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Investigational Paper

COVID-19

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Case Definition

SARI: ARI with history of fever or measured temperature ≥ 38°C and cough; onset within the last ~10 days; and requiring hospitalization. However, the absence of fever does NOT exclude viral infection.

Surveillance case definitions for nCoV

- Severe acute respiratory infection (SARI) in a person, with history of fever and cough requiring admission to hospital, with no other etiology that fully explains the clinical presentation AND any of the following:

- A history of travel to Wuhan, Hubei Province China and other countries with positive cases of corona, in the 14 days prior to symptom onset; or A person with acute respiratory illness of any degree of severity who, within 14 days before onset of illness, had any of the following exposures:

    - Close physical contact with a confirmed case of nCoV infection, while that patient was symptomatic; or
    - A healthcare facility in a country where hospital-associated nCoV infections have been reported
    - The disease occurs in a health care worker who has been working in an environment where patients with SARI are being cared for, without regard to place of residence or history of travel; or
    - The person develops an unusual or unexpected clinical course, especially sudden deterioration despite appropriate treatment, without regard to place of residence or history of travel, even if another etiology has been identified that fully explains the clinical presentation.

Close contact

- Health care associated exposure, including providing direct care for nCoV patients, working with health care workers infected with nCoV, visiting patients or staying in the same close environment of a nCoV patient.
- Working together in close proximity or sharing the same classroom environment with a with nCoV patient.
- Traveling together with nCoV patient in any kind of conveyance.
- Living in the same household as a nCoV patient.

Infection prevention and control

- Medical mask and direct patient to separate area.
- At least 1meter distance between suspected patients and other patients.
- Cover nose and mouth during coughing or sneezing with tissue or flexed elbow for others.
- Hand hygiene after contact with respiratory secretions.

Droplet precautions

- Medical mask if working within 1 - 2 metres of the patient.
- Place patients in single rooms, or group together those with the same etiological diagnosis.
- Group patients with similar clinical diagnosis and based on epidemiological risk factors, with a spatial separation.
- Use eye protection (face-mask or goggles).
- Limit patient movement within the institution.
- Ensure that patients wear medical masks when outside their room.

Cover your mouth and nose

- Cover your mouth and nose with a tissue when coughing or sneezing.
- It may prevent those around you from getting sick.

Figure 1

Cover your cough/sneeze!

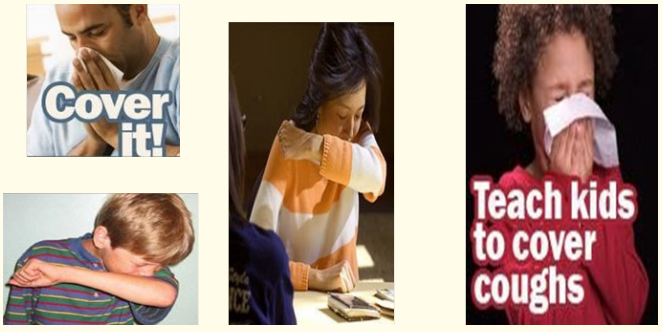

Figure 2

Contact precautions

- Use PPE (medical mask, eye protection, gloves and gown) when entering room and remove PPE when leaving.
- Use either disposable or dedicated equipment (e.g. stethoscopes, blood pressure cuffs and thermometers).
- If needs to be shared clean and disinfect between each patient use.
- Avoid contaminating environmental surfaces that are not directly related to patient care (e.g. door handles and light switches). Ensure adequate room ventilation. Avoid movement of patients or transport.
- Perform hand hygiene.

Airborne precautions when performing an aerosol generating procedure

- Ensure that healthcare workers performing aerosol-generating procedures (i.e. open suctioning of respiratory tract, intubation, bronchoscopy, cardiopulmonary resuscitation) use PPE, including gloves, long-sleeved gowns, eye protection and fit-tested particulate respirators (N95 or equivalent, or higher level of protection).
- Whenever possible, use adequately ventilated single rooms when performing aerosol-generating procedures, meaning negative pressure rooms with minimum of 12 air changes per hour or at least 160 litres/second/patient in facilities with natural ventilation.
- Avoid the presence of unnecessary individuals in the room.
- Care for the patient in the same type of room after mechanical ventilation commences.

Chain of transmission

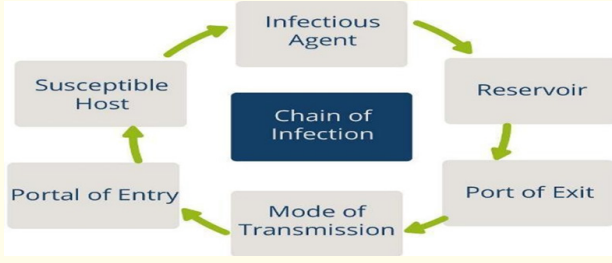

Figure 3

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.

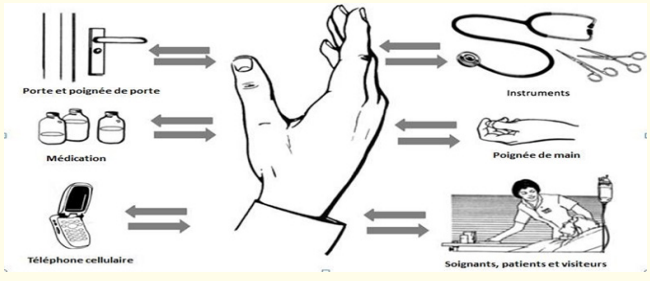

Figure 4

Hand hygiene: WHO 5 moments

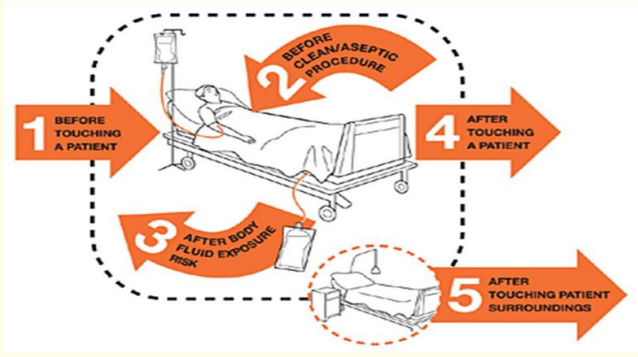

Figure 5

Respiratory hygiene/etiquette

- Reduces the spread of microorganisms (germs) that cause respiratory infections (colds, flu).
- 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.
- Do not spit here and there.

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.

Figure 6

- Post visual aids reminding patients and visitors with respiratory symptoms to cover their cough.

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

Figure 7

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

- Clean work space
- Hand hygiene
- Sterile safety-engineered syringe
- Sterile vial of medication and diluent
- Skin cleaning and antisepsis
- Appropriate collection of sharps
- Appropriate waste management.

Home care for patients with suspected COVID19 infection with mild symptoms

- Place the patient in a well-ventilated single room (i.e. with open windows and an open door).
- Limit the movement of the patient and minimize shared space.
- Household members should stay in a different room or, if that is not possible, maintain a distance of at least 1m from the ill person (e.g. sleep in a separate bed).
- Limit the number of care givers - good health and has no underlying disease.
- Visitors should not be allowed.
- Perform hand hygiene after contact with patients or their immediate environment, before and after preparing food, before eating, after using the toilet and whenever hands look dirty.
- To contain respiratory secretions, provide medical mask to the patient.

Home care for patients with suspected COVID19 infection with mild symptoms

- Individuals who cannot tolerate a medical mask should use rigorous respiratory hygiene.
- Caregivers should wear a tightly fitted medical mask that covers their mouth and nose when in the same room as the patient.
- Avoid direct contact with body fluids. Use disposable gloves and a mask when providing oral or respiratory care and when handling stool, urine and other waste. Perform hand hygiene before and after removing gloves and the mask.
- Use dedicated linen and eating utensils for the patient; these items should be cleaned with soap and water after use and may be re-used instead of being discarded.
- Clean and disinfect daily surfaces that are frequently touched in the room where the patient is being cared for (Household soap or detergent should be used first for cleaning, and then, after rinsing, regular household disinfectant-sodium hypochlorite).
- Clean the patient's clothes, bed linen, and bath and hand towels using regular laundry soap and water or machine wash at 60 - 90°C with common household detergent, and dry thoroughly.

Use of masks

- Use of Mask- limit spread of certain respiratory diseases.
- Mask alone is insufficient to provide the adequate level of protection and other equally relevant measures should be adopted- Hand hygiene.
- Wearing medical masks when not indicated may cause.
- Unnecessary cost.
- Procurement burden.
- Create a false sense of security that can lead to neglecting other essential measures such as hand hygiene practices.
- Using a mask incorrectly may hamper its effectiveness to reduce the risk of transmission.

Use of mask: Community setting

- Individuals without respiratory symptoms
- Avoid closed crowded spaces
- Maintain distance - 1m

- Practice hand and respiratory hygiene
- Refrain from touching face, nose, mouth
- No need of mask
- Individuals with respiratory symptoms
- Wear a medical mask
- Seek medical care
- Learn mask management.

Use of mask: Home care

- Individuals with suspected infection with mild respiratory symptoms.
- Relatives or caregivers.

Along with

- Hand hygiene.
- Keep distance from affected individual as much as possible (at least 1 meter).
- Improve airflow in living space by opening windows as much as possible.
- Mask management.

Use of mask: Health care settings

Individuals with respiratory symptoms should:

- Wear a medical mask while waiting in triage or waiting areas or during transportation within the facility;
- Wear a medical mask when staying in cohorting areas dedicated to suspected or confirmed cases.

Health care workers should:

- Wear a medical mask while providing care to the patient.
- Use a particulate respirator N95 (NIOSH certified), FFP2 (EU standard), or equivalent, when performing aerosol generating procedures (tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy.

Masks management

- Place mask carefully to cover mouth and nose and tie securely to minimise any gaps between the face and the mask.
- While in use, avoid touching the mask.
- Remove the mask by using appropriate technique (i.e. do not touch the front but remove the lace from behind).
- After removal or whenever you inadvertently touch a used mask, clean hands by using an alcohol-based hand rub or soap and water if visibly soiled.
- Replace masks with a new clean, dry mask as soon as they become damp/humid.
- Do not re-use single-use masks.
- Discard single-use masks after each use and dispose of them immediately upon removal.

Outpatient care

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

Triage and early recognition

- Emphasis on hand hygiene, respiratory hygiene and medical masks to be used by patients with respiratory symptoms (consider having signage);
- 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.

Hospital admission

- Place patients with ARI of potential concern in single, well ventilated room, when possible.
- Cohort patients with the same diagnosis in one area.
- Do not place suspect patients in same area as those who are confirmed.
- Assign health care worker with experience in clinics to take care of patient.

Role of clinician in triage

- 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 1m distance between patients.
- 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.

Set up of the area during triage

1. Ensure adequate space for triage (maintain at least 1m distance between staff screening and patient/staff entering).
2. Waiting room chairs for patients should be 1m apart.
3. Maintain a one way flow for patients and for staff.
4. Clear signage for symptoms and directions.
5. Family members should wait outside the triage area prevent triage area from overcrowding

Samples to be collected

- Essential samples:
    - Throat swab (oropharyngeal swab).
- Nasal swab (Nasopharyngeal swab).
- Other preferred samples:
    - Bronchoalveolar lavage

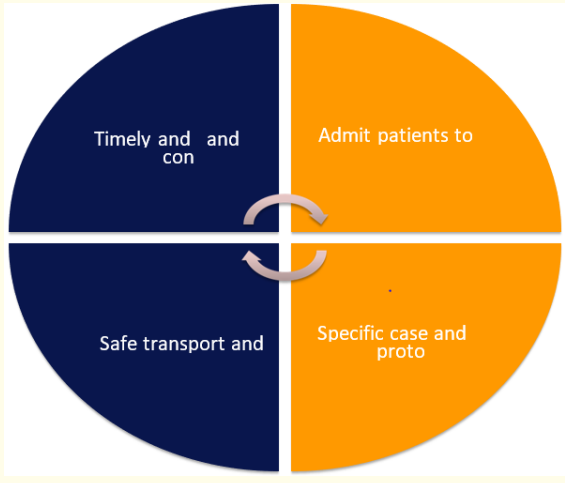

Figure 8

    - Tracheal aspirate Wide mouth sterile plastic containers
    - Sputum.
- In lab confirmed patients:
    - Blood
    - Stool and urine
    - Wide mouth sterile plastic containers.

Personal protective equipment

Table 1. Recommended type of personal protective equipment (PPE) to be used in the context of COVID-19 disease, according to the setting, personnel and type of activity[a]

Setting	Target personnel or patients	Activity	Type of PPE or procedure
Healthcare facilities			
Inpatient facilities			
Patient room	Healthcare workers	Providing direct care to COVID-19 patients.	Medical mask Gown Gloves Eye protection (goggles or face shield).
		Aerosol-generating procedures performed on COVID-19 patients.	Respirator N95 or FFP2 standard, or equivalent. Gown Gloves Eye protection Apron
	Cleaners	Entering the room of COVID-19 patients.	Medical mask Gown Heavy duty gloves Eye protection (if risk of splash from organic material or chemicals). Boots or closed work shoes
	Visitors[b]	Entering the room of a COVID-19 patient	Medical mask Gown Gloves
Other areas of patient transit (e.g., wards, corridors).	All staff, including healthcare workers.	Any activity that does not involve contact with COVID-19 patients.	No PPE required

Figure 9

Collection of OP and NP swabs

Optimal timing:

- Within 3 days of symptom onset and no later than 7 days.
- Preferably prior to initiation of antimicrobial chemoprophylaxis or therapy.

Collection of oropharyngeal swab

- Materials
  - Sterile Dacron/Nylon flocked swab.
  - Viral Transport Medium (3 ml sterile VTM).
- Procedure:
  - Hold the tongue out of the way with a tongue depressor.
  - Use a sweeping motion to swab posterior pharyngeal wall and tonsillar pillars.
  - Have the subject say "aahh" to elevate the uvula.
  - Avoid swabbing soft palate and do not touch the tongue with swab tip.

Collection of nasopharyngeal swabs

- Materials
  - Sterile Dacron/Nylon flocked swab.
  - Viral Transport Medium (3 ml sterile VTM).
- Procedure
  - Tilt patient's head back 70 degrees.
  - Insert swab into nostril (Swab should reach depth to distance from nostrils to outer opening of the ear.
  - Leave swab in place in place for several seconds to absorb secretions.
  - Slowly remove swab while rotating it.
  - Place tip of swab into VTM and snap/cut off the applicator stick.

Blood collection

- Blood sample collection from all cases.
- Plasma sample collection in EDTA vials.
- Resin separator tubes for serum sample collection.

Guidance for specimen collection

- A BSL2 containment level is required to handle suspected samples.

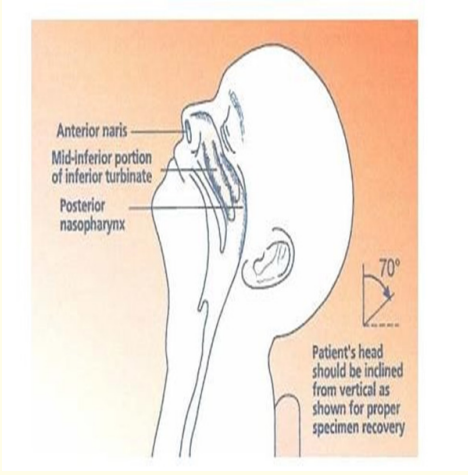

Figure 10

- Consider all specimens as potentially hazardous/infectious.
- Handle all specimens with gloves in a secure manner.
- Place each specimen into a separate container labeled with the patient's name and identification number, the collection site, the date of collection and the time of the collection.
- Do not contaminate the outside of the specimen container.
- Do not handle laboratory requisition forms with gloves.

Transport precautions

- Adequate cushioning materials inside the box to absorb shocks during transport.
- Adequate absorbing material to absorb any spillage should it occur.
- Do not stick the request form on the specimen.
- Specimen request forms should be put into a separate plastic bag.

Storage of specimen

- Keep refrigerated (2 - 8°C) if it is to be processed (or sent to a reference laboratory) within 48 hours.
- Keep frozen (-10 to -20°C) if it is to be processed after the first 48 hours or within 7 days.
- Keep frozen (-70°C) if it is to be processed after a week. The sample can be preserved for extended periods.

Labeling of package

- Sender's, name, address and telephone number.
- Whom to contact in case of emergency with telephone number.
- Receiver's name, address and telephone number.
- Proper shipping name (e.g. "biological substance, category B").
- UN number e.g. 3373.
- Temperature storage requirements.
- Quantity of dry ice inside the container.
- Arrow mark to indicate upright direction.