Sustaining Otolaryngology services for the long haul during the COVID-19 pandemic: Experience from a tertiary health system.

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Abstract

The impact of the COVID-19 pandemic has been far-reaching and has affected the practice of Otolaryngology profoundly in an unprecedented way. In this commentary, we draw from our experience in the first 90 days of the pandemic and discuss a set of workflow measures, PPE protocols and strategic goals that can provide a safe environment for patients and staff to continue managing a significant proportion of patients in the Otolaryngology service during the pandemic.
It was just before the turn of the new year that a horizon scanning detection system at our institution flagged an outbreak of pneumonia of unknown etiology in Wuhan City, Hubei Province, China. It was December 31 2019, the Wuhan Municipal Health Commission had just reported 27 cases of unexplained viral pneumonia related to the Huanan Seafood Market.\(^1\) With the sparse information available, it was thought that this infection might be similar to the severe acute respiratory syndrome (SARS) outbreak that had impacted East Asia in 2003.

This set into motion preparation plans within our health system for managing a potentially lethal outbreak that could rapidly escalate. Within the specialty of Otolaryngology – Head and Neck Surgery, we drew on existing protocols based on our experience with SARS as well as the Influenza A (H1N1-2009) pandemic. As reports detailing the epidemiology and infectivity of COVID-19 emerged, as well as the rapid extent of global transmission, it became evident that COVID-19 was going to be a pandemic lasting beyond a few months.

Apart from nation-wide measures in Singapore to flatten the epidemic curve, our health system’s strategies in this outbreak were to (1) detect and isolate COVID-19 patients early, (2) keep the hospital environment safe for patients and staff, and (3) to be able to continue, for as long as possible, to manage existing and new patients without significant disruption to their clinical care.

The care of patients with Otolaryngology complaints poses a unique challenge in the setting of COVID-19 because of the overlap of symptoms which are often indistinguishable from acute respiratory illnesses. It is also possible that these acute symptoms are masked by the chronicity of presenting complaints in our patients. As such, workflow changes, including the use of personal protection equipment (PPE), are
required for the safety of healthcare workers and patients. Here, we share our experiences from our first 90 days in managing an Otolaryngology service in the midst of the COVID-19 pandemic.

Business Continuity Planning

The National University Hospital is a tertiary care institution comprising 1,200 inpatient beds. The Otolaryngology service manages more than 50,000 outpatient visits and about 3,000 surgeries in the operating room annually. There are 24 doctors in the service, including staff surgeon and residents. Our fear was for an undetected infected patient to pass through our outpatient service, resulting in many staff becoming infected and/or placed on quarantine. To ensure continuity of services in such a scenario, we segregated our clinical staff into two teams. Such segregation and social distancing measures at the workplace were found to be effective during the Influenza A (H1N1-2009) pandemic\textsuperscript{2,3} and are also found in pandemic preparation guidelines for Singapore.\textsuperscript{4,5} Each team would have the full capabilities of a functional Otolaryngology service, including surgeons covering the spectrum of Otolaryngology sub-specialties. Nursing staff, audiologists and administrative staff involved in patient encounters were also similarly segregated. Barriers were erected in the Otolaryngology clinic so that both clinical teams could be physically separate, having dedicated registration counters, corridors, consultation rooms and break rooms. These segregation measures extended beyond the workday, with members of different teams practicing social distancing.

We rationalized early in the outbreak that a complete cessation of outpatient services was unnecessary and would be detrimental to patient care in a prolonged pandemic situation. Instead, we considered a gradual reduction based on the extent of community-transmission in Singapore and our manpower capabilities. National guidelines curtailed the movement of doctors between healthcare institutions. This dictated that 4 of our surgeons be deployed to a related healthcare institution, and a further 2 residents
deployed to augment manpower needs at the Emergency Department. We are thus currently functioning at about 50% of our pre-pandemic caseload. Interestingly, we are beginning to see an increase in clinic bookings and attendances a month after the Disease Outbreak Response Level was raised to “Orange” in Singapore, despite a continued increase in the number of COVID-19 cases (Figure 1). This suggests that while the majority of Otolaryngology conditions are chronic, patients still have needs that warrant early outpatient care.

Consultation Workflow

From the onset of the pandemic, access to the medical center where the Otolaryngology clinic is located was immediately restricted. All patients are subjected to temperature screening with a thermal scanner and triage at the entrance of the medical center based on their risks. Patients with fever are directed to the emergency department. An afebrile patient with a positive travel history or respiratory tract symptoms will be allowed to proceed to the clinic, but is considered high-risk. Such a patient is identified with a red sticker, provided with a surgical mask, and escorted directly to an isolation room in the clinic to prevent mingling with other patients. Before entering the isolation room, the attending clinician will don full PPE, comprising N95 mask, goggles, gown and gloves. Only one accompanying person is allowed for every patient.

In contrast to our regular practice of patients waiting in a common area in the clinic, low-risk patients now wait directly outside the consultation room after registration. We have spaced out our clinic appointment times to allow for this. Seats outside the consultation room are also spaced 2m apart. Patients are told exactly where they are to be seated in the waiting area. These measures serve to minimize contact with other patients in the hospital and also facilitate targeted contact tracing should a patient or healthcare worker be subsequently diagnosed with COVID-19.
Based on the referral letter or medical history of the patient, an initial pre-consultation assessment is made by the attending clinician of the examination requirements for the patient. We have deliberately designated “clean” rooms in the clinic only for low-risk patients in which minimal examination is required, such as those on follow-up for a palpable thyroid nodule. Patients likely to require examination of the oral or nasal cavity have their consultation and examination performed in designated “dirty” procedure rooms. All potentially aerosol-generating procedures such as nasoendoscopy, nasal toilet or any transoral procedures are deferred unless absolutely necessary. Full PPE measures are mandatory for these procedures. The processes and PPE requirements for the various scenarios are summarized in Table 1. These PPE requirements are in line with recently published recommendations from our Otolaryngology colleagues in other institutions.6,7

A Test of Protective Measures

On March 16 2020, an elderly gentleman was scheduled for a regular follow-up appointment at our Otolaryngology clinic. He also had a four day history of rhinorrhea and had just returned from an overseas trip three days before. Upon entering the building, he was first triaged at the screening area. Given his symptoms and travel history, he was deemed “high-risk” and labelled with a red sticker. He was asked to put on a surgical mask and escorted to an isolation room in the clinic. The reviewing doctor and healthcare assistant attended to him in the isolation room while wearing full PPE including N95 mask, goggles, gown, and gloves. After the consultation, he was escorted out of the clinic complex via a separate exit to prevent contact with other patients. Arrangements were made for payment to be made remotely and for medications to be delivered to his house.
Unfortunately, the patient was found to be positive for the COVID-19 virus at another institution, two days after his outpatient visit. A national contact tracing system mapped his activity prior to the COVID-19 diagnosis and the information was relayed to us within 48 hours. Within our institution, we activated an internal contact tracing system which identified only the two healthcare workers who attended to the patient during the consultation as close contacts. Given the precautions taken, they were deemed to be at low risk and did not need to be quarantined. None of the healthcare workers who attended to the patient along the chain of care developed COVID-19. This case highlighted the importance of early triage, isolation measures for high-risk individuals, and adherence to PPE requirements.

**Conclusion**

Our experience in this outbreak indicates the importance of a set of workflow measures, disciplined yet judicious PPE protocols and clear strategic goals can provide a safe environment for patients and staff to continue managing a significant proportion of patients in the Otolaryngology – Head and Neck Surgery service. Otolaryngology teams around the world should take any window of opportunity afforded to them, to make organizational and procedural decisions that have an impact on the safety and continuity of services in their jurisdiction, with the goal of remaining one step ahead of the pandemic curve.

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**Conflicts of interest**

The authors declare no conflicts of interest.
Table 1. Clinic arrangements and PPE based on patient risk and examination requirements.

<table>
<thead>
<tr>
<th>Triage*</th>
<th>Low risk patient</th>
<th>High-risk patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Components of physical exam</td>
<td>Neck examination, examination of superficial lumps, otology examination only. No examination involving the oral or nasal cavities.</td>
<td>Any examination of the oral or nasal cavities. Aerosol-generating procedures such as nasoendoscopy and laryngoscopy. Any physical examination or procedure in a high-risk patient.</td>
</tr>
<tr>
<td>Location of consultation and examination</td>
<td>Clean room</td>
<td>Procedure room</td>
</tr>
<tr>
<td>Additional measures</td>
<td>Designated waiting area outside the consultation room.</td>
<td>Designated waiting area outside the consultation room.</td>
</tr>
</tbody>
</table>

* Triage performed at entrance to medical center and confirmed again during patient registration. A high-risk patient is one with any respiratory tract symptoms or a positive travel history. Febrile patients are referred directly to the hospital’s emergency department and not seen in the Otolaryngology clinic.
References


Figure 1. Daily Otolaryngology outpatient visits during the COVID-19 pandemic from 2 January to 30 March 2020.