "PRECAUTIONARY MEASURES FOR EMERGENCY SURGERY DURING COVID PANDEMIC" and March 26,2020 "PCS Guideline on Personal Protective Equipment (PPE) For Surgery During COVID-19 Pandemic". These guidelines can be adapted by neurosurgeons to their particular setting.

2. Minimal OR team as much as possible[1], no observers, students, nonsurgical team members allowed in the operating room.

3. Prefer use of face shields with protective goggles rather than protective goggles alone. Surgical methods such as use of irrigated high-speed drills and thermal cautery appears to promote generation of viral-containing aerosols and should be used with caution[(2,3,4)].

4. There are very few non-emergency, non-urgent neurosurgical procedures so it is better to classify the urgency of the patient's surgical condition (see Advisory 1) for judicious use of the Operating Room and other hospital facilities.

5. In the absence of standard PPEs and PAPRs, may use improvised PPEs[5] for emergency procedures, preferably of non-woven, non-permeable material. For individuals at institutions that are unable to provide N95 masks to all members of the OR team, all surgeons and other personnel who are not wearing N95s may evacuate the OR during intubation, extubation, and other procedures that may generate aerosolized small particles[6].

While PPEs are in short supply, depending on the local situation of neurosurgical practice (i.e. number of practicing neurosurgeons, number of capable hospitals) neurosurgical operations are better limited to hospitals that can provide complete or near complete PPEs, as well as PAPRs and full face respirators with P100 (HEPA) filters when needed by the particular case.

6. Since most hospitals by now have devised their own individual guidelines for admitting surgical patients during this COVID19 Pandemic, as well as procedures on handling these patients postop, neurosurgeons are advised to follow these guidelines (eg some hospitals require that all patients to be admitted are to be seen by the Infectious Disease section prior to admission).

7. **Transnasal Surgery**. These are procedures which require special precaution. A Transcranial approach to the lesion, where a transnasal approach is ordinarily favored, should always be considered. Although the risk of infectivity is still unclear, procedures through the nasopharyngeal poses an inherent danger of COVID19 transmission due to the high detectable viral titers in the said location[7].

At this time of the COVID19 pandemic, surgery through the nasal cavity (endoscopic and non-endoscopic) should be done only for urgent or emergent cases. Endonasal surgery creates clouds of droplets and aerosols which may permeate the operating environment [1]. Preoperative COVID19

testing should be done on all patients who will undergo endoscopic transnasal surgery, whether symptomatic or not. If the test is negative and the patient is asymptomatic, use the normal protective gear[1] (PPEs). If the test is positive, defer surgery as much as possible until the infection is cleared, verified by repeat testing[1] (following DOH protocols).

When endonasal surgery cannot be postponed (urgent) in a COVID-19 positive patient, utilize a PAPR or full-face respirators with P100 (HEPA) filters for everyone in the operating room [1]. If possible, perform two Covid-19 tests, 24 hours apart while the patient is in quarantine and perform the surgery only if the results of the 2 tests are negative.

In the uncommon situation when one is dealing with a pituitary apoplexy where surgery is emergent, assume all patients are COVID 19 positive. Take a swab for COVID testing as part of preop preparation. Consider the transcranial approach. If the endonasal approach is used, PAPR or full-face respirators with P100 (HEPA) filters is recommended for everyone in the operating room. In its absence, well fitted N95 masks, eye protection (goggles/full face shield), with full PPEs should be used[8].

Non-transnasal Endoscopic procedures. The aerosol-generating effect of neurosurgical endoscopic procedures is not well established, although there is a recommendation to avoid non-neurosurgical endoscopic procedures (eg gastroscopy). Therefore, these are better avoided unless the benefits of these procedures far outweigh the traditional non-endoscopic approaches.

9. Avoid direct exposure to high risk areas of the hospital and make good use of virtual technology for referrals/ consultations. The emergency room/admitting section frontliners can do the workup of patients under the guidance of the neurosurgical team who may just see the patient in the operating room, icu or at the wards.

10. For emergency spine surgeries, the patient should be considered COVID positive unless proven otherwise. All operating theatre personnel should wear proper protective equipment and hospital protocols for disinfection should be practiced. Aside from taking a preoperative specimen for COVID testing, the following strategies should be kept in mind: (1) Consider using minimally invasive spine surgery and minimize the scope of surgery, thus shortening the operative time. (2) Prone position is preferred to avoid transmission by respiratory droplets. (3) Reduce the use of electrotomes, and use suction devices with caution to reduce aerosol diffusion. (4) Surgery should be performed with care, avoiding body fluid spatter and sharp instrument injury. (5) Limit the traffic in and out of the operating theatre[9].

11. If feasible, neurosurgeons in a given locality may organize themselves to see patients or do surgery on rotation basis among themselves. This is to minimize exposure and minimize virus load from asymptomatic Covid positive patients.

12. Depending on availability of tests and urgency of the case, it is recommended to do rapid antibody testing and/or RT-PCR prior to surgery for emergency cases. At the very least, samples for covid testing should be collected prior to surgery.

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References.

1. Zara M. Patel, MD; Juan Fernandez-Miranda, MD; Peter H. Hwang, MD; et al. Stanford University School of Medicine Departments of Otolaryngology-Head & Neck Surgery and Neurosurgery. PRECAUTIONS FOR ENDOSCOPIC TRANSNASAL SKULL BASE SURGERY DURING THE COVID-19 PANDEMIC. This article has been accepted for publication in Neurosurgery published by Oxford University Press.

2. Workman, et al. Endonasal Instrumentation and Aerosolization Risk in the Era of COVID-19: Simulation, Literature Review, and Proposed Mitigation Strategies. Int Forum Allergy Rhinol. 2020.

3. 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.

4. Brüske-Hohlfeld I, Preissler G, Jauch KW, et al. Surgical smoke and ultrafine particles. J Occup Med Toxicol 2008.

5. PMA ADVISORY FOR OUR COVID-19 FRONTLINERS. PMA guidelines dated March 26, 2020.

6. American College of Surgeons. ACS: COVID-19 and Surgery, Personal Protective Equipment (Other PPE Recommendations). https://www.facs.org>covid-19>ppe

7. 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; 382:1177–1179

8. Yu Tung Lo MBBS, MRCS; Neville Wei Yang Teo MBBS, MRCS, MMed;–and Beng Ti Ang MBBS, FRCSEd(SN). Departments of Neurosurgery and Otolaryngology, Singapore General Hospital, Singapore. Editorial. Endonasal neurosurgery during the COVID-19 pandemic: the Singapore perspective. Journal of Neurosurgery.
DOI**:** https://doi.org/10.3171/2020.4.JNS201036

9. PHILIPPINE SPINE SOCIETY GUIDELINES DURING THE COVID-19 PANDEMIC. April 2020.