

Augusta University Department of Otolaryngology – Head and Neck Surgery
Resident Use of Personal Protective Equipment (PPE) during the COVID-19 Pandemic

Background: The COVID-19 pandemic presents numerous challenges to the Graduate Medical Education (GME) community. Among the most important difficulties are the competing interests of allowing residents to fulfill their professional duty to care for patients, while at the same time providing them with appropriate protective measures to preserve their own health and well-being. The ACGME has mandated that residents be provided with appropriate guidance and training prior to engaging in the care of patients with known or suspected infection with COVID-19.

Purpose: This policy will delineate the procedures Otolaryngology residents should follow and how PPE should be used while completing clinical duties during the COVID-19 pandemic.

Procedures:

- 1) Hospital scrubs should be worn during all patient encounters, regardless of suspected COVID-19 infection. Residents should change into hospital scrubs on arrival to work and change back into street clothes before going home. Hospital scrubs are NOT to be worn outside of the hospital, and should NOT be laundered at home.
- 2) Avoid using personal phones in patient care areas. Clean phones regularly.
- 3) Flexible and rigid scope exams should only be performed if absolutely necessary (e.g. suspected invasive fungal sinusitis, head/neck cancer, or angioedema/acute airway obstruction), and should be discussed with a faculty member PRIOR to performing, except in the emergent setting.
 - a) Disposable scopes with monitor to be used for all inpatient and ED consults until further notice
 - b) The scope monitor must be thoroughly cleaned immediately upon leaving the examination/patient room
- 4) As per hospital policy and CDC recommendations, Standard Precautions should be taken with patients not suspected to have COVID-19 infection. Standard Precautions for any examination of mucosal surfaces in the head/neck region in Otolaryngology-Head and Neck Surgery include:
 - a) Surgical mask and eye protection
 - b) Clean nitrile gloves
- 5) If a patient is NOT suspected to be infected with COVID-19, but requires an aerosol-generating procedure (AGP) such as flexible/rigid endoscopy, drainage of peritonsillar abscess, emergent transnasal fiberoptic intubation, etc., or requires tracheostomy or laryngectomy stoma care, the following PPE should be used:
 - a) Surgical mask and eye protection
 - b) Impermeable gown
 - c) Clean nitrile gloves
- 6) If a patient is known or suspected to be infected with COVID-19, the following PPE should be used:
 - a) N95 respirator
 - b) Face shield
 - c) Surgical hat

- d) Impermeable gown
 - e) 2 sets of clean nitrile gloves
- 7) Protocol for donning of PPE:
- a) Wash hands with soap and water
 - b) Put on mask, face shield, and hat
 - c) Put on 1st set of gloves
 - d) Put on impermeable gown
 - e) Put on 2nd set of gloves
- 8) Protocol for removal of PPE:
- a) Remove outer gloves
 - b) Gel inner gloves
 - c) Remove gown, roll and discard along with second pair of gloves
 - d) Go outside of room
 - e) Remove and discard eye protection & mask
 - f) Clean hands
- 9) The number of residents and other healthcare professionals present during any aerosol-generating procedure should be limited to only those essential for patient care and procedure support. Visitors should not be present for the procedure.
- 10) While on duty residents should observe proper social distancing (> 6 ft) as much as possible. Residents are not allowed to congregate in the Resident Office and should only enter the office one at a time to store or retrieve personal effects.

References:

Zhonghua Er Bi Yan Hou Tou Jing Wai Ke Za Zhi. 2020 Feb 2;55(0):E001. doi: 10.3760/cma.j.issn.1673-0860.2020.0001. [Epub ahead of print]
[Suggestions for prevention of 2019 novel coronavirus infection in otolaryngology head and neck surgery medical staff]. (Attached)

CDC Guidelines

[Suggestions for prevention of 2019 novel coronavirus infection in otolaryngology head and neck surgery medical staff].

[Article in Chinese; Abstract available in Chinese from the publisher]
[Xu K](#)¹, [Lai XQ](#)², [Liu Z](#)¹.

2019-nCoV is an enveloped, non-segmented, single-stranded positive-strand RNA virus with round or oval particles and a diameter of about 60 to 140 nm. It is a new type of coronavirus belonging to the genus β with SARS-CoV [1]. Current research shows that the 2019-nCoV has 86.9% homology with bat SARS-like coronavirus (bat-SL-CoVZC45, MG772933.1) [2]. The host is generally considered to be a chrysanthemum bat, but the existence of an intermediate host has not been confirmed. Studies have suggested that mink and snake may play the role of intermediate host [3], but the current source of infection is mainly pneumonia patients infected by new coronavirus [1]. According to existing knowledge, the virus is thermally sensitive and can be inactivated by exposure to ultraviolet light or at 56 ° C for 30 minutes. At the same time, the use of lipid solvents such as ether, 75% ethanol, chlorine-containing disinfectant, peracetic acid and chloroform can effectively inactivate the virus, and chlorhexidine cannot effectively inactivate the virus [1].

The new coronavirus is considered to be generally susceptible to the population [1], and has the ability to transmit from person to person, including: respiratory droplet transmission and contact transmission, or can be transmitted through direct contact with virus-containing secretions [4,5]. The elderly and those with underlying diseases are more severely affected after infection, and children, infants and young children also develop symptoms, but the symptoms are relatively mild [5]. Loss of ciliary oscillations can be found in human respiratory epithelial cells 96 hours after infection with 2019-nCoV [2]. At present, the way that 2019-nCoV infects cells is not clear. It is speculated that the bat-like SARS virus, which may be closely related to it, also uses human angiotensin-converting enzyme 2 as a receptor to bind and replicate. Studies have shown that the average incubation period of the new coronavirus is 5.2 days (the 95% confidence interval is 4.1 days to 7.0 days), and the 95th percentile is 12.5 days [4]. Compared with SARS virus, pneumonia caused by the new coronavirus is generally milder but more spread, and has a longer incubation period, making it more difficult to prevent

and control [4,5,6].

Second, the treatment of fever patients in the otolaryngology head and neck surgery clinic

Medical staff's 2019-nCoV infections have emerged as the disease has spread. Of the initial 425 patients, 15 were medical staff [4]. Due to the large flow of medical personnel in the environment, not only a large number of contacts with patients, but also extensive contact with other medical personnel, cross-infection is easily caused. Therefore, how to reduce the infection of medical personnel has become an urgent issue in the current fight against new coronavirus pneumonia.

Otolaryngology head and neck surgery has many fevers caused by upper respiratory tract infections, such as: influenza, acute tonsillitis, acute sinusitis, and acute otitis media. In addition, patients with lymphoma in the nasopharynx also present with repeated persistent fever. At present, in the areas where the new coronavirus is endemic, hospitals usually divert these patients to fever clinics. Once patients are excluded from related diseases such as new coronavirus pneumonia, such patients may return to ENT surgery. These patients may be infected with 2019-nCoV at the fever clinic or have 2019-nCoV left on their skin and clothing due to insufficient protection. Therefore, for fever patients, whether or not they are infected with the new type of coronavirus pneumonia, medical staff of ENT surgery should be adequately protected.

According to the current standard of grading protection [7], general protection: wear work clothes, disposable surgical masks, and latex gloves if necessary; primary protection: wear work clothes, disposable work caps, disposable surgical masks, disposable gowns, and Latex gloves; secondary protection: wear disposable work caps, medical protective masks (N95 or N99), protective glasses (anti-fog type), protective clothing or face shields, work clothes (white coat) coats, disposable protective clothing or once Anti-permeability isolation gown, disposable latex gloves, and disposable disposable shoe covers if necessary; tertiary protection: use a comprehensive protective mask, comprehensive respiratory protective device or positive pressure headgear on the basis of secondary protection [8]. It is recommended that in areas where the new coronavirus is endemic, secondary protection is recommended as a baseline for patients with fever, and tertiary protection may be used if necessary for 2019-nCoV suspected or confirmed cases [8,9,10].

3. Medical protection for outpatient examinations of patients with new type of coronavirus infection

Otolaryngology head and neck surgery clinics include oropharynx, nasal cavity, indirect laryngoscope, and indirect nasopharyngoscope. Some patients

with new-type coronavirus pneumonia have cough (82%), runny nose (4%), sore throat (5%) [11], nasal congestion, sneezing and other symptoms [5,12], which is easily confused with undergraduate related diseases . A sample study of a familial infection 2019-nCoV suggests that of the 6 2019-nCoV infected patients obtained, 5 patients were positive for 2019-nCoV by RT-PCR on nasopharyngeal smears; in 4 oropharyngeal samples Of the smears, 3 showed 2019-nCoV positive; of the 2 serum samples, 1 2019-nCoV was positive, suggesting that 2019-nCoV is present in the throat of most patients [5]. During ENT examination, it can cause cough, pharyngeal reflex, and sneezing. The droplets produced by patients with new coronavirus infection, such as talking, coughing, and sneezing, can carry the virus to a distance of 1 to 2 meters. And cause the virus to form an aerosol [9,10]. When medical personnel perform relevant physical examinations, they are slightly improperly protected and easily infected, which is a high-risk exposure [9]. Therefore, in the Otolaryngology head and neck surgery clinic, it is recommended to reduce the relevant physical examination. For patients with new-type coronavirus infections that must be checked, it is recommended to check the secondary protection as the benchmark; for patients at risk of splashing, such as: electronic nasopharyngoscope, nosebleeds, and emergency tracheotomy in outpatients, three Level protection [9,13].

Medical protection against surgery for patients with a new type of coronavirus infection

For patients who have been diagnosed with a new type of coronavirus infection and must undergo surgery, they must notify the anesthesiologist and the operating room in advance of the surgical connection [14]. It is necessary to choose a negative pressure operating room or an isolated operating room, minimize unnecessary instruments, equipment, and articles in the operating room, strengthen disinfection and isolation measures, and prepare isolation protective equipment [15]. Endotracheal intubation should be performed using standard rapid sequential intubation, and muscle relaxants should be used whenever possible to minimize the spread of droplets caused by coughing in patients [14]. Since the patient's serum may carry the 2019-nCoV virus [5], in order to prevent blood spatter during surgery, the surgical team recommends three levels of protection. The hospital's infection management department was notified for terminal disinfection after the operation. The patient was sent to an isolation ward after surgery, and the body temperature returned to normal for more than 3 days. The respiratory symptoms improved significantly, pulmonary imaging inflammation was significantly absorbed, and two consecutive consecutive respiratory pathogen nucleic acid tests were negative (sampling interval at least 1 day). Transfer to the corresponding department for treatment of other diseases according to the condition [14].

V. Medical protection for non-fever patients who come to the otolaryngology head and neck surgery clinic

More than 80% of patients with new coronavirus pneumonia are associated with fever [2,11]. However, the average incubation period of new coronavirus pneumonia is 5.2 days, and the longest incubation period can reach more than 14 days [4]. During the incubation period, the patient does not have any symptoms, but is still infectious and becomes an important source of viral infection [1].

Otolaryngology head and neck surgery is a department that is in close contact with the patient's throat. Therefore, in areas where the new coronavirus pneumonia is endemic, it is recommended that medical staff who consult patients without fever should wear medical protective masks, goggles / face shields, and disposable anti-permeation. For gowns, it is recommended to consider tertiary protection as appropriate for patients at risk of splashing. For patients who do not need a nasopharyngeal examination, it is recommended to give the patient a disposable surgical mask before the visit to reduce the risk of both the doctor and the patient infected with 2019-nCoV.

6. Preoperative investigation of new coronavirus infection and medical protection for patients with no fever

Epidemic history is an important part of diagnosis. The following conditions need to be vigilant [1]: (1) travel history or residence history in Wuhan area or other areas where local cases continue to spread within 14 days before onset; (2) 14 days before onset Have contacted patients with fever or respiratory symptoms from Wuhan or other areas where local cases of continuous transmission have occurred; (3) Aggregative onset or epidemiological association with new coronavirus infection. In accordance with the National New Coronavirus Pneumonia Diagnosis and Treatment Program (trial version 4). For the above epidemiological history, accompanied by typical blood routine (normal or reduced white blood cells in the early stage of onset, or decreased lymphocyte count) and chest CT manifestations (multiple small patchy shadows and interstitial changes in the early stage, marked by extrapulmonary bands) Developed into multiple ground glass infiltration and infiltrates of the lungs, severe pulmonary consolidation and rare pleural effusion can be considered as suspected cases [1].

It is worth noting that in the course of severe and critically ill patients, there may be moderate to low fever, even without obvious fever. Some patients showed only low fever, mild fatigue, and no pneumonia. Therefore, the absence of fever does not rule out new coronavirus infections, nor does it rule out the infectivity of such patients [1]. Typical blood routine and chest CT findings help identify patients with potential new coronavirus pneumonia [1]. However, research results show that typical pathological changes can be

seen 96 hours after infection with 2019-nCoV [2], and there is a latency period of 4.1-7.0 days for 2019-nCoV infection [4], so within 96 hours after 2019-nCoV infection Patients are likely not to have typical chest CT findings but remain contagious. Another group of cases of familial infection 2019-nCoV reported a case of a 10-year-old child with no clinical manifestations such as fever, cough, diarrhea, and complete normal haematology. Only slight and focal small pieces were seen on lung CT. Ground-glass-like changes [5] suggest that normal hemograms cannot rule out new coronavirus infections. Therefore, given that the current 2019-nCoV infection patients cannot be completely excluded before surgery, and there is a potential greater risk of cross-infection by medical staff, the use of tertiary protection for all surgical patients will cause a large medical economic burden, and Conducive to epidemic control. It is recommended not to perform elective surgery of otolaryngology head and neck surgery as far as possible in areas where the new coronavirus pneumonia is endemic. Emergency operations should be carried out on the basis of proper protection.

Summary

Recently, the situation of combating the new coronavirus pneumonia epidemic situation is grim. It is necessary for the medical staff of the otolaryngology head and neck surgery nationwide to strike a balance between carrying out daily medical activities and avoiding doctor-patient 2019-nCoV infection. The general recommendations of this article are: (1) For areas with severe outbreaks, given that ENT surgeons are at high risk, the number of routine outpatient and ward work for non-emergency cases should be reduced as much as possible to cooperate with national epidemic prevention and control; (2) For areas with severe epidemics, outpatient medical staff need to adopt secondary or tertiary protection, and surgical staff recommends tertiary protection; (3) For latent or asymptomatic carriers, there is currently no effective screening method. With the progress of epidemic prevention and control and diagnosis and treatment, it is hoped that this recommendation will be further updated and improved.