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**Integrated infection control strategy to minimize nosocomial
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workers**

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Abbreviations

Ear Nose and Throat (ENT)

Corona virus disease 2019 (COVID-19)

Novel coronavirus (nCoV)

Healthcare workers (HCWs)

West China Hospital (WCH)

Sir,

Coronavirus disease 2019 (COVID-19) is caused by a novel coronavirus (2019-nCoV). The most common symptoms are fever and dry cough; a minority of patients report other symptoms such as headache, sore throat and sneeze [1,2]. COVID-19 has rapidly spread from Wuhan, throughout China and into other countries. The virus-specific nucleic acid sequences have been detected in lung fluid, throat, oropharyngeal and nasopharyngeal swab samples [3]. Due to lack of sufficient awareness of the COVID-19 in the early stages of the epidemic, some healthcare workers (HCWs) have been infected [4,5]. Patients with symptoms of COVID-19 may present to Ear Nose and Throat (ENT) Departments. Moreover diagnostic and therapeutic procedures in ENT Departments involve direct contact with patients' upper respiratory tract mucosa, and/or induce patients to cough or sneeze. This there is a particularly high risk to HCWs and other patients in ENT Departments.

To protect HCWs and non-infected patients from potential COVID-19 patients, infection control measures were established in the West China Hospital (WCH) ENT department. We summarize our experiences, which we hope might help other ENT units to formulate their own infection control plans to prevent nosocomial transmission of COVID-19.

As COVID-19 began to spread, WCH set up a trans-department emergency infection control team that was in charge of infection control

and protection management for the entire hospital. The strategy for infection control against COVID-19 includes: material preparation and distribution, training on infection prevention measures, a triage strategy, limiting traffic in the hospital, reorganization of hospital departments, keeping the environment clean, etc.

To decrease the density of patients, the ENT department separated the waiting area from the treatment area, reduced the number of appointments, scheduled appointments at different times, and increased online consulting services. In addition, taking account of the facts that the median age of COVID-19 patients was 59 years and that morbidity and mortality is greater in the elderly [4], HCWs older than 65 years of age were suspended from outpatient activities. Further, our escalation plan is that if the number of COVID-19 cases continues to rise, only emergency services will be maintained.

Among ENT examinations, nose and throat examinations were considered to present the highest risk, and additional protective measures were implemented. During flexible laryngoscope examination, to reduce irrigated nausea and cough, local anesthetic spray was replaced by gel anaesthesia, and the smallest possible diameter laryngoscope was recommended. During nasal endoscopy, care was taken to ensure adequate surface anesthesia to reduce the sneeze reflex.

On the ward, temperature monitoring was conducted at the entrance for all persons, an epidemiological history was taken from all patients, and everyone on the ward was required to wear a surgical mask. Vital signs were monitored every 4 hours for patients, and temperatures were taken twice daily from caregivers. In order to reduce the crowding of the ward, visiting was restricted to a single visitor. An emergency isolation ward was established to manage suspected patients.

Elective surgery was initially suspended until the control measures were established, and was then gradually reintroduced to ensure familiarity with the new systems. Emergency patients are assessed and managed according to the flowchart in Figure 1. After surgery, patients with suspected COVID-19 are transferred to a negative pressure isolation ward and screened for COVID-19. Those that screen negative are returned to the ENT department; those that test positive are transferred to the infectious ward for further treatment. It should be emphasized that fever occurred in only 43.8% of patients with 2019-nCoV on initial presentation [6], those patients may be missed if the surveillance case definition only focused on fever detection during preoperative screening. Thus, chest x-ray or CT are required pre-operatively on elective surgical patients, along with virological testing for COVID-19 in suspected patients [6].

ENT patients ifetn undergo aerosol generating procedures during

nursing care. To manage the risks associated with these open-type suction was replaced by closed suction for patients with tracheotomy. Suction was used before tracheal nursing in procedure to minimize sputum production during the nursing procedure. Aerosol inhalation was replaced by in-tube infusion or spray humidification to humidify the trachea as well.

Up to February 20, 2020, a total of 4148 fever cases visited in our hospital, of which 22 cases were confirmed as COVID-19. Up to now, no nosocomial infection has occurred in WCH, including the ENT department. We hope that this report of our experience will assist infection prevention and control teams with setting up precautionary measures in their facilities.

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None.

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Authorship

All authors have made substantial contributions to all of the following:

- (1) Dan Lu drafted the manuscript.
- (2) Haiyang Wang and Rong Yu revised the manuscript.
- (3) Hui Yang and Yu Zhao designed the conception, and revised the manuscript for the important intellectual content.

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Not applicable.

Figure 1 Pathway for the management of emergency ENT patients

Abbreviation: Corona virus disease 2019(COVID-19)

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