



सत्यमेव जयते

Ministry of Health & Family Welfare  
Government of India

# Infection Prevention and Control in Special Units or Situations

## Training Session – VI



---

National Center for Disease Control, New Delhi

# Outline

- Infection prevention and Control in
  - Surgical units
  - Intensive Care Units (ICU)
  - maternal and neonatal units
  - OPD and emergency care
  - Dialysis units
  - Clinical laboratory
  - Immunocompromised patients
- IPC practices in HCFs during epidemics/pandemics



# IPC in Surgical Units

# Asepsis for Surgical Procedures

- Perform surgical hand antisepsis using a suitable antimicrobial soap or ABHR before donning sterile gloves
- A preoperative surgical hand scrub should be done for at least 5 minutes using an appropriate antiseptic scrub
- After performing the surgical hand scrub, hands should be kept up and away from the body (elbows in flexed position) so that water runs from the tips of the fingers toward the elbows and not vice versa
- The abdomen should not be shaved prior to surgery; if required, hair clipper should be used instead
- It is important to maintain a sterile field to prevent contamination of the surgical incision
- Only sterile objects and persons in surgical attire (scrubbed team) are allowed within this field

# Cleaning and disinfection

- A clean operating environment is essential to prevent surgical site infection (SSI)
- There should be no dust in the OT
- Lint-containing textiles and floor mops can be a source of dust
- OTs must be cleaned daily – before first surgery, after each surgery and at the end of the day
- Cleaning should include cleaning of OT table, furniture, lights, equipment, windowsills, ledges, scrub rooms and sinks
- Thorough cleaning of the entire OT should be done once a week

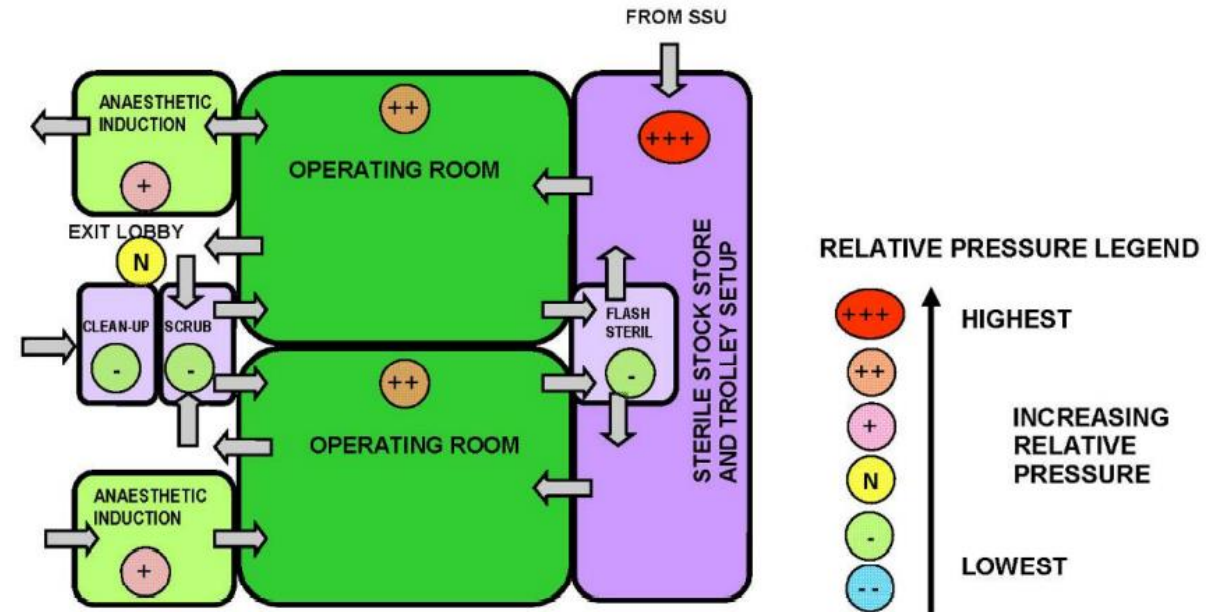
# Components of the Operation Theatre (OT)

- The OT/ OR is a multifunctional area
- In this area patients are received and prepared for surgery, the operation team prepares for surgery and the actual surgical procedures are carried out
- Equipment cleaning, processing and sterilization should be done in centralized area or a CSSD
- In addition, there are areas for administrative functions, sluicing and waste disposal
- The OT areas are distributed into zones depending upon the level of sterility and cleanliness required

# Zones

## Concept of zoning

1. Unrestricted zone or clean area.
2. Semi restricted zone or sub sterile area
3. Restricted zone or sterile area
4. Disposal zone or area



**Separate and clearly defined functional and decontamination areas are required to maintain effective barriers for infection control**

# Functional and Decontamination areas in OT

- Functional areas can be categorized as extreme, high, medium, and low risk
- Both functional and decontamination areas should have:
  - Adequate lighting to minimize the risk of injury and enable inspection of cleaned areas and equipment
  - Good ventilation to reduce the risk of cross-infection from aerosols
  - Smooth impervious work surfaces made from non-porous materials without crevices
  - Slip resistant or non-slip, water-imperious flooring with sealed joints
  - Correct bins for the disposal of hazardous waste

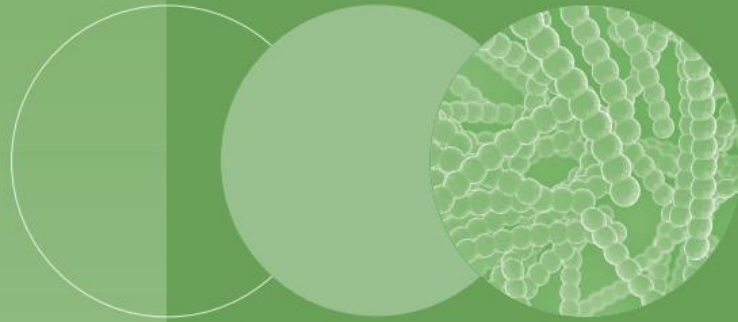
# Surgical antimicrobial prophylaxis (SAP)

- Before the surgical incision when indicated (depends on type of surgery) based on the half life of the antibiotic and hospital antibiotic policy
- The initial dose of prophylactic antimicrobial agent should be administered by the IV route administered within 120 minutes, timed such that a bactericidal concentration of the drug is established in the serum and tissues when the incision is made
- Should not be prolonged after completion of the operation
- The patient should be educated on how to take care of the incision site, personal hygiene, signs and symptoms of infection and whom to contact if infection occurs

## GLOBAL GUIDELINES FOR THE PREVENTION OF SURGICAL SITE INFECTION



## WHO recommendations for prevention and treatment of maternal peripartum infections





# IPC in Intensive care unit

# IPC in ICUs

- Intensive care patients have 5-10 times higher risk of HAI
- Compromised defenses due to various invasive devices
- High risk due to immunosuppression and comorbidities
- Exposure to broad-spectrum antibiotics and susceptible to MDROs

- **Standard precautions should be applied for all patients in the ICU**
- **In addition, transmission-based precautions should be applied to standard precautions to prevent infections where the route of transmission is known**

## B. IPC for insertion of devices

### Skin preparation and use of antiseptic agents

- Gross contamination at the site of incision should be removed before antiseptic skin preparation
- Choice of antiseptic according to HICC
  - Alcoholic chlorhexidine, chlorhexidine, povidone iodine (in order of preference)

### Handling of devices

- Aseptic non-touch technique to be used

## B. IPC in ICUs contd.

### ICU footwear

- Closed-toed shoes with impervious soles should be worn in the ICU
- Clean regularly to remove splashes of blood and body fluids
- ICU footwear must not be taken out of the ICU to other areas of the hospital
- The ICU footwear should be worn by the regular on-duty staff and those coming in to perform any invasive procedures

# Prevention of device-associated infections

## Bundle approach

- A care bundle identifies a set of key interventions based on evidence-based guidelines that, when implemented, are expected to improve health outcomes of patients
- Aim of care bundles is to improve health outcomes by facilitating and promoting changes in patient care and encouraging compliance to guidelines

# Implementing care bundles

- Implementation of care bundles creates an important opportunity for delivering evidence-based and safe healthcare to patients using a multimodal or multidisciplinary approach
- Training of staff is one of the most important components of a care bundle for prevention of HAIs
- Care bundles for prevention of device-associated infections are:
  - Ventilator-associated pneumonia (VAP) bundle
  - Central line-associated bloodstream infection bundle
  - Catheter-associated urinary tract infection bundle

# VAP Prevention Bundle

- Preventive measures for VAP include decreasing aspiration by the patient, preventing cross-contamination or colonization via hands of personnel, the correct use and appropriate disinfection or sterilization of respiratory therapy devices and staff education

## Strategies to prevent VAP

1. Maintenance of in-use respiratory therapy equipment
2. Processing reusable equipment
3. Suctioning of the respiratory tract

# Central line-associated bloodstream infection (CLABSI bundle)

## Insertion bundle

- Competent staff
- Selection of site
- Maximal barrier precautions including hand hygiene
- Skin preparation
- Dressing

## Maintenance bundle

- Scrub the hub
- Flush protocol
- Daily assessment, including for removal
- Dressing (preferably transparent) as and when required

# Catheter associated urinary tract infection (CAUTI) bundle

## Insertion bundle

- Should be inserted only when necessary and left in place for as short duration as possible
- Thoroughly wash hands or use ABHR before inserting the catheter
- Catheters should be inserted using aseptic technique
- Use sterile gloves, drapes, sponges, appropriate antiseptic solution for peri-urethral cleansing, and single-use packet of lubricant jelly
- Sterile personal protective equipment shall be worn by the HCW inserting the catheter
- Indwelling catheters should be properly secured after insertion to prevent movement and urethral traction

# CAUTI Bundle contd.

## Maintenance bundle

- Maintain a closed drainage system
- Keep the catheter and collecting tube free from kinking
- Affix the catheter to the inner thigh
- Keep the collecting bag below the level of bladder and above the floor level at all times
- Empty the collecting bag regularly using a separate, clean, collecting container for each patient
- Indwelling catheters or drainage bags should not be changed unless there is break in aseptic technique, disconnection, obstruction or leakage, the catheter and the collecting system should be replaced using aseptic technique

# Urinary catheter maintenance

- Daily assessment for catheter removal
- Avoid clamping before catheter removal
- Routine bladder wash is not recommended
- Routine hygiene (e.g. cleansing of meatal surface during daily bathing or showering) is appropriate
- The periurethral area should not be cleaned with antiseptics to prevent CAUTI
- Routine use of systemic antimicrobials should not be administered to prevent CAUTI



# IPC in Maternal and Neonatal Units

# Prevention of new-born and maternal infections during deliveries

- Prevention during vaginal delivery
- Cleanliness is of utmost importance for all vaginal deliveries
- Particular attention should be given to having clean hands, clean perineal area and clean umbilicus
- Use sterile surgical gloves, sterile water-resistant gown, rubber/plastic apron, mask with eye shield and boots
- Instruments used during delivery should be sterile
- The HCW receiving the baby should clean their hands by performing hand hygiene and wear clean examination gloves
- Baby should be received on a clean dry towel

# Prevention of infection during caesarean section

- The WHO surgical checklist to prevent surgical complications should be applied
- Caesarean section should be performed using all the precautions and procedures as recommended for surgery
- A single dose of appropriate antibiotic as per hospital antibiotic policy be administered 30-60 minutes before incision rather than after the cord is clamped



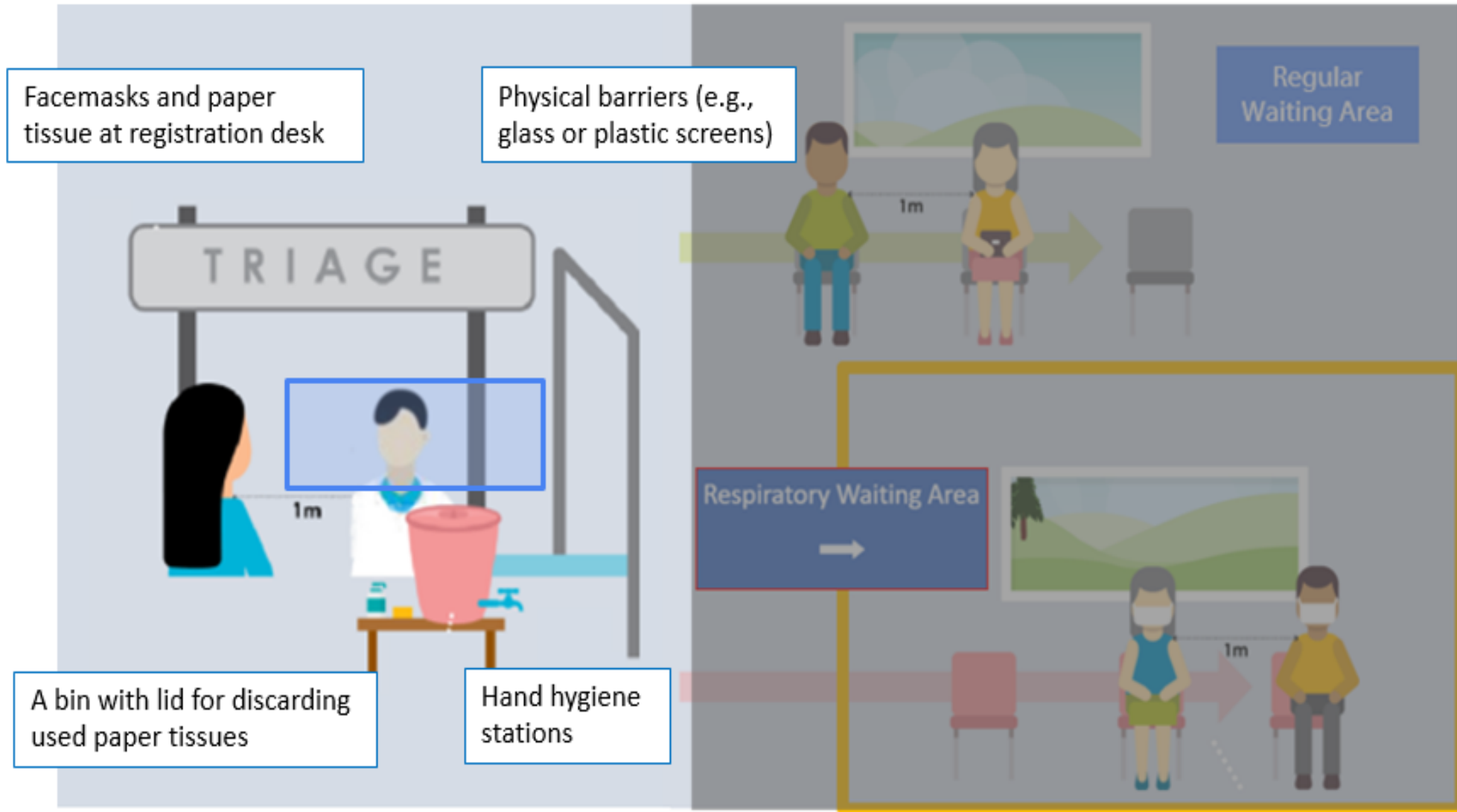
# Intravenous fluids for neonates

- Outbreaks of sepsis have often implicated IV fluids as either the source or vehicles of transmission between neonates
- Strict attention to aseptic technique is essential in the preparation and administration of IV fluids
- As far as possible procure base solutions such as IV glucose, saline solutions in pediatric packings/small amounts rather than adult packaging and transfer into smaller aliquots
- Dedicated clean area to prepare IV infusions

# IPC in OPD

## Registration desk and triage

- The first point of contact for an ill patient seeking hospital care is the registration desk of the OPD
- Recognition of transmissible illness and moving the infectious patients to the appropriate examination room as quickly as possible is important
- Frontline staff at the registration desk should be trained to recognize patients showing signs and symptoms of transmissible diseases
- Signage and posters indicating the signs and symptoms of transmissible diseases should be displayed at the entrance



# IPC in emergency care

- The emergency department is a busy place subject to rapid patient turnover and overcrowding
- Patients admitted through the emergency are sicker than those who report to the OPD
- Risk recognition and decision-making are often based on limited and changing data
- Standard precautions and appropriate PPE according to the risk is must for all HCW/staff

# IPC in dialysis unit

- Stringent standard precautions including hand hygiene and environmental cleaning
- Respiratory hygiene/etiquette
- Patient and staff should be vaccinated for Hepatitis B. and national immunization program
- Reuse and reprocessing of dialyzer set must follow all applicable standards
- IPC bundles for central line insertion and maintenance

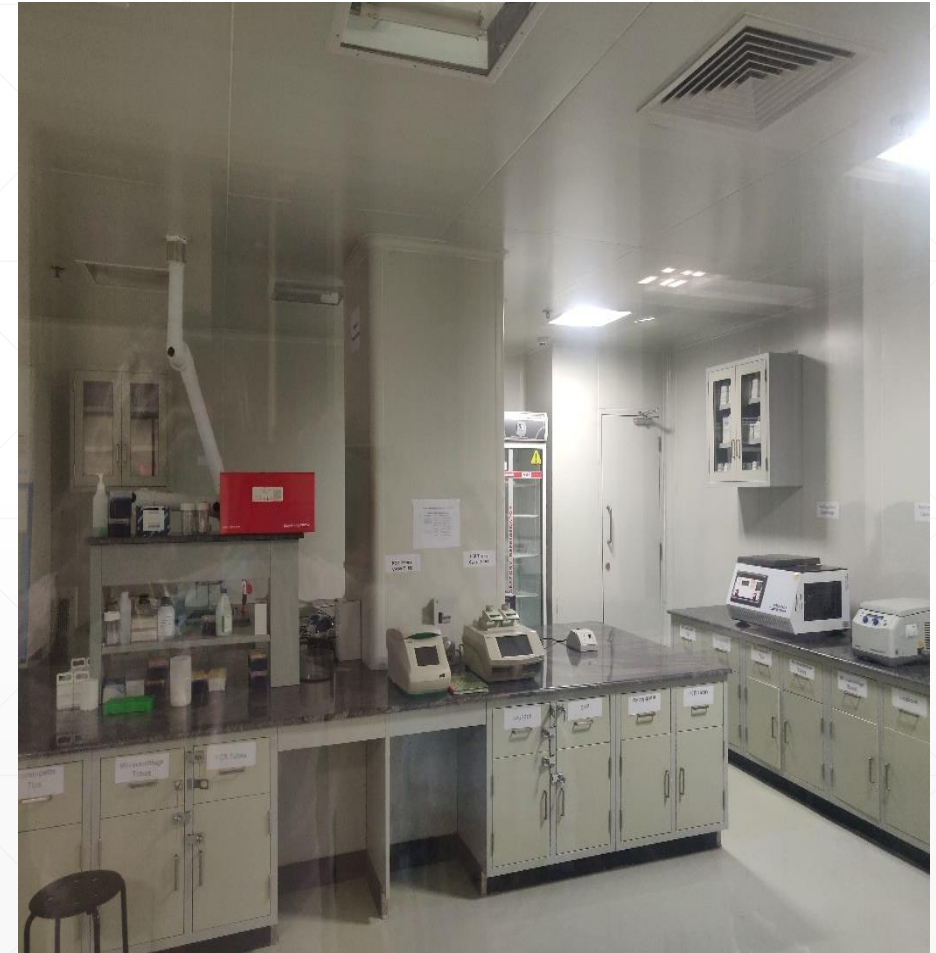
**Care of patients with HCV and HIV requires strict adherence to environmental IPC practices including equipment disinfection**

# IPC in Immunocompromised patients

- Transplant recipients are at increased risk of HAIs
- Meticulous adherence to IPC practices is an essential requirement for the transplant unit
- Protective isolation and use of appropriate PPE for regular patient may be needed
- The range of organisms that can cause infection is very broad and the infection can progress rapidly
- The recognition of infection in immunocompromised patients particularly transplant recipients is a challenge as the signs and symptoms of infection are suppressed and may even be absent
- Moreover, fever may be caused by non-infectious conditions such as graft rejection, reaction to drugs which makes the diagnosis of infection difficult

# IPC in the clinical laboratory

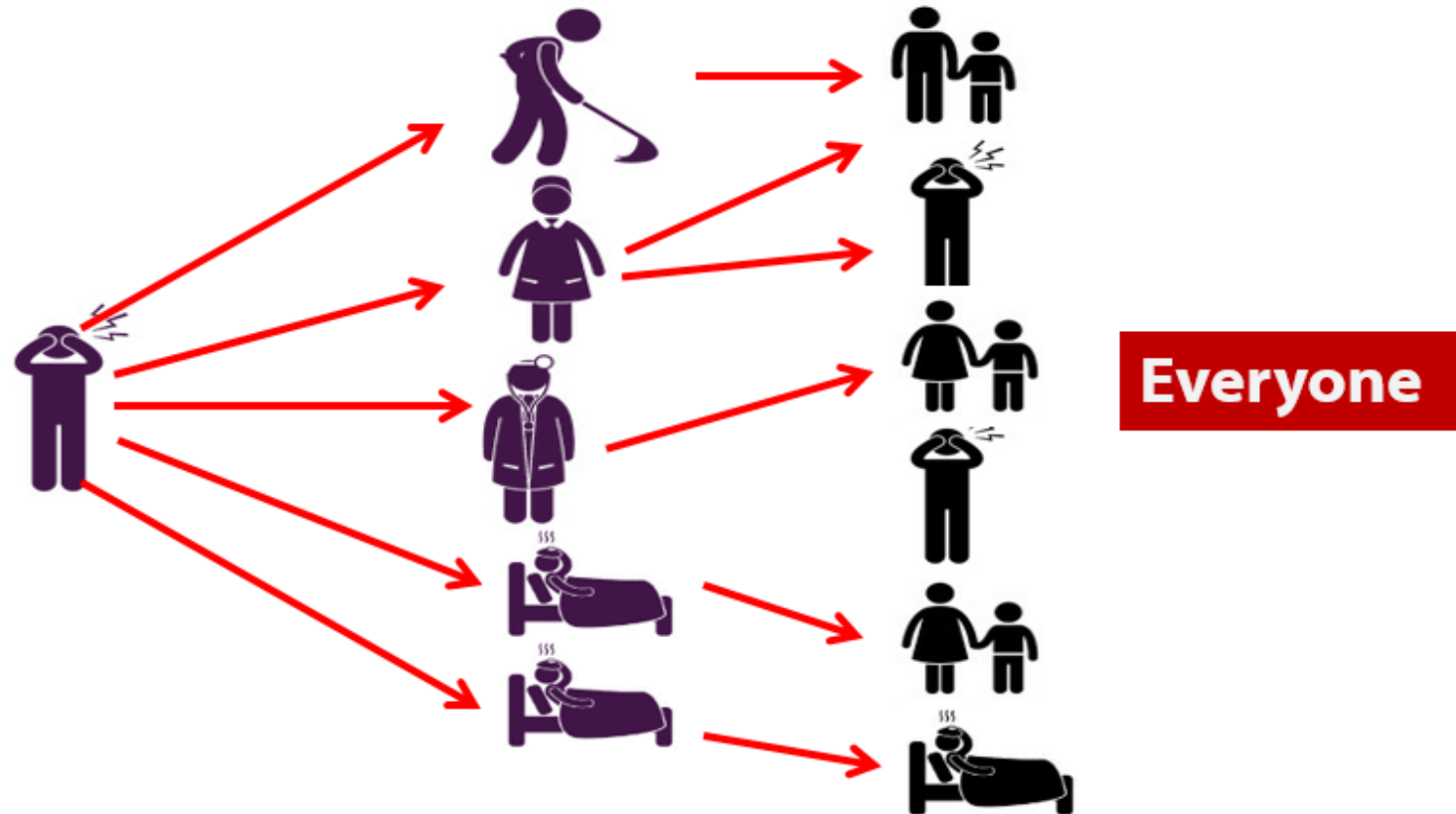
- Laboratory design and facilities
- Good laboratory practices (GLP)
- Biosafety and biosecurity
- Laboratory dress code and good personal habits
- General laboratory safety practices
- Proper risk assessment
- Good housekeeping practices in laboratories





# IPC Practices in HCFs during Epidemics/Pandemics

# Who is at risk in HCF during Epidemics/ Pandemics



# IPC during epidemics/pandemics

- HCFs play a critical role in national and local responses to emergencies
- HCF may amplify an epidemic by spreading the infection to patients, staff and visitors
- Appropriate measures should be taken to prevent the spread of infection to hospital staff, patients and visitors
- HICC and the hospital management should review and, if required, revise the hospital's IPC protocols
- Additional prevention and control measures may be required to cope with the specific nature of an epidemic (see Annex 2)
- Develop pandemic/emergency preparedness plan

# IPC risk communication during epidemics/pandemics

- Information issued by the hospital regarding risk reduction should be consistent with the information provided by health authorities
- Develop a risk communication policy
- Information about the epidemic and the risks should be communicated to all staff as soon as an alert of an impending emergency has been declared

# Summary

- Infection Prevention and Control in
  - Surgical units
  - ICUs
  - Maternal and neonatal units
  - OPD and emergency care
  - Dialysis units
  - Immunocompromised patients
  - Clinical laboratory
- HCFs during epidemics/pandemics



# Questions?