



杭州市第一人民医院集团
杭州市第一人民医院

浙江大学医学院附属杭州市第一人民医院
Affiliated Hangzhou First People's Hospital, Zhejiang University School of Medicine



中國醫院協會
CHINESE HOSPITAL ASSOCIATION

Contact Information:

Affiliated Hangzhou First People's Hospital, Zhejiang University School of Medicine

Ms. WANG Shuying, Vice Director of Nosocomial Infection Manage Department

(86) (0) 13957116427, zmsw2009@sina.com

Chinese Hospital Association

Department of International Cooperation

cha-international@cha.org.cn

COVID-19 Prevention and Control Manual

*Affiliated Hangzhou First People's Hospital,
Zhejiang University School of Medicine*



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Introduction

As a pandemic infectious disease, COVID-19 is spreading globally. The public health threat that it represents is the most serious infectious disease that we ever seen in respiratory virus disease.

Hangzhou First People's Hospital (HFPH) is the largest tertiary hospital in Hangzhou city, China. During the epidemic of COVID-19, HFPH is a non-designated hospital for COVID-19 treatment, but she is still responsible for the treatment of critically ill patients, including critical maternity, surgery, emergency, endoscopic retrograde cholangiopancreatography (ERCP), hemodialysis and so on. Usually, HFPH's fever clinic is responsible for fever patients caused by common cold and influenza. During the epidemic, HFPH opened a second fever clinic to identify COVID-19 patients.

Here, we are glad to share HFPH's experience of what we did to minimize the hospital internal transmission aimed at fighting COVID-19 together.

Principles

1. Infection control measures in Hangzhou city

Based on the demographic and epidemiological situation of the city during COVID-19, the epidemic risk level of some districts in Hangzhou city once were medium-risk areas, whereas most districts are low-risk areas. In low-risk areas, the prevention and control strategy is to "strictly prevent importation". In medium-risk areas, the prevention and control strategy is "to prevent importation and stop local transmission".

2. Prevention and control measures in HFPH

The principles of prevention and control measures in HFPH include early detection, early reporting, early isolation, and early treatment. Covid-19 corresponding plans and guidelines were generated ahead. And every department cooperated closely in the hospital.

To prevent and control nosocomial infection, according to the epidemiological characteristics of the pathogen of 2019-nCov, the Technical Guidelines for Disinfection in Healthcare Facilities and Hospital Air Purification Management Guidelines are strictly implemented to clean and disinfect medical equipment, contaminated articles, surfaces, and floors.

3. The principle of using protective equipment during epidemic

Effective personal protection in hospital applied to all of medical staff, patients and escorts. Strict adherence to infection control protocols are required specially to protect staff when one is entering a contaminated area or performing diagnosis and treatment and/or when one's eyes, eye conjunctiva, or face are at risk of being contaminated by blood, body fluids, secretions, excreta, and aerosols, in



particular the removal of personal protective equipment (PPE).

COVID-19 Related PPE Management in Different Areas

Area	Mask	Goggles / Barrier face mask	Gloves	Cap	Clothing
Outpatient preview triage	Disposable surgical mask	/	Disposable latex gloves	Disposable surgical cap	Work uniform, isolation gown
Emergency preview triage	Medical protective mask /N95	Goggles	Disposable latex gloves	Disposable surgical cap	Work uniform, isolation gown
Fever clinic	Medical protective mask	Goggles	Disposable latex gloves	Disposable surgical cap	Work uniform, isolation gown
Emergency department	Medical protective mask/N95	Goggles	/	Disposable surgical cap	Work uniform, isolation gown
Respiratory clinic	Medical protective mask/N95	Goggles	/	Disposable surgical cap	Work uniform, isolation gown
Stomatology clinic/ Otolaryngology clinic	Medical protective mask	Barrier face mask	Disposable latex gloves	Disposable surgical cap	Work uniform, isolation gown
Other clinics	Disposable surgical mask	/	/	/	Work uniform
Isolation ward/ The second fever clinic	Medical protective mask	Goggles/ Barrier face mask	Disposable latex gloves	Disposable surgical cap	Work uniform, disposable medical protective clothing
Operation/ gastroenterological endoscope for suspected patient	Medical protective mask	Goggles/ Barrier face mask	Sterilized disposable latex gloves	Disposable surgical cap	Work uniform, disposable medical protective clothing

Notes:

If there is a high risk of body fluid exposure, waterproof boot covers should be worn. Additional PPE including a disposable isolation gown and face shield/powered air-purifying respirator should be put on while confronting the following procedures that might produce aerosol such as respiratory tract sampling, trachea intubation, tracheotomy, noninvasive ventilation and sputum suction etc. for suspected or confirmed patients.



Notification for Patient to HFPH

1. The body temperature of all the visiting patients who come to the hospital will be measured.
2. Patients have to follow the instructions of the hospital to enter and leave the hospital through the designated entrance and exit.
3. Patients are required to inform proactively and truthfully if they meet one of the following situations, and follow the recommendations of the medical staff. After patient information registration, the patient will be referred to the designated clinic according to the hospital.

(1) Fever (37.5°C and above);

(2) Within 14 days prior to onset of the disease, have a travel history or residence history in high-risk regions or countries;

(3) Within 14 days prior to onset of the disease, have a history of contact with novel coronavirus infected patients (positive with a nucleic acid test);

(4) Within 14 days prior to onset of the disease, have a history of contact with those with fever or respiratory symptoms in high-risk regions or countries;

(5) People around have clustered disease (2 or more cases with fever and/or respiratory symptoms) such as in families, offices, schools, workplaces, etc., or have epidemiological association with COVID-19 cases;

(6) Other suspicious symptoms such as fatigue, cough, etc.

4. All the patients have to wear a mask when you and the accompanying person come to the clinic; please keep more than 1 meter away distance when talking with others.

5. To reduce unnecessary riding, only one family member is allowed to accompany you to avoid overcrowding.

6. Access control will be implemented in the ward. The number of visitors is limited to the ward, and the visiting time is shortened to less than 15 mins.

7. Avoid touching your mouth, nose, eyes and public objects with your hands until after washing your hands.

8. If you want to take the elevator, we remind you to pay attention to the following points:

If the elevator room is too crowded, we recommend you wait for the next elevator.

When waiting for the elevator, if you find the companion have a cough or fever, try to avoid riding together.

Before entering the elevator room, you should prepare to wear your mask throughout.

9. Every time you suspect that your hands are contaminated, you should wash your hands in time.

10. Wear masks properly

How to wear Surgical Mask



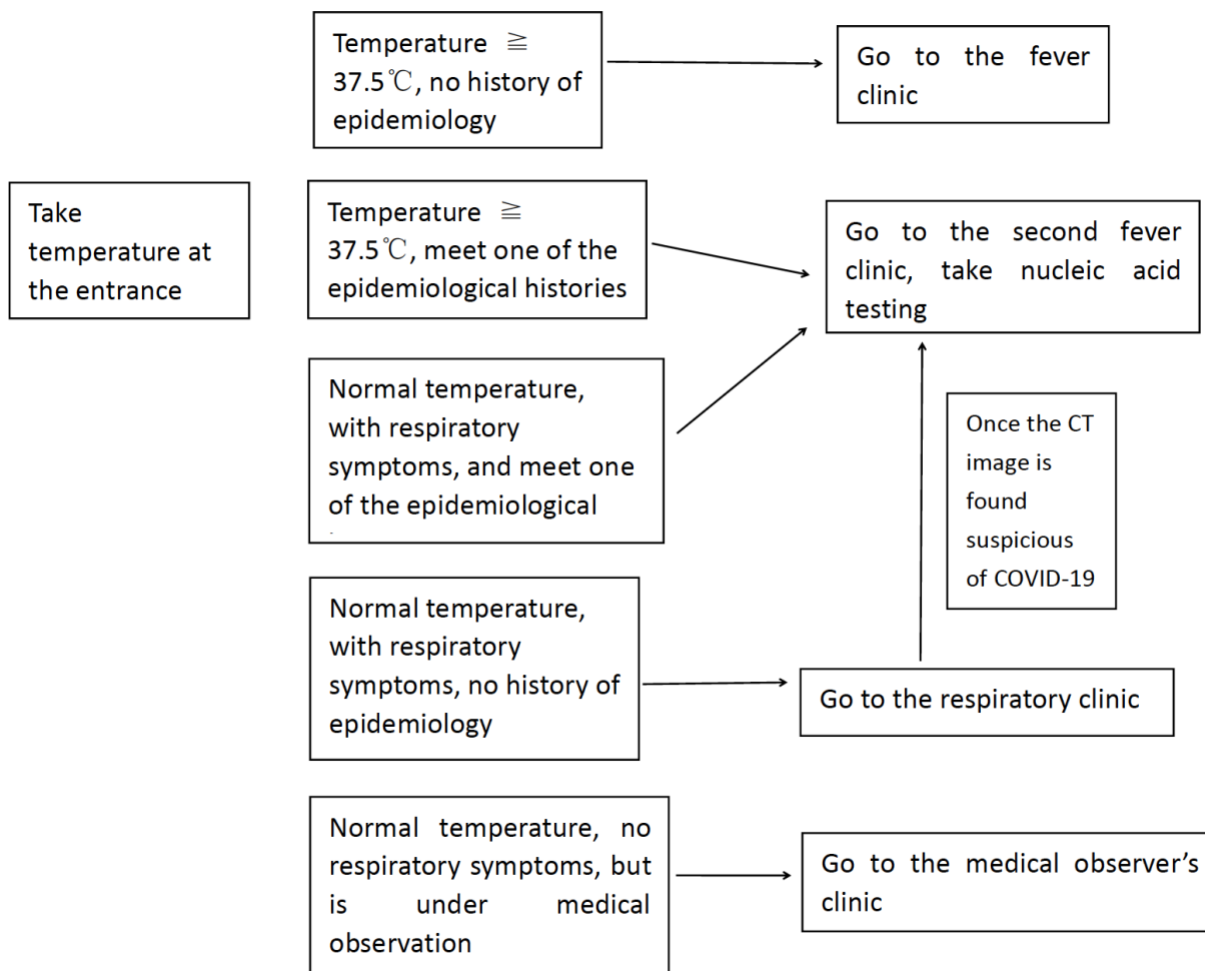
- Choose the appropriate mask size (children should choose the child size).
- Wash your hands properly before wearing a mask.
- The metallic strip should be uppermost.
- The coloured side of the mask faces outwards.
- Extend it to cover fully the mouth, nose and chin.
- Press the metallic strip over nose bridge and fit snugly over the face.

11. If you want to dispose the used masks, which are considered as a kind of medical waste, you should dispose them in strict accordance with relevant medical procedures.

Hand Hygiene Moments

- Before contacting patient.
- Before aseptic operation.
- After contacting patient.
- After contact with the surrounding environment of the patient.
- After contact with the patient's blood, secretions and excreta.
- Before meals.
- Before going to toilet.
- After toilet.

Guidance on Previewing Triage Suspected Patients



Notes:

special medical observer's clinic is for the patients who has close contact of COVID-19 patients. "Close Contacts" include anyone who may have had contact with a COVID-19 positive case through a range of circumstances or activities including being family members, relatives, friends, colleagues, classmates, health care workers, and services personnel.

The medical observation period should last 14 days after the last contact with a confirmed case or an asymptomatic infected person without effective protections. According to Guidelines for Investigation and Management of Close Contacts of COVID-19 Cases.

Outpatient Department/General Wards Management

1. All of the hospital staff should attach great importance to COVID-19 prevention and control, wear **medical surgical masks** and strictly implement **hand hygiene**.



2. Patients should take temperature at preview triage. When a doctor receiving patients, he must routinely ask everyone about the relevant **epidemiological history** and respiratory symptoms of COVID-19, and make notes in patient's medical record.
3. Once a suspected case of COVID-19 is found in clinic, inform escort nurse to evacuate other waiting patients, and guide the patient (must wear a surgical mask and keep a distance more than 1 meter away) along guiding route to the second fever clinic.
4. Disinfect the clinic/ward with ultraviolet or other air sterilization machine twice a day and wipe the ground and the surface of articles with 1000ml/L chlorine-containing disinfectant.
5. In every general ward, at least one temporary isolation room should be set up aside so that suspected patients of COVID-19 can be dwelled immediately to avoid cross infection. Referring to specialist care, the access of unnecessary personnel should be limited. Transferring to isolation ward, be excluded of COVID-19, or still under medical observation will be decided by consultant. After the transfer of patient, the room should be disinfected terminally.

Guidance for Staff Work in Fever Clinic and Isolation Ward

1. During COVID-19 epidemic, **infectious disease area** include three zones--**clean zone, potentially contaminated zone, contaminated zone**, three parts--fever clinic, second fever clinic and isolation ward, two passageways--**staff passageway** and **patient passageway**. Pharmacy, payment, laboratory, and X-ray examination room are also belonging to the infectious disease area.
2. Every staff entering the area shall implement **standardized management**. The nurse director assumes direct responsibility for management.
 - 2.1 Every medical staff needs to be trained on how to put on and remove PPE correctly and must pass the examinations, before they are allowed to work in the infectious disease.
 - 2.2 Be sure to follow the route from clean zone to contaminated zone. Do not open the two doors of clean zone at the same time and potentially contaminated zone.
 - 2.3 **Dress code**: when going to work, change into scrubs and work shoes in the dressing room, hand hygiene, then wear PPE according to the protocol. After work, take a bath, then change home clothes and shoes back to the place of residence.
 - 2.4 All staff must fully understand the principles of **putting on and taking off PPE safely and effectively**, the key points are as below:
 - a. Wear: Before entering contaminated zone, you must wear it properly. Only wearing PPE correctly and comfortably, you can enter contaminated zone.



b. PPE should not be adjusted in contaminated zone. If the protective equipment is damaged in contaminated zone, you must immediately leave the zone, remove it according to the corresponding procedure.

c. You should not leave the isolation ward or the second fever clinic in medical protective masks and protective clothing.

d. Removal: The procedure of removing protective equipment is high risk of infection. Perform the procedure orderly and carefully.

e. Precautions for removal of protective equipment:

(1) Minimize contact with contaminated surfaces when removing.

(2) Every step of removing protective equipment should process hand hygiene. Mask is removed in the end. After all protective equipment is removed, hand hygiene again.

(3) The removed reusable goggles should be wiped with disinfectant wipes at first, then be placed in a chlorine-containing disinfectant 1000mg/L container and soaked for 30 minutes; the disposable objects should be placed in yellow medical waste collection bag as medical waste dispose.

(4) Monitoring body temperature and respiratory symptoms daily and reporting to the nurse director are necessary.

Management of Occupational Exposure to COVID-19

1. If skin or muco-cutaneous exposure to blood, body fluids, secretions, or excretions from a patient with suspected or confirmed COVID-19, immediately leave the patient care area, and carefully remove PPE according to the corresponding procedure.

2. After leaving the patient care area, thoroughly wash your hands followed by the affected skin surfaces or the percutaneous injury site with running water, and disinfect with 75% alcohol or 0.5% iodophor.

3. If irrigate mucous membranes such as conjunctiva exposure, flush with copious amounts of normal saline or an eyewash solution, and not with chlorine solutions or other disinfectants.

4. Immediately report the incident to the relevant departments.

5. Follow “medical observation” requirements for 14 days. During the observation period, monitor body temperature and respiratory symptoms daily and report to the relevant departments.

PPE (Protective Clothing) Donning Procedure



With the assistance of an infection control supervisor or install an overcoat mirror for inspection

PPE (Protective Clothing) Doffing Procedure

Next to a medical waste bin and monitored by the infection control supervisor for each step



Wash hands



Take off outer gloves



Discard the gloves into the bin



Wash hands



Take off goggles/barrier face mask



Pull the zipper of protective clothing, remove the helmet



Roll the clothing inside outwards



Roll the clothing to the ankles



Remove inner gloves with the clothing sleeves, place them into the bin



Wash hands



Remove the mask with the lower string first (pull the string over your head)



Lower the mask away from your face, remove it inside upwards



Take off the cap

Wash hands using the 7 steps, put on a surgical mask, enter the clean zone



Donning and Doffing PPE Checklist

	Key points	Met	Not Met
Prepare PPE available before donning	Check PPE are intact and undamaged		
	Remove mobile phones, watches, etc. And wash hands		
Donning PPE	No hair exposed over the cap		
	Medical protective mask is put on correctly		
	No air leakage in the tightness test of mask		
	Protective clothing is worn in the correct order		
	The mask is closely fitted to the protective clothing		
	The inner scubs is not exposed over the protective clothing cuff		
	Wear goggles correctly, close to the face		
	The cuffs of the protective clothing are fastened into the gloves		
Doffing PPE	Avoid contact with contaminated surfaces when removing gloves(inside outwards)		
	Remove protective clothing gently and roll it to the ankles(inside outwards)		
	Gently remove the mask/goggles(grab the outer edge of the back band, pull back and up)		
	Gently remove the mask, pull the band over your head and remove it(inside upwards)		
	Every step process hand hygiene		

Signature Of Assessor:

date:



Infection Control Procedure of Emergency Surgery (Including Interventional Operation, Various Endoscopies) for Suspected/Confirmed Patients

1. In order to implement a standardized protocol to manage HFPH's surgery (including interventional operation and various endoscopies) and to prevent the hospital internal transmission during COVID-19 epidemic, the principles are formulated as follows:

1.1 The principles apply to the patients as suspected or confirmed cases and the emergency surgery is urgently needed to relieve patient's life-threatening condition. Patients whose conditions are allowed to be transferred to designated hospitals are not included.

1.2 The process of confirming or suspecting COVID-19 infection must be consistent with the latest version of the National Health Commission's diagnosis and treatment protocol involving nucleic acid testing and chest CT scan.

1.3 The indicator of routine emergency surgery is strictly controlled by the director of clinical specialty through COVID-19-risk and medical condition assessment in accordance with *Emergency Surgery Management Process* of HFPH. Once the possibility of COVID-19 infection be excluded, it should be implemented as a routine emergency surgery.

2. Infection control procedure

2.1 Minimize the items in the operating room and streamline the personnel involved in the operation. Visitors entering the operating room are forbidden.

2.2 The designated operating rooms (including various endoscopies such as digestive endoscopy, bronchoscopy, etc.) are No.2 operating room in Building 1 (negative pressure operating room) and No.1 interventional room on the 2nd floor of Building 1. Verify the air pressure value of negative pressure operating room is lower than -5Pa.

2.3 If patient's medical condition permit, those with non-general anesthesia should wear surgical mask during operation.

2.4 Precautions for general anesthesia

a. All anesthesia utensils, medicines, etc. must be single used. The anesthesia utensils that contacts the patient's respiratory tract, such as visual laryngoscope lenses, suction tube, sputum suction tube, etc., must be disposable.

b. During general anesthesia, muscle relaxation should be given sufficiently to the patient to prevent choking cough.



2.5 During operation, after contact with the patient, disinfect the latex gloves with disposable disinfectant wipes.

2.6 After operation, patient wake up, until the evaluation meets the transfer criteria, the escort nurse, anesthesiologist, and surgeon should take off the surgical gown and gloves, spray protective clothing with 75% alcohol, and put on fresh disposable surgical gown and gloves. Cover the patient with a large order, then transfer the patient to isolation ward. After handover, remove the surgical gown and PPE according to the process.

2.7 The staff involved in the operation for confirmed or suspected later confirmed patient will be required to follow “medical observation” requirements for 14 days.

3. In-hospital transfer

3.1 The transfer pathway is bypass from the outside of building to the entrance of No. 4 transfer elevator in Building 1.

3.2 The nurse in charge telephone the manager of General Affairs Section and security (phone: ***, ***) to inform the preparation of transfer elevator and cordon off of pathway for transfer in advance. Move “no entry” sign board in front of the door to prevent others into the elevator. Disinfect the elevator and re-activate elevator service according to the corresponding procedure.

4. Implement terminal disinfection procedures according to *Technical Guidelines for Disinfection of Special Sites for COVID-19*.