

# Isolation and Cohorting for COVID-19


Preventing and controlling transmission of  
COVID 19 infection

# Objectives

- Principles of Isolation and Cohorting.
- How to institute isolation and cohorting in different health care settings
- How to adapt existing health facilities to minimise risk of transmission

# WHO Recommended Strategies for COVID-19

Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected  
Interim guidance  
25 January 2020

 World Health Organization

**Introduction**

This is the first edition of guidance on infection prevention and control (IPC) strategies for use when infection with a novel coronavirus (2019-nCoV) is suspected. It has been adapted from WHO's *Infection prevention and control during health care for probable or confirmed cases of Middle East respiratory syndrome coronavirus (MERS-CoV) infection*,<sup>1</sup> based on current knowledge of the situation in China and other countries where cases were identified and experiences with severe acute respiratory syndrome (SARS)-CoV and MERS-CoV.<sup>2</sup>

WHO will update these recommendations as new information becomes available.

This guidance is intended for healthcare workers (HCWs), healthcare managers and IPC teams at the facility level but it is also relevant for the national and district/provincial level. Full guidelines are available from WHO.<sup>3</sup>

**Principles of IPC strategies associated with health care for suspected nCoV infection**

To achieve the highest level of effectiveness in the response to an nCoV outbreak using the strategies and practices recommended in this document, an IPC programme with a dedicated and trained team or at least an IPC focal point should be in place and supported by the national and facility senior management.<sup>4</sup> In countries where IPC is limited or immature, it is critical to start by ensuring that at least minimum requirements for IPC are in place as soon as possible, both at the national and facility level, and to gradually progress to the full achievement of all requirements of the IPC team components according to local priority plans.<sup>5</sup>

IPC strategies to prevent or limit transmission in healthcare settings include the following:

1. ensuring triage, early recognition, and source control (including patients with suspected nCoV infection);
2. applying standard precautions for all patients;
3. implementing empiric additional precautions (droplet and contact and, whenever applicable, airborne precautions) for suspected cases of nCoV infection;
4. implementing administrative controls;
5. using environmental and engineering controls.

1. Ensuring triage, early recognition, and source control

Clinical triage includes a system for assessing all patients at admission allowing early recognition of possible 2019-nCoV infection and immediate isolation of patients with suspected nCoV infection in an area separate from other patients (source control). To facilitate the early identification of cases of suspected nCoV infection, healthcare facilities should:

- encourage HCWs to have a high level of clinical suspicion;
- establish a well-equipped triage station at the entrance of health care facility, supported by trained staff;
- institute the use of screening questionnaires according to the updated case definition (<https://www.who.int/publications-and-communications/item/2019-ncov>) and
- post signs in public areas reminding symptomatic patients to alert HCWs.

The promotion of hand hygiene and respiratory hygiene are essential preventive measures.

2. Applying standard precautions for all patients

Standard precautions include hand and respiratory hygiene, the use of appropriate personal protective equipment (PPE) according to risk assessment, injection safety practices, safe waste management, proper linen, environmental cleaning and disinfection of patient-care equipment.

Ensure that the following respiratory hygiene measures are used:

- ensure that all patients cover their nose and mouth with a tissue or elbow when coughing or sneezing;
- offer a medical mask to patients with suspected 2019-nCoV infection while they are in waiting/public areas or in cohorting rooms;
- perform hand hygiene after contact with respiratory secretions.

HCWs should apply the WHO's My 5 Moments for Hand Hygiene approach before touching a patient, before any clean or aseptic procedure is performed, after exposure to body fluid, after touching a patient, and after touching a patient's surroundings.<sup>6</sup>

- hand hygiene includes either cleansing hands with an alcohol-based hand rub (ABHR) or with soap and water;
- alcohol-based hand rubs are preferred if hands are not visibly soiled;
- wash hands with soap and water when they are visibly soiled.

1. Ensuring triage, early recognition, and source control (**isolating** patients with suspected nCoV infection)
2. Applying standard precautions for all patients
3. Implementing empiric additional precautions (droplet and contact and, whenever applicable, airborne precautions) for suspected cases of SARS CoV2 infection; - **ISOLATION**
4. Implementing administrative controls;
5. Using environmental and engineering controls

# Key recommendations for isolation based on case severity irrespective of transmission scenario.

| Case severity, risk severity  |  |
|---|--|
| Mild<br>Moderate with no risk factors<br>Age > 60, diabetes, heart disease, chronic respiratory disease, immunocompromising conditions, hypertension. | 1, Self isolate contact Covid 19 information line for advice on testing and referral<br>2, Test suspect and isolate according to country policy<br>Healthcare facility<br>Community centre<br>Home |
| Moderate with risk factors<br>Severe<br>Critical  | 1. Self Isolate contact Covid 19 information line for emergency referral asap<br>2. Hospitalisation for isolation or cohorting   |

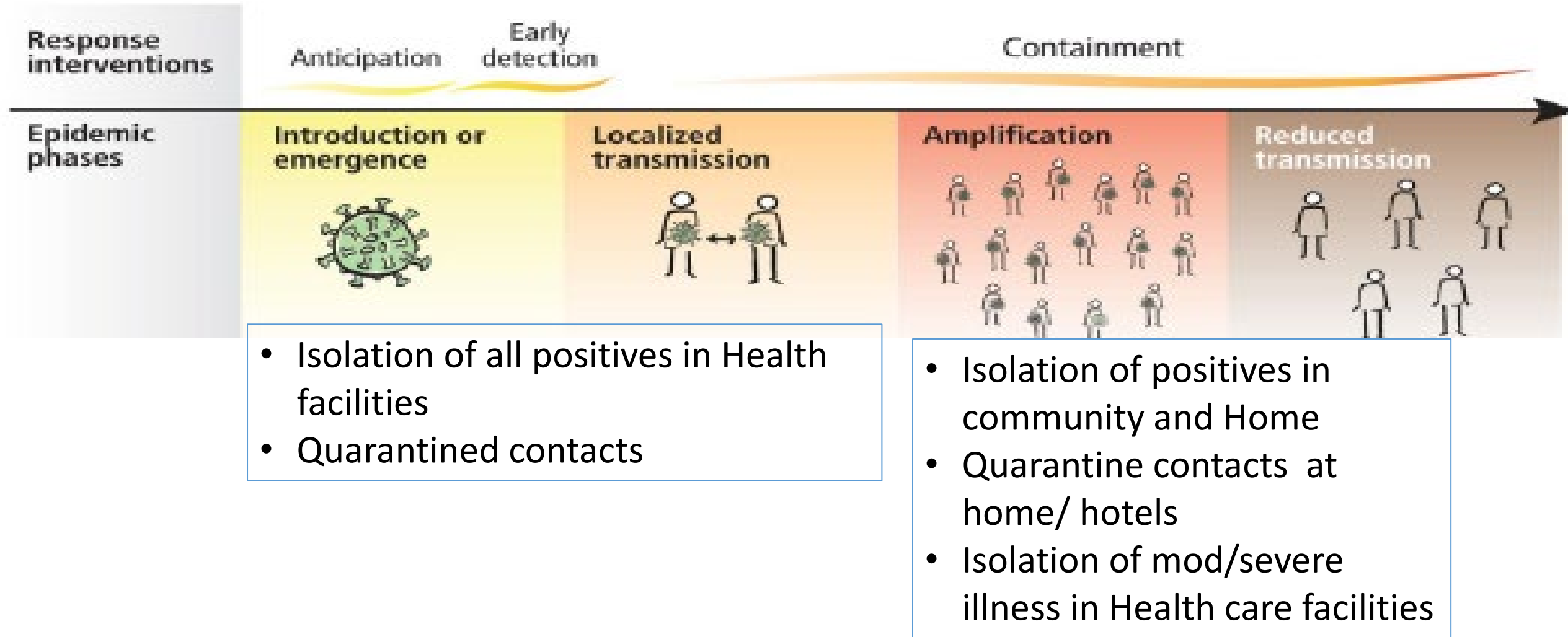
## Key recommendations for isolation based on transmission scenario.

| Case severity, risk severity | Reccomendations  |
|------------------------------|--|
| Sporadic cases               | Quarantine all contacts<br>Care for all suspected and confirmed COVID-19 patients in isolation (or cohorting) according to disease severity and acute care needs for treatment at the COVID-19 designated treatment area |
| Clusters of cases            | Care for all COVID-19 patients in the designated treatment area, according to disease severity and acute care needs according to the recommendations in  |
| Community trnsmission        | <ol style="list-style-type: none"><li>1. Self Isolate contact Covid 19 information line for emergency referal</li><li>2. Hospitalisation for islation or cohorting</li></ol>   |

# When to Isolate in COVID

- This will depend on the country policy which will be based on the
  - Phase of epidemic
  - Case severity
- Isolation affects two groups
  - Suspects: After screening – suspects are isolated till confirmed or cleared
  - Confirmed cases : After laboratory confirmation of infection patients are moved to isolation centers

# Example of Choices that can be made



# What is Isolation?

- **Isolation** is defined as the separation of persons with a communicable disease from those who are healthy.
- It is used to limit the transmission of infectious diseases and are based on routes of transmission of the organism.
  - Contact, Droplet and Airborne isolation precautions (**Transmission based precautions**)
- In COVID-19 – Transmission is by Droplet and Contact routes
- Airborne precautions are used when performing aerosol generating procedures in Healthcare





# Quarantine

- Separation and restriction of movement of people who may have been exposed to a contagious disease to see if they become sick.
- Three Categories
  1. Those who may have been exposed and Know or do not know
  2. Those who have the disease but do not show symptoms.
  3. Those who are not exposed but we do not know – precautionary principle
- Mostly used for people travelling-in from countries with community transmission of COVID-19 to prevent importation of SARS CoV-2

# Cohorting

- Grouping of patients who are infected with the same pathogen in the same location to confine their care to one area and prevent contact with other patients.
- Part of a hierarchy of patient placement decisions for patients requiring care
- May be in a ward or bay within a ward or a community facility eg hall, tent
- In COVID-19 the cohort is a group of **LABORATORY-CONFIRMED** patients

# Cohorting

- Patient cohorting should be combined with other infection prevention and control measures e.g. hand hygiene, PPE and environmental decontamination.
- Beds should be separated by at least 3 feet (approximately 1m) from edge to edge and beds can be separated by a barrier
- If possible a team of healthcare staff should be dedicated to care for the patients.
  - May help to minimise the risk of contamination between groups of symptomatic and non-symptomatic patients if there is adequate staff resource available to do so.

# What are the type of Isolation facilities available

- These can be specialised Negative pressure rooms that utilise mechanical ventilation
- Single rooms with ensuite facilities
- They could be whole wards as is found in specialised infectious disease hospitals
- Community halls, tents, hotels repurposed as isolation centers to meet demand during an outbreak
- They can be purpose built for a particular type of infection: Ebola layout, Cholera, Severe acute respiratory infection treatment (SARI)centre

# Where should an Isolation centre be located?

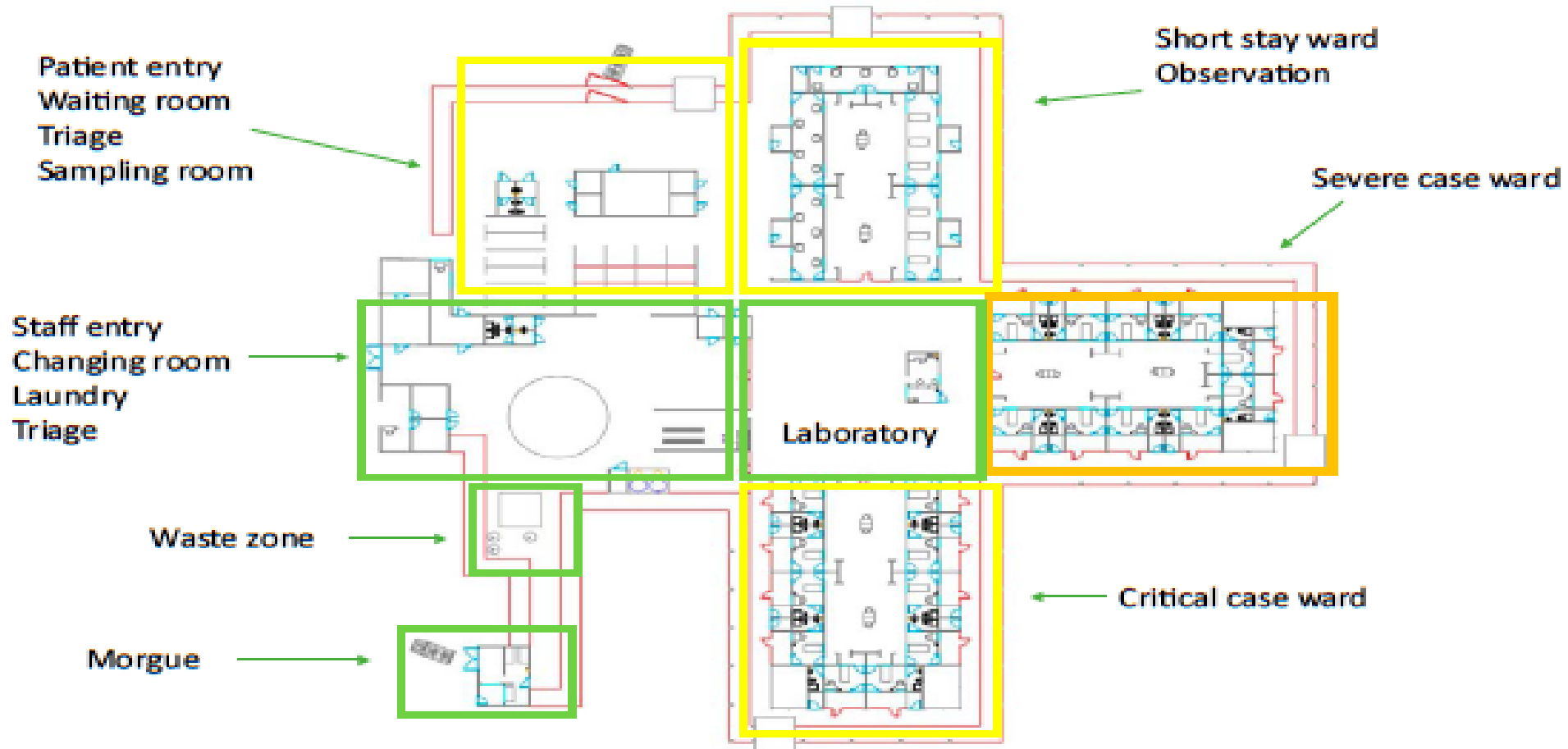
- It can be in a healthcare facility, or in the community.
- It should be in a segregated area which is not frequented by outsiders/ visitors.
- Should be located close to an Intensive care unit for easy transfer of patients who become critically ill
- Should have access to clean running water, toilet facilities and safe waste disposal facilities
- There should be clear signages on the door indicating that the space is an isolation area.

# Location

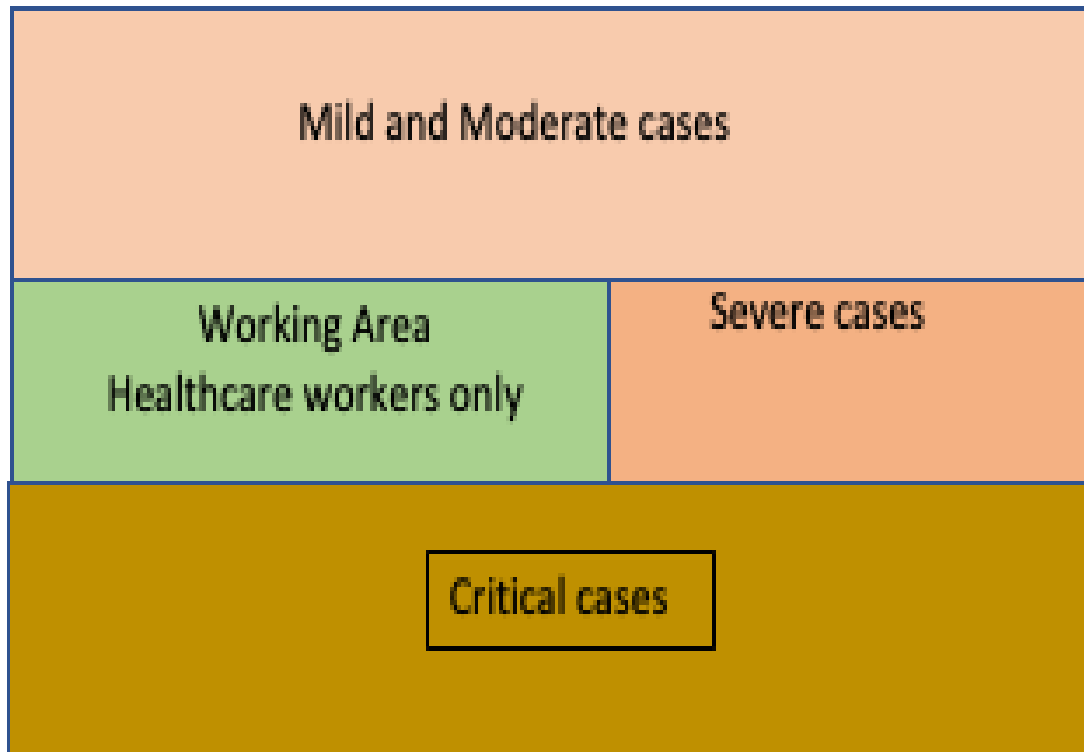
- They should not be co-located with post-surgical wards, labour wards, neonatal units and wards with vulnerable patients
- If possible, the access to isolation ward should be through dedicated lifts/guarded stairs.
- Entry and Exit doors should be separate and clearly marked
- The facility should have appropriate flooring material, adequate floor space for beds and inter-bed space, adequate hand washing stations, standard laboratory, work stations, adequate ventilation, pest and rodent control

# WHO Severe acute respiratory treatment Centre - SARI

Figure 27. Layout of services and facilities in a severe acute respiratory infection treatment centre



# RATIONALE FOR SARI



Two functional concepts:

1. To minimize healthcare associated transmission of COVID-19 by ensuring staff areas are clearly separated from patient areas including ventilation
2. Provide an efficient work flow for the management of cases by grouping cases according to the severity of their infection.



# The lay out should include

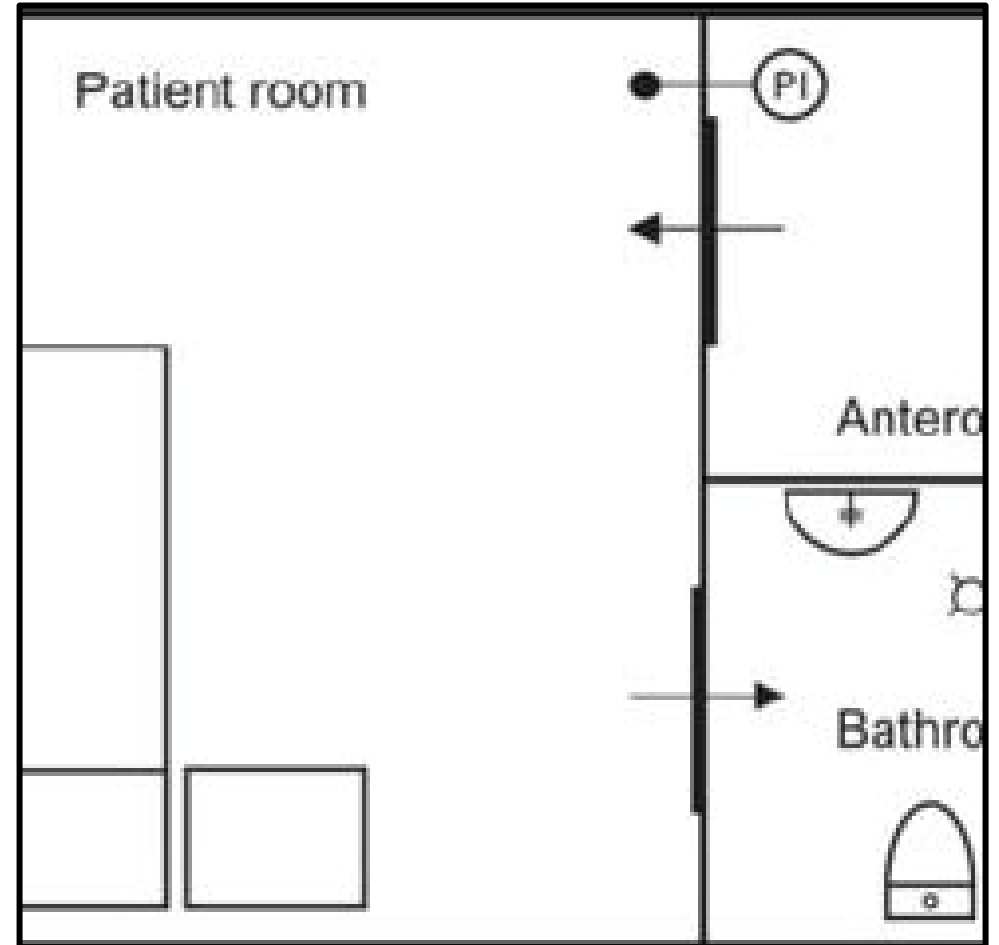
- Patient Waiting area and Reception
- Triaging section
- Drs/Nurses handover area/office
- Staff area for donning and doffing PPE,
- Confirmed and suspect wards or rooms
- Discharge area
- Visitors area
- Access to Critical care,
- Access to Morgue, Laboratory, Pharmacy, Laundry,
- Waste management area, Cleaners store in low and highrisk areas.

# Single room Isolation unit - layout

- An “Enhanced single room with en-suite toilet and bathroom facilities and ventilated anteroom.

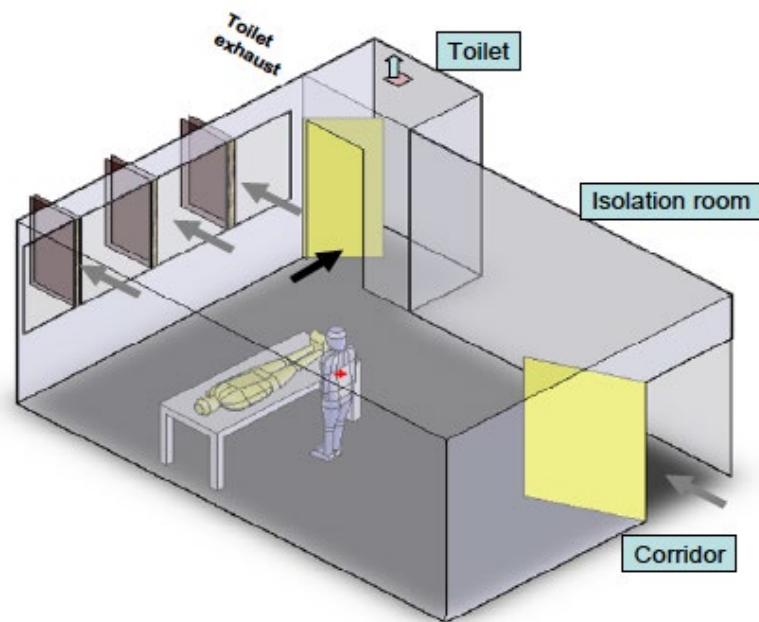
## HOWEVER

- “A well ventilated single room with en-suite facilities is acceptable”
- Ventilation of 60L/s /patient
- Doors must always be shut

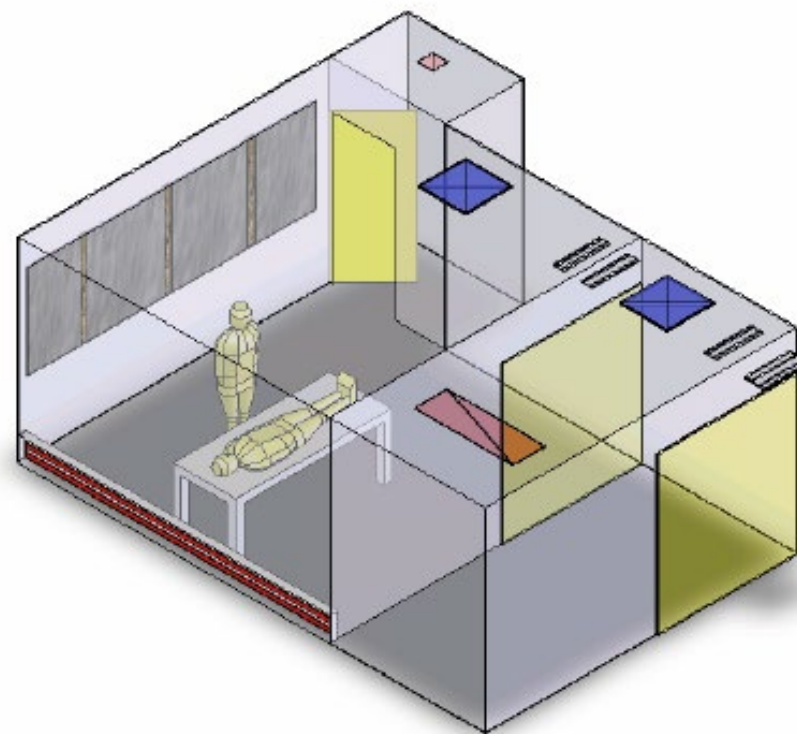


# Layout of Isolation rooms

## Ideal Natural Ventilation



## Ideal Mechanical Ventilation



- Monitored negative air pressure
- 12 ACH
- Discharge of air outdoors, or recirculation through monitored high-efficiency particulate air (HEPA)
- filtration of room air



# Isolation centre requirements

- Well defined space with Staff areas separated from other patient areas
  - Clearly designated with signs
  - Should have separate entrances and exits for staff and patients
  - Good Layout free of clutter to enhance patient and work flow.
  - Patients should be able to move from the ambulance to the isolation area without going through the facility
- Dedicated Instruments and equipment
  - Dedicated furniture : bed, chair, shelves etc
  - Dedicated Medical Equipment
  - Dedicated Cleaning/decontaminating equipment and materials.
    - To reduce risk of cross transmission, single use preferred
    - Requires adequate numbers

# Isolation centre requirements

- Changing rooms for medical staff – ensuite facilities
- Space for doffing and donning with hand hygiene facilities
  - Clearly separated from patient area but adjacent
  - Handwash stations
  - Shelves for PPE
  - Waste bins for disposal of contaminated PPE
- Supplies for patient care, changing room, cleaning, office
- With proper storage facilities for supplies
- Good Ventilation



# Administrative controls

- Availability of policies, procedures, guidelines
  - on visits and family care givers, Human resource, HCW infections, Communication
- Ensure that there is an adequate patient-to-staff ratio with well defined roles and responsibilities,
- Logistics and supplies of IPC materials: PPE, ABHR etc
- Triage, standard precautions: face to face: simulation
- Schedule for Training of staff.- Orientation and follow up. procedures , PPE, Cleaning,
- Monitoring, Audit and feed back – to ensure adherence and Quality improvement
- Maintenance of Incident register.
- materials: Posters, Signs, Leaflets etc
  - To educate and inform patients and relative

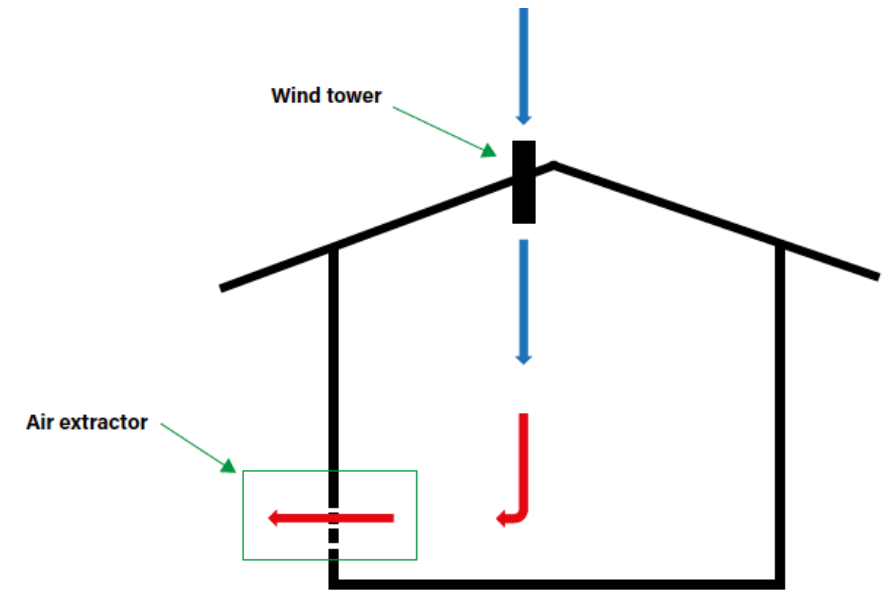
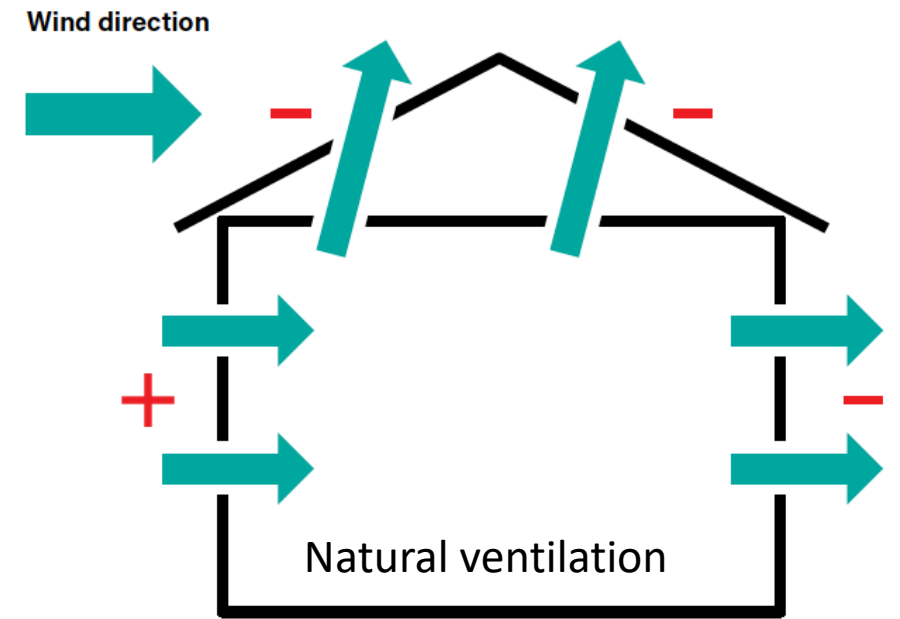
# Engineering/ Environmental controls

- Maintenance of Ventilation system
  - records of the lobby pressure, taken by ward staff from gauges and monitoring devices provided
  - Who opens windows,, When, How often
  - records of any routine service and maintenance activities;
    - Extractor fans, Checking on HEPA filters,, Cleaning Filters
- Waste management system,
- Nets against mosquitoes and insects
- Maintenance of WASH facilities
- Records of any repairs or modifications;



# Ventilation –some principles

- Airflow direction: the overall airflow should be from clean to dirty zones.
- Air distribution or airflow pattern: the external air should be delivered to each part of the space in an efficient manner, and remove generated airborne pollutants in an efficient manner
- If extractor fans used: Air should flow from top to bottom, Extractor fan should be 20 cm above the ground
- Ceiling Fans are a NO! NO!
- Air conditioners also No No



Top down hybrid ventilation

# What do we do with air conditioners????????



- Used by most to improve comfort
- Weather is Very Hot and Dry or/and Very Hot and Very Humid
- All these recirculate
- What solution??

Working in an Isolation centre

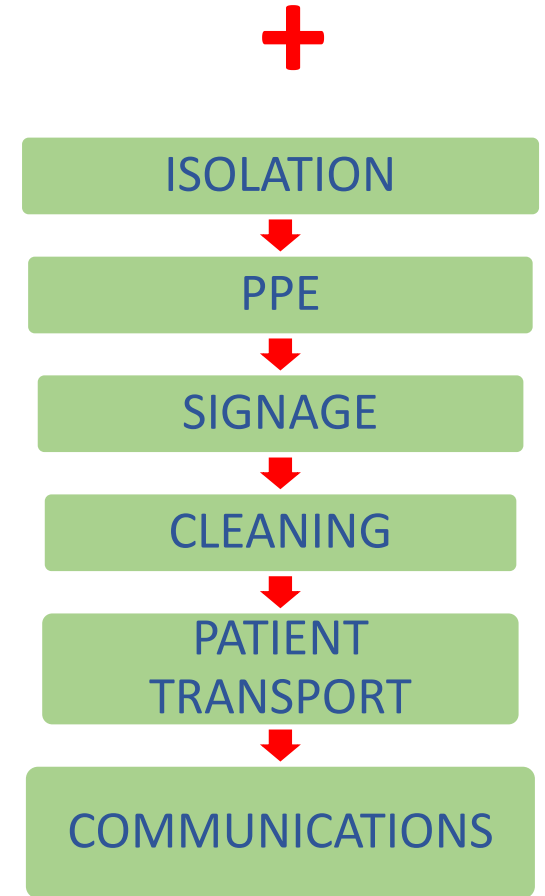
# WHO Isolation recommendations for COVID-19

- Contact and droplet precautions are recommended for all patients with suspected or confirmed COVID-19.
- Airborne precautions are recommended only for aerosol generating procedures
- All patients should be in a single room, or minimum 1m away from other patients when waiting for a room
- Dedicated teams of HCW to care exclusively for suspected and Confirmed patients
- HCW to wear PPE appropriately: a medical mask, goggles or face shield, gown, and gloves
- Hand hygiene should be done any time the WHO “5 Moments” apply, and before PPE and after removing PPE

# Additional precautions

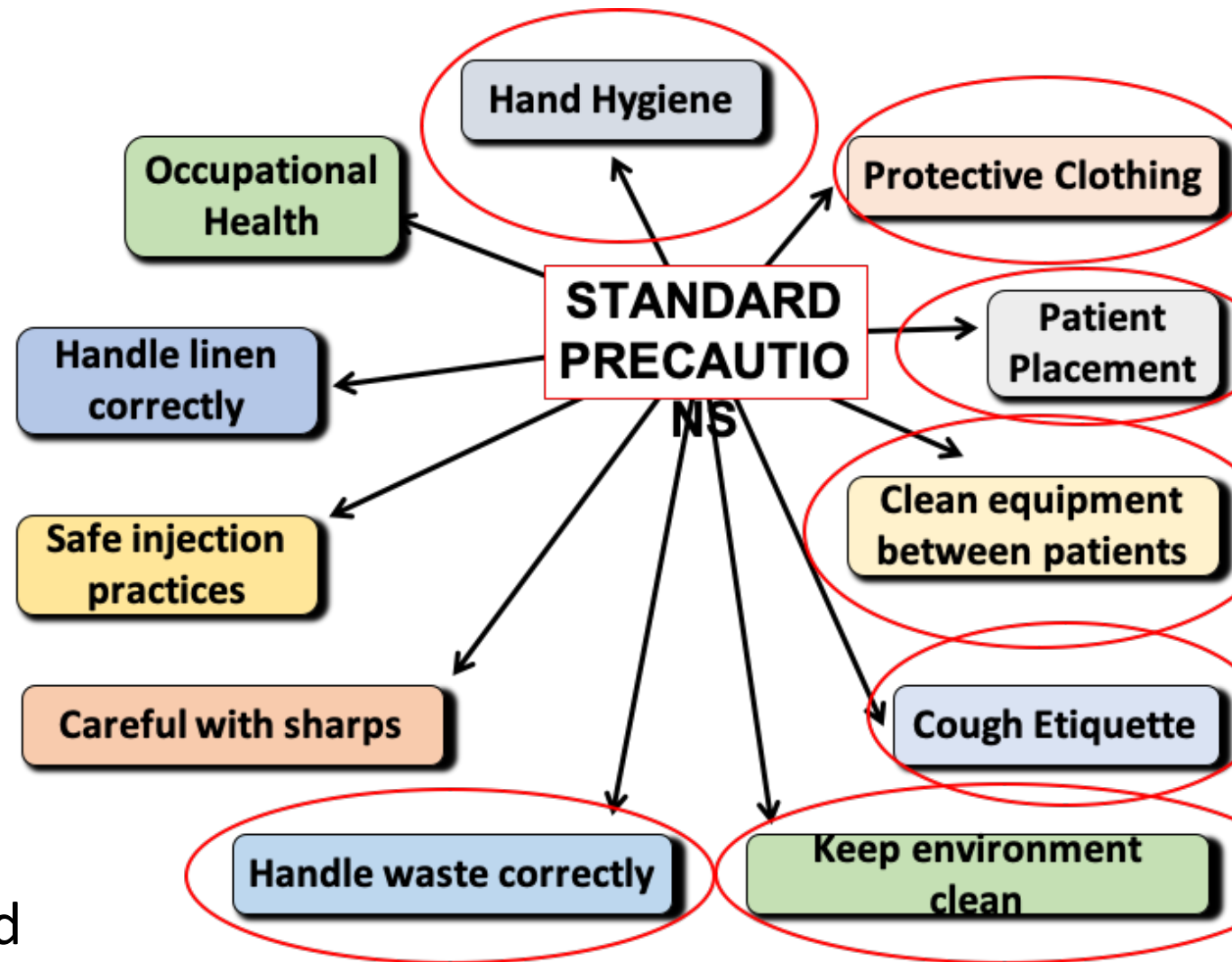
- Used when infections are not adequately interrupted using standard precautions only
- Always carried out in addition to standard precautions
  - Source control
  - Dedicated Healthcare workers
  - Dedicated Equipment (preferably single use)
  - Minimal Transportation
  - Appropriate Environmental Cleaning
  - Appropriate and adequate PPE
  - Hand Hygiene

## Standard precautions



# Standard Precautions

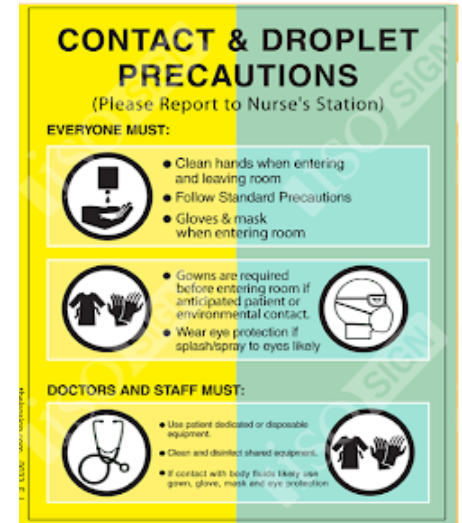
- Used for every patient at all times wherever healthcare is practiced.
- Choice of PPE is based on Risk assessment
- With community transmission of COVID every healthcare worker should assume every patient could be carrying SARS Co-V2



# Contact and Droplet Precautions: Placement

## SUSPECT CASES

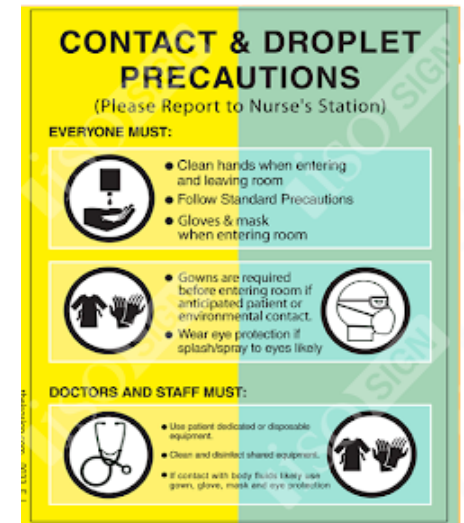
- Should be nursed in single rooms
- Good ventilation
- Natural ventilation preferred
- Air flow should be 60L/s/ patient
- Have a dedicated team of HCWs to care exclusively for suspect cases to reduce the risk of transmission;



# Contact and Droplet Precautions: Confirmed

## Confirmed cases

- Single rooms preferred but can be nursed as Cohorts
- Wards should have Good ventilation with Air flow about 60L/s/ patient
- Natural ventilation preferred because of the difficulty of maintaining mechanical ventilation
- Beds should be placed at least 1 metre apart regardless of whether they are suspected to have COVID-19;
- Have a dedicated team of HCWs to care exclusively for confirmed cases





# Contact and Droplet precautions

- HCW should change PPE in between patients
- Disposable single use or dedicated equipment should be used (e.g. stethoscopes, blood pressure cuffs and thermometers) (if shared disinfect between use. e.g. by using ethyl alcohol 70%)
- HCWs should refrain from touching eyes, nose, or mouth with potentially contaminated gloved or bare hands;
- Should carry out hand hygiene according to the 5 moments
- Enhanced cleaning and disinfection of High touch and horizontal surfaces

# COVID-19 CONTACT +DROPLET - PPE

- Based on risk assessment of type and duration of exposure to body fluids
- HCWs should wear Gowns, medical masks and gloves
- HCWs should wear eye protection (goggles) or facial protection (face shield) to avoid contamination of mucous membranes;
- Boots, **coverall**, and apron **are not required during routine care**

Face shield



Face Mask



Goggles



Gloves



Gown



Head covering



# Airborne Precautions for COVID-19

- Used for **Aerosol generating procedures**.
- Ensure patient is placed in well ventilated room with an airflow of about 160L/s
- or in an AIIR negative air pressure room that has at least 12 air changes per hour (ACH)
- With airflow directed away from corridor and directly to outside,
- Wear an **N-95** or **ffp2** or higher level respirator before entry into room.
- Perform a seal check



**STOP** AIRBORNE **ALTO**  
**INFECTION ISOLATION PRECAUTIONS**

*Visitors must report to Nursing Station before entering.*

- Perform hand hygiene before entering and before leaving room
- Wear N95 respirator when entering room  
*Visitors see nurse for instruction on proper use.*
- Keep door closed
- Dietary may not enter  
*No debe entrar el dietista*

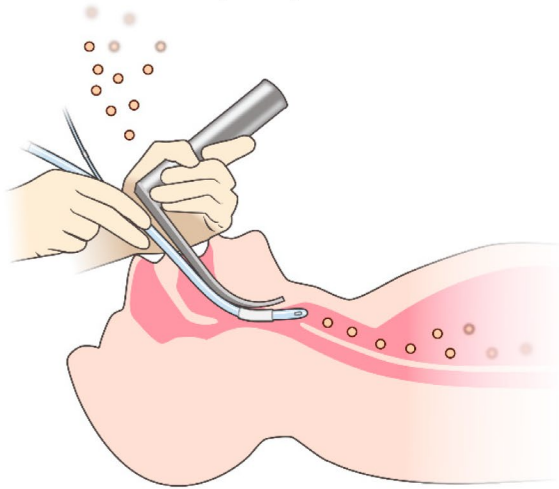
**PRECAUCIONES AMBIENTALES**  
*Los visitantes deben presentarse primero al puesto de enfermería antes de entrar. Lávese las manos. Póngase máscara N95 con filtro al entrar al cuarto. Mantenga la puerta cerrada. No debe entrar el dietista.*

# Aerosol generating procedures

## Aerosol Generating Procedures

- Intubation and related procedures (e.g. manual ventilation, open suctioning of endotracheal sites , Endotracheal intubation, Nasogastric intubation)
- Cardiopulmonary resuscitation
- Bronchoscopy
- surgery
- Post mortem
- Insertion and removal of chest drain

Induced aerosol generation in respiratory tract



Examples: Intubation, Bronchoscopy, CPR

Mechanical aerosol generation in respiratory tract



Examples: Ventilation, Suctioning

# Airborne Precautions for COVID-19

- Use eye protection: goggle or shield
- Wear a clean, non-sterile, long-sleeved gown and gloves.
- If gowns are not fluid-resistant, use a waterproof apron for procedures expected to create high volumes of fluid that might penetrate the gown;
- Limit number of staff in the room to the absolute minimum – “Need to be there basis!”
- Clean hands (hand washing or use ABHR) according to five moments of hand hygiene

Face shield



Goggles



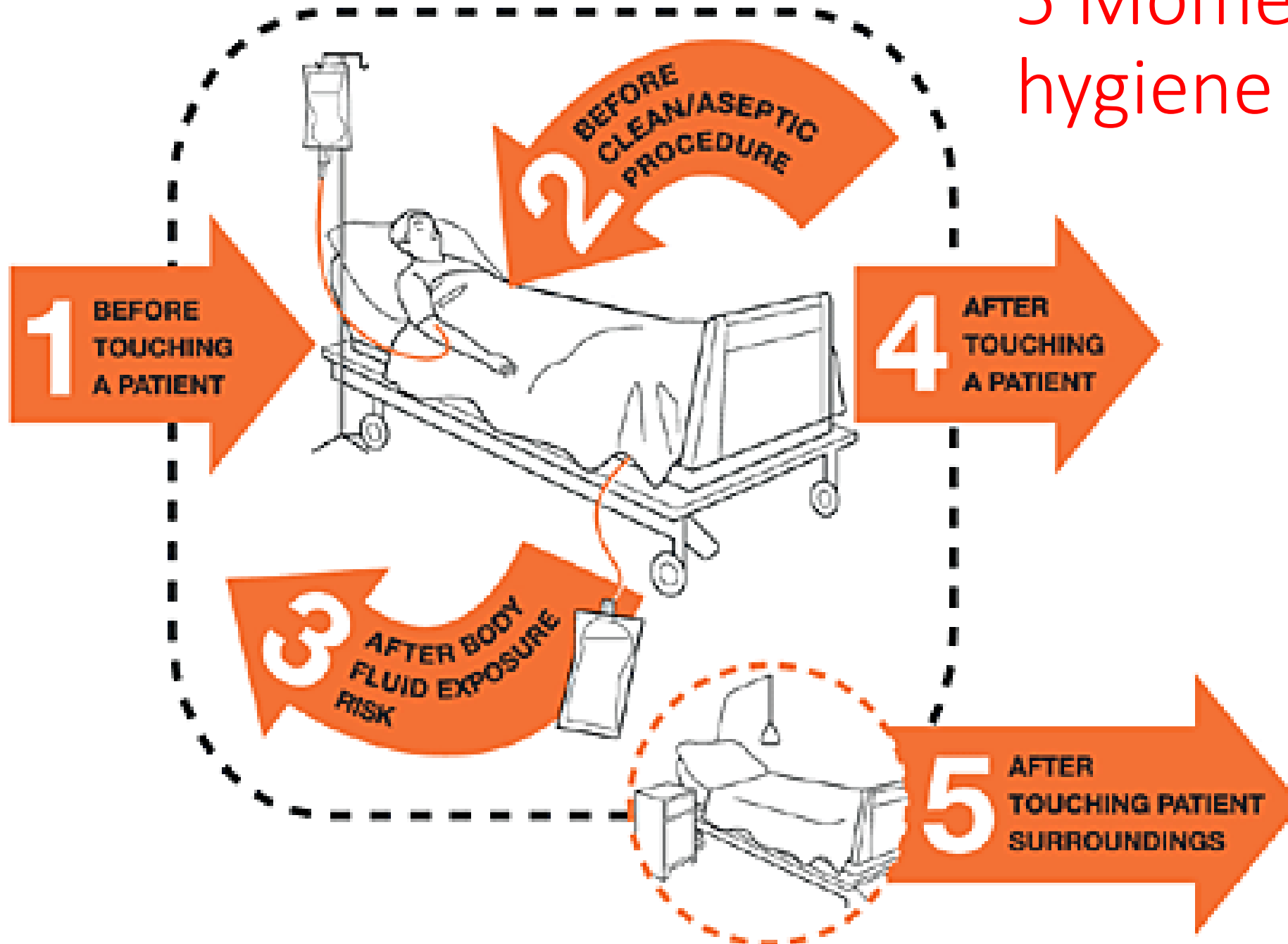
**STOP** AIRBORNE INFECTION ISOLATION PRECAUTIONS **ALTO**

*Visitors must report to Nursing Station before entering.*

|   |                                     |  |
|---|-------------------------------------|--|
|  | <input checked="" type="checkbox"/> | Perform hand hygiene before entering and before leaving room   |
|  | <input checked="" type="checkbox"/> | Wear N95 respirator when entering room<br><small>Visitors see nurse for instruction on proper use.</small> |
|  | <input checked="" type="checkbox"/> | Keep door closed   |
|  | <input checked="" type="checkbox"/> | <b>Dietary may not enter</b><br><small>No debe entrar el dietista</small>                                  |

**PRECAUCIONES AMBIENTALES**  
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# 5 Moments of Hand hygiene



# Donning and Doffing of PPE

## 9A. Putting on PPE (when all PPE items are needed)



- 1
- Identify hazards & manage risk. Gather the necessary PPE.
  - Plan where to put on & take off PPE.
  - Do you have a buddy? Mirror?
  - Do you know how you will deal with waste?



- 2 Put on a gown



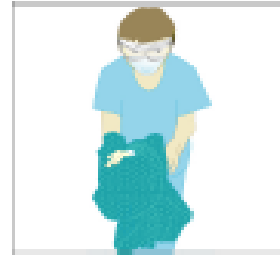
- 3 Put on particulate respirator or medical mask; perform user seal check if using a respirator



- 4 Put on eye protection e.g. face shield/goggles (consider anti-fog drops or fog-resistant goggles) Caps are optional: If worn, put on after eye protection

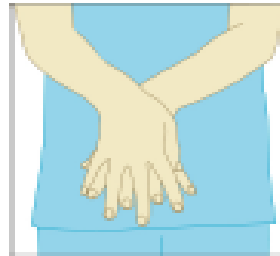


- 5 Put on gloves (over cuff)

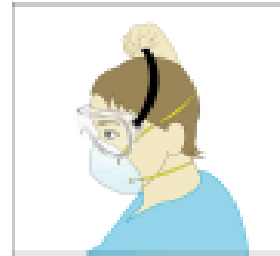


- 1
- Avoid contamination of self, others & the environment
  - Remove the most heavily contaminated items first

Remove gloves & gown:  
- peel off gown & gloves and roll inside, out  
- dispose gloves and gown safely



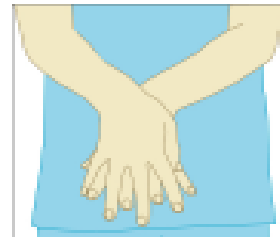
- 2 **Perform hand hygiene**



- 3
- Remove cap (if worn)
  - Remove goggles from behind
  - Put goggles in a separate container for reprocessing



- 4 Remove respirator from behind

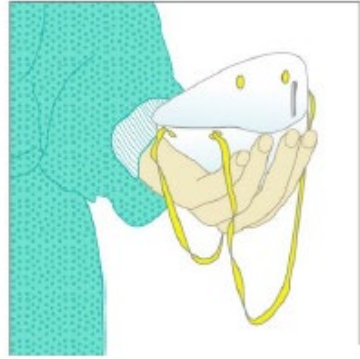


- 5 **Perform hand hygiene**



## How to do a seal check.

Do a seal check before you enter the room



### 5A Positive seal check

- Exhale sharply. A positive pressure inside the respirator = no leakage. If leakage, adjust position and/or tension straps. Retest the seal.
- Repeat the steps until respirator is sealed properly.

### 5B Negative seal check

- Inhale deeply. If no leakage, negative pressure will make respirator cling to your face.
- Leakage will result in loss of negative pressure in the respirator due to air entering through gaps in the seal.



# Patient Transport

- Avoid moving and transporting patients out of their room or area unless medically necessary (e.g., use mobile x-rays)
- Use predetermined route
- Staff should use appropriate PPE
- notify the area receiving the patient of any necessary precautions as early as possible before the patient's arrival;
- Use medical mask on patient when moving him

# Principles to Remember While Working Inside the Isolation Area

- Team work
- Limit the number of HCWs or family members who are in contact with suspected or confirmed COVID-19 patients
- Maintain a record of all persons entering a patient's room/ ward, including staff
- Any materials brought into the isolation area must stay in the isolation area
  - Medical records should be reviewed prior to entry
  - Medications should be measured before entering
  - All waste created in the isolation area must be treated as infectious waste
  - Equipment must be disinfected before removing from isolation area
- The door of an isolation suite/room must remain closed when not in use, and door opening should be kept to a minimum

# Environmental cleaning

- Routinely clean and disinfect surfaces with which the patient is in contact;
- Clean the unit at least twice daily
- Use Soap and water and allow to dry
- Follow with 0.5% chlorine solution if the area was contaminated with body fluids.
- Equipment:
  - Floors- use bucket and mop
  - Surfaces - use damp cloths
- After patient discharge perform a terminal clean with decontamination
  - Wash first with soap and water then wipe all surfaces with 0.5% Chlorine
  - DO NOT SPRAY Chlorine solution – wiping is as effective

# Requirements for self Isolation

- Self-isolation is when a person symptomatic stays at home and does not go to work, school or public places to avoid infecting others in the community, including family members.
  - Can be voluntarily or based on his/her health care provider's recommendation A large, well-ventilated room ensuite toilet facilities
- Monitor your symptoms daily with a thermometer
- Keep away from family members
- Mask if you come out of your room and maintain at least 1 metre from others,

# Requirements for self Isolation

- Isolate for 14 days, even if you feel healthy
- **Practice hand hygiene, cough etiquette and physical distancing**
- If it is not possible to have a room by yourself, place beds at least 1-2 metre apart
- Do not share with vulnerable at risk members of the family
- If you develop difficulty breathing, contact your healthcare provider immediately – call them first if possible

# Discharge Criteria

- The duration that a patient should remain isolated is determined by clinical judgement and country policy and depends on length of viral shedding period
- Could be based on laboratory confirmation or clinical judgement.
- **Patients should remain isolated whilst they remain symptomatic and/or are considered infectious.**

# Summary

- Isolation and cohorting are based on Modes of transmission
- Isolation precautions are Contact and Droplet precautions
- **Airborne precautions are used for Aerosol generating procedures**
- PPE used is based on Risk assessment: MASK, Gown, Gloves, Goggles, Face shields.
- Control of ventilation is important for droplet and Airborne precautions
- There are still problems in ensuring appropriate airflow in Africa and it is a gap that needs innovative cost effective solutions.