SARI CLINICAL CARE TRAINING

INFECTION PREVENTION AND CONTROL FOR PATIENTS WITH SARI

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Learning objectives

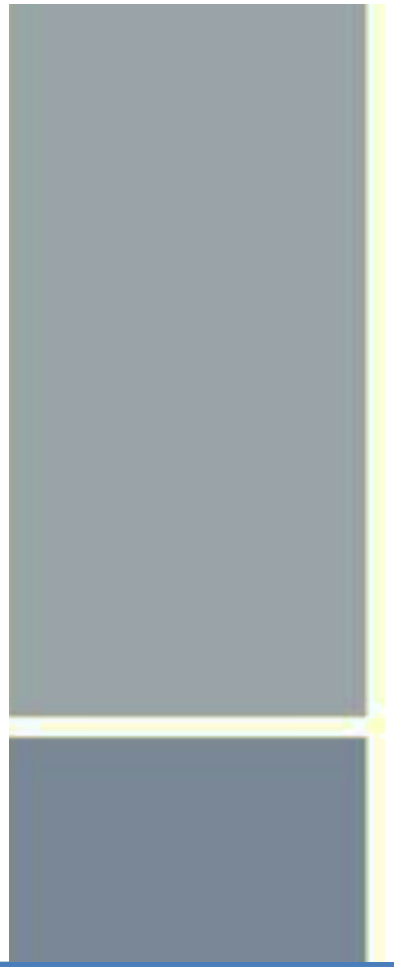
At the end of this lecture, you will be able to:

- Describe the general principles of IPC when caring for patients with ARI.
- Describe specific measures to take in the hospital when caring for patients with SARI, including those with pandemic or epidemic potential.
- Describe how administrative and engineering controls facilitate the implementation of IPC.

General principles

- Recognize suspect patients early and rapidly and apply appropriate source control.
- Apply routine IPC (i.e. standard precautions) for all patients.
- Apply additional precautions in selected patients depending on presumed diagnosis.
- Collaborate and communicate with the health care facility's IPC infrastructure.

IPC guidelines



Infection prevention and control of epidemic- and pandemic-prone acute respiratory infections in health care

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ARIs that may constitute a public health emergency of international concern

- Severe acute respiratory syndrome (SARS).
- Middle East respiratory syndrome (MERS-CoV).
- Human influenza caused by a new subtype.
- Zoonotic influenza that causes disease in humans.
- Emerging ARIs that cause large outbreaks or outbreaks with high mortality and morbidity, such as **2019-CoV.**

ARIs that may constitute a public health emergency of international concern

- Epidemiological clues:
  - Travel to area with known circulation of the pathogen of concern within the incubation period.
  - Unprotected contact with patient with ARI of concern within incubation period.
  - Part of rapidly spreading cluster of patients with ARI of unknown cause.

- Clinical clues:
  - Patient with or dying from unexplained cause of ARI illness with an exposure history as above.

- Immediate notification of appropriate health officials is essential!

When to suspect COVID-19

- Epidemiological clues:
  - Travel to area with known circulation of the pathogen of concern within the incubation period.
  - Unprotected contact with patient with ARI of concern within incubation period.
  - Part of rapidly spreading cluster of patients with ARI of unknown cause.

- Clinical clues:
  - Patient with or dying from unexplained cause of ARI illness with an exposure history as above.

- Immediate notification of appropriate health officials is essential!

COVID-19 Case Definition

A. Patients with severe acute respiratory infection (fever, cough, and requiring admission to hospital), AND with no other aetiology that fully explains the clinical presentation AND at least one of the following:

• a history of travel to or residence in the city of Wuhan, Hubei Province, China in the 14 days prior to symptom onset,

or

• patient is a health care worker who has been working in an environment where severe acute respiratory infections of unknown aetiology are being cared for.

B. Patients with any acute respiratory illness AND at least one of the following:

• close contact with a confirmed or probable case of COVID-19 in the 14 days prior to illness onset, or

• visiting or working in a live animal market in Wuhan, Hubei Province, China in the 14 days prior to symptom onset,

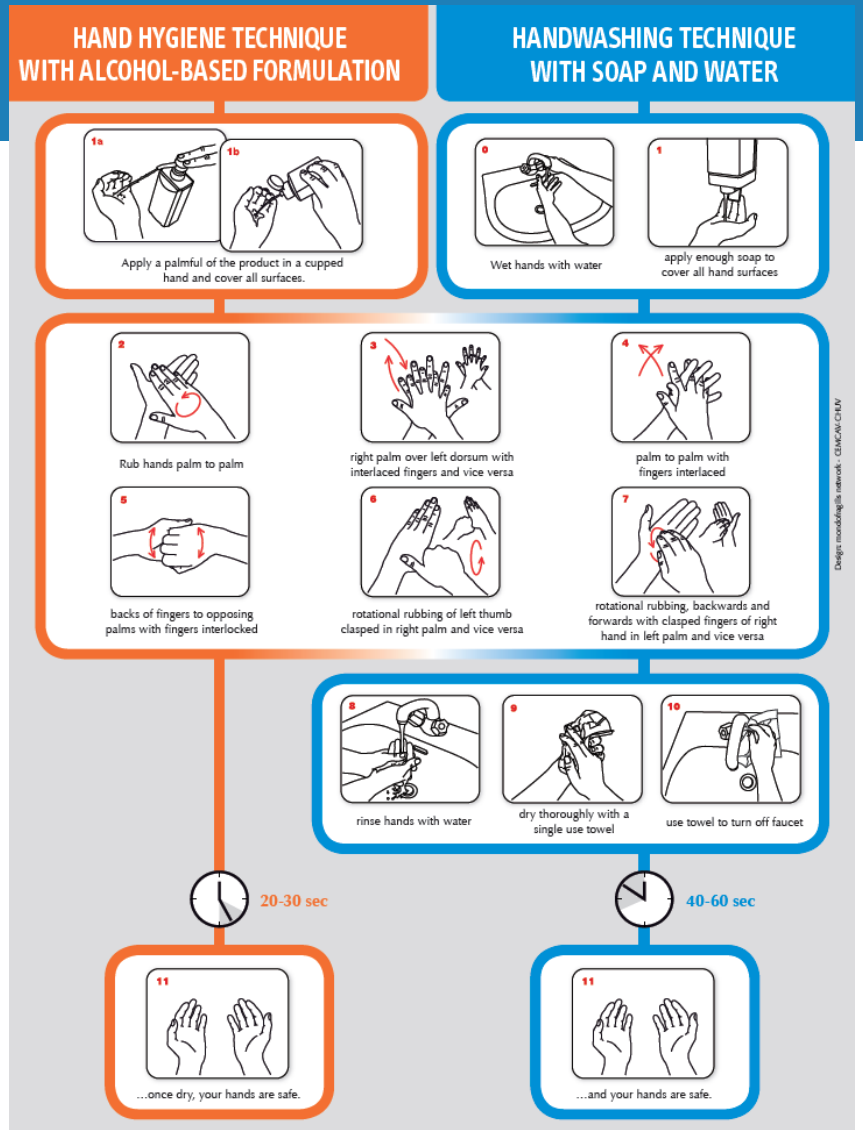
or

• worked or attended a health care facility in the 14 days prior to onset of symptoms where patients with hospital associated COVID-19 infections have been reported.

Apply standard precautions at all times

- At all times, when caring for all patients:
  - Hand hygiene
  - Respiratory hygiene
  - PPE according to the risk
  - Safe injection practices, sharps management and injury prevention
  - Safe handling, cleaning and disinfection of patient care equipment
  - Environmental cleaning
  - Safe handling and cleaning of soiled linen
  - Waste management

Hand hygiene: how

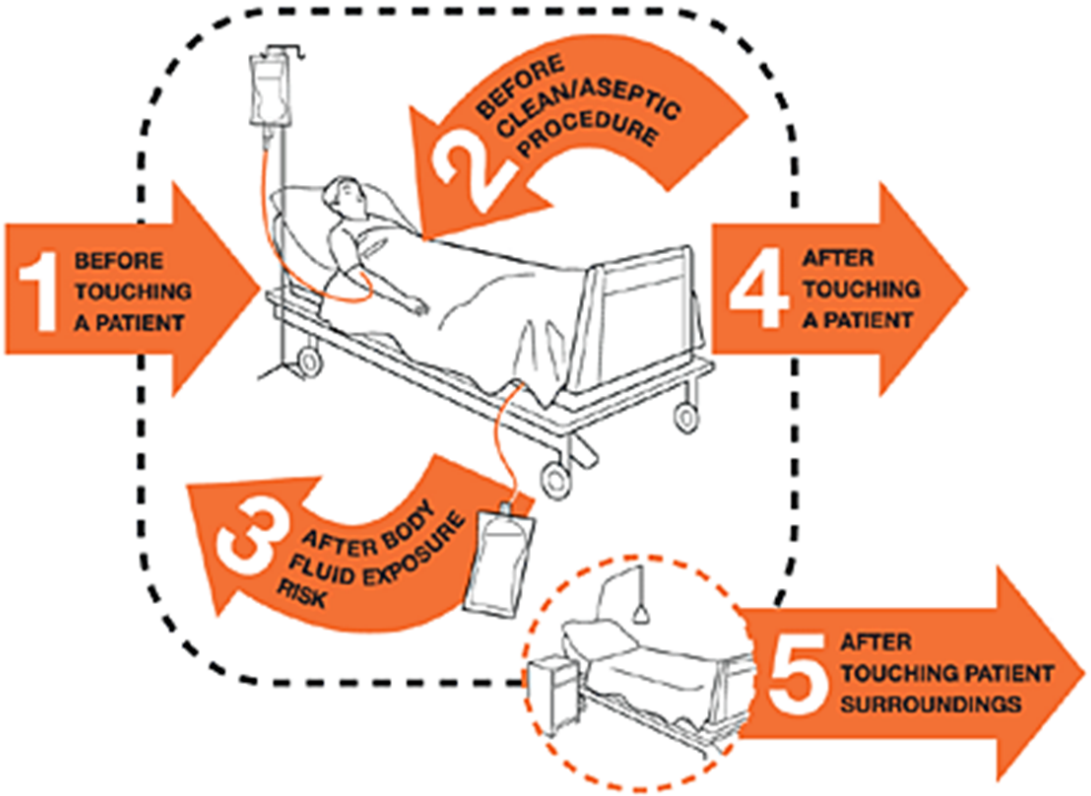


- **Use appropriate product and technique**
  - **An alcohol-based hand rub product is preferable, if hands are not visibly soiled**
    - **Rub hands for 20–30 seconds!**
  - **Soap, running water and single use towel, when visibly dirty or contaminated with proteinaceous material**
    - **Wash hands for 40–60 seconds!**

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Hand hygiene: when



- **Always perform hand hygiene when indicated, i.e. " Five moments"**
  - before and after any contact with patients
  - before any clean procedure and after body fluid exposure risk
  - after contact with patient surrounding/contaminated items

Respiratory hygiene/etiquette
(applying to health workers, visitors and families)

- Cover nose and mouth when sneezing and/or coughing with a piece of cloth, a tissue or a surgical mask
- Immediately and appropriately dispose of these items
- Cough/sneeze into your sleeve/inside of your elbow if no tissue is available
- Perform hand hygiene with alcohol based hand rub products or water and soap if hands are visibly soiled
- Wear a medical mask if having respiratory symptoms
- Stay away from others when sick
- No introductory kissing or shaking hands when ill
- Avoid close contact with people who exhibit symptoms









Risk assessment for appropriate use of PPE

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

Use droplet precautions when caring for all patients with SARI

- Patients with SARI and suspected infection from:
  - human influenza virus (seasonal, pandemic)
  - zoonotic influenza virus
  - MERS-CoV
  - adenovirus, RSV, parainfluenza virus
  - **emerging respiratory virus of potential concern (COVID-19).**

- Droplet precautions prevent droplet transmission of respiratory viruses.

Droplet precautions



- **Health care worker**
  - wear a medical/surgical mask when within 1 m of patient with ARI
  - Wear eye protection (goggles or face shield) if there is a risk of splashes onto the face
- **Patient**
  - placed in single room (when available) or cohorted
  - separated from others by at least 1 m
  - limited movement out of the hospital room
  - uses a medical-surgical mask if has to move outside of area.

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Use contact precautions in some patients with SARI

- In patients with suspected infection from:
  - MERS-CoV, SARS-CoV, COVID-19
  - zoonotic influenza virus
  - RSV, adenovirus, parainfluenza
  - emerging respiratory virus of potential concern.

- **Not** necessary when caring for patients with seasonal influenza or common bacterial respiratory infections:
  - use PPE based on risk assessment.

- Contact precautions prevent direct or indirect transmission from contact with contaminated surfaces.

Contact precautions

- Health care worker
  - Wears appropriate PPE (gloves, masks, eye protection, long sleeved-gown) upon entering room or < 1 m in distance. Remove after leaving room, and perform hand hygiene
  - Perform hand hygiene according to the “5 Moments”, in particular before and after contact with the patient and after removing PPE
  - Use disposable or dedicated patient equipment when possible.
  - Clean and disinfect between use if sharing between patients.
  - Refrain from touching their eyes, nose or mouth with contaminated gloved or ungloved hands.
  - Avoid contaminating surfaces not involved with direct patient care: i.e. door knobs, light switches, mobile phones.
  - Ensure appropriate and frequent (e.g., at least daily) environmental and equipment cleaning, disinfection, and sterilization (when indicated). Prioritize frequently-touched surfaces (e.g., bed rails, overbed table, bedside commode, lavatory surfaces in patient bathrooms, doorknobs) and equipment in the immediate vicinity of the patient.

Contact precautions

- Patient
  - Placed in single room or cohorted with other patients with same etiologic diagnosis.
  - > 1 m between patient.
  - Avoids movement or transport of patients out of hospital room.

When to use airborne precautions (1/2)



- In all patients with SARI that require droplet precautions and are undergoing aerosol-generating procedures:
  - aspiration or open suctioning of respiratory tract secretions
  - intubation
  - cardiopulmonary resuscitation
  - bronchoscopy
  - aerosolized nebulizer*
  - non-invasive ventilation*
  - high-flow oxygen*

* Though data is limited, these interventions may produce aerosols and thus airborne precautions recommended.

When to use airborne precautions (2/2)



- At all times, in patients suspected to have an emerging respiratory virus of potential concern.
- At all times, in patient suspected to have TB.
- Airborne precautions prevent transmission of very small droplets of all respiratory pathogens.

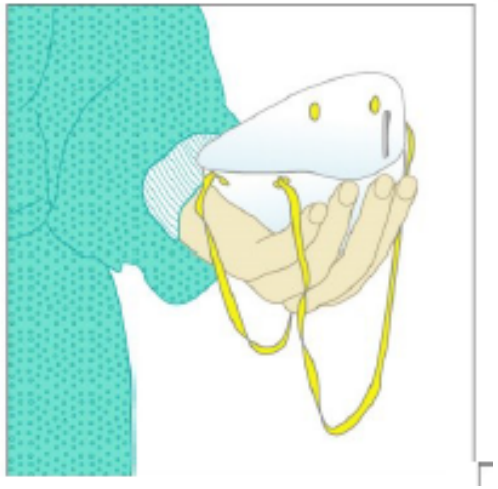
Airborne precautions



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- Health care worker
  - uses a particulate respirator, gown, eye protection, gloves.
- Patient
  - placed in single room
  - avoid unnecessary individuals in the room.
- Airborne precaution room
  - natural ventilation with at least 160 L/s/patient air flow
  - negative pressure rooms with at least 12 air changes per hour
  - controlled direction of air flow

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.

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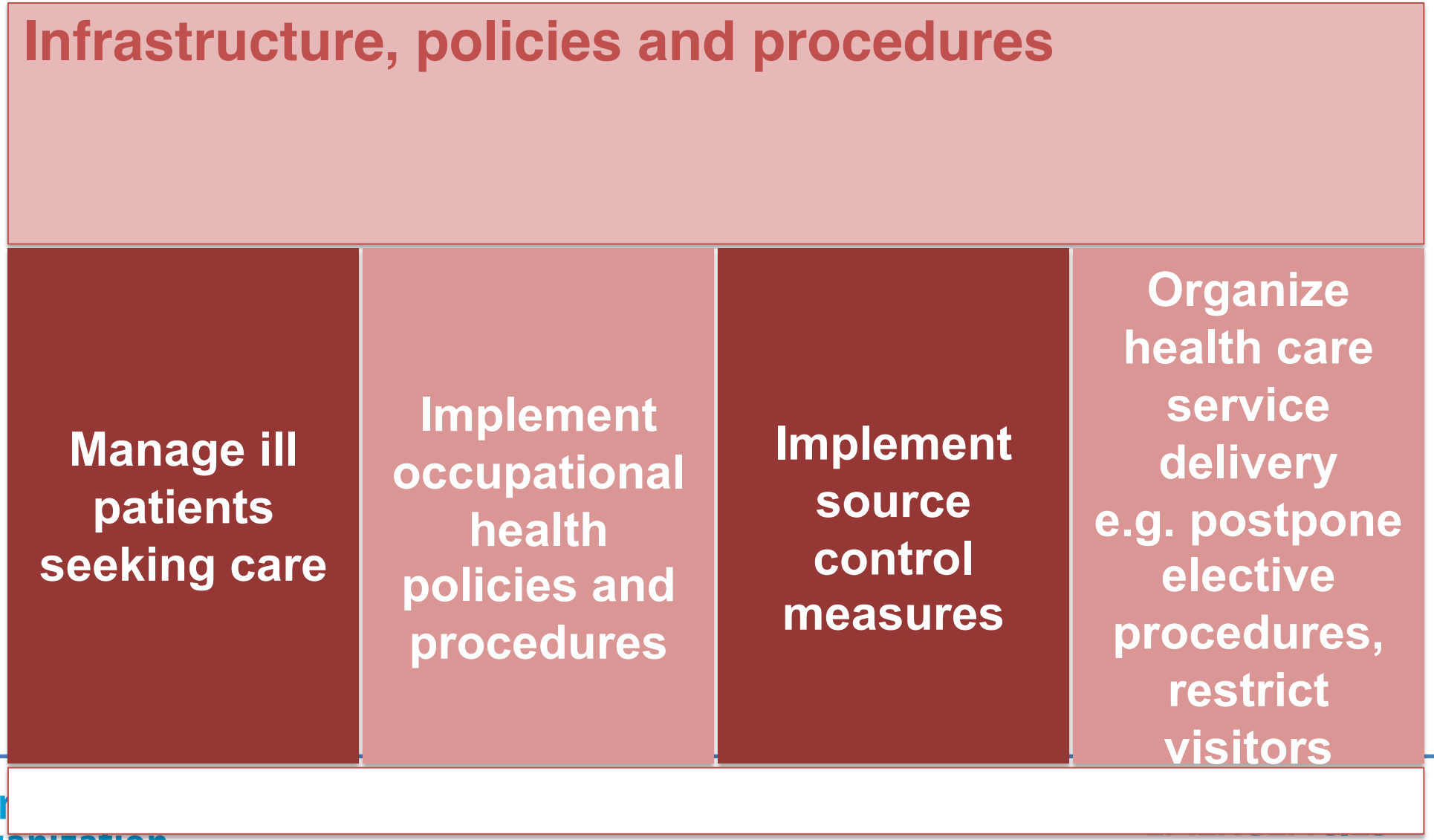
If patient has suggestion of an emerging ARI with epidemic or pandemic potential and transmission not yet established, implement airborne, droplet and contact in addition to standard precautions.

Building blocks of IPC

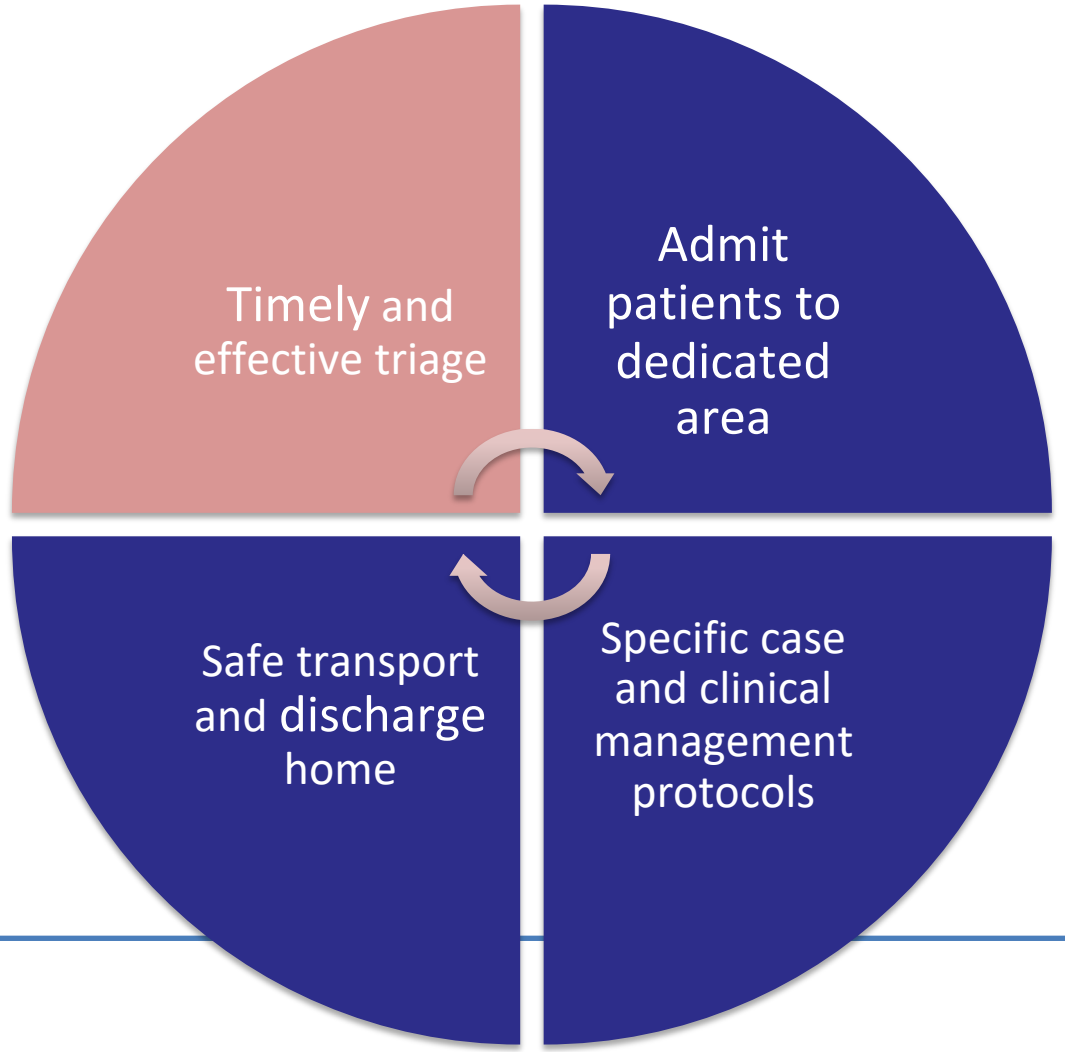
- First priority is administrative control.
- Second priority is engineering control.
- Third priority is personal protective equipment.

These three priorities work together to prevent, detect and control infections.
Communicate and collaborate with your IPC team.

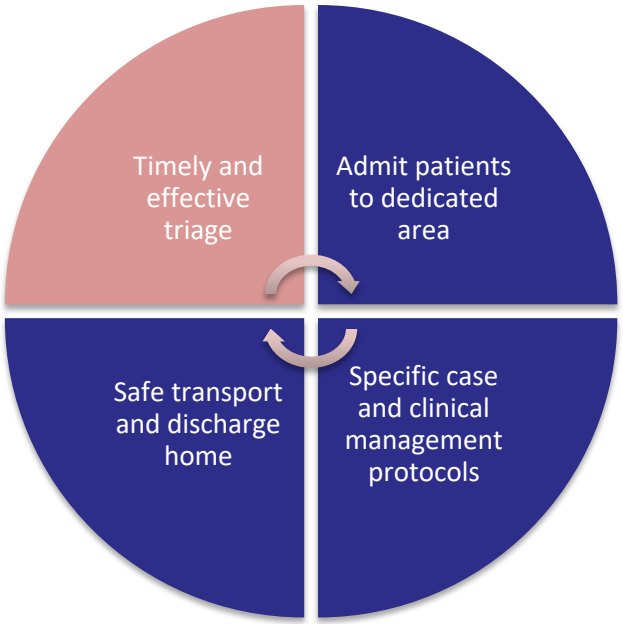
Infrastructure, policies and procedures



Manage ill patients seeking care

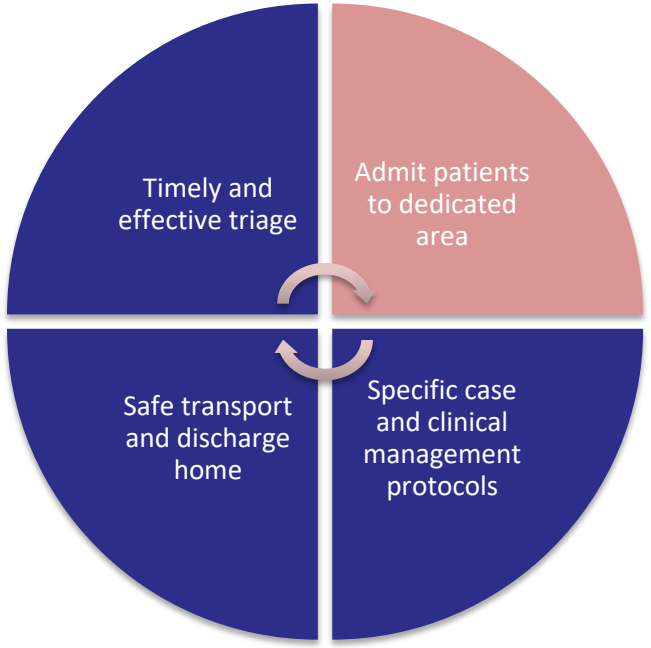


Triage



- Prevent overcrowding.
- Place ARI patients in dedicated waiting areas with adequate ventilation.
- Implement droplet precautions in addition to standard precautions.
- Conduct rapid triage.

Hospital admission



- Avoid admitting low-risk patients with uncomplicated seasonal influenza virus infection.
- 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.

Occupational health policies (1/2)

- Educate staff about:
  - ARIs
  - protective measures
  - risk factor for severe disease.
- Offer alternative work assignments to staff from at-risk groups.
- Vaccinate staff if vaccine available.
- Screen staff for symptoms of ARI.

Occupational health policies (2/2)

- Instruct staff that develop symptoms of ARI, to:
  - Notify infection-control team/hospital authorities immediately.
  - Stop working with patients immediately.
  - Limit contact with other staff members.
  - Exclude themselves from public areas.
  - Apply standard and droplet precautions.

Source controls (1/2)

- Adequate equipment, education, training, policies, and protocols should be available for:
  - hand hygiene
  - PPE use
  - cleaning and disinfection of materials and environment
  - one-time use patient care items:
    - i.e. oxygen delivery devices, ventilator circuits, closed suction system

Source controls (2/2)

- Basic infrastructure:
  - minimum 1 m physical separation between patients
  - physical structures as barriers to partition triage areas
  - well ventilated corridors
  - well ventilated patient care areas.

Personal protective equipment (PPE)

- Last line of defence against hazards that cannot otherwise be eliminated or controlled.

- Appropriate use of PPE:
  - only effective if used throughout potential exposure periods
  - only effective if adherence is 100%
  - must be properly used and maintained
  - does not eliminate need for hand hygiene.



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Do you see a problem?



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Summary

- When caring for **all patients**, always use standard precautions.
- When caring for patients with SARI and respiratory virus infection suspected, also use droplet precautions.
- When caring for patient with COVID-19, zoonotic influenza, MERS-CoV, or emerging respiratory virus is suspected, also use contact precautions.
- When carrying out high-risk, aerosol-generating procedures such as intubation or open suctioning in patient with SARI, also use airborne precautions.
- When caring for patients with emerging infection of concern (and transmission pattern unknown), use airborne, droplet, contact in addition to standard precautions.

Acknowledgements

Contributors

Dr Eric Walter, University of Washington, Seattle, USA

Dr Monica Thormann, Asociación Panamericana de Infectología, Santo Domingo, Dominican Republic

Dr Niranjan Bhat, Johns Hopkins University, Baltimore, USA

Dr Timothy Uyeki, Centers for Disease Control and Prevention, Atlanta, USA

Dr Sergey Romualdovich Eremin, WHO HQ

Dr Janet Diaz, WHO Consultant

Dr Paula Lister, Great Ormond Street Hospital, London, UK

Dr Natalia Pshenichnaya, Rostov State Medical University, Russian Federation

Dr Rosa Constanza Vallenas Bejar De Villar, WHO HQ