LETTER TO THE EDITOR

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Resuming otolaryngology services following a COVID-19 lockdown in Singapore

Dear Editor,

Many countries are still battling the COVID-19 pandemic today.[1] When the outbreak first occurred, we tweaked our department workflows to cope with the various demands of our practice and the pandemic.[2] When Singapore's Multi-ministry Taskforce on COVID-19 deemed that it was safe to begin reopening the economy in 3 phases,[3,4] our department adopted a gradual resumption of otolaryngology services with a vigilant stance. Our Otorhinolaryngology Department provides outpatient and inpatient ENT (ear, nose and throat) services to both Tan Tock Seng Hospital (TTSH) and National Centre of Infectious Diseases (NCID), where NCID plays a key role in Singapore's COVID-19 management. We highlight our experience in the following 6 domains when we resumed services after a national lockdown: (1) clinical work, (2) education, (3) research, (4) safety of patients and staff, (5) morale of staff and (6) pandemic frontline work (Table 1).

Clinical work. The resumption of non-urgent services meant seeing new patients and coping with the backlog of cases that were postponed due to the lockdown.

Outpatient clinics. We initially reduced our outpatient appointments to 20% of the normal caseload during the lockdown, before gradually increasing to 65% over 2 months, followed by 80%. This stepwise increase allowed us to monitor the local and international situation closely for any significant developments relevant to Singapore. In the unfortunate scenario where a second or third wave of COVID-19 infections were to occur, reversion to outbreak mode could happen quickly with minimal logistics change. At the start of the outbreak, we observed a patient "no-show" rate of about 30%, presumably due to concerns of COVID-19. This improved to around 25% from June 2020 (Fig. 1). The no-show rate was an important factor to consider when planning resumption of health services in pandemics. It is affected by factors such as virus' infectivity, route of transmission, and public perception about how dangerous the threat is to themselves.

Elective surgery. Early in the outbreak, our allocated operating theatre (OT) time was significantly curtailed because the anaesthetists were transferred to the Outbreak Intensive Care Units (ICU) in TTSH and NCID. The anaesthetists then augmented an Enhanced Pneumonia Surveillance programme, where patients with acute respiratory infections—defined as symptoms of cough, sore throat, runny nose and anosmia, according to the Ministry of Health circular 167/2020—of any duration and/or clinical findings suspicious for chest infection were considered as COVID-19 suspect cases until 2 swab results were negative. Patients who required critical care were managed by the anaesthetists in the Outbreak ICU until confirmation of their COVID-19 status.

As we could not maximise the service of the anaesthetists, our allocated OT time remained at 55.5% of our pre-COVID-19 situation and triage of cases to determine priority for surgery had to continue. Any additional OT time available to us was on an ad hoc basis, allocated by an OT committee to the department in greatest need.

In response to the pandemic, surgical disciplines across Singapore's hospitals have had to implement safety measures in the OT.[5,6] The greatest concern was reserved for otolaryngology surgeons who operate on the upper aerodigestive tract where the highest concentration of COVID-19 viral particles are found.[7] Evidence-based safety guidelines have been formulated for the use of personal protective equipment (PPE) during various types of otolaryngologic procedures, including tracheostomies.[8] More studies have strengthened our understanding of the levels of PPE required during otolaryngology surgeries.[9,10,11] Our department performed a total of 6 tracheostomies for COVID-19 patients, with special precautions taken during the procedures. To the best of our knowledge, no otolaryngologist has been infected in Singapore since the start of the pandemic. Internationally, at least 361 otolaryngologists, including residents, have been infected.[12]

Education. Major disruptions occurred in undergraduate, residency and subspecialist fellowship training as a result of COVID-19.

Medical students. Clinical and bedside teaching was suspended for approximately 6 months. In the Phase 2 reopening of Singapore's economy, 50% of our clinical sessions resumed with measures in place.

Residents. Weekly national resident teaching sessions were conducted via teleconferencing. Despite the absence of face-to-face communication, the online platforms have allowed more members of the senior fraternity to be present to provide valuable input to

Table 1. Important domains for consideration by otolaryngology departments resuming services in a pandemic

Domain	Measures undertaken by Otorhinolaryngology Department, TTSH
Clinical work	**Outpatient clinics** *Gradual increase of outpatient appointments* • Increase in outpatient load from 20% during lockdown to 65% over 2 months, followed by 80% • No polyclinic referrals during lockdown, gradual increase *Social distancing* • Expansion of clinic waiting area to include corridors outside clinic *No-show rate* • 30% no-show rate at start of outbreak, improved in June 2020 **Elective surgery** *OT allocation* • OT allocation reduced to 55.5% due to reduction of anaesthesia manpower who had to support the Enhanced Pneumonia Surveillance programme • Triage of cases: head and neck cancer given highest priority followed by quality-of-life conditions e.g. debilitating sinusitis/cholesteatoma, etc. *Safety measures* • Adherence to safety guidelines on PPE usage
Education	**Medical students** • In Phase 2, 50% clinical sessions resumed, use of patient case encounter logbook for expeditious contact tracing • Group discussions and didactic lectures by teleconferencing **Residents** • Weekly national resident teaching sessions by teleconferencing • Residency examinations postponed, 50% of examinations via videoconferencing to reduce intermingling of personnel from different hospitals • Use of surgical masks and face shields by candidates and examiners **Junior otolaryngology specialists** • Delay in departure for overseas fellowship training programmes by junior otolaryngology specialists in Singapore planning to subspecialise
Research	• Journal clubs discussed current evidence in COVID-19 and related otolaryngology publications to keep abreast of the latest scientific knowledge
Safety of patients and staff	**Safety of patients** • Screening of patients and 1 allowed accompanying caregiver at entrances • Frequent discussions for consensus on how, when and where different patients e.g. recovered COVID-19 patients, non-COVID-19 patients who live in high-risk areas such as worker dormitories, should be seen • Adherence to mask wearing and social distancing **Safety of medical staff** • In Phase 2 reopening, flexible nasoendoscopy performed in individual clinic consultation rooms, with attending staff wearing level 2 PPE (fitted N95 mask, eye protection, disposable gloves, cap and gown). Patients wear 1-ply surgical mask with small opening to reduce aerosolisation should sneezing occur • Mask fitting and refresher PPE sessions were conducted before change in nasoendoscopy workflow for all clinic staff, including Patient Service Assistants • Education of nurses and clinic assistants on the evidence for PPE safety several weeks before decentralisation of nasoendoscopy to multiple consultation rooms, to prepare staff clinically as well as psychologically
Morale of staff	**Department level** • Strict social distancing during group lunches of maximum 5 staff **Hospital level** • Various incentives including product and retreat discounts were offered to healthcare workers to enjoy a short break • Cash bonuses for frontline COVID-19 healthcare workers
Pandemic frontline work	• Deployment at NCID Screening Centre to serve as standby personnel to be activated within 24 hours • Training of volunteers from Singapore Healthcare Corps on nasal anatomy and swabbing techniques for COVID-19 tests • Involvement in development of 3-dimensional printing of nasal anatomy models used for training volunteers

OT: operating theatre; PPE: personal protective equipment; NCID: National Centre for Infectious; TTSH: Tan Tock Seng Hospital

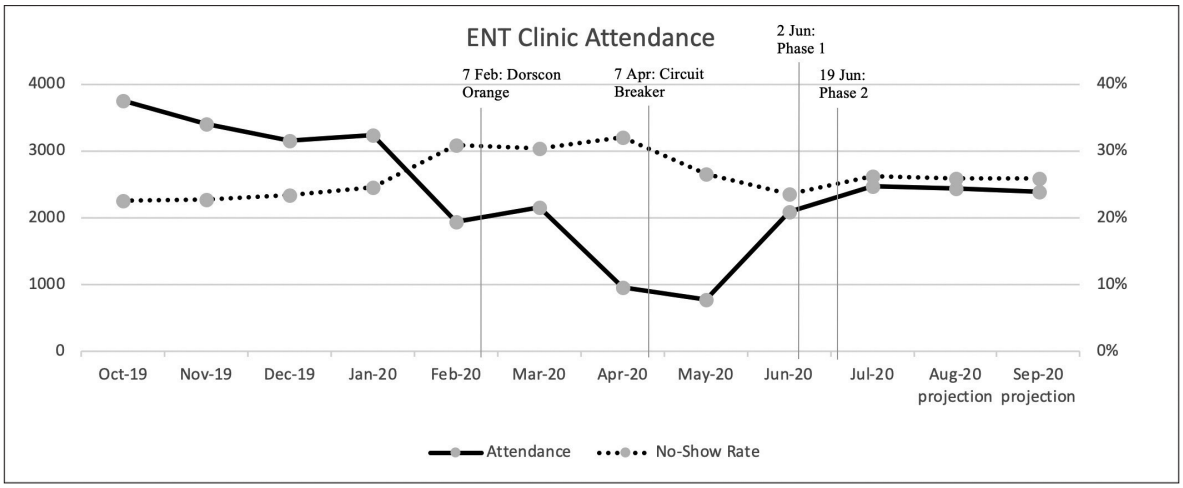

Fig 1. Trajectory of outpatient load from October 2019 to September 2020.
DORSCON: Disease Outbreak Response System Condition; ENT: ear, nose and throat.

residents. With a reduction in clinical workload for residents, there were concerns as to how it would affect their training. Currently our department is analysing its clinic and surgical caseload numbers to accurately assess the effect of COVID-19 pandemic on training.

Junior otolaryngology specialists. There was a delay in overseas fellowship training programmes during COVID-19 following the advisory of the Singapore Ministry of Health in February 2020. The reasons for the delay were: (1) conserving of manpower to fight the COVID-19 pandemic, (2) the emerging COVID-19 situation and (3) pandemic safety in the country offering the fellowship programme.

Research. COVID-19 has created a plethora of research opportunities in otolaryngology. Our department continued to apply for research grants. Journal clubs discussed current evidence in COVID-19 and related otolaryngology publications to stay abreast of the latest scientific knowledge.

Safety of patients and staff. As the pandemic progressed, the definitions of active infection clusters and suspect cases were constantly changing. Even the definition of "suspect travel history" of an individual varied from country to country, and at different time points during the outbreak.[13] There were also additional categories of patients, such as recovered COVID-19 patients and non-COVID-19 patients who lived in high infection risk areas.

Safety of patients. In view of the variable definitions of COVID-19 risk, it was important that the screening process at all main hospital entrances and our clinic entrances be kept up-to-date with the pandemic. Continued discussion among all levels of staff in our department was necessary to maintain consensus and agreement regarding how, when and where patients should be seen.

Safety of medical staff. The safety of healthcare workers should be of topmost priority in all healthcare institutions. We enforced different PPE levels according to the type of procedure being performed and the risk factors of the patient involved.[2,14] During the national lockdown, we were able to centralise all high-risk clinic procedures, including nasoendoscopy, to 2 designated rooms. As our caseload gradually increased and this workflow was no longer feasible, we then returned diagnostic nasoendoscopy to the individual clinic consultation rooms, but with all attending staff wearing level 2 PPE (Table 1). This workflow was based on the evidence that simple diagnostic nasoendoscopy without any drilling had a low risk of aerosolisation.[10] Decentralising our nasoendoscopies from a single procedure room back to multiple clinic consultation rooms necessitated additional PPE and protocol training of all clinic staff, including Patient Service Assistants.

Morale of staff. Our hospital's experience in the 2003 severe acute respiratory syndrome epidemic showed that psychological distress was common among frontline workers. NCID conducted a study and showed that food and beverages, appreciation by patients and public, and positive portrayal of healthcare workers in the media were the top 3 factors that boosted the morale of the healthcare workers deployed to the NCID screening centre.[15] Various incentives including product and retreat discounts were offered to all healthcare staff.

Pandemic frontline work. During the initial phase of the outbreak, all doctors from our department volunteered as frontline doctors at the NCID screening

centre, except those over 60 years of age. This manpower deployment was subsequently reduced by 60% as the otolaryngology caseload gradually increased, to allow specialist staff to return to focusing on providing specialist care. Our department was also recruited to train healthcare volunteers on nasal anatomy and swabbing techniques for COVID-19, under the auspices of the Singapore Healthcare Corps. These training sessions were conducted after office hours in the evenings, and in ventilated open spaces to minimise infection risk. Some of our specialists were also involved in 3-dimensional printing of nasal anatomy models for training the volunteers.

In the initial phase of the COVID-19 pandemic, there were many unknowns surrounding the novel coronavirus, and our department had come to a near standstill to cope with the pandemic. The acquisition of new knowledge and development of a COVID-19 safety protocol have helped us face the challenges associated with providing tertiary otolaryngology services to TTSH and NCID. We navigated the dual role of having to re-open otolaryngology services cautiously, yet stay nimble enough to revert back to an outbreak mode. Our experiences highlighted in the 6 important domains above serve as an important reference for otolaryngology departments to consider when resuming services in a pandemic.

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Jian Li Tan, [1]*MBBS, MRCS (Glasgow), FAMS (ORL)*,
Ming Yann Lim, [1]*MBBS (Melbourne), FAMS (ORL), FRCS ORL (England)*,
Chrisanda Si Ying Lee, [1]*MBBS, MRCS (England)*,
Seng Beng Yeo, [1]*MBBS, FRCS (Edin), FAMS (ORL)*

[1] Department of Otorhinolaryngology, Tan Tock Seng Hospital, Singapore

Correspondence: Dr Jian Li Tan, Department of Otorhinolaryngology, Tan Tock Seng Hospital, 11 Jln Tan Tock Seng, Singapore 308433.
Email: Jian_Li_TAN@ttsh.com.sg