PAHO
Pan American Health Organization
World Health Organization
REGIONAL OFFICE FOR THE Americas

Emergency Medical Teams
Medical Surge

COVID-19

Technical Recommendations for the Selection of Alternative Medical Care Sites (AMCS)

Preliminary document - Version 2.2 May 1, 2020

ACRONYMS

AMCS: Alternative Medical Care Site

EMT: Emergency medical team

HEPA: High Efficiency Particle Arresting

IPC: Infection prevention and control

PPE: Personal protective equipment

PVC: Thermoplastic material obtained from polyvinyl chloride

SARI: Severe acute respiratory infection

Introduction

Before integrated health services networks reach their peak care threshold during the COVID-19 response, alternative medical care sites (AMCS) should be identified to expand the network's surge capacity, following the principles and standards of the Emergency Medical Team (EMT) initiative.[1]

AMCSs should be considered a last resort, used only after exhausting all other resources, such as reorganizing health services and/or scaling up capacities through the deployment of emergency medical teams that enable a better management and self-sufficiency in the response.

When planning the expansion of integrated health services networks, it is important to focus on the capacity for patient care rather than increasing the number of beds without planning for adequate staffing or operational self-sufficiency. Preparing to set up an AMCS is a major endeavor, not only in terms of structurally repurposing the facilities, but in staffing, managing health care and operational flows, adhering to IPC measures, supply chain management, and ensuring quality health care and health care worker safety.

When opening an AMCS, the type of care to be strengthened (isolation of mild cases, monitoring of moderate cases, hospitalization of severe cases, intensive care for critical cases, etc.) must be identified in advance to determine the type of building to select and its use or purpose. Knowing its purpose will facilitate building assessment and redesign, as well as the scale and planning of the work in terms of the human resources and materials to be employed.

The technical recommendations in this document are designed to guide the steps in the assessment, redesign, and scaling up of new AMCSs. Users will be able to quickly and methodically locate and determine the viability of new sites.

To implement these recommendations, a multidisciplinary work team should be created to address the main components of planning and setting up AMCSs:
- Service and systems
- Staff
- Space (facilities)
- Stuff (equipment and supplies)
- Operational support

---

[1] Recommendations for medical surge capacity and deployment of emergency medical teams

Clinical considerations for the implementation of AMCSs

The trajectory of the COVID-19 pandemic in some countries has shown a 3-day case duplication rate, with a higher proportion of severe and critical cases.[2] The local and national response capacity of integrated health services networks will determine when alternative care sites will be required. The situation analysis—in terms of scalability, the proportion of different types of patients (mild, moderate, severe, and critical), and the capacity of the available network facilities— will help determine the type of care to be provided in the AMCS, as well as the type of site and staffing required.

Scalability

Countries may be in one or more epidemiological contexts and will need to tailor their response to the evolving case scenarios and number of patients.

The steps for expanding capacity[3] will go from strengthening health facilities (Tier 1), to strengthening the network (Tier 2), to expanding the network with the use of AMCSs (Tier 3).

---
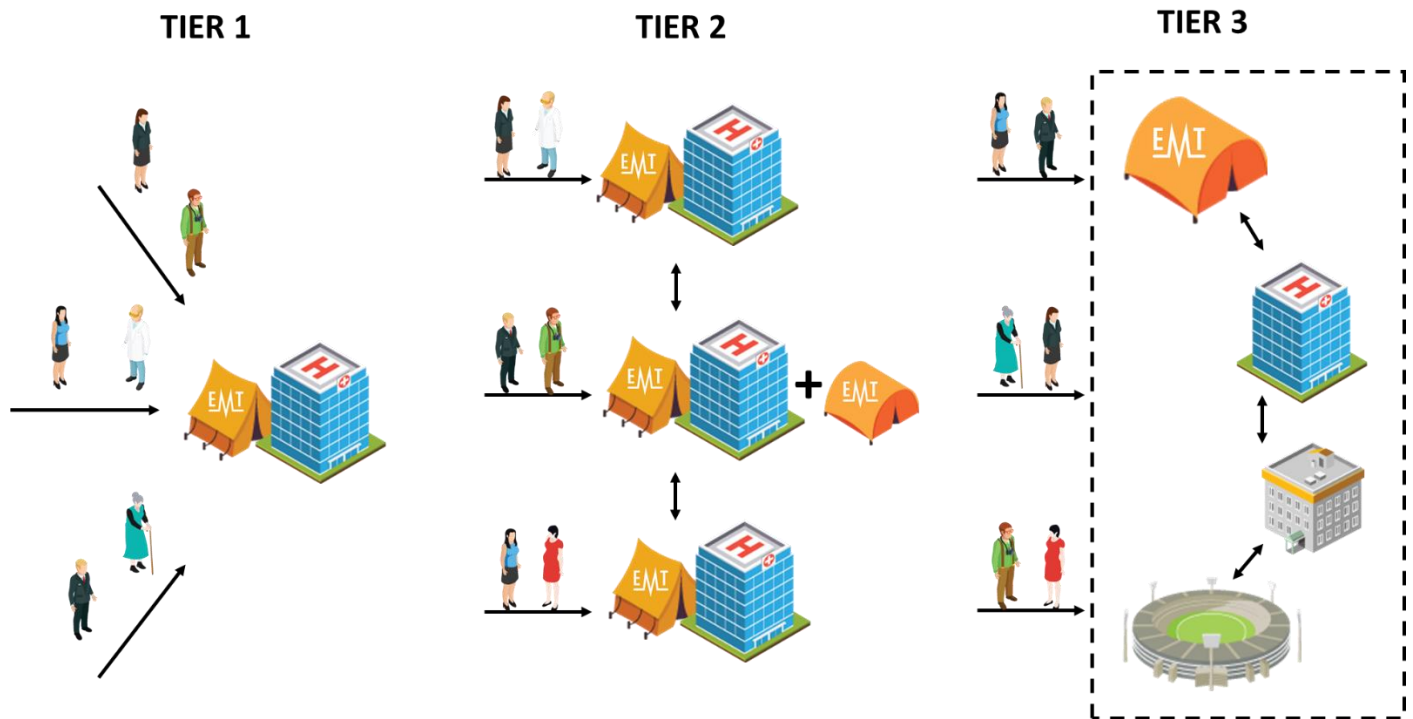
2   World Health Organization (WHO). Operational considerations for case management of COVID-19 in health facility and community. WHO, 2020
3   Recommendations for medical surge capacity and deployment of emergency medical teams

Type of medical care

It is necessary to identify the level of care that patients require in order to determine the type of clinical care that should be provided. An AMCS can serve many purposes, depending on the health system's needs and the gaps in care. This guide will focus on sites that offer medical care and isolation, bearing in mind that, like EMTs, every AMCS should perform some form of triage when patients arrive, followed by IPC procedures to prevent the spread of the infection.

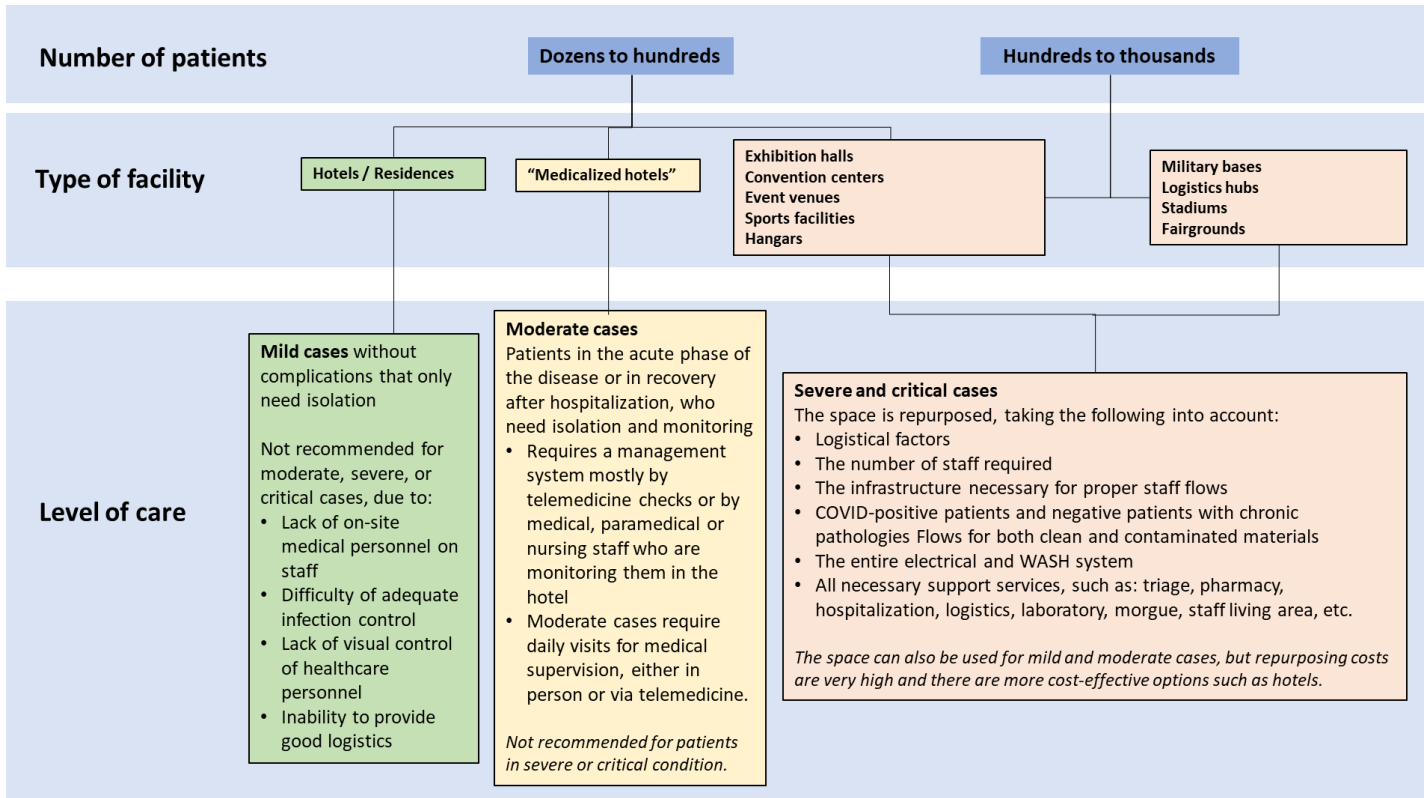The medical care provided by an AMCS can be for:

- Mild cases: mildly ill patients who do not require hospitalization and whose treatment will be mainly symptomatic. These patients can be managed at the ambulatory level or isolated in hotels and residences, if necessary

- Moderate cases: patients in the acute phase of the disease and/or with risk factors requiring periodic monitoring of their vital signs, especially oxygenation and respiratory rate, and possibly some type of care. This group also includes recovering patients who have been transferred out of a hospital setting but still require monitoring and ambulatory care while they complete their recovery.

- Severe and critical cases: patients in the acute phase of the disease who will need hospitalization in a facility that can provide oxygen therapy or mechanical ventilation, in addition to pharmacological treatment and/or intensive care. This type of patient requires more specialized care and entails greater demand for nursing care.

It is also necessary to consider the possibility that the AMCS will need to provide space for the health professionals who work there or those from nearby health centers, either to facilitate shift work or, if necessary, to maintain a quarantine.
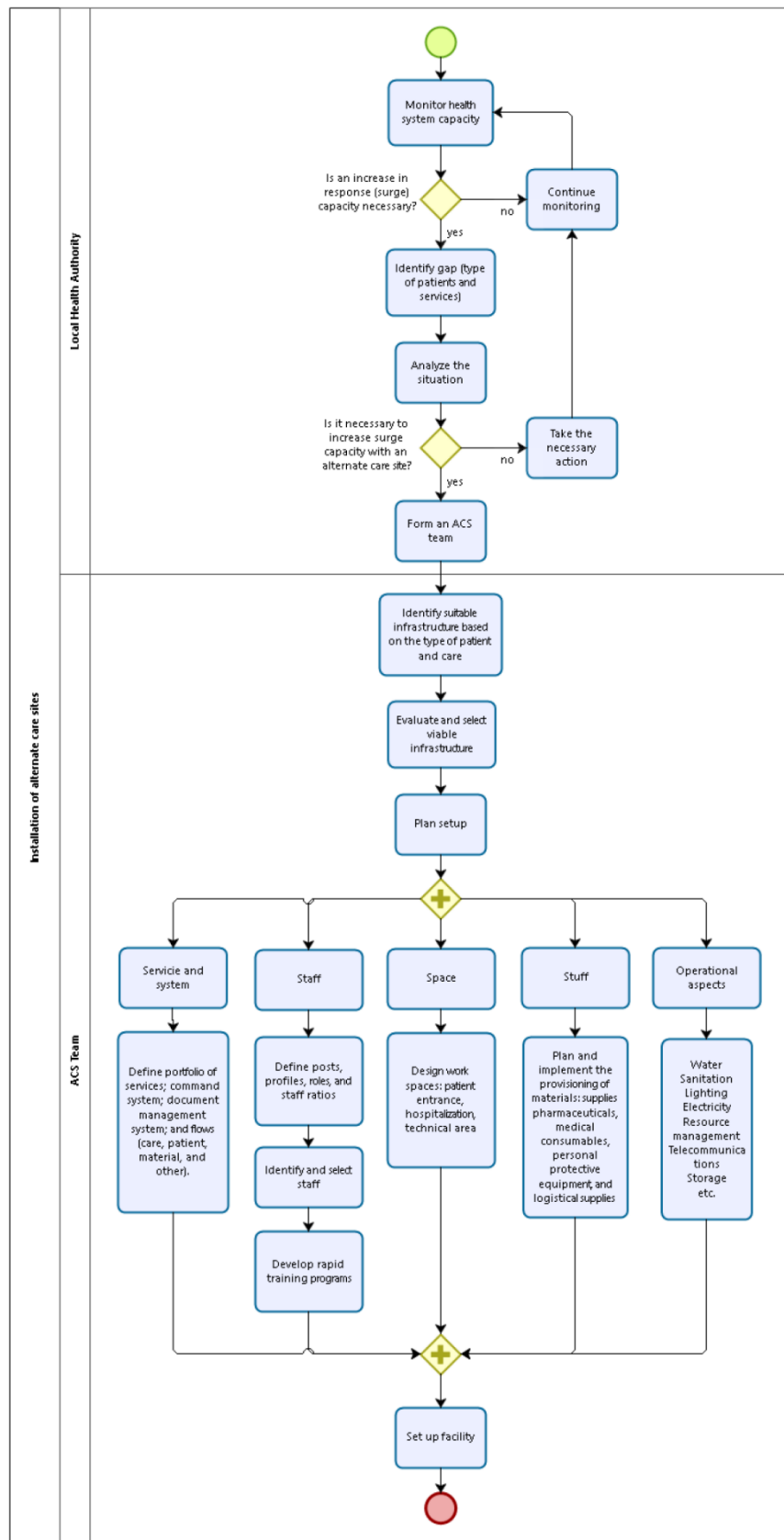
Facilities by type of patient

The criteria for the classification of mild, moderate, severe, and critical cases are changing as studies emerge on the pathogen's behavior. The latest directives from the World Health Organization/Pan American Health Organization or the competent country health authority should therefore be followed.

Flow chart 1. Relationship between the number of patients, type of facility, and level of care.

Number of patients	Dozens to hundreds		Hundreds to thousands	
Type of facility	Hotels / Residences	"Medicalized hotels"	Exhibition halls / Convention centers / Event venues / Sports facilities / Hangars	Military bases / Logistics hubs / Stadiums / Fairgrounds

Level of care

Mild cases without complications that only need isolation

Not recommended for moderate, severe, or critical cases, due to:
• Lack of on-site medical personnel on staff
• Difficulty of adequate infection control
• Lack of visual control of healthcare personnel
• Inability to provide good logistics

Moderate cases
Patients in the acute phase of the disease or in recovery after hospitalization, who need isolation and monitoring
• Requires a management system mostly by telemedicine checks or by medical, paramedical or nursing staff who are monitoring them in the hotel
• Moderate cases require daily visits for medical supervision, either in person or via telemedicine.

Not recommended for patients in severe or critical condition.

Severe and critical cases
The space is repurposed, taking the following into account:
• Logistical factors
• The number of staff required
• The infrastructure necessary for proper staff flows
• COVID-positive patients and negative patients with chronic pathologies Flows for both clean and contaminated materials
• The entire electrical and WASH system
• All necessary support services, such as: triage, pharmacy, hospitalization, logistics, laboratory, morgue, staff living area, etc.

The space can also be used for mild and moderate cases, but repurposing costs are very high and there are more cost-effective options such as hotels.

The situation analysis will also determine when to begin to plan for and set up of an AMCS, as well as the steps that should be taken. The algorithm below shows these steps and serves as a guide for the use of these technical recommendations for selecting alternate sites and planning their setting up.

PAHO
Pan American Health Organization
World Health Organization
REGIONAL OFFICE FOR THE Americas

Technical Recommendations for the Selection of Alternative Medical Care Sites (AMCS)
Preliminary document 2.2 | May 1, 2020

EMT

Algorithm 1. Decision-making, planning, and setting up an AMCS.

PAHO
Pan American Health Organization | World Health Organization | Regional Office for the Americas

Technical Recommendations for the Selection of Alternative Medical Care Sites (AMCS)
Preliminary document 2.2 | May 1, 2020

EMT

Considerations for selecting the right infrastructure for alternative care sites

Once the need for surge capacity has been identified, based on the type of patient and care to be provided at the alternate sites, select the infrastructure best suited to the needs of the proposed AMCS. The recommendations for the selection of that infrastructure are listed below.

Types of infrastructure

Infrastructure can be classified as buildings with horizontal and vertical partitions and buildings without partitions.

Table 1. Types of infrastructure and potential uses.

Buildings with horizontal and vertical partitions			
Examples	**Advantages**	**Disadvantages**	**Recommended use**
- Hotels - Student residences - Medicalized hotels - Hospitals in disuse - Mobile hospitals	They have a spatial distribution very similar to that of hospitalization areas, meaning that an AMCS can be set up very quickly. They have internal storerooms, a kitchen, dining rooms, meeting rooms, dressing rooms for staff, etc.	If these are private facilities, the time they are used could entail a cost or conflict with the economic interests of the owners. Infection control is problematic, mainly with respect to the criteria for cleaning the area surrounding patients. Limitations on repurposing the spaces, since permanent horizontal divisions already exist.	Isolation and control of mild and moderate cases. Lodging for health workers. They make it possible to limit the movements of confirmed or suspected cases. Monitoring of moderate cases. Limited expansion of the capacity to manage severe or critical cases.
Buildings without partitions			
Examples	**Advantages**	**Disadvantages**	**Recommended use**
- Houses of worship - Sports pavilions - Hangars - Military bases - Logistics hubs - Fairgrounds - Stadiums	Flexibility when designing the spaces for clinical care. Outdoor spaces have considerable capacity for parking, fences, and controlled access. They are usually public buildings, resulting in a lower cost for their alternative use.	Large spaces require major effort and financial investment: i.e., remodeling the facilities so that work spaces are adapted to procedures and types of care, services (laboratory and diagnosis, sterilization of medical equipment, kitchen, and laundry), etc.	Hospitalization for moderate, severe, and/or critical cases, such as patients with SARI (including COVID-19) as well as non-infectious patients.

When planning future expansion of AMCS capacity, the size of the facility should be taken into account because space can become a limiting factor.

Facility requirements

Once the most appropriate type of infrastructure has been determined, certain requirements should be considered for the proper operation of an AMCS. If these cannot be met and if there are no other alternatives, the necessary modifications will be considered. These requirements are listed below.

Location:

- Near a hospital in order to facilitate patient transfer and to receive support and supplies from laboratory and imaging services, etc.
- Near logistics warehouses not at risk of natural hazards (floods, landslides, etc.) or human-made hazards (social, health, ecological, chemical, technological, etc.).
- Access to appropriate types of telecommunications and sufficient equipment to install computer, Internet, and telephone systems for proper AMCS operations.
- Access to least two streets, roads, or avenues to ensure that the facility has sufficient access and exits in the event streets are blocked.

Exterior:

- Parking for medical, law enforcement, AMCS staff, and/or supply transport vehicles; the facility should preferably have loading docks to facilitate the intake of supplies.
- Security perimeter that includes fencing, adequate exterior lighting, controlled access, and other security measures.
- Asphalt or concrete paving.
- Areas for the temporary waste storage, or if necessary, final disposal in AMCS s where the appropriate equipment can be installed.

Interior:

- Building structure capable of supporting potential overload due to the alternative use of the facility.
- A limited number of secure entrances and exits that are easy to monitor and block, if necessary, including exterior access.
- Access for the entry of equipment, wheelchairs, and stretchers through building entrances and all doors. If the building has several floors, an elevator or ramps are needed.
- Partitions where admission and triage areas can be installed for patients entering the facility.
- Area for the command center, near triage and administration and patient registration services.
- Cold chain for drugs and blood products, if applicable.
- Area for donning and doffing personal protective equipment.
- Nurses station, including area for the preparation of medicines.
- Area for minor surgical procedures.
- Isolated area for a mental health clinic.

- Adequate auxiliary facilities:

•	**Electricity:**	If the system is not adequate for the AMCS power use, auxiliary sources of energy, such as electric generators, should be installed.
•	**Lighting:**	Good natural and/or artificial lighting.
•	**Noise:**	Low noise level.
•	**Ventilation:**	Ventilation features adaptable to the requirements of this type of facility.
•	**Climate control:**	Ability to provide temperature control.
•	**Water:**	Presence of water connections for sanitation and fire extinguishing.
•	**Sanitation:**	Sewage system, showers, etc.

- Separate toilets and showers for men and women; these should be safe and well-lit if for collective use. Toilets for persons with mobility limitations. There should be enough units to provide separate toilets and showers for patients and staff.
- Areas for hand-washing or other safe hygiene measures. If there are not enough or if they are not located in the right place, sinks should be installed in the clinical care zones and respective areas for hygiene.
- Kitchen area and area for washing dishes/utensils with enough equipment to prepare or distribute meals for patients and staff.
- Staff rest areas and dining room, including a bathroom with a shower exclusively for staff and, if possible, an area for staff to stay overnight, if necessary.
- Sequential areas for storing supplies, with proper spaces and environmental conditions.
- Installation of fire safety equipment.
- Refrigeration and cold chambers for drug and food storage.
- Laundry, or at least somewhere to install one, with water and drainage connections.
- Partitioned or separate area for the initial management of dead bodies, with direct access to the exterior for their subsequent transfer.
- Structure and facilities compliant with current national standards governing fire safety and the confidentiality of information systems, including the elements of active response.
- Area for the temporary waste deposit
- Area for storing cleaning materials and chemical products and for cleaning these materials

Considerations for planning and setting up alternative medical care sites

Formation of the team for planning and setting up the AMCS

Once the need to set up an AMCS has been identified and its scale determined, a team should be formed, with the technical know-how and enough members to perform the following tasks:

- Select the best type of infrastructure (hotels, sports venues, fairgrounds, etc.) for setting up an AMCS, following the guidelines mentioned in the previous section of this document.
- Locate, assess, and select the facility (or facilities) that will be converted to AMCSs.
- Determine the scale of the facility and the staffing, equipment, supply, and operational support requirements for setting up the AMCS.
- Plan the preparatory tasks for repurposing the facility, as well as complementary measures for the set up of the AMCS.
- Direct the execution of these tasks and, when they are complete, transfer the AMCS to its management and coordination team.

To undertake all the suggested tasks, the multidisciplinary team should have at least one expert or group of experts in the following specialties:

Coordination
- Experience in incidence command systems and familiarity with the development and deployment of mobile hospitals and/or hospital management is recommended.
- The expert will be responsible for coordinating the activities of the entire team and executing the plan for setting up the AMCS.
- The expert will serve as liaison with the health authorities in charge of the COVID-19 response.

Case management
- The expert(s) should be, at least, a health professional with experience in AMCS flows and processes.
- The individual(s) will be responsible for ensuring that the site has sufficient capacity to provide adequate clinical care in a manner that is safe for patients and for health professionals.

Operations management
- Professional experience in engineering and/or architecture is recommended.
- This individual will be in charge of evaluating the existing structures and services in the future AMCS to verify that it is feasible to repurpose them for their new use; and designing any changes that may be necessary to repurpose them.

Logistics

- A professional trained in logistics and supply chain management is recommended.
- The expert will be responsible for evaluating the location of the building, the interior storage, the surrounding area, and the loading and unloading zones to develop an adequate supply chain that will guarantee the provision of materials and equipment for the facility.

IPC management

- A physician and/or professional nurse specializing in infection prevention and control is recommended.
- This individual will be responsible for ensuring that the designated site and entire plan for setting up the AMCS meet the minimum national and international IPC requirements for COVID-19.
- Together with the operations management team, the expert should ensure that the facility has a basic environmental sanitation system.

Security management

- A professional with experience in the comprehensive security of buildings and facilities is recommended.
- This individual will be responsible for the facility's security measures, including the personal protection of staff, evacuation protocols, and controlling entrances and exits at the AMCS.

Telecommunications management

- A professional with experience in communications and/or systems networks is recommended.
- The individual will evaluate existing communications in the facility to be repurposed and will design the necessary changes to ensure that the AMCS provides adequate internal communication between staff and patients and external communication with the health network and emergency command center, while facilitating the capacity for telemedicine, if necessary.

Administrative management

- A professional with experience in the administrative and financial procedures of the government agencies that will be involved in the process is recommended.
- This individual will evaluate and handle billing and financial control for the AMCS, as well as the memorandums and/or contracts necessary for the facility's use as an AMCS.

Legal management

- An attorney is recommended.
- The attorney will advise on legal matters in memorandums, contracts, and in any other aspect related to the use of the facility as an AMCS.

Considerations for planning and setup.

When setting up an AMCS, it is recommended that the following aspects essential to its good operation be considered:
1. Services and systems
2. Staff
3. Space (facilities)
4. Stuff (equipment and supplies)
5. Operational aspects

Services and systems

The services to be provided in the AMCS should meet the expected technical standard, and should have systems in place to support operational activities in all phases of the response (planning, setup, operation, dismantling, etc.), for which the following is recommended:

- Clearly define the purpose of the AMCS and the portfolio of services to be provided in the facility.
- Create a command center, using the Incident Command System methodology or a similar methodology for directing AMCS operations.
- Establish a process to connect with local health networks, as well as the response mechanism.
- Clearly define the portfolio of services to be provided in the AMCS.
- Identify the daily operational activities to be carried out, supported by:
    o Appropriate leadership and management roles
    o Financial responsibility and governance
    o Daily internal routines

- Create a document management system with an adequate traceability mechanism, records, and forms to support clinical care and operational support. This should include:
    o Registration of patient admission
    o Clinical history
    o Patient transfer records
    o Death and birth records (if applicable to the type of AMCS to be set up)
    o Clinical, operational, and infection prevention and control guidelines and protocols.
    o Administrative and logistical records
- Establish internal and external communication.
- Define flows for patients, staff, services, and materials; dead bodies; food; waste; and clothing; and the care or work areas that flows pass through. Flows may change slightly, depending on whether the AMCS will be used for the isolation of mild cases and/or monitoring of moderate cases or for the hospitalization of severe and/or critical cases.

Table 2 lists the factors that should be considered in developing patient flows:

Table 2. Recommendations for patient flow

Patient flow			
Flow phase	**Action**	**AMCS requirement for the isolation of mild cases and/or monitoring of moderate cases**	**AMCS requirement for the hospitalization of severe and/or critical cases**
Patient entry	- Mild or moderate cases with suspected COVID-19 may arrive at the facility on their own for triage and admission for isolation and monitoring.	✓	✓
	- More severe cases may arrive by ambulance or other vehicles.	✓	✓
	- Patients are classified by the severity of their illness, and a decision is made to admit them, refer them to another facility, or send them home.	✓	✓
	- Patients who are not admitted must leave through a door other than the entrance.	✓	✓
Patient treatment	- Patients are isolated in individual rooms, and if this is not possible, are kept at a minimum distance of two meters on all sides from the rest of the beds and with temporary dividers made of non-porous, easily disinfected material, avoiding contact with other patients.	✓	
	- Patients stay in common areas (hospitalization wards) classified by severity and whether they are confirmed or suspected SARI (COVID-19) cases, maintaining a distance of two meters on all sides from the rest of the beds and with temporary dividers made of non-porous, easily disinfected materials, avoiding contact with other patients.		✓
	- Patients are monitored and may be provided with symptomatic treatment but are not dependent on care.	✓	
	- Patients are monitored and treated according to the severity of their condition, with treatment including oxygen therapy or mechanical ventilation for SARI patients.		✓
	- Patients undergo analytical testing and imaging to monitor their condition. They can leave their room/bed for these tests if the routes are well established.	✓	
	- Patients undergo analytical testing and imaging to monitor their condition. They do not leave their room/bed for tests.		✓
Patient exit	- Patients who are asymptomatic and test negative for SARS-CoV2 are discharged to their home, leaving through a door other than the entrance.	✓	✓

- Patients whose condition improves are transferred to wards for less severe cases.		✔
- Patients whose condition deteriorates are taken to other centers by ambulance.	✔	✔
- Patients whose condition deteriorates are transferred to wards for more severe cases.	✔	✔
- Patients who die are taken to an area for dead body management until their transfer to a location indicated by the authorities.		✔

When planning staff flows, it is recommended that staff activities in each work zone be studied. These activities are listed in Table 3, below:

Table 3. Recommendations for staff flow.

Staff flow		
Flow phase	**AMCS requirement for isolation of mild cases and/or monitoring of moderate cases**	**AMCS requirement for hospitalization of severe and/or critical cases**
Access to the facility	- Staff enter the facility through a different entrance than the patients. - Staff must show their identification and work area. - Staff go to the dressing room to change out of their street clothes and don work clothes.	
Movement in the uncontaminated area (operations zone)	- Staff with work clothes enter the uncontaminated area. - Staff move about operational support areas without risk. - Staff work in their work areas in the operational support zone. - Staff have access to the bathroom. - Staff can wash their hands - Staff can access the dining room. - Staff can access the rest area. - Staff have access to the area for donning PPE in preparation for entering clinical areas, including the laboratory. - Staff can access the street	
Movement in the contaminated area (clinical zone)	- Staff prepare drugs for treating patients. - Staff control isolation, monitor clinical status, and treat and care for patients. - Staff accompany patients to the sample collection (testing) and imaging zone. - Staff clean and disinfect the patient's environment. - Staff bring meals to patients and remove the dishes/utensils once they have finished eating. - Staff go to the decontamination area and doff their PPE to enter the operations zone.	- Staff prepare drugs for treating patients. - Staff perform analytical tests and imaging at the patient's bedside. - Staff monitor the clinical course of the disease and provide treatment appropriate to the severity of the case. - Staff have a direct view of the patient. - Staff clean and disinfect the patient's environment. - Staff bring meals to patients and remove the dishes/utensils once they have finished eating. - Staff go to the decontamination area and doff their PPE to enter the operations area.
Staff exit the facility	- Staff deposit their work clothes for washing. - Staff can shower and wash up. Staff can change their clothes and leave by the door they used to enter the building.	

In this type of facility, service and material flows are similar in all types of AMCSs. Table 4 lists the activities that should be considered when designing proper service and material flows:

Table 4. Recommendations for service and material flows

Service and material flows	
Flow phase	**Activities**
Clinical laboratory	- The health team should collect samples from the patient. - The samples should be transported to the laboratory in the proper container (to ensure the quality of the sample and biosafety). - The laboratory enters the results in the respective information system for physician viewing or provides a hard copy. - The current standards for case classification are followed, and infectious waste and sharps are properly disposed of. - The laboratory has procedures in place for referral to a nearby laboratory validated for handling SARS-CoV-2 samples or to other higher-level laboratories that might be needed. - Infectious materials are transported to the reference laboratory in triple packaging. - The laboratory has semiautomated clinical testing equipment for monitoring patients (biochemistry, liver biometrics, urine strips, safe and validated rapid tests, blood group, etc.)
X-rays	- If portable x-ray equipment is available, it should be brought to the patient's bedside and the necessary x-rays taken. - If portable x-ray equipment is not available, the patient goes to the respective x-ray room to take the x-rays. - The results are digitally entered in the information system or delivered to the medical staff for their files. - Portable lead curtains will be used to protect the other patients.
Sterilization	- The material to be sterilized should be washed and placed in a receptacle containing a chlorine solution before leaving the hospitalization zone. - The receptacle should be taken to the sterilization zone, where the material is rewashed and inspected for cleanliness, functionality, and collection. - The material is sterilized. - The material should be transported back to the medicine cabinets or closets, where it will be stored until used. Sterilized material should be transported in closed carts used exclusively for this purpose. The sterile material flow should not cross the contaminated material flow or the cleaning and waste collection flow.
Cleaning of the environment	- Cleaning should start in the cleanest area and proceed to the dirtiest area. - The area near the patient (bed, table, pumps and monitors, and IV equipment) should be cleaned frequently. - Floors and surfaces should be cleaned once a day or whenever they are visibly dirty. - A secure flow should be created for waste removal. - Common areas and areas for admitted patients should be ventilated, directing ventilation flows from clean areas toward dirty areas. - Sinks should be installed in patient care and drug preparation areas. - The personal protective equipment needed for the work area should be provided. - Containers should be provided for segregating and collecting waste.
Meals	- Food and beverages should be distributed to patients according to the type of care and specific diet indicated for their illness. - Drinking water should be provided to patients. - Food is transported and distributed to patients. - The food is removed and the waste is segregated. - Priority should be given to the use of reusable dishes/utensils–for example, those made of stainless steel and/or glass - Reusable dishes and utensils are washed with soap and water in separate areas and immersed in chlorine solutions in contaminated areas.

Pharmacy	- Drugs should be stored in a general pharmacy in the facility. - The pharmaceutical team will distribute the drugs from the pharmacy to the medicine cabinets in the different work areas. - The transportation and storage of drugs and blood products requiring cold chain must comply with national regulations, and the temperature and humidity in the areas should be traced from the storage area to the use of these products. - Drugs that are unused, expired, or damaged for some reason should be screened and collected.
Dead body management	- Bodies should be wrapped in a sheet or some other fabric. - Bodies should be transferred using routes where there are no patients and minimum staff. - Body bags should be disinfected with chlorine spray. - There should be a family waiting room. - A psychosocial support team should be available. - The morgue must have a direct exit for transferring the body to a hearse for its transport.

Space (facilities)

The spaces in an AMCS are very similar, whether in isolation, control, or monitoring centers or in the different treatment and hospitalization centers (for moderate, severe and/or critical cases). Regardless of the spatial arrangement permitted by the selected infrastructure, there should be common spaces and areas. This can clearly be seen in the conceptual diagram in Illustration 1. The diagram shows the zones and work areas required in an AMCS. It should be underscored that this drawing is a conceptual diagram and not a floor plan. This specific layout is not required, and the sizes of the areas may differ depending on actual needs.

During planning it will be necessary to decide how and where to prepare these zones and areas in the existing property and buildings. If it cannot be done, it will be necessary to search for alternate solutions to ensure that the system has these spaces. The diagram in Illustration 1 can serve as a planning checklist.

Although there are different criteria for classifying work zones, in this document they will be grouped as follows:

Table 5. Classification of work zones.

Zone	Color	Description
Exterior zones	Blue frame	These areas—on the property but outside the building where the AMCS will be set up—are common for all types of uses (isolation and treatment for moderate, severe, or critical cases).
Patient access and classification zone	Green frame	In these work areas, patients are received, observed, and classified. They are admitted or isolated, as necessary, or they are sent home. The areas in the patient access and classification zone will vary slightly depending on how the AMCS will be used.
Operations zone	Orange frame	The work areas in the operations zone support clinical care and are common to all types of uses in AMCSs. The areas for diagnosis (laboratory and pharmacy) can sometimes be located in the areas where patients are admitted or isolated, depending on the design or the available space in the building to be repurposed.
Technical zone	Magenta frame	The work areas in the technical zone are common to all types of AMCS and provide logistical support and WASH for the system.
Admission or isolation zone	Red frame	Although they have many areas in common, some differ slightly (including their spatial arrangement) if the AMCS is set up in structures with horizontal and/or vertical partitions for the isolation and control of mild cases and the monitoring of moderate cases (arrangement of areas to the left in the conceptual diagram) or if, on the contrary, the AMCS is set up in structures with spaces without partitions for the hospitalization of severe or critical cases (arrangement of areas to the right in the conceptual diagram).

These zones are assigned different risk levels (green diagonal lines– low; orange diagonal lines – moderate; and red diagonal lines – high), based on contact with and proximity to patients and contaminated materials.

Illustration 1. Conceptual diagram for checklist of areas by zone in an AMCS**.**
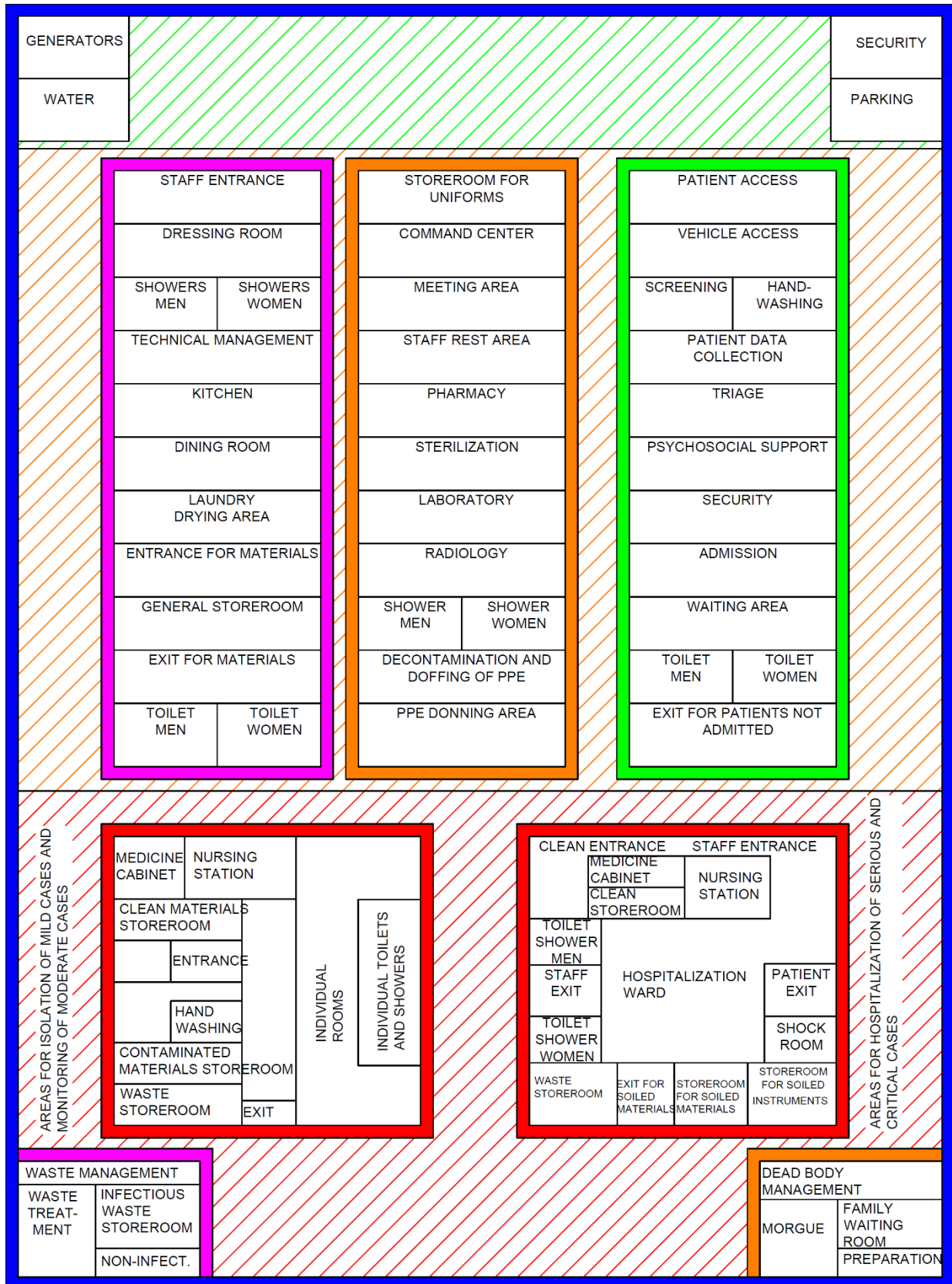
Staff

When planning and setting up an AMCS, consideration should be given to a personnel management system that includes:

- Definition of the necessary staff positions, based on the type of patient, the portfolio of services, and the installed capacity of the AMCS. This includes the quantification of ratios and the definition of roles, post profiles, and shifts.
- Identification and selection of the appropriate staff based on the job profiles. There should be a staff roster that allows for an effective relief system and the immediate activation of staff as needed in the AMCS.
- The use of health teams that combine professionals specializing in care with non-specialist health workers under their supervision to assist with care.
- The development of rapid and specific training programs for work in the AMCS, with emphasis on infection prevention and control.

The staff are divided into two groups: health workers (Table 6) and operational support staff (Table 7). The final number of necessary staff for each new profile or profiles will be determined by the AMCS planning team, based on:

- National and state/local regulations
- The professional experience of the staff in hospital and/or intensive care
- The availability of auxiliary staff
- The scenario they are dealing with at the time, especially when there is an overload of care requirements.

Table 6. Considerations on health workers by type of patient for initial AMCS estimates.

Health workers (per shift)	Ratio mild cases	Ratio moderate cases	Ratio severe cases	Ratio critical cases
Medical director	N/A	N/A	1x AMCS	1x AMCS
Operations/nursing director	N/A	N/A	1 x AMCS	1 x AMCS
Physician	N/A	1 x facility or telemedicine	1x every 10 beds	1x every 5 beds
Intensivist physician	N/A	N/A	N/A	1 x every 10 beds
Nurse	1 x facility	1 x every 50 beds	1 x every 9 beds	1 x every 3 beds
Auxiliary nurse	N/A	N/A	1x every 5 beds	1x every 2 beds
Respiratory therapy technician	N/A	N/A	1 x every 20 beds	1 x every 10 beds
Psychologist	1 x facility	1 x every 250 beds	1 x every 100 beds	
Laboratory technician	N/A	N/A	2x every 50 beds and up to 10	
Pharmacist	N/A	N/A	1 x every 50 beds	
Pharmacy technician	N/A	N/A	2x every 50 beds	
Radiology technician	N/A	N/A	1 x every 50 beds	
Medical records technician	N/A	N/A	1x every 50 beds	
Infection control professional	1x every 100 beds			
Physical therapist			1 x every 50 beds	
Environmental health technician	1 x facility			

Table 7. Considerations for operational support staff for initial AMCS estimates.

Operational support staff	Initial basic team per facility	Increase per every 100 patients
Coordinator	1	0
Storeroom technician	2	1
Electromechanical technician	1	1
Electromedical technician	1	1
Water treatment and sanitation technician	2	1
Waste management technician	2	2
Cleaning and sanitation staff	6	4
Telecommunications technician	1	1
Computer technician	1	0
Security technician	1	0
Security staff	6	2
Administrative staff	2	1
Cook	2	1
Kitchen assistant	4	2

Stuff (equipment and supplies)

The provision of materials when setting up an AMCS requires a major logistical effort. Storerooms are sometimes not large enough to store the total volume of supplies in the AMCS. To properly control supply use, a system of sequential storerooms is recommended (i.e., small storerooms located near where supplies are used, and larger storerooms in other areas a little farther away for managing larger volumes). It is also necessary to plan an adequate supply system. These materials can be classified as:

Table 8. Type of material.

Type	Considerations
Pharmaceutical supplies (including cold chain)	In managing these supplies, consideration should be given to pharmaceutical regulations. The drug supply should be guaranteed for treatment at all levels, based on the available national or international list of essential drugs for patient management[4]. The pharmacist in charge, or in his or her absence, the pharmacy technical staff, will be responsible for requesting, receiving, and distributing drugs. Drugs should be stored in locations far from the patients, and special security measures should be in place. The drug storage area should be equipped with climate control and not exceed 28° C to ensure proper conservation of the medications.
Medical consumables (including consumables for electromedical equipment)	These supplies occupy a great deal of space and require nurses or specialized staff for rapid identification. They should be stored separately from drugs and logistical supplies. The storeroom for medical consumables should be clean to prevent medical infections and should be monitored to prevent unnecessary and avoidable removal of these supplies.
Personal protective equipment supplies	In AMCS s for SARI, the procurement and use of large volumes of PPE are required to protect both staff and patients. This equipment is in high demand; thus, accurate quantification of these supplies is essential.
Logistical supplies	Logistical supplies are those not represented in any of the previous three groups. These products can range from fuel for generators to water. Medical staff are not required for their control.

---

[4] Essential Medicines List for Management of Patients Admitted to Intensive Care Units with Suspected or Confirmed COVID-19 Diagnosis

Operational support

Operational support for this type of facility is described in Table 8, below.

Table 8. Operational support.

Operational support	
Area of support	**Actions**
Water	- A sufficient supply of drinking water should be ensured, as defined in national and international regulations. - Water in faucets and sinks should be chlorinated.
Sanitation	- Separate toilets should be provided for male and female patients, located at a reasonable distance and with well-lit access. - Separate showers should be provided for male and female patients, located at a reasonable distance and with well-lit access, hot water, and space to change clothes. - Separate toilets should be provided for male and female staff, located at a reasonable distance and with well-lit access. - Separate showers should be provided for male and female staff, located at a reasonable distance and with well-lit access, hot water, and space to change clothes. - Vector control measures should be adopted.
Lighting	- There should be good lighting in corridors, work and hospital rooms, and entrances. - Emergency lighting should be provided in the corridors and doors of emergency exit routes. - It is recommended that hospitalization areas where patients stay overnight have the option of dimming the lights during sleep time. Individual lamps should be provided for each bed to facilitate patient treatment at night.
Electricity	- There should be outlets for connecting electromedical equipment. - Voltage should stably reach all points with sufficient intensity. - Electrical lines should be protected with safety switches. - The electricity supply should be reliable.
Ventilation	- Ventilation in facilities should be reliable. - Ventilation should be done safely, following the recommendations for the different areas.
Climate control	- A pleasant atmosphere should be created, with temperature and humidity that enables staff to work comfortably, especially in areas where the use of PPE is compulsory.
Waste management	- Waste should be collected and transferred to storage zones on routes that avoid staff and patient areas as much as possible. - Waste should be properly segregated. - Waste should be stored in secure isolated places until its transport for treatment. - Waste should be treated at the facility, in compliance with current legal standards.
Telecommunications	- Staff should be connected at work, so that they can be promptly located. - The command center should be properly connected to the outside, for integration with the incident command system and proper referral of patients.
Storage	- The AMCS should have a storage area with enough secure space to store all the necessary materials. - The storage team should be capable of loading, unloading, storing, and transferring all necessary materials. - Storerooms should maintain the proper cleanliness, temperature, and humidity
Security	- The security of AMCS staff, patients, and equipment should be guaranteed. - Patient access, as well as the capacity of the AMCS, should be controlled. - The AMCS system should have evacuation plans. - Fire safety plans and measures should be established.

Bibliography

1. Pan American Health Organization. Recommendations for medical surge capacity and deployment of emergency medical teams. Provisional document. PAHO 2020. Available from: https://www.paho.org/en/documents/recommendations-medical-surge-capacity-and-deployment-emergency-medical-teams Cited 2020 May 1

2. World Health Organization. Natural ventilation for infection control in health-care settings. WHO 2009. Available from: https://www.who.int/water_sanitation_health/publications/natural_ventilation/en/ . Cited 2020 April 21

3. World Health Organization. Operational considerations for case management of COVID-19 in health facility and community. WHO 2020. Available from: https://apps.who.int/iris/bitstream/handle/10665/331492/WHO-2019-nCoVHCF_operations-2020.1-eng.pdf . Cited 2020 April 21

4. Pan American Health Organization . Nota técnica sobre los requisitos mínimos de los EMT que responden a desastres en las Américas. PAHO 2019. Available from: https://www.paho.org/disasters/index.php?option=com_docman&task=doc_download&gid=2411&Itemid=&lang=en Cited 2020 April 21

5. Pan American Health Organization. Recomendaciones técnicas para la configuración de un EMT especializado en tratamiento IRAG. Preliminary document 3.5. PAHO 2020. Available from: https://www.paho.org/es/documentos/recomendaciones-tecnicas-para-configuracion-equipo-medico-emergencia-emt-especializado . Cited 2020 April 21.

6. Sociedad Española de Salud y Seguridad en el Trabajo. Manual de prevención y tratamiento de COVID-19. Primer Hospital Adscrito a la Facultad de Medicina de la Universidad de Zhejiang. Document based on practical experience. Tingbo Liang. 2020. Available from: https://www.sesst.org/manual-de-prevencion-y-tratamiento-de-covid-19/ . Cited 2020 April 21

7. World Health Organization (WHO). Classification and Minimum Standards for Foreign Medical Teams in Sudden Onset Disasters. WHO. 2013 Available from: http://www.who.int/hac/global_health_cluster/fmt_guidelines_september2013.pdf?ua=1 Cited 2020 April 21

8. Pan American Health Organization. COVID-19 Recommendations for medical surge capacity and deployment of emergency medical teams.. PAHO 2020. Preliminary document. Available from: file:///C:/Users/mksir/Downloads/Medical-surge-EMT-response-recommendations-fv_1%20(4).pdf . Cited 2020 April 21.

9. Pan American Health Organization. Lista de Dispositivos Médicos Prioritarios en el contexto de COVID-19. Preliminary document. Available from: https://www.paho.org/en/documents/technical-specifications-medical-devices-case-management-covid-19-healthcare-settings   Cited 2020 May 1

10. Pan American Health Organization. Technical Specifications of Medical Devices for the Case Management of COVID-19 in Healthcare Settings. Preliminary document. PAHO 2020. https://www.paho.org/en/documents/technical-specifications-medical-devices-case-management-covid-19-healthcare-settings Cited 2020 April 3

11. California Department of Public Health. Standards and Guidelines for Healthcare Surge During Emergencies. Volume II: Government-Authorized Alternate Care Sites. 2007. Available from: https://www.cidrap.umn.edu/sites/default/files/public/php/258/258_acs.pdf Cited 2020 April 21

12. East-West Gateway Council of Governments Regional Alternate Care Site Plan. Operational Overview Document. The STARRS Regional Alternate Care Site Planning. June 2016 Available from: https://files.asprtracie.hhs.gov/documents/starrs-regional-acs-plan-and-operational-guide.pdf Cited 2020 April 21

13. Committee on Crisis Standards of Care: A Toolkit for Indicators and Triggers; Board on Health Sciences Policy; Institute of Medicine; Hanfling D, Hick JL, Stroud C, editors. Crisis Standards of Care: A Toolkit for Indicators and Triggers. Washington, DC: National Academies Press (US); 2013 Sep 27. 2, Indicators and Triggers. Available from: https://www.ncbi.nlm.nih.gov/books/NBK202381/ Cited 2020 April 21

14. Pan American Health Organization. Considerations for the use of hotels during the COVID-19 pandemic. Preliminary document. PAHO 2020. Available from: https://www.paho.org/en/documents/considerations-use-hotels-during-covid-19-pandemic Cited 2020 April 21

15. Surge capacity logistics: Care of the critically ill and injured during pandemics and disasters: Chest consensus statement. Einav S., Hick J.L., Hanfling D., Erstad B.L., Toner E.S., Branson R.D., Kanter R.K., (...), Task Force for Mass Critical Care (2014) Chest, 146, pp. e17S-e43S. Available from: https://journal.chestnet.org/article/S0012-3692(15)51988-0/pdf Cited 2020 April 21

16. Pan American Health Organization. Directrices provisionales de bioseguridad de laboratorio para el manejo y transporte de muestras asociadas al nuevo coronavirus 2019 (2019-nCoV). Preliminary document. PAHO 2020. Available from: https://www.paho.org/es/documentos/directrices-provisionales-bioseguridad-laboratorio-para-manejo-transporte-muestras Cited 2020 April 21

17. Pan American Health Organization. Laboratory Guidelines for the Detection and Diagnosis of COVID-19 Virus Infection. Preliminary document. Available from: https://www.paho.org/en/documents/laboratory-guidelines-detection-and-diagnosis-covid-19-virus-infection Cited 2020 April 21