Algorithm for COVID-19 triage and referral

Patient triage and referral for resource-limited settings during community transmission

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World Health Organization
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1. Introduction

1.1 Background

Based on current estimates, 80% of confirmed cases of coronavirus disease 2019 (COVID-19) can be treated as outpatients, up to 20% require hospitalization, and 5% need intensive care. Efficient triage of patients with COVID-19 at all health facility levels (primary, secondary and tertiary) will help the national response planning and case management system cope with patient influx, direct necessary medical resources to efficiently support the critically ill and protect the safety of health-care workers.

The objective of this algorithm is to give overall guidance for the triage and referral of symptomatic COVID-19 patients. This algorithm provides a general framework to be adapted to local health systems in countries.

1.2 Target audience

Ministries of health, hospital administrators and health workers involved in response planning for COVID-19 and/or patient triage, management and referral.

Box 1. Health facilities and referrals

Primary facilities may include community health centres, primary health care facilities, specialty outpatient clinics, private clinics or others.

Secondary centres provide hospital services with specialist care and emergency departments. These vary in the size, range and level of services. Referral is based on whether the specific health service can meet a patient's needs.

Tertiary hospitals have specialized staff, equipment and services, including intensive care units. They may have advanced therapies, imaging and laboratory services.

Intensive care units (ICUs) have highly specialized staff, equipment and facilities, as well as high clinician-to-patient ratios. Capacity includes intensive monitoring, haemodynamic management, organ support and life-sustaining interventions.

Designated facilities (primary, secondary, tertiary) are those chosen and prepared for COVID-19 screening, early recognition, diagnosis and severity assessment, referral, triage, and clinical care. They should have trained staff, appropriate infection prevention and control measures in place, and a communication mechanism to discuss referrals with the receiving transport and health facilities.

2. Patient triage and referral during community transmission

2.1 Patient entry to triage pathway

The triage pathway starts from patient entry within the existing mechanism in each country, including hotlines, online or mobile platforms, drive-through testing and primary care service visits. Sick people may also go directly to first-level (including primary and secondary) health facilities (Box 1). Response personnel, such as clinicians or health-care workers at patient entry, screen the initial symptoms and decide if individuals should be assessed at designated primary or secondary hospitals.

Initial symptoms for COVID-19 include fever and/or respiratory symptoms such as cough, sputum production and shortness of breath. Responders should pay attention to other presentations such as fatigue, sore throat, myalgia (muscle pain) and diarrhoea.

2.1.1 Infection prevention and control

Standard precautions[1] should be taken for all patients, including those suspected of COVID-19. Patients with respiratory symptoms or fever should be screened at the entrance of the hospital. Once suspected of COVID-19, the patient should wear a medical mask and be separated from other people by a distance of at least 1 metre.

2.2 Primary and secondary facilities

The primary and secondary facilities conduct the initial assessment, triage and start necessary management of the suspected cases, and, if available, carry out sampling and testing for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Triage and referral decisions depend on existing resources, local ethical considerations and patient acceptance of referral.

Mild cases are referred to community care and isolated. Depending on the country system in place, mild cases may be cared for at home or in designated non-health facilities. If the conditions of patients deteriorate, they should be referred back to the primary and secondary facilities for reassessment.

Patients who are severely or critically ill should be referred to designated tertiary hospitals. The threshold for referral may be lower for high-risk cases likely to become severe or critical. A pulse oximeter is an easy-to-use and reliable device for screening hypoxia and can be especially useful in resource-limited settings. Criteria to refer patients to a designated tertiary hospital:

- Respiratory failure, shock or complications: altered mental status, shortness of breath, peripheral oxygen saturation SpO_2 < 94%, respiratory rate > 30/min, systolic blood pressure < 90 mm Hg, organ failure.
- Clinicians should be aware that co-morbidities and age over 60 years are associated with more serious illness and death.

Criteria for referral to a tertiary hospital should take into account the judgement of clinicians and local capacity, for instance if a patient needs a higher level of care than can be provided at the primary or secondary facility. Close monitoring and treatment should be started immediately for patients who are severely or critically ill – before, during and after referral.

2.2.1 Infection prevention and control

Standard, droplet and contact precautions should be initiated for all patients with suspected or confirmed COVID-19. Isolate patients where possible in a single room, or cohort (e.g. keep suspected and confirmed cases together in one area) when isolation is not possible. Health-care workers who refer patients using an ambulance or other designated vehicle and are involved in direct care of patients should practise standard, droplet and contact precautions.

[1] Including hand and respiratory hygiene, use of appropriate personal protective equipment (PPE) according to a risk assessment, injection safety practices, safe waste management, proper linens, environmental cleaning, and sterilization of patient-care equipment.

2.3 Tertiary hospitals

Full clinical assessment and management of severe, critical and high-risk cases should be done at designated (tertiary) hospitals:

- **Perform blood test** (e.g. haematology, biochemistry), electrocardiogram (ECG) and chest X-ray or computerized tomography (CT) scan, if available.
- **Test for COVID-19,** if not tested or if test was negative but COVID-19 is suspected. Unstable cases and those anticipated to need aerosol-generating procedures should be prioritized.
- **Monitor severity** of illness and complications (e.g. respiratory failure, acute respiratory distress syndrome [ARDS], septic shock).

Critically ill patients should be referred to the ICU based on:

- impending respiratory failure, life-threatening organ dysfunction or shock;
- needs for intensive monitoring; and
- needs for intensive therapies (e.g. mechanical ventilation).

Referral to the ICU should also take into account the judgement of clinicians, patients' wishes and local capacity. Patients who do not meet ICU referral criteria may be admitted as inpatients at the designated (tertiary) hospital and reassessed for ICU admission if their condition worsens. If their condition improves and care at hospital is no longer required, these patients may be discharged to community care, either at home or in designated non-health facilities.

2.3.1 Infection prevention and control

Standard, droplet and contact precautions should be implemented for the triage and care of all suspected and confirmed cases. When possible, patients should be isolated in a single room for assessment and treatment; when is not possible, they should be cohorted.

If aerosol-generating procedures are used (e.g. open suctioning of respiratory tract, intubation, bronchoscopy, manual ventilation, cardiopulmonary resuscitation, non-invasive positive pressure ventilation, nebulized treatment, disconnection from the ventilator, turning intubated patients, insertion of tracheostomies), airborne precautions should be implemented. This includes use of appropriate personal protective equipment (e.g. fit-tested N95 or equivalent respirator mask, eye protection, gown, gloves) and adequately ventilated rooms during the procedure.

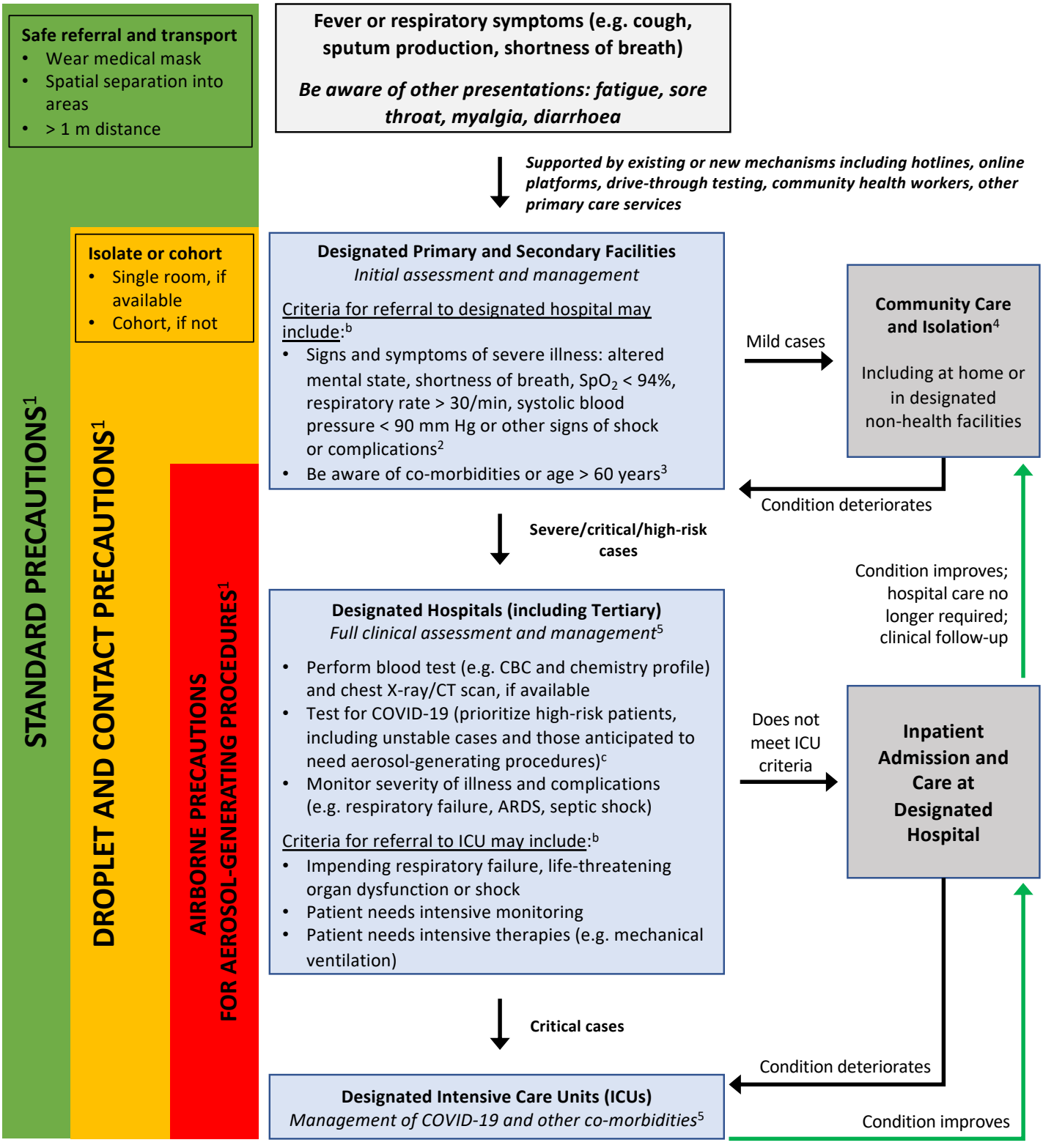
2.3 Designated ICUs

Acute respiratory distress, septic shock, and other complications for suspected or confirmed cases of COVID-19 are preferably managed in designated ICUs.

Please refer to:

- WHO (2020). Clinical management of severe acute respiratory infection (SARI) when COVID-19 disease is suspected. https://apps.who.int/iris/handle/10665/331446.

Algorithm for COVID-19 patient triage and referral[a] for resource-limited settings during community transmission



Notes:

a. The referral and triage pathways are intended to be adapted to the local context and to comply with local ethical guidelines.
b. Taking into account judgement of clinicians and local capacity, for example if patient requires higher level of care than can be provided at facility.
c. If not previously tested or if prior test was negative but COVID-19 is clinically suspected.

Sources:

1. Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected. Geneva: World Health Organization; 2020.
2. Lim WS, van der Eerden MM, Laing R, Boersma WG, Karalus N, Town GI et al. Defining community acquired pneumonia severity on presentation to hospital: an international derivation and validation study. Thorax. 2003;58(5):377–82.
3. Zhou F, Yu T, Du R, Fan G, Liu Y, Liu Z et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet. 2020;pii:S0140-6736(20)30566-3.
4. Home care for patients with COVID-19 presenting with mild symptoms and management of their contacts. Geneva: World Health Organization; 2020.
5. Clinical management of severe acute respiratory infection (SARI) when COVID-19 disease is suspected. Geneva: World Health Organization; 2020.

3. Guidance development

3.1 Acknowledgements

This document was developed by a guidance development group composed of staff from the WHO Regional Office for the Western Pacific (WHO Health Emergencies Programme and Division of Health Systems and Services).

3.2 Guidance development methods

This document was developed based on adaptation of WHO COVID-19 global interim guidance, review of relevant literature, expert consultation and guidance development group discussion and consensus.

3.3 Declaration of interests

Interests have been declared in line with WHO policy, and no conflicts of interest were identified from any of the contributors.

References

Infection prevention and control	Infection prevention and control during health care when COVID-19 is suspected [interim guidance]. Geneva: World Health Organization; 2020. (https://apps.who.int/iris/handle/10665/331495)
Home care	Home care for patients with COVID-19 presenting with mild symptoms and management of their contacts [interim guidance]. Geneva: World Health Organization; 2020. (https://apps.who.int/iris/handle/10665/331133)
Clinical management	Clinical management of severe acute respiratory infection (SARI) when COVID-19 disease is suspected [interim guidance]. Geneva: World Health Organization; 2020. (https://apps.who.int/iris/handle/10665/331446)
Additional publications used as resources	Lim WS, van der Eerden MM, Laing R, Boersma WG, Karalus N, Town GI et al. Defining community acquired pneumonia severity on presentation to hospital: an international derivation and validation study. Thorax. 2003;58(5):377–82. doi:10.1136/thorax.58.5.377. Zhou F, Yu T, Du R, Fan G, Liu Y, Liu Z et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet. 2020;pii:S0140-6736(20)30566-3. doi:10.1016/S0140-6736(20)30633-4. Gray AZ, Morpeth M, Duke T, Peel D, Winter C, Satvady M et al. Improved oxygen systems in district hospitals in Lao PDR: a prospective field trial of the impact on outcomes for childhood pneumonia and equipment sustainability BMJ Paediatrics Open. 2017;1(1):e000083. doi:10.1136/bmjpo-2017-000083.