

# Infection Prevention and Control (IPC) for Novel Coronavirus (COVID-19)



**Module 3: IPC in the context of COVID-19**  
**Standard precautions, transmission-based precautions &**  
**COVID-19 specific recommendations**

## Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected

[https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-\(ncov\)-infection-is-suspected-20200125](https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected-20200125)

## Home care for patients with suspected novel coronavirus (nCoV) infection presenting with mild symptoms and management of contacts

[https://www.who.int/publications-detail/home-care-for-patients-with-suspected-novel-coronavirus-\(ncov\)-infection-presenting-with-mild-symptoms-and-management-of-contacts](https://www.who.int/publications-detail/home-care-for-patients-with-suspected-novel-coronavirus-(ncov)-infection-presenting-with-mild-symptoms-and-management-of-contacts)

## Advice on the use of masks in the community, during home care and in health care settings in the context of the novel coronavirus (2019-nCoV) outbreak

[https://www.who.int/publications-detail/advice-on-the-use-of-masks-the-community-during-home-care-and-in-health-care-settings-in-the-context-of-the-novel-coronavirus-\(COVID-19\)-outbreak](https://www.who.int/publications-detail/advice-on-the-use-of-masks-the-community-during-home-care-and-in-health-care-settings-in-the-context-of-the-novel-coronavirus-(COVID-19)-outbreak)

# General WHO advice for COVID-19



- Avoid close contact with people suffering from acute respiratory infections
- Frequent hand hygiene, especially after direct contact with ill people or their environment
- People with symptoms of acute respiratory infection should practice respiratory etiquette, wear a medical mask and seek medical care if in respiratory distress

# WHO travel advice



- WHO does not recommend any specific health measures for travelers.
- In case of symptoms suggestive of acute respiratory illness either during or after travel, the travelers are encouraged to seek medical attention and share their travel history with their health care provider.

**What IPC strategies  
are recommended by  
WHO for COVID-19?**

# WHO recommended IPC strategies for preventing or limiting the spread of COVID-19



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

1. applying standard precautions for all patients;
2. ensuring triage, early recognition, and source control;
3. implementing empiric additional precautions for suspected cases of COVID-19 infection;
4. implementing administrative controls; and
5. using environmental and engineering controls.

**Recommendation 1.  
Applying standard  
precautions for all patients**

# Standard precautions



The basic level of IPC precautions, to be used for ALL patients at ALL times:

- the minimum prevention measures that apply at all times to all patient care regardless of suspected or confirmed status of the patient

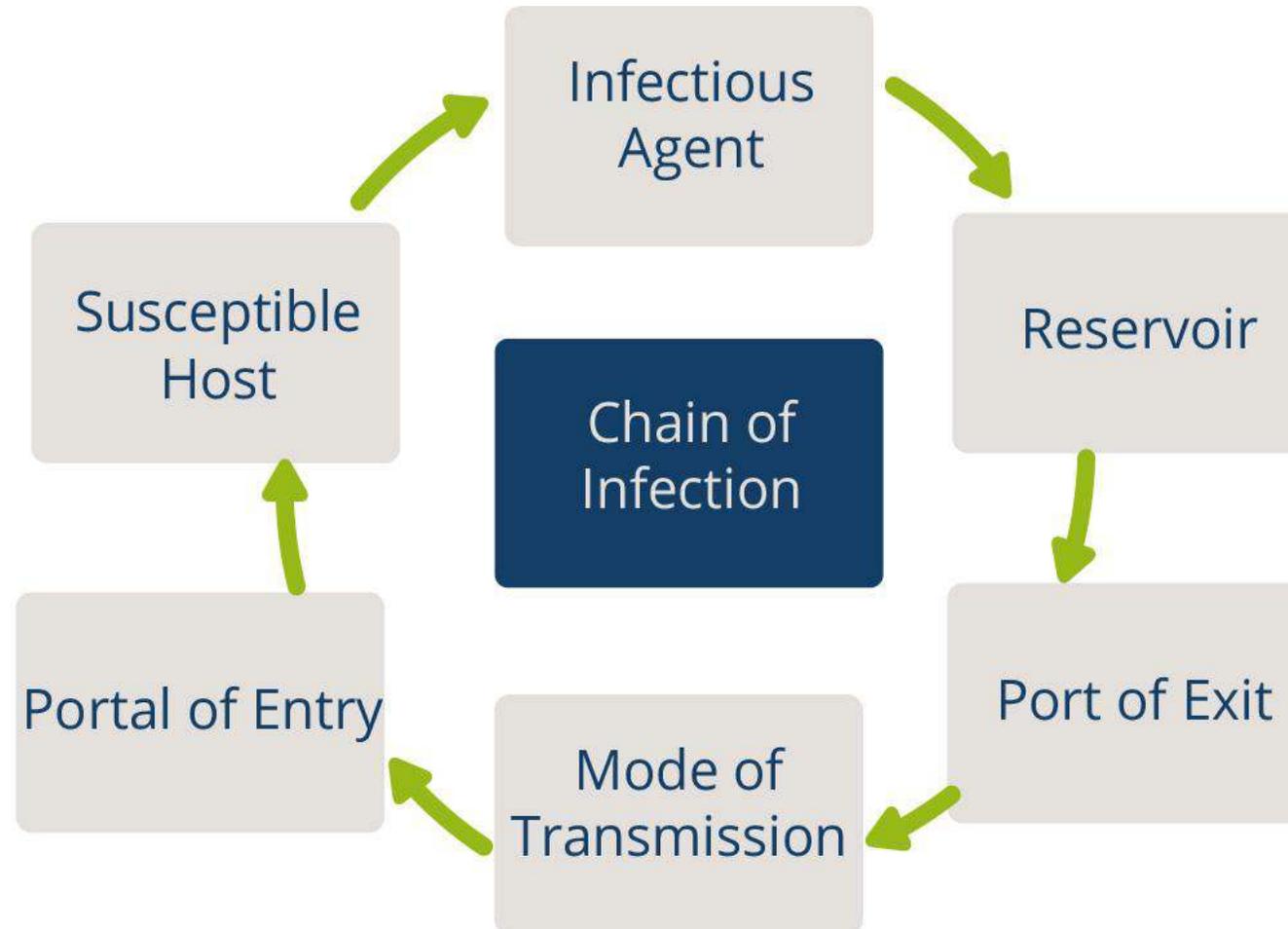
Risk assessment is critical for all activities, i.e. assess each health care activity and determine the personal protective equipment (PPE) that is needed for adequate protection

# Elements of Standard Precautions



1. Hand hygiene
2. Respiratory hygiene (etiquette)
3. PPE according to the risk
4. Safe injection practices, sharps management and injury prevention
5. Safe handling, cleaning and disinfection of patient care equipment
6. Environmental cleaning
7. Safe handling and cleaning of soiled linen
8. Waste management

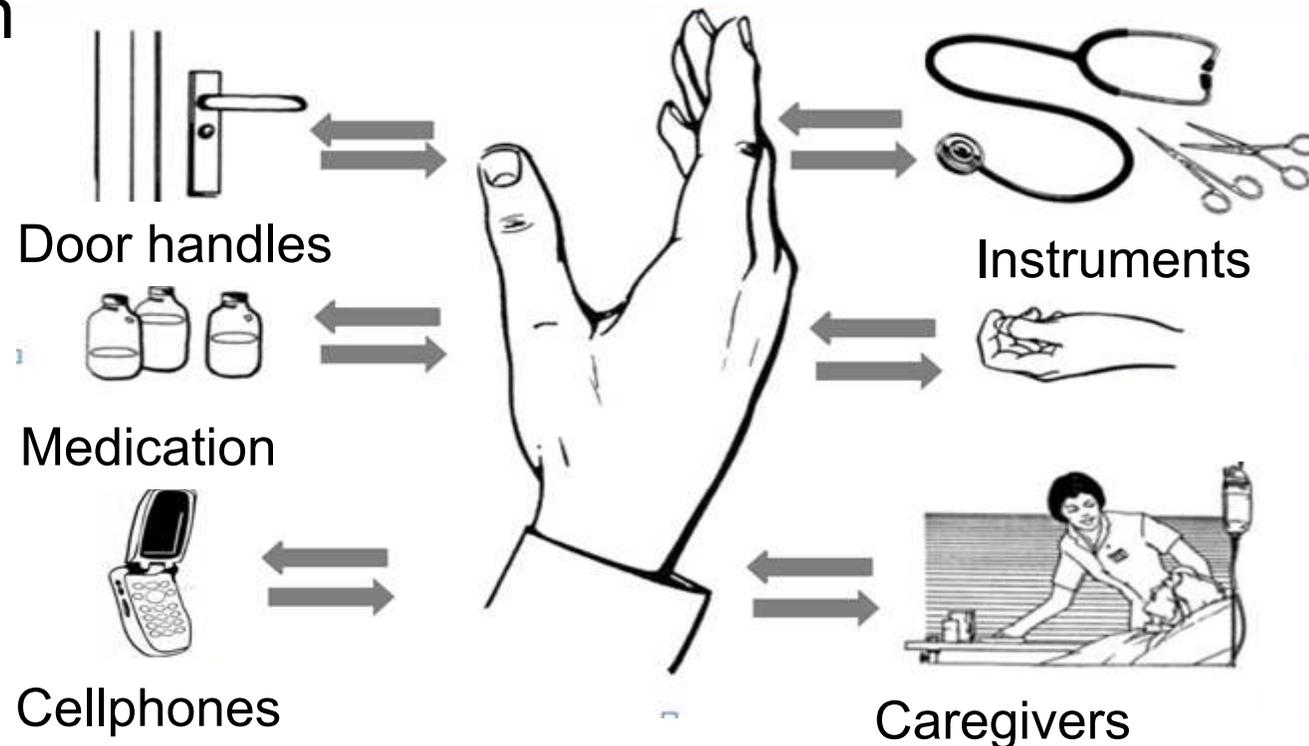
# Chain of Transmission



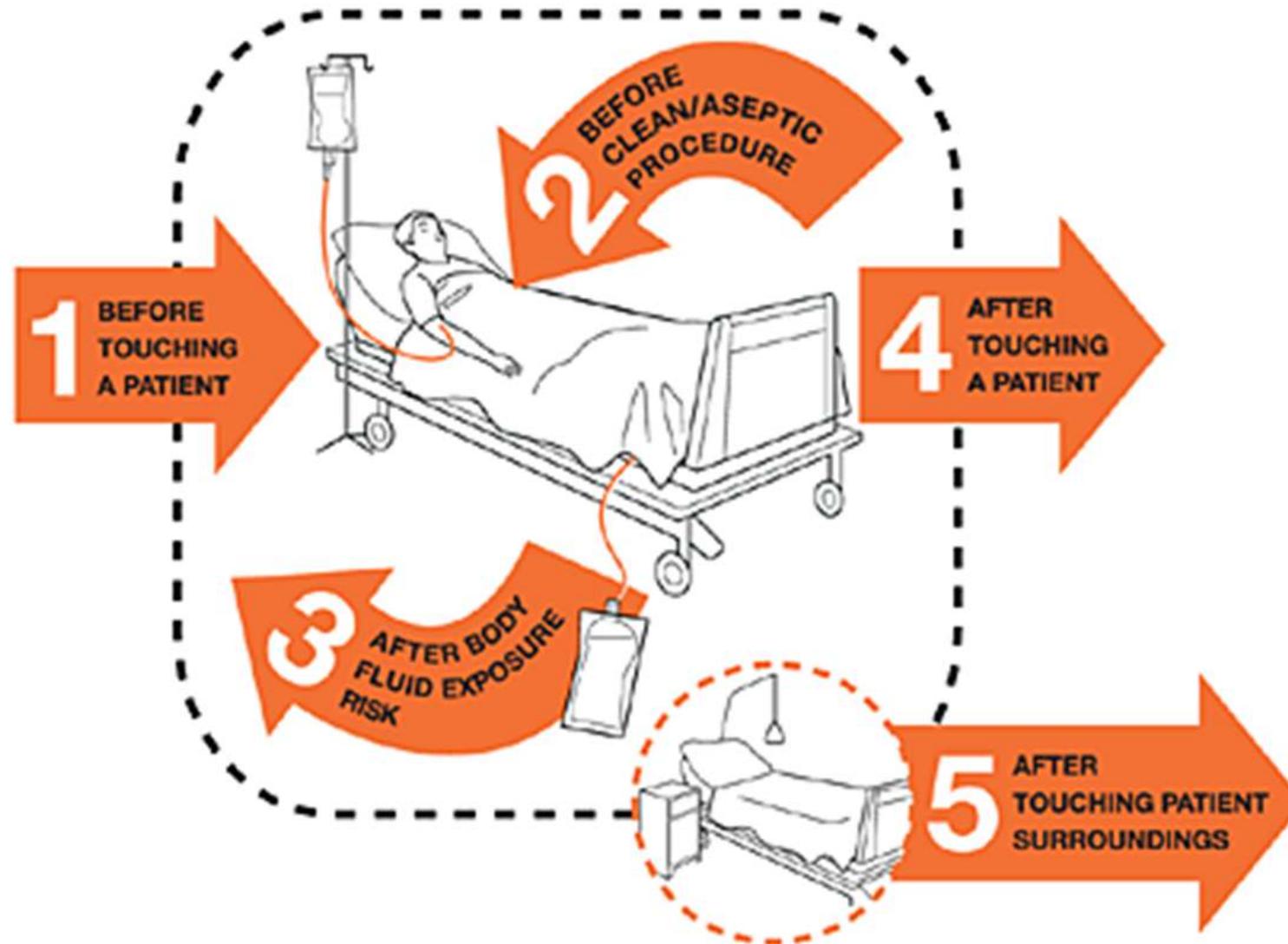
- For an infection to spread, all links must be connected
- Breaking any one link, will stop disease transmission!

# Hand Hygiene

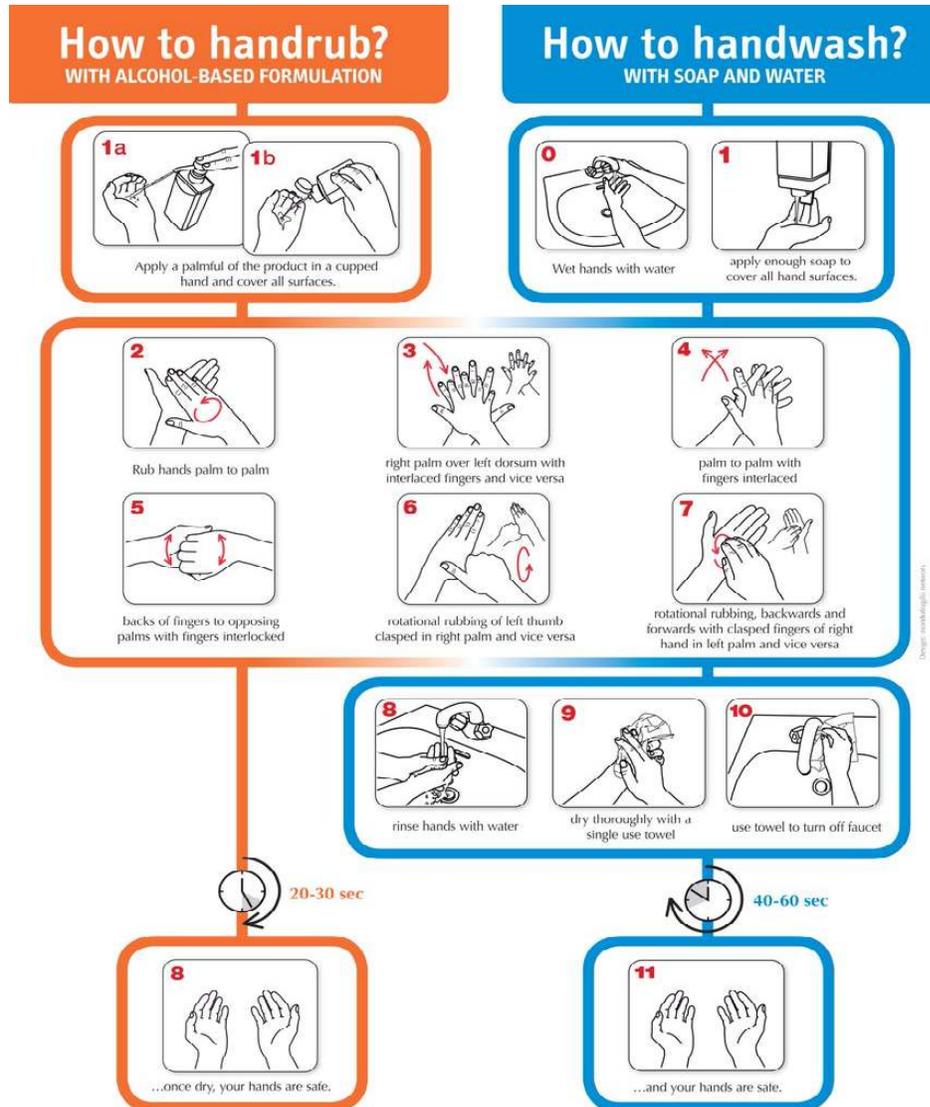
- Best way to prevent the spread of germs in the health care setting and community
- Our hands are our main tool for work as health care workers- and they are the key link in the chain of transmission



# Hand Hygiene: WHO 5 moments



# Hand hygiene: HOW



Use appropriate product and technique  
An alcohol-based hand rub product is preferable, if hands are not visibly soiled

- Rub hands for 20–30 seconds!

Soap, running water and single use towel, when visibly dirty or contaminated with proteinaceous material

- Wash hands for 40–60 seconds!

# How to handrub?

RUB HANDS FOR HAND HYGIENE! WASH HANDS WHEN VISIBLY SOILED

**⌚** Duration of the entire procedure: 20-30 seconds



# How to handwash?

WASH HANDS WHEN VISIBLY SOILED! OTHERWISE, USE HANDRUB

**⌚** Duration of the entire procedure: 40-60 seconds



# Why is respiratory hygiene important?

Good respiratory hygiene/cough etiquette can reduce the spread of microorganisms (germs) that cause respiratory infections (colds, flu).



# Respiratory hygiene/etiquette procedures

- Turn head away from others when coughing/sneezing
- Cover the nose and mouth with a tissue.
- If tissues are used, discard immediately into the trash
- Cough/sneeze into your sleeve if no tissue is available
- Clean your hands with soap and water or alcohol-based products



# Promoting respiratory hygiene

- Encourage handwashing for patients with respiratory symptoms
- Provide masks for patients with respiratory symptoms
- Patients with fever + cough or sneezing should be kept at least 1m away from other patients
- Post visual aids reminding patients and visitors with respiratory symptoms to cover their cough
- Consider having masks and tissues available for patients in all areas



# Examples of PPE for use in health care settings for COVID-19

**Face Mask**



**Nose +  
mouth**

**N95 Mask**



**Nose +  
mouth**

**Face shield**



**Eyes + nose +  
mouth**

**Goggles**



**Eyes**

**Gown**



**Body**

**Apron**



**Body**

**Gloves**



**Hands**

**Head  
cover**



**Head +  
hair**

# Risk Assessment and Standard Precautions



**Risk assessment:** risk of exposure and extent of contact anticipated with blood, body fluids, respiratory droplets, and/or open skin

- Select which PPE items to wear based on this assessment
- Perform hand hygiene according to the WHO “5 Moments”
- Should be done for each patient, each time

**Make this routine!**

# Minimize direct unprotected exposure to blood and body fluids



SCENARIO	HAND HYGIENE	GLOVES	GOWN	MEDICAL MASK	EYE-WEAR
Always before and after patient contact, and after contaminated environment	x				
If direct contact with blood and body fluids, secretions, excretions, mucous membranes, non-intact skin	x	x			
If there is risk of splashes onto the health care worker's body	x	x	x		
If there is a risk of splashes onto the body and face	x	x	x	x	x

# Principles for using PPE (1)

Always clean your hands before and after wearing PPE

PPE should be available where and when it is indicated

- in the correct size
- select according to risk or per transmission-based precautions

Always put on before contact with the patient

Always remove immediately after completing the task and/or leaving the patient care area

NEVER reuse disposable PPE

Clean and disinfect reusable PPE between each use

## Principles for using PPE (2)



Change PPE immediately if it becomes contaminated or damaged

PPE should not be adjusted or touched during patient care; specifically

- never touch your face while wearing PPE
- if there is concern and/or breach of these practices, leave the patient care area when safe to do so and properly remove and change the PPE
- Always remove carefully to avoid self-contamination (from dirtiest to cleanest areas)

# The seven steps to safe injections

1 Clean workspace	
2 Hand hygiene	
3 Sterile safety-engineered syringe	
4 Sterile vial of medication and diluent	
5 Skin cleaning and antisepsis	
6 Appropriate collection of sharps	
7 Appropriate waste management	

# What is decontamination?

## Decontamination

Removes soil and pathogenic microorganisms from objects so they are safe to handle, subject to further processing, use or discard

Cleaning

Disinfecting

Sterilization



Source: World Health Organization. 2016. Decontamination and reprocessing of medical devices for health-care facilities. World Health Organization. Retrieved from : <https://www.who.int/infection-prevention/publications/decontamination/en/>

# What is decontamination?

## Cleaning

The first step required to physically remove contamination by foreign material, e.g. dust, soil. It will also remove organic material, such as blood, secretions, excretions and microorganisms, to prepare a medical device for disinfection or sterilization.

## Disinfecting

A process to reduce the number of viable microorganisms to a less harmful level. This process may not inactivate bacterial spores, prions and some viruses.

## Sterilization

A validated process used to render an object free from viable microorganisms, including viruses and bacterial spores, but not prions

# Principles of Cleaning (1)



**Definition of cleaning:** the physical removal of foreign material (e.g., dust, soil) and organic material (e.g., blood, secretions, excretions, microorganisms). Cleaning physically removes rather than kills microorganisms. It is accomplished with water, detergents and mechanical action.

The basic principles of cleaning and disinfecting apply to all patient care areas.

- Always be sure to clean patient care equipment between each patient use
- Where possible, dedicate cleaning supplies in higher risk areas (e.g., isolation, delivery, and operating rooms)
- Cleaning supplies for isolation should be kept in and only used in the isolation area/room

# Principles of cleaning (2)



- Always move from cleanest area to dirtiest area-
  - clean from high areas to low areas, outer to inner
  - clean isolation areas last
- Damp dusting and wet mopping is recommended to minimize dust
- Use a 3-bucket system for cleaning and disinfection
- Water for cleaning should be clean water
- Spraying of disinfectants is not recommended

# Environmental cleaning in isolation rooms/areas



- Increase frequency of cleaning by housekeeping in patient care areas
- Isolation areas should have their own cleaning supplies that are separate from clean patient care areas
- All waste from the isolation area is considered contaminated and should be disposed of following your facilities methods for contaminated waste
- Cleaners/housekeeping should ensure they are wearing the appropriate PPE when cleaning an isolation room or area
- Cleaning supplies for isolation should be kept in and only used in the isolation area/room

# Recommended cleaning procedures and frequencies



## General inpatient

General Category/ Specific Area	Area Description	Frequency	Person / Staff Responsible (facility-determined, shared requires detailed protocols)	Product(s)	Technique	Additional Guidance / Description of Cleaning
Inpatient area - Routine clean	not immunocompromised or acute illness (routine medical procedure)	daily and as needed	cleaning staff	clean (neutral detergent and water)	high-touch surfaces and floors; work towards patient zone	Low-touch surfaces also cleaned on a scheduled basis (e.g., weekly).
Inpatient area - Terminal clean	not immunocompromised or acute illness (routine medical procedure)	at discharge/transfer	cleaning staff	clean and disinfect	high-touch and low-touch surfaces and floors (see additional description)	includes: <ol style="list-style-type: none"> <li>1. removal of soiled/used patient care items, including linens, for reprocessing or disposal</li> <li>2. reprocessing of all reusable (noncritical) patient care equipment</li> <li>3. cleaning of all surfaces, including those that may not be accessible when the room/area was occupied (e.g., patient bed/mattress,</li> </ol>

# Steps for cleaning



**Routine cleaning:** the regular cleaning (and disinfection, when indicated) when the room is occupied to remove organic material, minimize microbial contamination, and provide a visually clean environment, emphasis is on surfaces within the patient zone.

# Steps for terminal cleaning



**Terminal cleaning:** cleaning and disinfection after the patient is discharged or transferred. Includes the removal of organic material and significant reduction and elimination of microbial contamination to ensure that there is no transfer of microorganisms to the next patient.

# Environmental: how to manage used linen on the wards



- Wear PPE according to the risk when handling used or soiled linen
- Handle soiled linen with minimum agitation to avoid contamination
- Place soiled linen into bags/containers at point of care
- If linen is grossly soiled:
  - remove gross soil (e.g. feces, vomit) with a gloved hand and using a flat, firm object
  - discard solid material into flush toilet and dispose of towel into waste
  - place soiled linen into a clearly labelled, leak-proof container (e.g., bag and closed bin) in the patient care area.

# Environmental: how to manage used linen on the wards



- Clean linen must be sorted and transported in a way to prevent contamination (i.e. closed bins)
- Linen on the patient care wards should be stored in a designated area (i.e. a closet or room) or closed containers away from public access.

# Waste management process



Safe treatment of waste generated during care activities is the responsibility of all staff

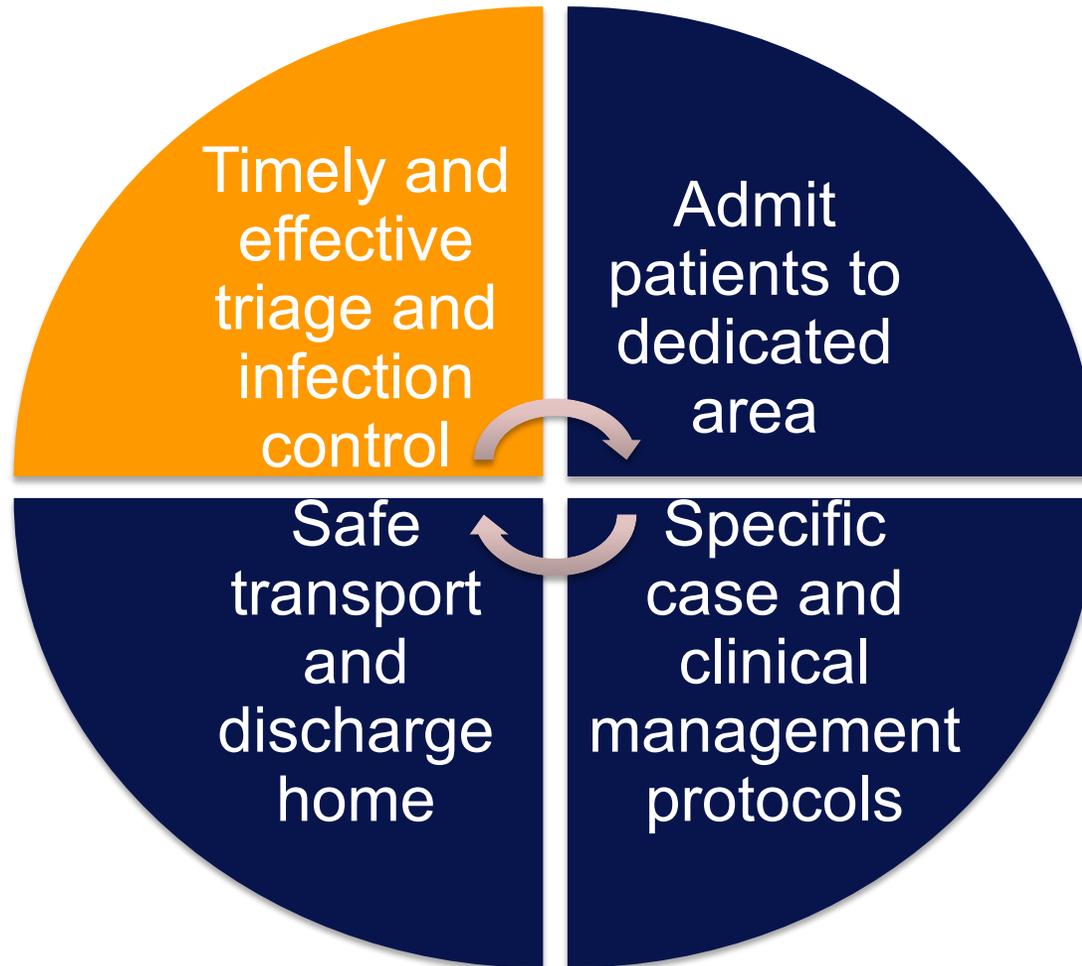
# Additional considerations for standard precautions



- It is important to ensure that environmental cleaning and disinfection procedures are followed consistently and correctly.
- Thorough cleaning environmental surfaces with water and detergent and applying commonly used hospital level disinfectants (such as sodium hypochlorite, 0.5%, or ethanol, 70%) are effective and sufficient procedures.
- Medical devices and equipment, laundry, food service utensils and medical waste should be managed in accordance with safe routine procedures.

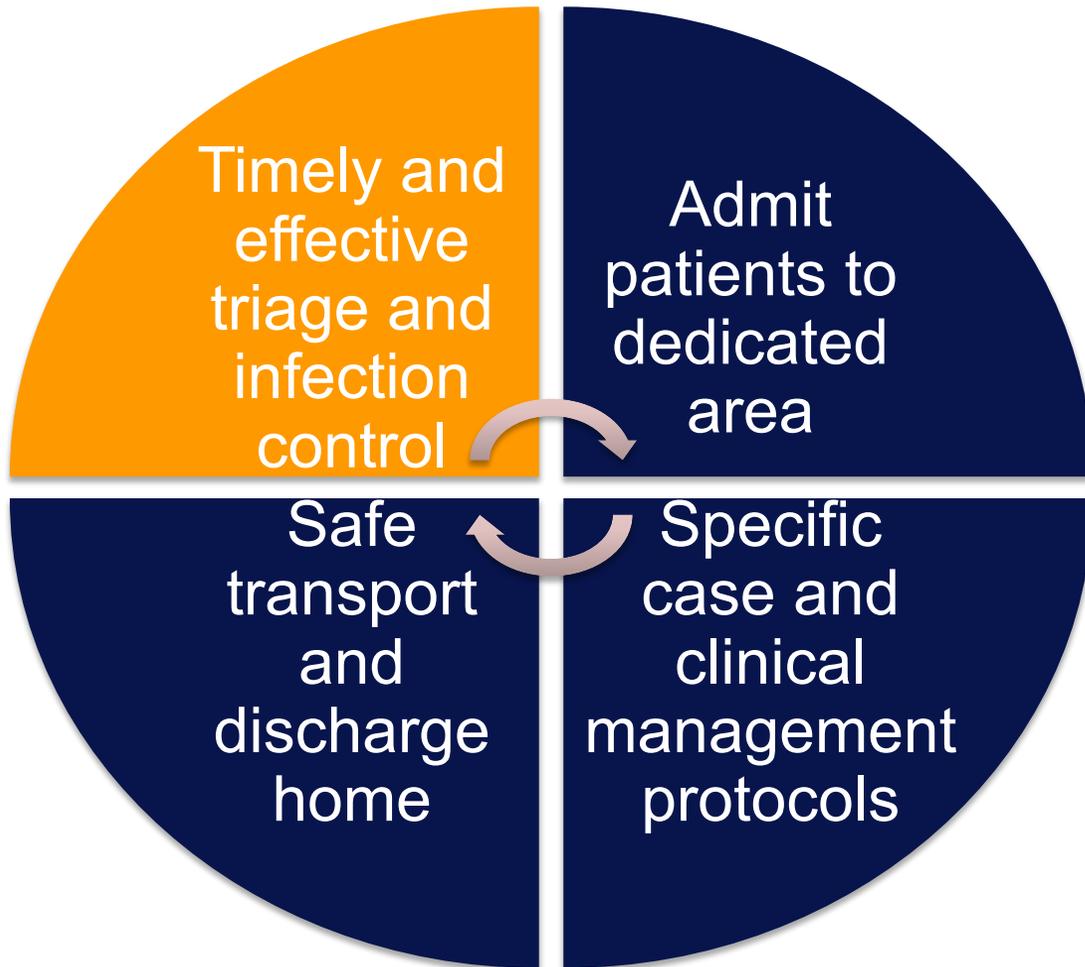
## **Recommendation 2. Ensuring triage, early recognition, and source control**

# Manage ill patients seeking care



Use clinical triage in health care facilities for early identification of patients with acute respiratory infection (ARI) to prevent the transmission of pathogens to health care workers and other patients.

# Triage (1)



- Prevent overcrowding.
- Conduct rapid triage.
- Place ARI patients in dedicated waiting areas with adequate ventilation.
- In addition to standard precautions, implement droplet precautions and contact precautions (if close contact with the patient or contaminated equipment or surfaces/materials).
- Ask patients with respiratory symptoms to perform hand hygiene, wear a mask and perform respiratory hygiene.
- Ensure at least 1 m distance between patients

## Triage (2)

The triage or screening area requires the following equipment:

- Screening questionnaire
- Algorithm for triage
- Documentation papers
- PPE
- Hand hygiene equipment and posters
- Infrared thermometer
- Waste bins and access to cleaning/disinfection
- Post signage in public areas with syndromic screening questions to instruct patients to alert HCWs.

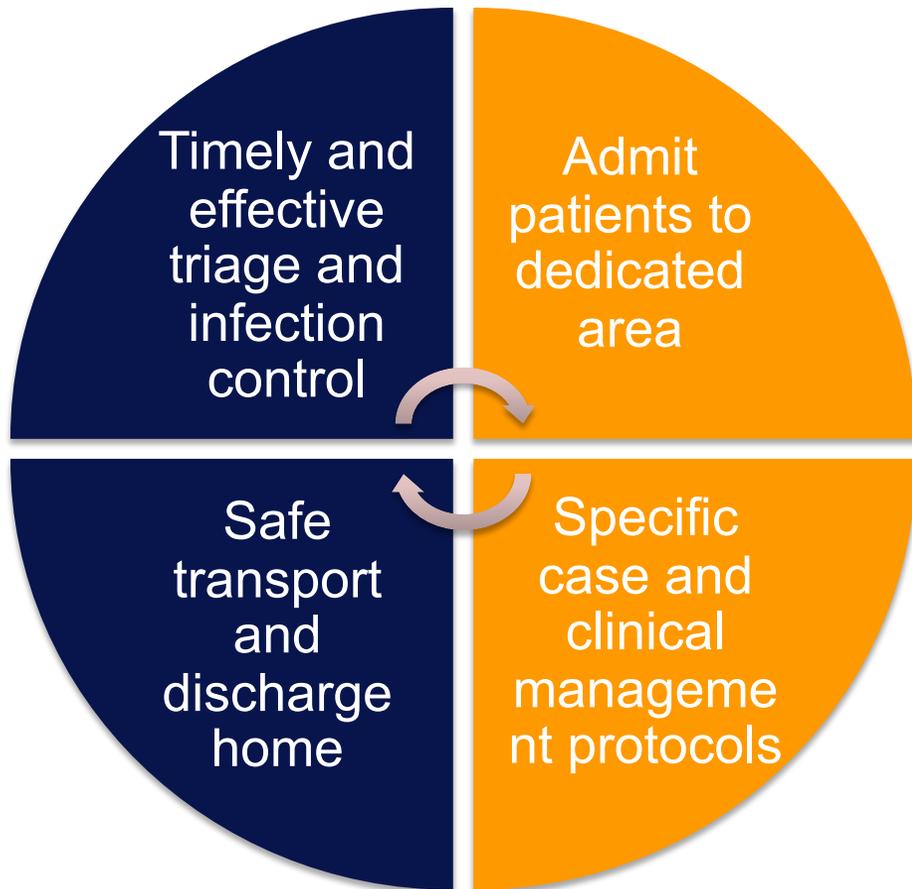
# Triage (3)



## Set up of the area during triage:

1. Ensure adequate space for triage (maintain at least 1 m distance between staff screening and patient/staff entering)
2. Have hand hygiene alcohol rub and masks available (also medical gloves, eye protection and gowns to be used according to risk assessment)
3. Waiting room chairs for patients should be 1m apart
4. Maintain a one-way flow for patients and for staff
5. Clear signage for symptoms and directions
6. Family members should wait outside the triage area-prevent triage area from overcrowding

# Hospital admission



- Avoid admitting low-risk patients with uncomplicated respiratory signs and symptoms of infection and no underlying diseases.
- Cohort patients with the same diagnosis in one area.
- Do not place suspect patients in same area as those who are confirmed.
- Place patients with ARI of potential concern in single, well ventilated room, when possible.
- Assign health care worker with experience with IPC and outbreaks.

**Recommendation 3.  
Implementing additional  
precautions for cases of  
COVID-19**

# Additional precautions



- for patients who are symptomatic and suspected or who have a confirmed infection with a highly transmissible pathogen,
- when the pathogen is considered important from an epidemiological point of view,
- when medical interventions increase the risk of transmission of a specific infectious agent,
- when the clinical situation prevents the systematic application of standard precautions

# What do additional precautions include?



Standard Precautions

+

Special accommodations/isolation (i.e. single room, space between beds, separate toilet etc.)

+

Signage

+

PPE

+

Dedicated equipment and additional cleaning

+

Limit transport

+

Communication

# Additional precautions are based on modes of transmission: direct modes

## Direct contact

Direct contact occurs through touching; an individual may transmit microorganisms to others by skin-skin contact or contact with surfaces, soil or vegetation



## Droplet spread

Droplet spread refers to spray with relatively large, short-range aerosols produced by sneezing, coughing, or even talking



# Indirect modes

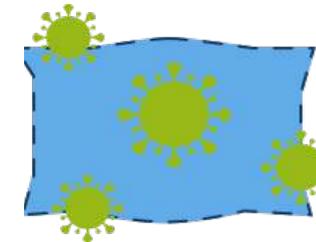
## Indirect contact:

Indirect transmission refers to the transfer of an infectious agent from a reservoir to a host

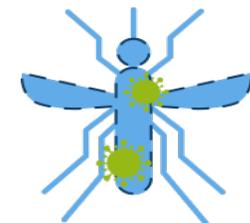
**Airborne transmission** occurs when infectious agents are carried by dust or droplet nuclei suspended in air



**Vehicles** may indirectly transmit an infectious agent



**Vectors** may carry an infectious agent or may support growth or changes in the agent



# Patients suspected or confirmed COVID-19 (1)



- **Contact and droplet precautions for all patients with suspected or confirmed COVID-19.**
- Airborne precautions are recommended **only for aerosol generating procedures** (i.e. open suctioning of respiratory tract, intubation, bronchoscopy, cardiopulmonary resuscitation).
- All **patients** with respiratory illness should be in a single room, or **minimum 1m away from other patients** when waiting for a room
- A team of HCW should be dedicated to care exclusively for suspected patients
- **HCW to wear PPE:** 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

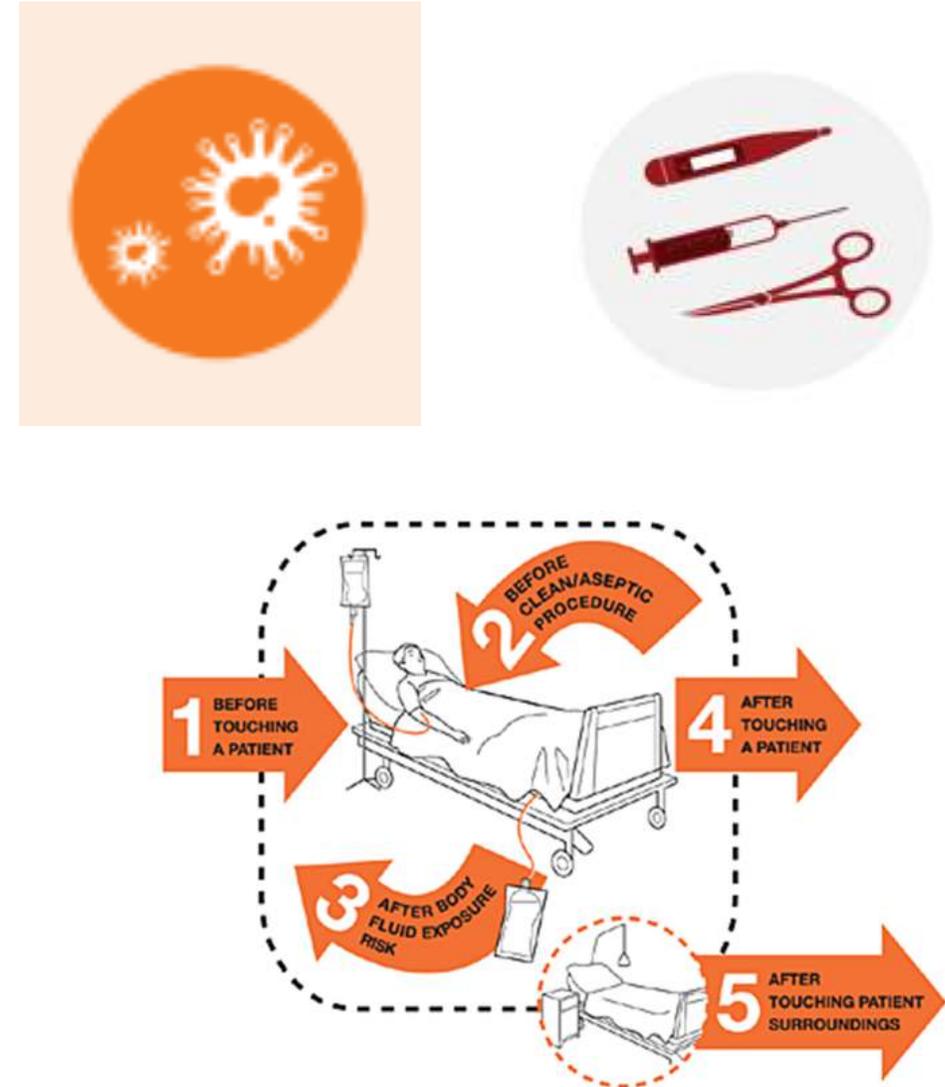
## Patients suspected or confirmed COVID-19 (2)



- Equipment should be single use when possible, dedicated to the patient and disinfected between uses
- Avoid transporting suspected or confirmed cases – if necessary, have patients wear masks. HCW should wear appropriate PPE.
- Routine cleaning of the environment is crucial
- Limit the number of HCW, visitors, and family members who are in contact with the patient. If necessary, everyone must wear PPE.
- All persons entering the patient's room (including visitors) should be recorded (for contact tracing purposes).
- Precautions should continue until the patient is asymptomatic.

# Contact precautions

- **Single room**
  - Patient to stay in room
- **Hand hygiene** according to the “5 Moments”, in particular before and after contact with the patient and after removing PPE
  - Avoiding touching eyes, nose or mouth with contaminated gloved or ungloved hands.
- Staff to wear appropriate **PPE: gown + gloves**
- Appropriate **equipment cleaning**, disinfection, and sterilization
- Enhanced **environmental cleaning**
  - Avoiding contaminating surfaces not involved with direct patient care (e.g., doorknobs, light switches, mobile phones)



# Droplet precautions

- **Single room**
  - if single rooms are not available, separating patients from others by at least 1m
- Health care workers must wear appropriate PPE:
  - Medical mask
  - Eye protection (goggles or face shield)
  - Gown
- Patient to stay in the room (limited movement)
  - If transport/movement is required, require the patient using a medical mask and use predetermined transport routes to minimize exposure for staff, other patients and visitors.



## Steps to put on personal protective equipment (PPE) including gown

**1** Remove all personal items (jewelry, watches, cell phones, pens, etc.)



**2** Put on scrub suit and rubber boots<sup>†</sup> in the changing room.

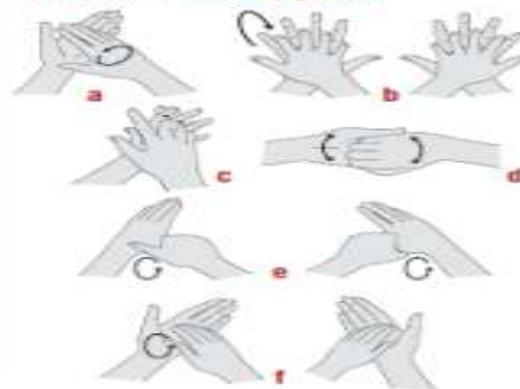


**3** Move to the clean area at the entrance of the isolation unit.

**4** By visual inspection, ensure that all sizes of the PPE set are correct and the quality is appropriate.

**5** Undertake the procedure of putting on PPE under the guidance and supervision of a trained observer (colleague).

**6** Perform hand hygiene.



**7** Put on gloves (examination, nitrile gloves).



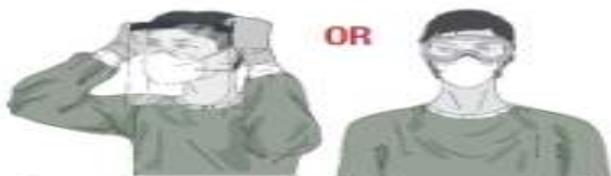
**8** Put on disposable gown made of fabric that is tested for resistance to penetration by blood or body fluids OR to blood-borne pathogens.



**9** Put on face mask.



**10** Put on face shield OR goggles.



**13** Put on second pair of (preferably long cuff) gloves over the cuff.



<sup>†</sup> If boots are not available, use closed shoes (slip-ons without shortaces and fully covering the dorsum of the foot and ankles) and shoe covers (thoroly and preferably impervious)

**11** Remove **eye protection** by pulling the string from behind the head and dispose of it safely.



**12** Perform **hand hygiene** on gloved hands.

**15** Remove **rubber boots** without touching them (or overshoes if wearing shoes). If the same boots are to be used outside of the high-risk zone, keep them on but clean and decontaminate appropriately before leaving the doffing area.<sup>2</sup>

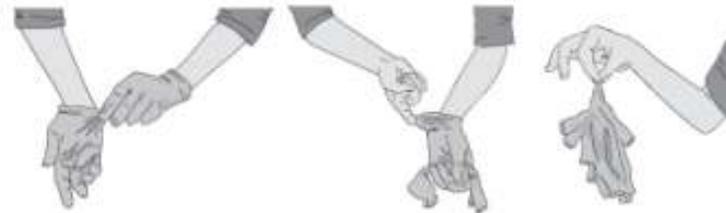
**16** Perform **hand hygiene** on gloved hands.

**13** Remove the **mask** from behind the head by first untying the bottom string above the head and leaving it hanging in front; and then the top string next from behind head and dispose of it safely.



**14** Perform **hand hygiene** on gloved hands.

**17** Remove **gloves** carefully with appropriate technique and dispose of them safely.



**18** Perform **hand hygiene**.

<sup>1</sup> While working in the patient care area, outer gloves should be changed between patients and prior to exiting (change after seeing the last patient)

<sup>2</sup> Appropriate decontamination of boots includes stepping into a footbath with 0.5% chlorine solution (and removing dirt with toilet brush if heavily soiled with mud and/or organic materials) and then wiping all sides with 0.5% chlorine solution. At least once a day boots should be disinfected by soaking in a 0.5% chlorine solution for 30 min, then rinsed and dried.

# Airborne precautions (in the context of COVID-19)

Airborne precautions are recommended ONLY for aerosol generating procedures such as:

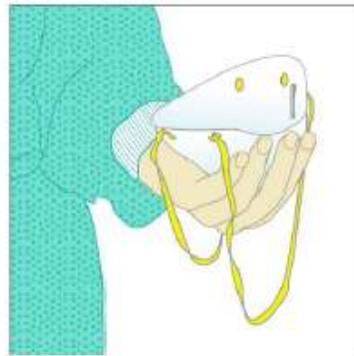
- bronchoscopy,
- tracheal intubation,
- pressure on the chest during cardiopulmonary resuscitation may induce production of aerosol.



The following is required:

- Single room with adequate ventilation:  
natural ventilation with air flow of at least 160 L/s per patient or  
in negative pressure rooms with at least 12 air changes per hour and controlled  
direction of air flow when using mechanical ventilation
- PPE: contact + droplet
  - Substitute medical mask for high-efficiency masks in room (N-95, or FFP2 or equivalent masks)

# N95 Mask Fitting – 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.

# Outpatient Care



The basic principles of IPC and standard precautions should be applied in all health care facilities, including outpatient care and primary care.



For COVID-19 infection, the following measures should be adopted:

- Triage and early recognition;
- syndromic screening to be done in clinics;
- emphasis on hand hygiene, respiratory hygiene and medical masks to be used by patients with respiratory symptoms (consider having signage);



# Outpatient Care

For COVID-19 infection, the following measures should be adopted (continued):



- if possible – place patients in separate rooms or away from other patients in the waiting rooms, and wear mask, gloves and gown if possible when seeing them in the clinic (as much of contact and droplet precautions as possible);



- when symptomatic patients are required to wait, ensure they have a separate waiting area (1m separation);
- prioritization of care of symptomatic patients;
- educate patients and families about the early recognition of symptoms, basic precautions to be used and which health care facility they should refer to.



# HOME CARE

**What IPC strategies are recommended by WHO for COVID-19?**

# Home care for patients with suspected novel coronavirus (2019-nCoV) infection presenting with mild symptoms and management of contacts

Interim guidance  
04 February 2020



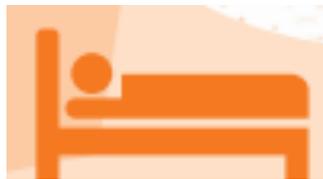
[https://www.who.int/publications-detail/home-care-for-patients-with-suspected-novel-coronavirus-\(ncov\)-infection-presenting-with-mild-symptoms-and-management-of-contacts](https://www.who.int/publications-detail/home-care-for-patients-with-suspected-novel-coronavirus-(ncov)-infection-presenting-with-mild-symptoms-and-management-of-contacts)

# Home Care – for HCW



Patients with mild respiratory illness are likely to need care in the home.

WHO recommends the patient has ongoing communication with a health care provider or public health person during the full duration of the home care period – until resolution of symptoms.



# Home Care – for HCW

HCW should:

- Wear a mask and perform appropriate hand hygiene, when providing care
- Educate the patient on how to limit exposure to the rest of their family. Also teach them respiratory etiquette and hand hygiene (cover their mouth and nose when coughing or sneezing).
- Educate caregivers on how to appropriately care for the ill member of the family as safely as possible; and provide the patient and family with ongoing support, education and monitoring.



# Home Care – by caregivers



Caregivers and family members should (if possible):

- Be advised on the type of care they are supposed to be providing and the use of available protection to cover their nose and mouth
- If not providing care, ensure physical separation (keep them in a separate room or at least 1 meter) away from others in the household
- Remind the patient to wear a mask when in the presence of other family members (if possible)

# Resources for COVID-19



## ***WHO Coronavirus Homepage***

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>

## ***All coronavirus (COVID-19) technical guidance documents***

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance>

## ***IPC documents***

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/infection-prevention-and-control>

<https://www.who.int/infection-prevention/publications/en/>

## ***Questions and Answers***

<https://www.who.int/news-room/q-a-detail/q-a-coronaviruses>

# Contributors



- *Benedetta Allegranzi, WHO HQ*
- *April Baller, WHO HQ*
- *Alice Simniceanu, WHO HQ*
- *Anthony Twyman, WHO HQ*
- *Vicky Willet, WHO HQ*
- *Christine Francis, WHO HQ*
- *Maria Clara Fonseca Barbosa Padoveze, WHO HQ*
- *Maria Van Kerkhove, WHO HQ*
- *Gertrude Avortri, AFRO*
- *Pierre Claver Kariyo, AFRO*
- *Kevin Ousman, AFRO*
- *Ana Paula Coutinho, EURO*
- *Joao Toledo, PAHO*
- *Takeshi Nishijima, WPRO*

**THANK  
YOU!**