COVID-19

CONSIDERATIONS FOR STRENGTHENING THE FIRST LEVEL OF CARE IN THE MANAGEMENT OF THE COVID-19 PANDEMIC

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Considerations for Strengthening the First Level of Care in the Management of the COVID-19 pandemic

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Acknowledgements

Introduction

During the COVID-19 pandemic, health systems have been facing the difficulty of providing timely access and coverage and meeting the needs of the population at the first level of care (FLC), particularly in rural, remote, and neglected areas and border zones where there is a high number of COVID-19 cases. These areas are inhabited by indigenous, Afro-descendant, and migrant populations, as well as people living in extreme poverty.

This document supplements the publication *Flowchart for the Management of Suspected COVID-19 Patients at the First Level of Care and in Remote Areas in the Region of the Americas (1)* published by the Pan American Health Organization (PAHO) and is intended for ministry of health decision-makers, directors of health service networks, health care facility managers, and health teams and workers in the first level of care.

The objective of this document is to present the necessary considerations regarding the response capacity of FLC services so that each patient with a confirmed or suspected case of COVID-19 receives appropriate care at the community level, including patients who can be treated in FLC facilities that have trained human resources and appropriate technology.

Logic model

A logic model (Figure 1) was developed that shows the components needed to ensure the accessible, integrated, and coordinated operation of the FLC with respect to the clinical management of COVID-19 cases, along with the respective activities, responsible parties, and short- and medium-term outcomes. These components are: the organization and management of COVID-19 health services, clinical management, and community prevention.

The logic model with the respective components and activities to be described in this document appears below:

FIGURE 1: Logic model for strengthening the first level of care in the management of the COVID-19 pandemic

Vision	Accessible, integrated, and coordinated prevention and management of SARS-CoV-2 infection		
Resources	Human resources, guidelines and protocols, information systems, transportation systems, medical devices, and medicines		
Components	**Organization and management of health services**	**Clinical management**	**Community prevention**
Activities	* Coordination of the FLC, emergency teams, and specialized services (referral, transportation, and strategic partnerships). * Availability and training of FLC human resources. * Availability of medicines, medical devices, and essential supplies for the prevention, diagnosis, and clinical management of COVID-19 patients. * Implementation of digital health. * Strengthening of information systems and platforms. * Reorganization of COVID-19 patient care services and priority biosafety conditions in the community. * Deployment of emergency medical teams.	* Development of protocols for preventing infection among health professionals and in community settings. * Detection of suspected cases of COVID-19. * Identification of deterioration risk factors. * Diagnosis of patients infected with SARS-CoV-2 (hospital and community level), including differential diagnosis with other respiratory infections. * Management of patients with mild COVID-19. * Management of patients with moderate COVID-19. * Referral of patients with warning and deterioration signs to the second level of care. * Monitoring of recovered patients. * Use of management guidelines and algorithms.	* Support in the implementation of institutional, governmental, and community strategies for preventing the SARS-CoV-2 infection. * Use of digital tools to answer the community's questions. * Educating the community on COVID-19 myths and realities. * Providing guidance for the families of patients on how to prevent COVID-19 in the work place and at home.
Responsible partie	**Government agencies**	**Institutional health service providers, governmental agencies, and health professionals**	**Institutional health service providers, health professionals, general population, community agencies, leaders, and health council**
Short- and medium-term outcomes	* Create a roadmap for the management of COVID-19 patients and ensure the availability of drugs, devices, and supplies. * Enhance collaboration between the different actors and levels in the system in order to provide a rapid response to the pandemic and changes in the epidemiological profile. * Strengthen national pandemic management policies. * Ensure efficient management of resources.	Build knowledge on how to manage the SARS-CoV-2 infection based on the stage of the disease. * Ensure the timely referral of patients with warning signs. * Decrease the spread of infection among health professionals. * Reduce mortality from COVID-19.	* Increase the community's knowledge on how to prevent SARS-CoV-2 infection. * Decrease the spread of infection in the community. * Reduce mortality from COVID-19. * Improve knowledge about community needs.

Component 1. Organization and management of health services

The COVID-19 pandemic has posed a challenge in the delivery of health services, especially for the first level of care (FLC), as it entails providing patient care that is coordinated and integrated with the different levels of complexity while ensuring an uninterrupted supply of medicines and devices that are received by all health care facilities, including those in remote areas.

In different countries of the Region *(2)*, the FLC is organized in facilities with gradually increasing complexity, from health posts attended by a community health worker and basic health centers with teams including a doctor, nurse, and community health workers, to health facilities that provide diagnostic services, comprehensive specialized care, and hospitalization of medium-complexity patients. The complexity of FLC services depends on the human resources, technological capacity, and resources available to address different health problems *(3)*.

To facilitate the effective functioning of health service networks and the response capacity of the FLC (3), the network's structure, governance, and management should ensure the following: the availability and training of human resources; the supply and availability of medicines, supplies, and medical devices; the possibility of having an organization and platform that allows digital health applications and information systems to be used within the service network; and the availability of transportation for patient transfers, as well as coverage for the entire population *(4)*.

Coordination of the first level of care, emergency teams, and specialized services

- Protecting population health and reducing COVID-19 mortality requires strengthening the care model based on primary health care with initial response capacity and integrated functional health networks. This will optimize the availability of human resources, equipment, and supplies in hospitals and intensive care units, where pandemic response efforts have been concentrated *(5, 6)*.
- Patients infected with COVID-19 who live in rural, remote, or neglected areas and present warning signs or have complication risk factors should be promptly referred to institutions with a higher level of complexity *(1)*. This involves coordinating regional, state, and national care networks, simplifying formalities, and using emergency medical teams, increasing the integration of second- and third-tier hospitals into state care networks, and increasing financial resources for health providers caring for patients with COVID-19 *(7, 8)*.
- Rather than establishing boundaries between care levels, the service network organizes and coordinates a continuum of progressively more complex services for public health actions and the prevention, diagnosis, and treatment of patients, up to specialized hospitals where critical cases are managed *(9)*. The service network is also responsible for patient transfer coordination and communication activities.
- The proper functioning of network health services facilitates the coordination of public health actions, as well as patient flows based on clinical practice guidelines and established algorithms *(3)*, helps coordinate with specialized or more complex patient treatment services through communication mechanisms and patient referral and transfer processes, links complementary

services and community and social support resources to meet people's social needs, and promotes greater efficiency in the management of available resources and in building community and social health for a resilient response to needs stemming from the COVID-19 pandemic *(7, 9).*

- During the COVID-19 pandemic, several countries have set up and organized different types of emergency medical teams (EMTs) with varying levels of ability to provide triage and care services *(10).* These EMTs should be coordinated with FLC service providers during the entire time of their response and functioning in the pandemic and are part of health service networks in the territories where they have been deployed *(11).*

- The pandemic has revealed limitations in access to services and coverage in the countries. Rising unemployment has led to more people losing their enrolment in the health system *(12).* Governments should strengthen policies to keep FLC facilities in operation and provide coverage for the entire population, regardless of their enrolment in each country's social security program or their immigration status. Measures should be taken to mitigate transmission and ensure that diagnosis and treatment are provided in a timely manner, and to reduce inequalities in the management of clinical cases of COVID-19 and any other condition that requires urgent care *(5, 11).*

- It is important to note that for the service network to properly function in the territory, there must be a patient transportation service that is coordinated with each level of the health system to manage the transfer of patients suspected of having COVID-19. This service should function in emergency situations should serve to transport patients between health facilities (secondary transport), based on the level of complexity required for their care. A patient transport service should have the following basic components to ensure proper functioning:

    o Dispatch system: this may include emergency regulatory centers, health consoles, etc. This system should have an appropriate communications and information management system and should coordinate transportation (timely transfer and reception of patients) and ensure that emergencies are addressed as promptly as necessary.

    o Available transport vehicles: with different modalities (land, air, or water), depending on the location and characteristics of the territory. These vehicles should comply with national regulations on patient transport, with established protocols for managing suspected COVID-19 patients, and with particular emphasis on vehicle ventilation and patient contact. In addition, transport vehicles should have the supplies and equipment required for the proper management of these patients. If necessary, specific vehicles will be designated for the management of suspected or confirmed COVID-19 patients. The type of vehicle used will be determined based on the complexity of the patient to be transported. General recommendations for a basic life support vehicle are provided in Annex 1.

    o Staff: Transport vehicles must have staff who are sufficiently trained for this purpose. In addition, staff must be provided with appropriate personal protective equipment, and must use the established protocols for transporting COVID-19 patients, taking particular care with any actions that could generate aerosols.

First level of health care activities for managing mild and moderate cases of COVID-19

- FLC facilities perform actions to detect, track, isolate, and monitor infected individuals, and to monitor the isolation of contacts in order to stop the transmission of the virus, based on protocols for managing patients with a suspected or confirmed diagnosis of mild or moderate COVID-19; they also promptly identify warning and deterioration signs with a view to patient transfer. In addition, they should support community orientation activities on preventing COVID-19 infection and preventing the infection of health workers by adhering to protocols and using the required personal protective equipment, as well as proper cleaning and environmental disinfection of the facilities *(11, 12)*.

- Basic human resource teams should be available to trace contacts and suspected cases, take samples and send them to laboratories for PCR testing, perform on-the-spot rapid antigen tests and other basic examinations, determine where and under whose care patients should be isolated, perform contact tracing, and manage contact isolation *(11, 12)*.

- If a community health team identifies individuals who are exposed to COVID-19 and have risk factors, or vulnerable populations or situations warning of the specific potential complications identified in the algorithm, the team should be familiar with the system for promptly referring these cases to other health care providers in a timely fashion. To this end, the team should refer to national, state, or departmental legislation establishing the COVID-19 national service delivery model and the health care networks of each provider *(13)*.

- The clinical evolution of COVID-19 patients to critical stages involves being prepared and having the resources to ensure the prompt and efficient communication, coordination, transfer, and transportation of patients. Once patients with warning and/or deterioration signs have been identified, the process of moving them to a more complex hospital or the next level of health care should be initiated.

- It is recommended that facilities rely on telemedicine to decide on transfer conditions, appropriate timing, and anticipation of any risks that may arise during transfers. If suspected COVID-19 cases must be transferred to another level of care, the vehicles specifically designated by the care network for this purpose should be used. Patients should not be transferred in public or private transportation such as taxis or private cars *(11, 14)*.

Activities of higher-level facilities to support the first level of health care in the clinical management of mild and moderate cases of COVID-19

It is necessary to establish territorial micro-networks that include at least one complex facility for diagnosis and treatment.

- Each complex FLC facility should have a referral hospital and alternative hospitals in the event the initially designated hospital is full.

- Determine which facilities will be the referral centers and hold regular virtual meetings to review the development of the situation, protocols and procedures, as well as their ongoing evaluation and improvement.

- The health authority should designate the manager responsible for the care network. It is suggested that this should be the director in charge of high- complexity FLC, with authority to make patient transfer decisions and report on the hospital beds available for intensive care referrals.
- Ensure the availability of digital health platforms, as well as the organization and coordination needed for remote consultations and the collection of online data and results.
- Ensure the availability of a daily log or platform to know how many beds are available both at the FLC and in the micro-network's referral hospital, so that the manager can make timely and accurate transfer decisions. At the national level, it is ideal to have a centralized unit for COVID-19 patient bed management, especially in intermediate care and intensive care units.
- Determine the capacity and resources available for communication on and the coordination of support and transport vehicles for patient transfers.
- Integrated care between institutions and regions should be coordinated by identifying counterparts that would support the service provided, confirming availability with other organizations and providers that offer complementary services to establish centralized care models, while identifying barriers to local access and finding strategies with government agencies to reduce these barriers.
- Manage the implementation of safe health facilities, both permanent and ad hoc (in the event of other threats that could disrupt services).

Reorganization of services in the first level of care

- Facilities should have protected areas for essential activities that must continue during the pandemic, such as vaccination, supplementary food delivery, check-ups and monitoring of pregnant women, emergency contraception, follow-up and monitoring of TB patients, consultations for treating adolescents and patients with sexually transmitted infections, senior care, monitoring and follow-up of people with noncommunicable diseases and mental health disorders, among others. If necessary and whenever possible, some of these activities may take place outside of the health facilities in locations selected with the community and government authorities, in compliance with infection prevention and control measures. This decision will be made based on a risk-benefit analysis and on the prevalence of COVID-19 in the community. With regard to communicable diseases, prophylactic chemotherapy should be maintained for any patients who need it. The following activities should also be continued: individual case management; vector control and delivery of necessary supplies (e.g., insecticide-treated mosquito bed nets); mass vaccination of animals (e.g. rabies vaccine for dogs); and the provision of water to communities that need it *(11, 15)*.
- Vulnerable population groups (low-income people, homeless people, people with disabilities, care-dependent older adults, indigenous people, Afro-descendants, drug users, refugees, and migrants) who may face barriers in accessing care should be identified, and strategies should be developed in the event they need COVID-19 care *(16)*.

- During the reorganization of the first level of care in pandemic conditions, the risk of COVID-19 infection should be minimized while meeting the priority needs of the population, including *(13, 17):*

  o Prioritize care in urgent cases.
  o Reschedule chronic patient follow-up appointments
  o Continue the delivery of chronic-use medicines.
  o Improve at-home and community care
  o Ensure sufficient inventories of medicines.
  o Have sufficient devices and supplies (at least one month) for the management of COVID-19 and chronic patients.
  o Implement telemedicine to provide remote care and medical consultations for people who visit the facilities.
  o Reassign human resource activities based on needs (community work, disseminating information, providing first aid, etc.).
  o Implement protocols that include parameters for managing patients with confirmed or suspected COVID-19, including the provision of personal protective equipment (PPE) for health workers.
  o Select areas for patient isolation and initiate reporting systems.
  o Keep a daily record of patients and their condition and send it to the nationally designated information system and keep the families of patients who have been transferred to another facility informed, through the respective teams.
  o Form a team responsible for the telephone follow-up of patients with confirmed or suspected COVID-19, and for patients with other conditions that cannot be treated at the centers.
  o Adapt the health facility's infrastructure to comply with established biosecurity standards.

- When epidemiological conditions permit, services should be gradually opened based on previously established care priorities (such as diabetic foot treatment, minor procedures, follow-up appointments, newborn and pregnant women check-ups, and dental and psychological emergencies). These services may begin during low patient volume times *(9).*
- The delivery of medicines for chronic patients should be coordinated so that they have sufficient medication for two to three months, working with providers, the national distribution chain, and community and hospital pharmacies *(11).* Various strategies such as mail-order and home delivery of medicines may be implemented, with the support of different actors.
- Periodic adjustments should be made based on the capacity of the FLC and the local evolution of the pandemic. Patients and the general public should be informed of any decision to suspend the provision of certain services.
- Countries should have a public health information system that provides real-time data on the prevalence and incidence of not only COVID-19, but all notifiable diseases. The system must be connected to regional or federal health departments and health care providers and laboratories so that they have up-to-date information at all times for making decisions *(18, 19).* The availability

and development of health human resources must be ensured for the clinical management of COVID-19 patients at the first level of care

- Health human resources are one of the essential pillars for the health service's response to health crises, something that has become very clear in the COVID-19 pandemic. There must be sufficient human resources to serve the population requesting FLC services, and they must be trained in the management of COVID-19 and committed to providing equitable, quality care in the clinical management of patients. The response in terms of health human resources is closely linked to stewardship and planning capacities, the availability of national policies, sufficient investment, reliable information systems, and appropriate training programs (11, 20).

- All health personnel should be trained to make treatment decisions at the FLC and meet the needs of patients with mild or moderate COVID-19 symptoms, make timely diagnoses and have sufficient knowledge to identify the signs of deterioration in patients for the purpose of making timely referrals to other levels of care, and maintain the continuity of the other essential FLC services. Table 1 lists the specific human resource capacities needed for the management of COVID-19 patients (21-25).

- It is recommended that protocols be established for periodically assessing the mental health and psychosocial aspects of health workers on the front line in order to identify emerging mental risks and conditions, so that timely management can be provided. It is important to identify staff trained in providing psychological assistance to support health workers until they can receive specialized care (26), given the possible difficulties in accessing specialists.

TABLE 1. Specific health human resource capacities in the care of COVID-19 patients

Capacities of higher levels supporting FLC in order to have the human resources required for the clinical management of mild and moderate cases of COVID-19
1. Plan the human resources required at the FLC based on the duties and responsibilities to be assigned to these teams.
2. Establish a process to estimate the human resources required at the FLC to ensure the accessibility, longitudinal continuity, comprehensiveness, and coordination of health care.
3. Recruit, hire, and distribute human resources based on needs and the duties to be performed by health teams according to the defined care model, including the temporary mobilization or redistribution of staff.
4. Define and develop the duties that each member of the health team must perform according to existing regulations on health care delivery, in addition to the capacities and actions to be covered.
5. Review the existing regulatory framework[a] so that FLC team members can provide the health responses required for the specific health emergency situation, based on the capacities and skills established in their duties for each level of care.
6. Implement financial and non-financial incentives for staff working in remote and hard-to-reach areas, and in the care of COVID-19[b] patients.
7. Strengthen and incorporate information and communication technology in these geographic areas to support FLC staff.
8. Ensure the safety and protection of FLC health workers and support staff, including the provision of PPE and training in the use of the required equipment and supplies, with due consideration of the mental and psychosocial health and safety and protection of health personnel.
9. Provide or facilitate access to an appropriate, up-to-date and ongoing training process for health workers, including an appropriate training, supervision, and support plan, as well as a system to monitor and ensure the acquisition of knowledge, skills, and competencies and their appropriate use in practice.

Specific FLC capacities to ensure the availability of the human resources required for clinical management of mild and moderate cases of COVID-19

1. Have health teams that are trained in the detection, screening, follow-up, and monitoring of mild and moderate cases and identify any cases that need to be referred.
2. Ensure that health professionals and specialists who are not involved in the direct care of COVID-19 patients are redistributed, reassigned, and exempted from the care and management of COVID-19 cases pursuant to existing regulations and standards.

Monitoring of patients with suspected COVID-19 and management of mild and moderate cases (first level)

- Doctor or nurse who can diagnose COVID-19 and perform differential diagnoses with other respiratory infections and provide treatment in mild and moderate cases

Patient with signs of respiratory distress and signs of complications with or without risk factors (second level)

- o Management with doctors or nursing graduates trained to:
- o Monitor vital signs and possible need for respiratory assistance
- o Monitor lab results
- o Identify signs and symptoms of worsening patient symptoms
- o Perform differential diagnosis of the patient's signs and symptoms

Patients with signs of deterioration (third level)

- o Start pharmacological treatment (assess the need for corticosteroid treatment)
- o Respiratory support
- o Nursing support in patient life support

Referral to the third level of care:

3. Health personnel educated and trained in:
   - Interprofessional work
   - Intercultural approach and the social determinants of health that are essential for favorable patient evolution, addressing the particular circumstances of vulnerable populations.
   - Interventions that safely facilitate the exchange or expansion of roles.
   - Use of telemedicine, telehealth, and other virtual systems to:
     - o Provide direct patient care.
     - o Support clinical decision-making.
     - o Engage in cross-consultation with specialists.
     - o Call centers and hotlines to guide and answer questions, concerns, and issues that arise in the communities.

4. Consider strengthening support and pharmacy staff due to high demand during the pandemic and in order to prevent staff absences due to fear of infection.

Notes: [a] In the absence of these regulatory frameworks, it is suggested that temporary easing measures be established to expand the duties of professional practice, with the aim of increasing coverage under established supervisory mechanisms.

[b] For example: increased wages, career development opportunities, protection for staff with precarious contracts or no contracts, extension of fixed deadlines, life and accident insurance, sick leave, health care, health insurance for workers and their families, and compensation in the event of illness or death. Domestic support measures may also be considered to make it easier for health workers to work their shifts (e.g., transportation, childcare, care for family members who are sick, disabled, or elderly).

Sources: World Health Organization. Coronavirus disease (COVID-19) outbreak: rights, roles and responsibilities of health workers, including key considerations for occupational safety and health. Geneva: WHO; 2020. Available at: https://www.who.int/docs/default-source/coronaviruse/who-rights-roles-respon-hw-covid-19.pdf?sfvrsn=bcabd401_0. Pan American Health Organization. Care for health workers exposed to the new coronavirus (COVID-19) in health facilities (Interim Recommendations, 13 April 2020) Washington, D.C.: PAHO, 2017. Available at: https://iris.paho.org/handle/10665.2/52032 World Health Organization. Risk assessment and management of exposure of health care workers in the context of COVID-19. Geneva: WHO; 2020. Data template: https://www.who.int/publications/m/item/risk-assessment-and-management-of-exposure-of-health-care-workers-in-the-context-of-covid-19-data-template. Data dictionary: https://www.who.int/publications/m/item/data-dictionary-for-health-worker-exposure-assessment-tool; Pan American Health Organization. Virtual Campus for Public Health Washington, D.C.: PAHO, 2020. Available at: https://www.campusvirtualsp.org/en/covid-19; World Health Organization. WHO Academy mobile learning app. Geneva: WHO; 2020. Available at: https://www.who.int/about/who-academy/the-who-academy-s-covid-19-mobile-learning-app.

Availability of medicines, medical devices, and supplies for the management of patients with COVID-19

- FLC facilities should be familiar with and obtain appropriate medicines and other health technologies (including reagents and laboratory supplies) for the management of COVID-19 patients at the FLC. These items should always be available at the patient's care site and in sufficient quantities to prevent shortages; their quality should be assured from their origin and during transit in the distribution chain; and they should be used rationally *(27)*.

- The pandemic's impact on health technology management and delivery systems has been systemic, affecting the availability of medicines and technologies for COVID-19 management and the list of essential medicines in all health services, including the FLC. Medicines and other health technologies are the second largest item of expenditure in the provision of health services, after human resources. Drug management systems are not simply logistics systems: they are complex, multidisciplinary, and extend beyond the health sector. Table 2 lists the capacities that FLC facilities need to ensure the availability of medicines and supplies during the pandemic *(28-31)*.

- In the context of the pandemic, there must be a cost-effective approach to the management of medicines and other health technologies to be used for COVID-19 patients at the FLC. The lists of medicines and devices selected based on the best available evidence serve as an appropriate tool for this purpose.

- Supply chains should be strengthened by anticipating interruptions and developing critical control strategies to maintain the availability of essential medicines and health technologies. These strategies should consider the most common supplies, any other high-demand medicines, manufacturing and distribution mechanisms that ensure proper patient management, and universal coverage *(11)*.

TABLE 2. Capacities that FLC facilities should have to ensure the availability of medicines and supplies during the pandemic

Specific capacities of the first level of health care
- Use management standards for procedures and good practices for storing, distributing, and dispensing medicines.   - Quantify needs for medicines and other technologies, reserve contingency provisions, and set delivery times (based on expected patient epidemiological methods, bed capacities, and number of health workers).   - Maintain a continuously updated inventory management information (updated automatically or manually using stock cards) and information on processing and tracking supply orders at higher levels.   - Ensure that the health care facility has minimum provisions equivalent to at least one month of expected use during peak pandemic care, in accordance with national policies.   - Have sufficient storage space for three months of use based on the good practices of the World Health Organization (WHO); it should be noted that a high volume of certain supplies may be needed, especially PPE and parenteral fluids and administration sets.   - Ensure that environmental factors such as temperature (premises have air conditioning and a refrigerator), humidity, protection from direct sunlight and dust, and that any rodents and insects present do not affect the quality of the different supplies.   - Apply differential care strategies based on the needs of users and consider home delivery to facilitate access to required medicines with a lower risk to the patient.   - Be familiar with and manage lists of essential medicines and medical devices and the flowchart for managing suspected COVID-19 patients at the FLC and in remote areas of the Region.   - Dispense medications covering several months for stable chronic patients (with human immunodeficiency virus infection, hypertension, diabetes, etc.); follow the guidelines developed for this purpose by PAHO and the Joint United Nations Programme on HIV/AIDS.   - All human health resources that handle medicines at the FLC must be trained in the basic principles of the drug management cycle and other technologies (selection, quantification, reception, storage, internal distribution, dispensing, use, and disposal).
Capacities of higher levels that support the first level of health care
- Governance and a clear selection policy based on the list of essential medicines by level of care and defined treatment.   - Directives, training, and consensus on the implementation of guidelines, in particular the flowchart for managing patients suspected of having COVID-19 at the FLC and in remote areas of the Region of the Americas, and on the use of this list of medicines and other health technologies. These guidelines should be informed by the available evidence, to ensure patient safety, cost effectiveness, and the efficient and rational use of resources.   - Established and operational systems for: - Quality assurance of medicines, from their origin (manufacturing and purchase) to the user (distribution).   - Pharmacovigilance and adverse reaction reporting.   - Logistics information on national drug management with the ability to track distribution by lot number.   - Detailed supply planning with realistic delivery times, formulation of a purchasing plan with actual costs, and sufficient budget allocation.

- All functions or actions performed in the handling and comprehensive management of medicines (selection, quantification, reception, storage, internal distribution, dispensing, use, and disposal) have the respective standardized procedures for the FLC.
- Provision and allocation of trained human resources in primary care facilities who do not necessarily have to be licensed pharmacists; trained staff with pharmaceutical supervision are sufficient at the most basic levels with a limited drug list.
- Training and supervision in the basic concepts and principles of the drug management cycle for different sublevels within the first level of care.
- List of medicines, medical supplies, personal protective equipment, and laboratory supplies.
- Coordinated work to order and distribute essential medicines, supplies, safety equipment, and devices, ensuring that it is done fairly.
- Ensure that pharmacies, health posts, and other community establishments are included in distribution and in electronic prescription and dispensing systems.

PPE: personal protective equipment FLC: first level of care.

Sources: World Health Organization. Good storage and distribution practices. Geneva: WHO; 2019. Available at https://www.who.int/medicines/areas/quality_safety/quality_assurance/qas19_793_good_storage_and_distribution_practices_may_2019.pdf?ua=1; Pan American Health Organization. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection Recommendations for a public health approach. Washington, D.C: PAHO; 2016. Available at: https://iris.paho.org/handle/10665.2/49510; Pan American Health Organization. Pharmaceutical services based on primary health care. Washington, D.C: PAHO; 2013; World Health Organization. Clinical management of COVID-19: interim guidance, 27 March 2020. Geneva: WHO; 2020. Available at: https://apps.who.int/iris/handle/10665/332196.

List of essential medicines for managing patients with a suspected or confirmed case of mild or moderate COVID-19, for the first level of care

- The list basically includes medicines considered essential for the treatment of the most common clinical symptoms in outpatients and patients in temporary isolation for mild or moderate COVID-19 infection who may have comorbidities. It also includes medicines required to treat the comorbidities prevalent in most countries, or to stabilize acute symptoms caused by the presence of comorbidities (e.g., diabetes and hypertension). PAHO has developed a tool for estimating and quantifying the needed supplies and medicines, which is available in the countries of the Region. Specific medicines to treat the COVID-19 infection are not included, since there is currently no high-quality evidence to support their use in patients with mild or moderate infection *(32).*
- To develop this list of essential medicines, the most relevant clinical signs, symptoms, and treatments were identified in patients with mild or moderate COVID-19. These medicines have priority in the guidelines of WHO *(32)* and the National Institute of Health and Care Excellence (NICE) *(33).* The NICE guidelines on *Pneumonia (community-acquired): antimicrobial prescribing (34), COVID-19 Rapid Guideline: Antibiotics for Pneumonia in Adults in the Hospital (35), and PAHO's Flowchart for the management of suspected COVID-19 patients at the first level of care and in remote areas in the Region of the Americas (1)* were also considered. The list is based on the evidence-informed management recommendations presented in these guidelines. This list will be updated as new evidence emerges. Table 3 lists the essential medicines for managing patients with a suspected or confirmed case of mild or moderate COVID-19.

- The clinical symptoms selected to prepare the list of essential medicines for managing patients with a suspected or confirmed case of mild or moderate COVID-19 to be used at the FLC are patients with mild COVID-19 and symptomatic management (cough, pain, fever, dyspnoea), and patients with moderate COVID-19 (treatment of pneumonia and prevention of complications) *(32)*.

TABLE 3. List of essential medicines for managing patients with a suspected or confirmed case of mild or moderate COVID-19 to be used at the first level of care

Medication	Pharmaceutical form and concentration
Analgesics and antipyretics	
Paracetamol	Oral liquid: 120 mg/5 mL and 125 mg/5 mL Suppository: 100 mg. Tablet: 100 mg and 500 mg
Cough medicines	
Codeine	Tablet: 30 mg (phosphate).
Medicinal gases	
Oxygen	Inhalation, for use in hypoxemia management
Antimicrobials	
Amoxycillin + clavulanic acid	Oral liquid: 125 mg amoxicillin + 31.25 mg clavulanic acid/5 mL and 250 mg amoxicillin + 62.5 mg clavulanic acid/5 mL Tablet: 500 mg (as trihydrate) + 125 mg (as potassium salt). Injection powder: 500 mg (as sodium) + 100 mg (as potassium salt); 1000 mg (as sodium) + 200 mg (as potassium salt) in ampoule bottle
Clarithromycin	Tablets: 500 mg Oral liquid powder: 125 mg/5 mL and 250 mg/5 mL Injection powder: 500 mg in ampoule bottle
Antiseptics and disinfectants	
Alcohol	Solution: containing isopropyl alcohol 75% volume/volume or ethanol 80%, volume/volume
Chlorhexidine (digluconate)	5% solution
Yodopovidone	10% solution (equivalent to 1% of available iodine)
Bronchodilators	
Ipratropium bromide	Inhalation (aerosol): 20 micrograms/dose
Salbutamol (sulfate)	Inhalation (aerosol): 100 micrograms/dose Injection: 50 microgram ampoule)/mL in 5 mL
Anticoagulants	
Enoxaparin*	Injection: pre-filled ampoule or syringe 20 mg/0.2 mL; 40 mg/0.4 mL; 60 mg/0.6 mL; 80 mg/0.8 mL; 100 mg/1 mL; 120 mg/0.8 mL and 150 mg/1 mL *Alternatives limited to nadroparrin and dalteparin
Glucocorticoids	
Hydrocortisone (sodium succinate)	Injection powder: 100 mg in ampoule bottle
Dexamethasone (disodium phosphate)	4 mg/mL in 1 mL ampoule bottle

Treatment of comorbidities	
Medicines for the treatment of diabetes	
Soluble insulin	Injection: 40 IU/mL in 10 mL ampoule bottle and 100 IU/mL in 10 mL ampoule bottle
Intermediate-acting insulin	Injection: 40 IU/mL in ampoule bottle 10 mL and 100 IU/mL in 10 mL ampoule bottle (suspension composed of zinc insulin or isophanic insulin)
Metformin (hydrochloride)	Tablet: 500 mg
Antianginals	
Bisoprolol*	Tablet: 1.25 mg and 5 mg *Metoprolol and carvedilol as alternatives
Isosorbide (dinitrate)	Tablet (sublingual): 5 mg
Verapamil (hydrochloride)	Tablet: 40 mg and 80 mg
Antiarrhythmics	
Bisoprolol*	Tablet: 1.25 mg and 5 mg *Metoprolol and carvedilol as alternatives
Amiodarone (hydrochloride)	Injection: 50 mg/mL in 3 mL ampoule bottle Tablet: 100 mg, 200 mg and 400 mg
Verapamil (hydrochloride)	Injection: 2.5 mg/mL in ampoule bottle Tablet: 40 mg and 80 mg (hydrochloride)
Antihypertensives	
Amlodipine	Tablet: 5 mg (as maleate, mesilate, or besylate)
Bisoprolol*	Tablet: 1.25 mg and 5 mg. *Atenolol, metoprolol and carvedilol as alternatives. Atenolol should not be used as a first-line agent for uncomplicated hypertension in patients >60 years
Enalapril (hydrogen maleate)	Tablet: 2.5 mg and 5 mg
Losartan	Tablet: 25 mg, 50 mg and 100 mg
Hydrochlorothiazide	Oral liquid: 50 mg/5 mL Tablets: 12.5 mg and 25 mg
Sodium nitrite	Infusion powder: 50 mg in ampoule
Heart failure medications	
Bisoprolol*	Tablet: 1.25 mg and 5 mg *Metoprolol and carvedilol as alternatives
Enalapril (hydrogen maleate)	Tablet: 2.5 mg and 5 mg
Furosemide	Injection: 10 mg/mL in 2 mL ampoule bottle Oral liquid: 20 mg/5 mL Tablet: 40 mg
Dopamine	Injection: 40 mg/mL (hydrochloride) in 5 mL ampoule bottle
Antiplatelets	
Acetylsalic acid	Tablet: 100 mg
Other medicines for asthma and chronic obstructive pulmonary disease	

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Beclomethasone	Inhalation (aerosol): 50 micrograms/dose (dipropionate) and 100 micrograms/dose (dipropionate)
Budesonide	Inhalation (aerosol): 100 micrograms/dose
Epinephrine (adrenaline)	Injection: 1 mg in 1 mL ampoule (chloride or acid tartrate)

List of priority medical devices for the first level of care and remote areas in the context of the COVID-19 pandemic

- PAHO developed a list of priority medical devices in the context of COVID-19 (*36*). Table 4 lists priority medical devices for managing and treating suspected and confirmed COVID-19 patients at the FLC. It also includes some devices whose complexity exceeds normal FLC capacities but that may be considered for use at the FLC where conditions allow, in order to ensure the provision of adequate health services until patients can be referred to the second level of care. These devices are marked with a diamond (♦) in the last column of the table.

Table 4. List of medical devices organized by stage of COVID-19 and health care level

Category	Name of medical device	Triage and initial care	Diagnostic sampling	Early support treatment and monitoring	Management of AHRF, ARDS, and septic shock	FLC
Accessories and consumables	Flow divider			x	x	♦
	Non-thermal bubble humidifier				x	♦
	Resuscitator (Ambu) with mask and HEPA filter in the exhalation port			x	x	•
Disposable single-use medical devices and supplies	Biohazardous waste bag		x	x	x	•
	Flexible nasal catheter			x	x	•
	Swab for sampling and viral transport media		x			•
	Intravenous infusion kit with macro dropper			x	x	•
	Venturi mask				x	♦
	Mask with reservoir			x	x	•
	Nasal oxygen tips (nasal cannulae)			x	x	•

	Sharps collection container		x	x	x	•
	Triple packaging system		x			•
	Disposable towels for hand drying (paper or tissue)	x	x	x	x	•
	Oxygen tube, extension			x	x	•
Personal protective equipment PPE:	Glasses (eye protection)		x	x	x	•
	Surgical gown	x	x	x	x	•
	Face shield		x	x	x	•
	Apron	x	x	x	x	•
	Non-sterile examination gloves	x	x	x	x	•
	Cleaning gloves	x	x	x	x	•
	Sterile surgical gloves		x	x	x	•
	Medical mask for health workers	x	x	x	x	•
	Medical mask for patients	x	x	x	x	•
	Particulate respirator				x	•
Medical equipment	High-flow nasal cannula			x	x	♦
	Oxygen concentrator			x	x	•
	12-lead electrocardiogram			x	x	•
	Sphygmomanometer with bracelet for adults and children	x		x	x	•
	Stethoscope	x		x	x	•
	Flowmeter, Thorpe tube			x	x	•
	Basic multiparameter patient monitor			x		•
	Intermediate multiparameter patient monitor			x		•
	Finger pulse oximeter	x		X	x	•
	Hand pulse oximeter			x	x	•

Instruments	Digital thermometer	x		x	x	•
	Pedal-operated waste container	x	x	x	x	•
Solutions, reagents, and medicinal gases	Chlorine	x	x	x	x	•
	Liquid handwashing soap	x	x	x	x	•
	Alcohol-based hand sanitizer	x	x	x	x	•
Medical diagnostic equipment	Conventional X-ray equipment			x	x	♦
	Portable X-ray equipment				x	♦
	Portable ultrasound equipment			x	x	•

FLC: first level of care; AHRF: acute hypoxemic respiratory failure; ARDS: acute respiratory distress syndrome.

- The specific characteristics and needs for imaging equipment must be determined given the multiple uses these devices have, in order to know what is most useful in each setting. The health system clearly needs to strengthen its capacity in imaging services for the care of COVID-19 patients. The more complex FLC facilities must have x-ray equipment (at least one digital WHIS-RAD®) and laptops *(37)*.
- As for staff, each facility must have at least one radiology technician or technologist and should ideally have access to a radiologist in regional or national hospitals who can be consulted through teleradiology. If that option is too complex due to the investment in technology and physical infrastructure, a simpler solution would be a laptop; in this case, a radiology technician or technologist would be required. In addition, an ultrasound device provides good support. The minimum requirements for the care of COVID-19 patients are a portable ultrasound device along with a sonographer and a doctor with the proper training.

Using digital health to facilitate the management of COVID-19 patients
Telemedicine

- To prevent transmission of the virus to healthcare professionals and patients when they visit health care providers, patient care should take place virtually, whether by telephone or video-consultations. Telemedicine is the remote interaction between patients and health care providers using any form of communication or information technology, with the aim of facilitating or maximizing the quality and effectiveness of patient care. Telemedicine goes beyond remote consultation: among other things, it includes digital support for health professionals, online training for doctors and patients, coordination between services and pharmacies, having patient support tools (email contact, messaging, mobile apps, hospital platforms, etc.), and data collection and remote monitoring. When available and appropriate, most consultations should be performed virtually. Consultations will take place in person when the type of care requires a

physical examination or imaging studies, or when the patient does not have access to the technology or is not literate *(14, 15, 38).*

- It is important to remember that although telemedicine may increase access to patient care, it may also exacerbate inequalities in vulnerable populations. Efforts should be made to improve access to technology and provide training for these populations, and to identify alternative strategies such as home visits and in-person consultations for special cases *(12).*

- The incorporation and availability of digital applications and media in the services network would establish a digital relationship between the FLC and its referral hospital(s). A virtual media network would make it possible to have not just a referral hospital but would allow the concept of digital health referral networks to be applied. Telemedicine would provide access to real-time consultations, the option of getting a second opinion, and offering support for critical patients who need to be transferred. Such consultations could be considered even within and between island countries, territories, or border areas. An important issue to address is obviously the availability and training of medical staff on the use of these platforms and applications, as well as the provision of telemedicine services *(8, 11).*

- Table 5 lists the essential conditions for implementing telemedicine services. The minimum essential conditions must be in place before moving forward with telemedicine services, and should include technological infrastructure, regulatory issues, human and financial resources, standards and procedures, cybersecurity, etc. *(39).*

Table 5. Essential conditions needed to implement telemedicine services for the clinical management of mild and moderate cases of COVID-19.

Essential components	Specific FLC capacities	Capacities of higher levels to support FLC
Minimum processes	• Trained human resources, with knowledge and implementation of: • The roles, duties, and responsibilities associated with telemedicine services. • Patient safety and institutional legal liability considerations. • Defined processes to ensure the security, confidentiality, and copying of data and information generated during telemedicine services. • Procedures for recording patient satisfaction status. • Formal document to report possible incidents or adverse events occurring during telemedicine consultations. • Patient informed consent obtained remotely.	• Establish the minimum set of processes needed to safely and effectively implement digital health tools. These processes include a clear definition of the roles, duties, and responsibilities associated with telemedicine services for all staff involved; patient safety and institutional legal liability considerations; the processes established to ensure the security, confidentiality, and copying of the data and information generated during telemedicine services; procedures for recording the patient's satisfaction as well as a formal document to report possible incidents or adverse events that occurred during telemedicine consultations, obtaining patient informed consents remotely, etc.
Technology infrastructure	• Strengthen or establish a fixed and stable internet connection service • Ensure sufficient bandwidth to offer telemedicine services. • Technical support is available to resolve connectivity issues.	• Analyze and support the required technology infrastructure, including the minimal hardware and software needed to provide services digitally. This should include a fixed and stable internet connection service, sufficient bandwidth to offer telemedicine services without affecting other services, and technical support to resolve connectivity issues during interconsultations or when providing services, etc. It is also important to think about the effect that telemedicine services may have on pre-existing technology infrastructure. • Government agencies should support the community and its health care providers so that they have the technological infrastructure needed to perform telemedicine activities.

Platform	• At least one patient registration tool, data management, and processes resulting from digital consultations should be available, considering patient safety, data privacy, and confidentiality issues. • More complex facilities with connectivity should have a platform of minor or less complexity that enables the use of an electronic patient registration system, data management, and any processes resulting from digital consultations. These platforms should also consider patient safety, data privacy, and confidentiality issues. They should preferably have a certain degree of interoperability with the different subsystems and systems of other service providers that are connected through micro-networks.	• Government agencies in the countries should have a unified information system for reporting relevant data in order to better understand the prevalence of COVID-19 at the local level.
Institutional capacity	• Education and training plan for human resources	• Identify the minimum skills needed or identify knowledge gaps in people working with telemedicine in the various services to be provided.
Regulatory considerations	• Ensure that the institution is familiar with all the legal issues associated with the provision of telemedicine services, in accordance with local or federal law.	• Ensure that the institution is familiar with all the regulatory issues associated with the provision of telemedicine services, in accordance with local or federal law. In addition, check whether the institution has internal legal counsel or has access to a specialized legal consulting service should there be issues with malpractice reports, breach of privacy, or the confidentiality and security of personal data.

COVID-19 mobile apps in the Region

Several countries in Latin America and the Caribbean have developed mobile applications and other electronic means of communication such as text messages and WhatsApp® to provide guidance on COVID-19 symptoms, recognize warning signs that indicate the need for urgent medical care, find out the results of diagnostic tests, risk zones, and the nearest medical centers, and trace suspected and confirmed cases.

Some of these apps can be found in the Google store, as follows:

- Argentina   Cuidar COVID-19 Argentina
- Bolivia (Plurinational State of)   Bolivia Segura

- Brazil — Coronavirus SUS
- Chile — CoronApp
- Colombia — CoronApp
- Costa Rica — EDUS (Single Digital Health Record)
- Ecuador — ASI Ecuador
- El Salvador — Covid19 Tracker
- Guatemala — Alerta Guate
- Honduras — Alerta Honduras
- Mexico — COVID-19MX
- Panama — Protégete con Salud
- Paraguay — COVID-19 PY
- Peru — PeruEnTusManos - Stop the advance of COVID-19
- Dominican Republic — COVID-RD
- Uruguay — Coronavirus UY

Information systems and platforms:

- FLC facilities should have the ability to record, process, and communicate data that may be useful in information systems and for making decisions by assessing FLC response capacity. To do this, they should have a national or state guideline *(3)* on creating a system for real-time data collection, which allows proper monitoring of patients and obtaining reliable knowledge on the prevalence of COVID-19, mortality and recovery rates, and the use of services for COVID-19 and other diseases *(11, 12)*.
- The data collected is necessary to monitor and maintain essential health services and to help public health departments reduce COVID-19 transmission. Information collection should be supported by electronic medical records in the service network, electronic prescription, and national or institutional mobile applications. In places where FLC services collect information on paper, there are alternative solutions that can help digitize the process. If a mobile network is available, data can be entered in information centers by volunteers or photographs can be sent to a central office *(16, 19)*.

Information system activities for strengthening the first level of care

- Strengthen the governance of information systems by providing infrastructure for accessing the internet and using satellite connections; strengthen human resources through training on the effective use of information technologies; and improve data production, management, and processing.
- Promote the interoperability of electronic health records so that there are standardized databases or information systems for collecting information in an appropriate and timely manner.
- Ensure data privacy, confidentiality, and security. Ensure the availability of secure systems with regulated access that protects data confidentiality and integrity.

- Ensure a minimal technological operating infrastructure with technology available for data capture and analysis, real-time information dissemination, electronic health records, patient portals, and communications channels for remote consultations. In circumstances with connectivity issues, the use of image compression algorithms might be a working option. Information must be disaggregated by at least gender, age, education, income, financial situation, comorbidities, geographic location, and disability.
- There should be authoritative bodies that can analyze the situation and make technical recommendations on the management of COVID-19 based on local evidence.

Deployment of emergency medical teams to support FLC capacities

- Emergency medical teams (EMTs) are teams of health professionals (physicians, nurses, physical therapists, paramedics, etc.) that provide direct clinical care to populations in disasters, epidemics, and other types of emergencies, and support local health systems. Pre-hospital medical emergency services and the deployment of emergency medical teams can strengthen the FLC so that it is better able to respond, especially in remote areas.
- EMTs must ensure that they contribute to the response of the FLC and the referral system and that their practices meet the minimum standards or requirements established by the health system, in keeping with international standards for EMTs. They must have the ability to be completely self-sufficient for the duration of their mission. National teams will require a minimum of three days and international teams will require at least two weeks. This includes having sufficient staff, equipment, supplies, and the logistical means to be able to provide appropriate and timely clinical care.
- The deployment of international teams should be accepted and coordinated by national and local health authorities, and it is recommended that EMTs be deployed through mechanisms in line with the CICOM [medical coordination and information cells] methodology. EMTs have other teams that can provide hospitalization, critical care, surgery, and clinical support services (Type 2 and 3 and SARI) and can also be deployed to support the hospital network that is referred by the FLC.

Table 6 shows the different types of EMTs that can support the FLC response.

Table 6. Types of Emergency Medical Teams (EMTs)

Type of Emergency Medical Team	Description
EMT type 1 - mobile	These mobile rapid response teams (RRTs) are supported by an operational base, which allows them to replenish and rest during night-time hours. RRTs can quickly travel to small communities in remote areas and operate in existing structures or work with portable structures or adapted vehicles such as mobile clinics. They should be able to treat at least 50 outpatients a day.

EMT type 1 - permanent	These teams have their own permanent facilities such as tents that allow them to provide basic and emergency primary care on an outpatient basis in any emergency context. They can be deployed in remote areas or to strengthen the outpatient capacity of health facilities
Respiratory triage EMTs	These teams set up temporary structures at the emergency entrance of FLC facilities or hospitals for the triaging and referral of patients with respiratory symptoms; they facilitate the identification of suspected cases of COVID-19 for proper management and treatment.
Specialized pre-hospital care team	These specialized teams provide technical and clinical support to strengthen the capacities of pre-hospital medical emergency systems at the local level.
Specialized support team at alternative health care sites	These specialized teams provide technical and operational support for the selection and location of infrastructure to be used for the installation and subsequent operation of alternative health care sites.

Component 2. Clinical management of patients with a suspected or confirmed diagnosis of mild or moderate COVID-19 at the first level of care

The guidelines below are based on the *Guidelines for Critical Care of Seriously Ill Adult Patients with Coronavirus (COVID-19) in the Americas (40)*; *Flowchart for the management of suspected COVID-19 patients at the first level of care and in remote areas in the Region of the Americas (1)* (Annex 2); *Initial care of persons with acute respiratory illness (ARI) in the context of coronavirus disease (COVID-19) in healthcare facilities: assess the risk, isolate, refer (41)*; *Requirements and technical specifications of personal protective equipment (PPE) for the novel coronavirus (2019-nCoV) in healthcare settings (42)*; *Laboratory Guidelines for the Detection and Diagnosis of COVID-19 Virus Infection (43); Guidelines on Clinical management of COVID-19 (32);* and *Use of chest imaging in COVID-19 (44)*.

Integrated health services network and health care delivery model

Countries should have a network of comprehensive and integrated health services accessible to the entire population and provide care coverage for the management of patients with a suspected or confirmed diagnosis of COVID-19. Any patient who meets the suspected case criteria following a screening based on the assessment of symptoms and a standardized case definition (see Table 7) should receive all the services required for their clinical management at the point of care and at no cost.

The delivery model should have the following characteristics:

- Include the management of other infections and comorbidities in patients with COVID-19 as part of the guaranteed services coverage, with trained personnel and based on the most up-to-date evidence (guidelines and protocols) and the timely availability of needed medicines and supplies.
- All suspected cases should be tested for COVID-19 to determine whether they can be considered confirmed cases. Until a COVID-19 diagnosis is ruled out, all suspected cases should remain in the service delivery model for COVID-19 management. If no tests are available, they become probable cases (based on clinical suspicion) and should be handled within the delivery model.
- Transmission-related precautions (including isolation) will be suspended, and the COVID-19 delivery model will be discontinued:
  - Ten days after the onset of symptoms, plus a minimum of three days without symptoms (no fever or respiratory symptoms) for symptomatic patients.
  - Ten days after the first positive test for asymptomatic people.
- Countries select the mechanisms according to their availability, so as to monitor each patient until full recovery.

Prevention of transmission to health workers

- For health care workers performing non-aerosol-generating procedures on patients with COVID-19, surgical or medical masks should be used instead of respirator masks, in addition to other personal protective equipment.
- For health care workers performing aerosol-generating procedures in patients with COVID-19, respiratory masks should be used, in addition to other personal protective equipment in line with the recommendations contained in the document *Modes of transmission of virus causing COVID-19: implications for IPC precaution recommendations (45)*.
- Patients with suspected cases should be asked to wear surgical masks and should be taken to a separate area or, if possible, to an isolation room or ward. Ensure at least 1 meter of separation between patients. Patients should be instructed to cover their nose and mouth with a tissue or elbow when coughing or sneezing, immediately dispose of the tissue in a closed container, and wash their hands after contact with respiratory secretions.
- When providing any diagnostic service or care to any patient, standard precautions should always be taken, including hand hygiene; use of PPE according to the type of procedure, activities, and care; injury prevention after sharps accidents; safe waste management; cleaning and disinfection of medical equipment; and keeping the hospital environment clean.
- In suspected or confirmed cases of COVID-19, precautions should be taken against contact, particulate, or airborne transmission. Precautions against contact transmission include the use of disposable gloves and gowns. Facilities should be equipped to control indoor foot traffic, ensure physical distance, and provide safe environments for both workers and patients.
- For health care workers in contact with COVID-19 patients who perform aerosol-generating procedures or work in a unit where such procedures are performed without adequate ventilation, it is recommended that fitted respirator masks (N-95 respirator masks, FFP2, or equivalent) be

used, as opposed to surgical masks, in addition to other PPE (gloves, gown, and eye protection such as a face shield or safety goggles).

- Aerosol-generating procedures performed on patients with COVID-19 should be carried out in areas designated for that purpose and the best available measures for limiting contamination of other patients or health care workers should be implemented. An area that has natural ventilation should be designated in all patient care areas.
- For natural ventilation, the following minimum hourly averaged ventilation rates are recommended:
  - 160 l/s/patient (hourly average ventilation rate) for airborne precaution rooms (with a minimum of 80 l/s/patient).
  - When patient care is undertaken in corridors during emergency or other situations, the same ventilation rate requirements for airborne precaution rooms apply.
  - When natural ventilation alone cannot satisfy the recommended ventilation requirements, alternative ventilation systems, such as hybrid (mixed mode) natural ventilation should be considered; if that is not enough, mechanical ventilation should be used.
- Each patient should be in a single room; if that is not possible, only patients with the same etiological diagnosis should be grouped together, i.e., suspected cases with suspected cases, probable cases with probable cases, and confirmed cases with confirmed cases. Suspected or probable cases should not be grouped with confirmed cases. Limit patient movement within the facility and ensure that patients wear surgical masks when outside their rooms.

Triage

- For triage of patients with suspected SARS-CoV-2 infection, it is important to assess signs and symptoms of influenza-like illness or SARI (severe acute respiratory infection) and identify the presence of risk factors for the development of complications.
- For the clinical management of patients, the following risk factors for COVID-19 progression should be considered: advanced age, hypertension, obesity, diabetes, cardiovascular disease, chronic lung disease (e.g., chronic obstructive pulmonary disease and asthma), chronic kidney disease, chronic liver disease, cerebrovascular disease, cancer, and diseases that cause immunodeficiency.
- Institutional protocols for triage of patients with a suspected or confirmed diagnosis of COVID-19 should be implemented in order to appropriately classify patients who require management in an intensive care unit (ICU). The duration and severity of symptoms, imaging findings (radiography, computerized axial tomography [CAT] or lung ultrasound, as available), origin of pulmonary infiltrates, oxygenation needs, dysfunction of vital organs, and sepsis and septic shock should be evaluated to identify critical patients with COVID-19.
- Triage can be performed in emergency departments, in primary care centers, or by telemedicine. Triage involves asking a set of simple questions based on the WHO case definition. This is best done through screening protocols at all health service access points and during contact tracing activities.

The following information should be considered for triage of patients with COVID-19 (Tables 7 and 8).

TABLE 7. Symptoms and risk factors associated with COVID-19

Clinical presentation	The signs and symptoms of COVID-19 vary. • Most persons experience fever (83–99%), cough (59–82%), fatigue (44–70%), diminished appetite (40–84%), shortness of breath (31–40%), myalgia (11–35%). Other non-specific symptoms, such as sore throat, nasal congestion, headache, diarrhea, nausea, and vomiting, have also been reported. Loss of smell (anosmia) or loss of taste (ageusia) preceding the onset of respiratory symptoms has also been reported. • Older people and immunosuppressed patients in particular may present with atypical symptoms such as fatigue, reduced alertness, reduced mobility, diarrhea, loss of appetite, delirium, and absence of fever. • Symptoms such as dyspnea, fever, gastrointestinal (GI) symptoms or fatigue due to physiologic adaptations in pregnant women, adverse pregnancy events, or other diseases such as malaria, may overlap with symptoms of COVID-19. • Children may not report fever or cough as frequently as adults.

TABLE 8. Definition of mild, moderate, severe, and critical COVID-19 disease

Mild disease		Symptomatic patients meeting the case definition for COVID-19 without evidence of viral pneumonia or hypoxia.
Moderate disease	Pneumonia	**Adolescent or adult** with clinical signs of pneumonia (fever, cough, dyspnea, rapid breathing) but no signs of severe pneumonia, including $SpO_2 \geq 90\%$ on room air. **Child** with clinical signs of non-severe pneumonia (cough or difficulty breathing + rapid breathing and/or chest in-drawing) and no signs of severe pneumonia. • rapid breathing (in breaths/min): < 2 months: ≥ 60; 2–11 months, ≥50; 1-5 years: ≥40. While the diagnosis can be made on clinical grounds; chest imaging (radiograph, CT scan, ultrasound) may assist in diagnosis and identify or exclude pulmonary complications.
Severe disease	Severe pneumonia	• **Adolescent or adult** with clinical signs of pneumonia (fever, cough, dyspnea, rapid breathing) plus one of the following: respiratory rate > 30 breaths/min; severe respiratory distress; or $SpO_2 < 90\%$ on room air. **Child** with clinical signs of pneumonia (cough or difficulty in breathing) + at least one of the following: • Central Cyanosis or $SpO_2 < 90\%$; severe respiratory distress (e.g., rapid breathing, grunting, very severe chest in-drawing); general danger sign: inability to breastfeed or drink, lethargy or unconsciousness, or convulsions.

		• rapid breathing (in breaths/min): < 2 months: ≥ 60; 2–11 months, ≥50; 1-5 years: ≥40. While the diagnosis can be made on clinical grounds; chest imaging (radiograph, CT scan, ultrasound) may assist in diagnosis and identify or exclude pulmonary complications.
Critical disease	**Acute respiratory distress syndrome (ARDS)**	**Onset:** within 1 week of a known clinical insult (i.e., pneumonia) or new or worsening respiratory symptoms. **Chest imaging: (radiograph, CT scan, or lung ultrasound):** bilateral opacities, not fully explained by volume overload, lobar or lung collapse, or nodules. **Origin of pulmonary infiltrates:** respiratory failure not fully explained by cardiac failure or fluid overload. Need objective assessment (e.g., echocardiography) to exclude hydrostatic cause of infiltrates/edema if no risk factor present. **Oxygenation impairment in adults:** • Mild ARDS: 200 mmHg < PaO_2/FiO_2[a] ≤ 300 mmHg (with PEEP or CPAP ≥ 5 cmH2O)[b] • Moderate ARDS: 100 mmHg < PaO_2/FiO_2 ≤ 200 mmHg (with PEEP ≥ 5 cmH2O)[b] • Severe ARDS: PaO_2/FiO_2 ≤ 100 mmHg (with PEEP ≥ 5 cmH₂O)[b] **Oxygenation impairment in children:** note OI and OSI.[c] Use OI when available. If PaO_2 not available, wean FiO_2 to maintain SpO_2 ≤ 97% to calculate OSI or SpO_2/FiO_2 ratio: • Bilevel (NIV or CPAP) ≥ 5 cmH₂O via full face mask: PaO_2/FiO_2 ≤ 300 mmHg or SpO2/FiO2 ≤ 264. • Mild ARDS (invasively ventilated): 4 ≤ OI < 8 or 5 ≤ OSI < 7.5. • Moderate ARDS (invasively ventilated): 8 ≤ OI < 16 or 7.5 ≤ OSI < 12.3. • Severe ARDS (invasively ventilated): OI ≥ 16 or OSI ≥ 12.3.
Critical disease	**Sepsis**	**Adults:** acute life-threatening organ dysfunction caused by a dysregulated host response to suspected or proven infection. Signs of organ dysfunction include:[d] altered mental state, difficult or fast breathing, low oxygen saturation, reduced urine output, rapid heart rate, weak pulse, cold extremities or low blood pressure, skin mottling, laboratory evidence of coagulopathy, thrombocytopenia, acidosis, high lactate, or hyperbilirubinemia. **Children:** suspected or proven infection and ≥ 2 age-based systemic inflammatory response syndrome (SIRS) criteria,[e] of which one must be abnormal temperature or white blood cell count.
	Septic shock	**Adults:** persistent hypotension despite volume resuscitation, requiring vasopressors to maintain MAP ≥ 65 mmHg and serum lactate level > 2 mmol/L. **Children:** any hypotension (SBP < 5th centile or > 2 SD below normal for age) or two or three of the following: altered mental state; bradycardia or tachycardia (HR < 90 bpm or > 160 bpm in infants and heart rate < 70 bpm or > 150 bpm in children); prolonged capillary refill (> 2 sec) or weak pulse; fast breathing; mottled or cool skin or petechial or purpuric rash; high lactate; reduced urine output; hyperthermia or hypothermia.
Other complications that have been described in COVID-19 patients include acute, life-threatening conditions such as: acute pulmonary embolism, acute coronary syndrome, acute stroke, and delirium. Clinical suspicion for these complications should be heightened when caring for COVID-19 patients, and appropriate diagnostic and treatment protocols available.		

Notes: [a] If altitude is higher than 1000 m, then the correction factor should be calculated as follows: PaO_2/FiO_2 x barometric pressure/760.

[b] When PaO$_2$ is not available, SpO$_2$/FiO$_2$ ≤ 315 suggests ARDS (including in non-ventilated patients).

[c] Oxygenation Index (OI) is an invasive measurement of the severity of hypoxemic respiratory failure and may be used to predict outcomes in pediatric patients. It is calculated as follows: percentage of fraction of inhaled oxygen multiplied by the mean airway pressure (in mmHg), divided by the partial pressure of arterial oxygen (in mmHg). Oxygen saturation index (OSI) is a non-invasive measurement and has been shown to be a reliable surrogate marker of OI in children and adults with respiratory failure. OSI replaces PaO$_2$ with oxygen saturation as measured by pulse oximetry (SpO$_2$) in the OI equation.

[d] The SOFA score ranges from 0 to 24 and includes points related to six organ systems: respiratory (hypoxemia defined by low PaO$_2$/FiO$_2$); coagulation (low platelets); liver (high bilirubin); cardiovascular (hypotension); central nervous system (low level of consciousness defined by Glasgow Coma Scale); and renal (low urine output or high creatinine). Sepsis is defined by an increase in the sepsis-related SOFA score of ≥ 2 points. Assume the baseline score is 0 if data are not available.

[e] SIRS criteria: abnormal temperature (> 38.5 °C or < 36 °C); tachycardia for age or bradycardia for age if < 1 year; tachypnoea for age or need for mechanical ventilation; abnormal white blood cell count for age or > 10% bands.

Abbreviations: BP blood pressure; bpm beats per minute; CPAP continuous positive airway pressure; CT computed tomography; FiO$_2$ fraction of inspired oxygen; MAP mean arterial pressure; NIV non-invasive ventilation; OI Oxygenation Index; OSI Oxygenation Index using SpO$_2$; PaO$_2$ partial pressure arterial oxygen; PEEP positive end-expiratory pressure; SBP systolic blood pressure; SD standard deviation; SIRS systemic inflammatory response syndrome; SOFA sequential organ failure assessment; SpO$_2$ oxygen saturation.

Patients with more than six symptoms are more likely to have a positive COVID-19 test (odds ratio (OR) 2.61; 95% confidence interval [CI] 1.50-4.45). Loss of smell (anosmia) is considered a symptom indicating a high likelihood that a patient has a COVID-19 infection (OR: 7.21; CI95%: 2.95-17.67) *(46)*.

Diagnosis

- Rapid collection and testing of specimens from patients with suspected COVID-19 should be a priority and should be carried out by experts in accordance with biosafety recommendations.
- Polymerase chain reaction (PCR) testing is the preferred method for confirming SARS-CoV-2 infection. However, the use of rapid immunoassay antigen testing (Ag-RDT) may be considered in countries or areas with community transmission, where the health system may be overburdened, and where rapid PCR testing is not possible. The ease of use and quick response time of Ag-RDT offers the potential to expand access to testing and reduce diagnostic delays in patients with early symptoms and in remote areas where it is not easy to send samples to centralized laboratories, as long as properly validated Ag-RDTs are used. Under these conditions, a positive Ag-RDT result confirms SARS-CoV-2 infection. However, a negative result alone does not rule out possible infection, and clinical and epidemiological information should also be considered.
- Extensive testing should be conducted as needed to confirm SARS-CoV-2 infection and possible coinfections. Institutional guidelines for obtaining informed consent for specimen collection, testing, and future research should be implemented.
- When appropriate, testing for differential diagnosis with other pathologies (e.g., influenza, malaria, dengue) is suggested based on clinical characteristics and local epidemiology. A positive test for a pathogen other than SARS-CoV-2 does not rule out the presence of COVID-19, nor vice
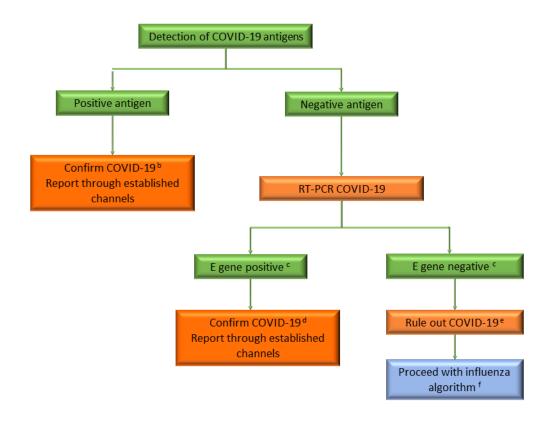
versa. At this stage, detailed microbiological studies are required in all suspected cases. Samples obtained from the upper respiratory tract (URT) and lower respiratory tract (LRT) may be tested for other respiratory viruses: influenza (influenza) A (including zoonotics) and B, respiratory syncytial virus, parainfluenza virus, rhinovirus, adenovirus, enterovirus (e.g., EVD68), human metapneumovirus and endemic human coronavirus (HKU1, OC43, NL63 and 229E). URT samples can also be tested for bacterial pathogens, including *Legionella pneumophila*.

- In all suspected cases, URT samples (nasopharyngeal and oropharyngeal) should be obtained for analysis using PCR or rapid antigen testing; if negative, but clinical suspicion remains, LRT samples should be obtained whenever available (sputum or endotracheal aspirate, or bronchoalveolar lavage fluid in patients on mechanical ventilation) for PCR. In addition, where clinical indications are present, testing for bacteria and other respiratory viruses should be considered. Institutional validation of the laboratory procedure is recommended.

- Although SARS-CoV-2 is still under study, it has been determined that the virus can be detected at least 48 hours before the onset of symptoms, up to 12 to 14 days in URT samples if PCR is used, or up to 10 days (ideally 5 to 7 days) if a rapid antigen test is used. It should be reiterated that a negative result does not rule out the presence of infection or another respiratory infectious agent, including influenza virus, which is a virus that is constantly present and under continuous surveillance in the countries of the Region. For this reason, and depending on the clinical and epidemiological context, additional laboratory testing (if available) should be considered as shown in Figure 2.

- Confirmatory diagnosis of COVID-19 is made only by molecular or antigen tests. Imaging studies are performed when the above tests are not available or the result is delayed, or when the test is negative and there is high clinical suspicion. For patients who test positive and are classified as having mild COVID-19, imaging studies and laboratory tests can be used to make decisions on hospitalization or home management. For patients who test positive and are classified as having moderate COVID-19, imaging studies and laboratory tests may be performed if available to make the decision to transfer the patient to another level of care.

FIGURE 2 Diagnostic algorithm for COVID-19 and influenza (flu)

Notes: [a] enzyme-linked immunosorbent assay (ELISA) or rapid tests with regulatory approval.
[b] Assay specificity (including potential cross-reactivity with other human coronaviruses) should be taken into account.
[c] When using the Charité reference protocol. If a different protocol is used, follow the indicated positivity criteria.
[d] As no other Sarbercovirus circulates globally, a positive result with the Charité E gene assay confirms the detection.
[e] Assuming the sample was collected properly, and all quality assurance processes were followed. Clinical and epidemiological information should also be considered before ruling out the case.
[f] Depending on surveillance protocols and available resources. Other respiratory viruses might also be tested.

Source: adapted from Pan American Health Organization. Laboratory Guidelines for the Detection and Diagnosis of COVID-19 Virus Infection, 8 July 2020. Washington, D.C.: PAHO, 2020. Available at: https://iris.paho.org/handle/10665.2/52458.

COVID-19 treatment overview

- Currently, there is no pharmacological or non-pharmacological treatment for mild or moderate COVID-19 infection that shows a decrease in key outcomes such as mortality and decreased need for intubation in patients *(47, 48)*. There are also several ongoing studies to evaluate the treatment of patients with mild and moderate COVID-19.
- Management of mild and moderate COVID-19 patients primarily involves symptomatic treatment.
- The recommended place to provide care may be a designated health facility for the management of patients with COVID-19, a community center, or the patient's home.
- Patients with mild or moderate illness often do not need emergency interventions or hospitalization, but all suspected or confirmed cases should be isolated to contain virus transmission. The decision to treat and monitor a suspected case in a health facility, community facility, or home should be made on a case-by-case basis. This decision will depend on the clinical presentation, need for supportive care, potential risk factors for severe disease, and conditions at home, including the presence of vulnerable persons in the household and the patient's ability to remain in self-isolation.
- Children with suspected or confirmed SARS-CoV-2 infection should be kept together with caregivers wherever possible (if caregivers also have suspected or confirmed COVID-19 infection), and cared for in child-friendly spaces, taking into account their specific medical, nursing, nutritional, and mental health and psychosocial support needs.
- Currently, there is no known difference between the clinical manifestations of COVID-19 in pregnant women and non-pregnant women of reproductive age. Treatment of mild and moderate cases is the same for all adult patients.

Management of patients with mild COVID-19: symptomatic treatment

- Patients with mild disease may present to emergency departments, outpatient clinics or primary care centers, or be detected during telemedicine or community outreach activities, such as home visits.
- If managed at home in self-isolation, refer to WHO and PAHO guidance on home care and management of their contacts *(49)*.
- Patients with mild COVID-19 should receive symptomatic treatment, such as analgesic antipyretics, and adequate nutrition and rehydration. At present, there is no evidence to indicate that there are severe adverse events in patients with COVID-19 as a result of the use of non-steroidal anti-inflammatory drugs.
- Patients with mild COVID-19 should be counseled about signs and symptoms of complications that should prompt urgent care.
- Patients with risk factors for severe illness should be monitored closely, given the possible risk of deterioration. If they develop any worsening symptoms (such as light headedness, difficulty breathing, chest pain, dehydration, etc.), they should seek urgent care through the established COVID-19 care pathway.

- Caregivers of children with mild COVID-19 should monitor for signs and symptoms of clinical deterioration requiring urgent re-evaluation. These include difficulty breathing or fast or shallow breathing (for infants: grunting, inability to breastfeed), blue lips or face, chest pain or pressure, new confusion, inability to awaken or not interacting when awake, inability to drink or keep down any liquids.
- Use of antibiotic therapy or prophylaxis is not recommended for patients with mild COVID-19. Widespread use of antibiotics should be discouraged, as their use may lead to higher bacterial resistance rates.

Management of patients with moderate COVID-19: pneumonia treatment

- Patients with moderate disease may present to emergency departments, outpatient clinics or primary care centers, or be detected during telemedicine or community outreach activities, such as home visits.
- Patients with moderate disease may not require emergency interventions or hospitalization; however, isolation is necessary for all suspected or confirmed cases.
- Antibiotics should not be prescribed to patients with suspected or confirmed cases of moderate COVID-19 unless there is clinical suspicion of bacterial infection.
- Empiric antibiotic treatments for possible pneumonia may be considered in older people, particularly those in long-term care facilities, and in children under 5 years of age. These should be prescribed by the treating physician at his or her discretion.
- Patients with risk factors for severe illness should be monitored closely, given the possible risk of deterioration. If they develop any worsening symptoms (such as light headedness, difficulty breathing, chest pain, dehydration, etc.), they should seek urgent care through the established COVID-19 care pathway.
- Patients treated at home and their caregivers should be counseled about the signs and symptoms of complications (difficulty breathing, persistent chest pain or pressure, confusion, inability to wake up or stay awake, bluish coloring of the lips or face, SpO_2 <90%, respiratory rate >24 breaths/minute, pneumonia [fever, cough, dyspnea, and rapid breathing]) and the use of thermometers and oximeters; if they have any of these symptoms, they should seek urgent care through the established care pathway. Alternative platforms, such as home, telephone, telemedicine, or community-based care, may be considered to assist with monitoring.
- In hospitalized patients, vital signs should be regularly monitored (including pulse oximetry) to facilitate early recognition of patient deterioration and intensification of treatment.

Referral to another level of care

- Some pneumonia patients require oxygen therapy, and a minority progress to critical disease with complications such as respiratory failure or septic shock. These patients should be moved quickly to another level of care and monitored for signs of deterioration, such as increased shortness of breath, decreased blood pressure, bluish lips or face, confusion or inability to get up, increased weakness, decreased oxygen saturation below 90%, persistent chest pain, redness or swelling of

the extremities, dizziness, loss of consciousness, and breathing rate greater than 20 breaths per minute. Early identification of patients with signs of deterioration allows for immediate referral within the COVID-19 care pathway and improved health outcomes.

- Each country's care pathway should ensure prompt and adequate transfer of patients (including those in remote areas) to second and third level health care providers for critical and acute patient management.

Component 3. Community-based prevention

- It is important that FLC health facilities promote dialogue with communities to understand risk perceptions, behaviors, myths, and specific needs, using virtual and audiovisual formats to disseminate institutional, state, national, and PAHO materials in the communityCOVID-19 prevention, It is recommended that information be delivered by loudspeakers, radio, email, websites, call centers, social media, videos, text messaging, and posters in places such as grocery stores, markets, public transportation, and churches *(50, 51)*.

- Health workers' duties should include informing individuals and families in communities and localities of the activities and actions taken by the health facility to protect the community and reduce the risk of infection *(47)*.

- Ongoing communication and training with leaders and key figures in the communities and territories, as well as coordination across sectors and with social and community support agencies, are vital actions during the pandemic for the containment and mitigation of COVID-19; monitoring, care, and transfer of patients; monitoring of contacts and people in vulnerable situations; and management of alternative care sites.

- The information provided to the community should include the following *(13, 48)*:

  - Measures to prevent the spread of COVID-19 in the community (social distancing, hand washing, use of alcohol-based antibacterial gel, use of masks)
  - Proper mask use: how to use them, recommended materials, and how they should be removed and cleaned
  - Adaptations of care facilities in response to the pandemic (schedule changes, services provided virtually, intake and appointment procedures, etc.)
  - Recommendations on supportive care and limitations for minors or people with high-risk conditions
  - Information on national regulatory measures
  - Recommendation to go to care facilities only in case of emergency
  - Suggested ways of receiving information (telephone, WhatsApp®, text messages, and email) and mobile applications or web tools with information about COVID-19
  - Guidance on signs and symptoms that indicate suspected COVID-19 infection and what to do in such cases
  - Key messages for general prevention of respiratory infections, aggravation of chronic diseases, isolation measures, and home isolation
  - Training of volunteers and community members to disseminate information and provide first aid to people with non-respiratory symptoms
  - Constant communication with patients and caregivers. Each institution will select the best way to do so and to provide the information needed to prevent infection.
  - Provide face masks to the general public or provide instructions on how to make homemade masks. Emphasize that masks are not the only protective measure.

- The FLC manages COVID-19 prevention and containment measures in coordination with the other institutions that make up emergency response systems (local police, civil protection, private sector, etc.).

- Promote cooperation and solidarity actions among various local stakeholders, such as humanitarian actors, the private sector, cooperatives, and chambers of commerce, among others, in coordination with civil protection institutions and authorities.

- Community health or health promotion committees are strategic partners with whom activities can be coordinated to promote healthy practices in communities and to undertake and manage actions to protect mental health.

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Annexes

Annex 1. Recommendations for a basic life support ambulance

General vehicle characteristics
• The vehicle should have mechanical features that allow for patient transport and be certified by the manufacturer for use as an ambulance. It should have two separate cabins, a main cabin for the driver and passengers, and a rear cabin for the treatment area with seats for occupants and enough space for ergonomic handling of the patient on the stretcher.
• The vehicle's cabin and body must be the original steel construction. The vehicle's interior height must be as originally manufactured.
• The power to engine ratio must allow for adequate acceleration and speed that can be maintained during patient transfer.
• The total load capacity must ensure a minimum mass reserve of 260 kg for medical products and equipment and a minimum capacity of four occupants. At least three of them must be seated (two of them in the treatment area) and one lying on the stretcher.
• It must have high frequency and ultrahigh frequency (VHF and UHF, respectively) trunked portable telecommunications equipment.
Electrical system
• Connection system and electrical outlets for biomedical equipment compatible with national technical specifications
• It must have an electrical power reserve for restarting the engine.
• All circuits should be protected by suitable fuses that are easily accessible for eventual replacement. The wiring and, where applicable, wiring ducts must be vibration-proof.
Accessories
• Seats with safety restraint systems, backrest, headrest
• Seat belts and airbag for the three occupants of the main cabin
• Air conditioning system, air extraction system, and overhead interior lighting
• Hardware to secure medical equipment and IV hangers on the ceiling
• Locking cabinets
• Two dry powder fire extinguishers, one ABC (driver's cabin) and one carbon dioxide (patient's cabin), with a minimum capacity of 2.26 kg
• Basic toolbox

Ceiling, floor, and walls

- Must be light-colored, fireproof, waterproof, and made of easy-to-clean material resistant to chemical disinfectants
- Must provide thermal and acoustic insulation
- Must have non-skid flooring with sealed joints

Doors and windows

- Must have hermetic door and window seals
- Functionally accessible side doors and functional swing-out rear doors. Must have a locking mechanism to keep them in an open position. Ideally, there should be a stainless-steel folding ramp to raise and lower the stretcher.
- Windows with tinted safety glass and permanent visibility only from the inside out, to ensure patient privacy

Visibility

- Vehicle color consistent with national regulations
- Siren with speaker system (four tones)
- Emergency light system visible from at least 180°, easy to see in daylight and in line with national regulations
- Front and sides: must bear the word AMBULANCE in reflective lettering

Basic equipment

- Telescopic stretcher

  - The ambulance's main stretcher should be made of a highly corrosion-resistant metal, with a high weight capacity and the ability to withstand serious impacts, to ensure rigidity and the capacity to transport people and equipment.
  - Retractable legs, patient fastening system, and anti-slip locking mechanism
  - Capacity to transport people and equipment weighing at least 250 kg
  - Waterproof mattress pad, easy to wash and disinfect, made of material resistant to chemical disinfectants, and the appropriate size for the stretcher
- Oxygen system in a separate compartment (including tank holder and lock, pressure gauge, humidifier bottle, flow meter, and wrench)
- Fixed standard "M" size oxygen cylinder (minimum 3000 l capacity, preferably two)
- Portable standard "D" size oxygen cylinder (minimum 360 l)
- Oxygen regulator with flowmeter range of 0-15 liters/minute
- Penlight with pupil gauge

- Digital thermometer
- Portable pulse oximeter
- Phonendoscope
- Glucometer
- Adult and pediatric blood pressure monitors and cuffs
- Automatic external defibrillator (AED) or semi-automatic external defibrillator (SAED)
- Portable nebulizer
- Electric suction apparatus
- Bag-valve-mask (BVM) system, cardiopulmonary resuscitation bag (adult and pediatric)
- Resuscitator (Ambu) with mask and HEPA filter in the exhalation port

- Trauma scissors
- Extrication vest
- Splint kit for upper and lower extremities (minimum three pieces)
- Suture kit
- Head immobilizers
- Long spine board, telescopic stretcher, or both
- Protective equipment (goggles, footwear with non-slip soles, ear plugs, medical gloves, mask, etc.)
- Portable wheelchair with a minimum load capacity of 120 kg that can be easily washed and disinfected
- Plastic bedpan and men's urinal
- Stainless steel or plastic emesis basin
- Medical supplies and equipment for basic patient treatment during transport
- Advanced life support bag (for use by primary care medical personnel if accompanying the patient)
- Basic life support bag (airway materials and supplies, ventilation and hemodynamic support for use by ambulance personnel)
- Pedal bin
- Sharps container

Annex 2. Flowchart for the Management of Suspected COVID-19 Patients at the First Level of Care and in Remote Areas in the Region of the Americas

FLOWCHART FOR THE MANAGEMENT OF COVID-19 INFECTION AT THE FIRST LEVEL OF CARE AND IN REMOTE AREAS (1,2,3)

Surveillance of Suspected COVID-19 Patients

- Fever higher than 38 C with dry cough and/or difficulty breathing?
- Shortness of breath, joint or muscle pain, loss of sense of smell/taste, weakness, diarrhea, abdominal pain, persistent diarrhea, headache, chills, fatigue, and/or sore throat?
- Patient has acute respiratory illness with fever and difficulty breathing in the absence of another diagnosis that would account for the clinical presentation?

NO → Perform the usual clinical evaluation in accordance with national guidelines, including evaluation for other respiratory infections.

YES

Healthcare workers caring for patients should have the necessary safety equipment and supplies.

SpO2 <94% or rapid RR for age (>20 in adults) or presence of emergency signs (difficulty breathing, pain or persistent pressure in the chest, confusion, inability to wake up or remain awake, bluish lips or face)?

NO → No risk factors* (suspected mild COVID-19)

NO → More than one risk factor*

YES → All patients regardless of risk factors*

* Risk Factors
Arteriosclerosis
Cancer
Diabetes
Male
Cardiovascular disease
Liver disease
Neurological disease
Lung disease
Kidney disease
Hypertension
Immunodeficiency due to any cause
Obesity
Over 60 years old

** Routine laboratory tests, if available
Respiratory specimens for COVID-19 viral test
Liver function
Complete blood count
Other laboratory tests depending on local epidemiology (e.g., influenza, other respiratory infections, dengue, malaria)
Urinalysis

Additional laboratory tests, if available
CPK
D-dimer and fibrinogen
C-reactive protein

Diagnostic imaging, if available
Chest X-ray
Chest CT scan

Isolate patient at home or in a facility designated for suspected COVID-19 cases.
If patient develops fever or pain, administer acetaminophen (500 mg every 6 to 8 hours up to 4 g a day).
Provide recommendations regarding adequate hydration, proper nutrition, and recognition of emergency signs.
Do not administer antibiotics.

Isolate patient in a facility designated for treating suspected COVID-19 cases.
Monitor vital signs and watch for emergency signs.
Consider administering oxygen support.

Isolate patient in a health facility and consider transfer to a higher level of care.
Monitor vital signs and watch for emergency signs.
Consider oxygen support and administration of fluids.
Order available laboratory and imaging tests.**

Evaluate risk for thromboembolism (respiratory rate over 24, increased levels of C-reactive protein, D-dimer, and fibrinogen)

HIGH → Refer to second level of care.

LOW OR MODERATE

If emergency signs develop:

If patient presents emergency signs (SpO2 <90% or respiratory rate >24) or pneumonia (fever, cough, shortness of breath, rapid breathing),
Call for consultation and initiate referral to second level of care.

Administer acetaminophen 500 mg every 6 to 8 hours (maximum 4 g per day).
Administer enoxaparin 40 mg daily.
Do not administer antibiotics unless a bacterial infection is suspected.

Refer patient to second level of care.

Initiate oxygen at 5 L/min (higher flows dry the mucous membranes).
Insert nasal cannula and use intermittent awake prone positioning.
Clear the airway if patient is producing secretions.
Evaluate response and watch for emergency signs.
Administer intravenous fluids conservatively.
When administering oxygen, estimate FiO2 as follows: 2-4 L/min (FiO2 0.28-0.36); 5 L/min (FiO2 0.40); 6-10 L/min (FiO2 0.44-0.60); 10-15 L/min (FiO2 0.60-0.95).

Administer corticosteroids in accordance with clinical criteria.
If the patient stabilizes (SpO2>90%, stable vital signs), continue management, evaluate response, and watch for any signs of deterioration.***

If patient's respiratory distress increases or SpO2 remains lower than 90%:
Use oxygen mask.
Increase oxygen flow to 6 to 10 L/min.
With oxygen mask in place, use intermittent awake prone positioning.
Evaluate response and check for signs of deterioration every 4 hours***

If the patient stabilizes (SpO2>90%, stable vital signs), continue management, evaluate response, and watch for any signs of deterioration.***

If respiratory distress continues or SpO2 remains lower than 90% and signs of deterioration develop:
Use oxygen mask with reservoir bag.
Increase oxygen flow to 10 to 15 L/min.
Make sure that the bag is inflating.
Call for virtual or in-person consultation with a clinical expert.
Consider referral to second level of care.

***Signs of Deterioration
Increased difficulty breathing
Drop in blood pressure
Bluish lips and face
Confusion or inability to sit up
Increased weakness
Oxygen saturation lower than 90%
Persistent chest pain
Reddening or inflammation of limbs
Dizziness
Loss of consciousness
Respiratory rate lower than 20

If respiratory distress continues or SpO2 remains lower than 90%, arrange to transfer patient as quickly as possible to the nearest hospital with a mechanical ventilator.

Source: Pan American Health Organization. Flowchart for the management of COVID-19 infection at the first level of care and in remote areas in the Region of the Americas. Washington D.C: PAHO, 2020. Available at https://iris.paho.org/hanndle/10665.2/52577.