Infection Control

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Outline

- Hospital Acquired Infections (HAI)
- Hand Hygiene (HH)
- Isolation Precautions
- Others

Hospital Acquired Infections (HAI)

- At any time, over 1.4 million people worldwide are suffering from infections acquired in hospital
- Between 5% and d10% of patients admitted to hospitals acquire one or more infections
- **Causes more serious illness**
- Prolong hospital stay
- Long-term disability
- High additional financial burden
- High personal burden on patients and their families
- Deaths

Most frequent sites of infection and their risk factors

URINARY TRACT INFECTIONS — **34%**

Urinary catheter
Urinary invasive procedures
Advanced age
Severe underlying disease
Urolitiasis
Pregnancy
Diabetes

13% — **LOWER RESPIRATORY TRACT INFECTIONS**

Mechanical ventilation
Aspiration
Nasogastric tube
Central nervous system depressants
Antibiotics and anti-acids
Prolonged health-care facilities stay
Malnutrition
Advanced age
Surgery
Immunodeficiency

Most common sites of health care-associated infection and the risk factors underlying the occurrence of infections

LACK OF HAND HYGIENE

SURGICAL SITE INFECTIONS

Inadequate antibiotic prophylaxis
Incorrect surgical skin preparation
Inappropriate wound care
Surgical intervention duration
Type of wound
Poor surgical asepsis
Diabetes
Nutritional state
Immunodeficiency
Lack of training and supervision

17%

BLOOD INFECTIONS

Vascular catheter
Neonatal age
Critical care
Severe underlying disease
Neutropenia
Immunodeficiency
New invasive technologies
Lack of training and supervision

14%

Prevention of HAI

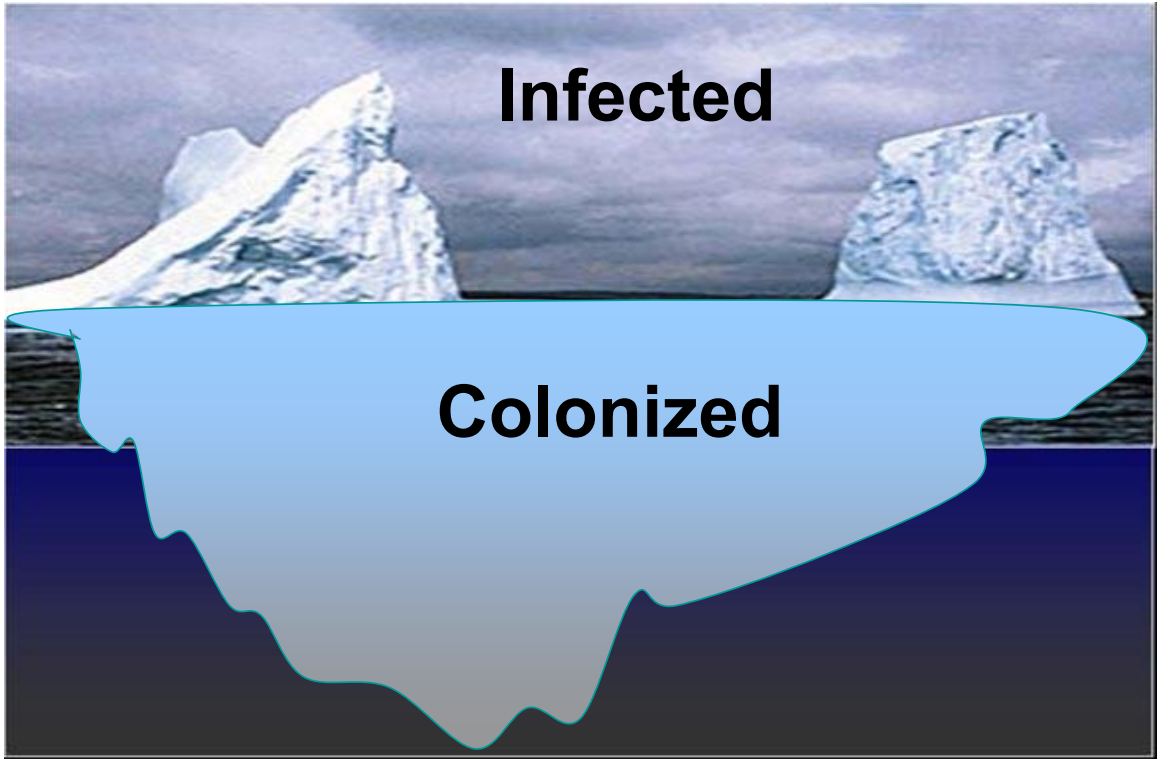
- Validated and standardized prevention strategies have been shown to reduce HAI
- At least 50% HAI could be prevented
- Most solutions are simple and not resource-demanding and can be implemented
- Hand hygiene, bundles

Colonization Versus Infection

- People who carry bacteria without evidence of infection (fever, increased WBC) are colonized
- If an infection develops, it is usually from bacteria that colonize patients
- Bacteria that colonize patients can be transmitted form one patient to another by hands of healthcare workers

Bacteria can be transmitted even if the patient is not infected.

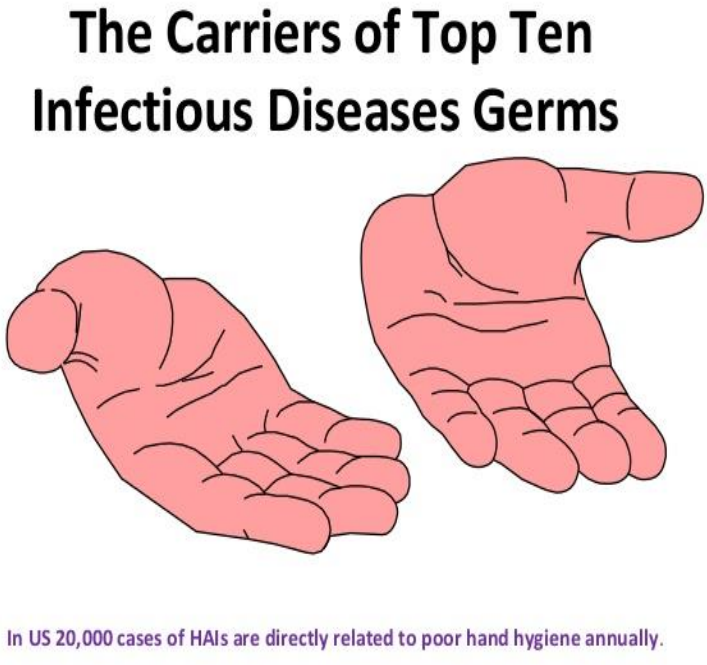
The Iceberg Effect



The inanimate environment can facilitate transmission

Hand transmission

- Hands are the most common vehicle to transmit healthcare associated pathogens
- Transmission of microbiological organisms from one patient to another via healthcare worker's hands



Why should you clean your hands

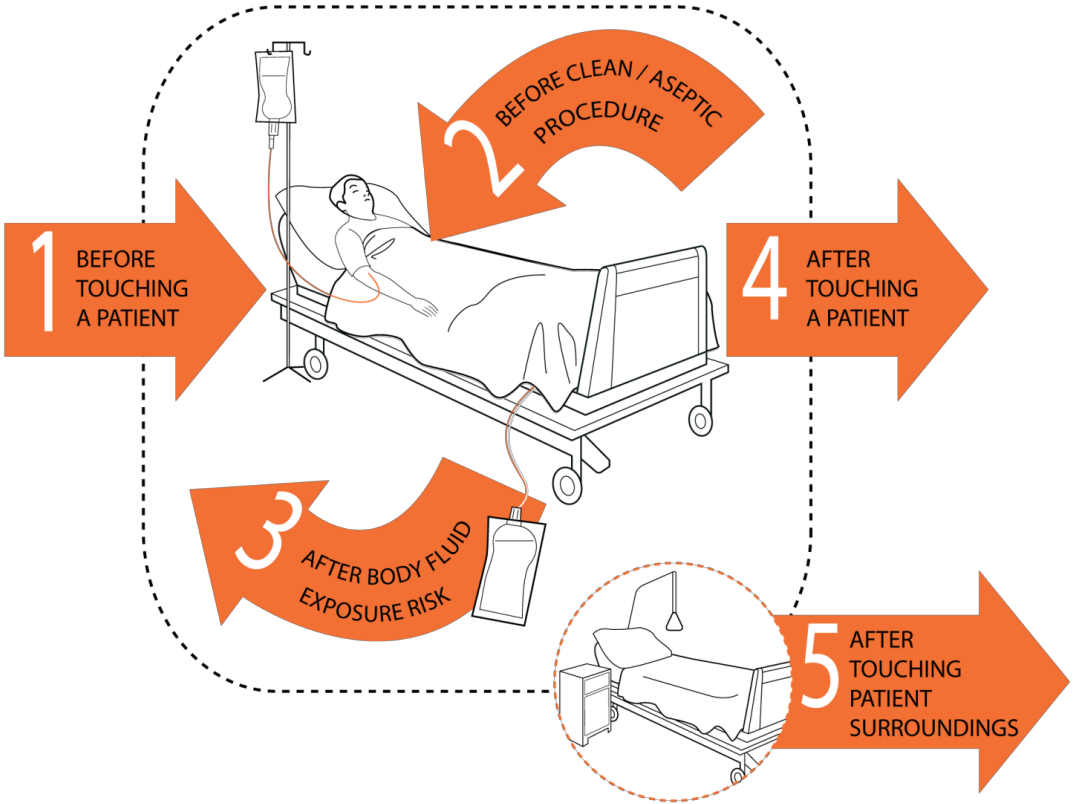
- Any HCW involved in health care needs to be concerned about hand hygiene
- Other HCW hand hygiene concerns you as well
- You must perform hand hygiene to :

  - protect the patient against harmful microbes in your hands or present on your skin

  - protect yourself and the healthcare environment from harmful microbes

FIVE MOMENTS OF HAND HYGIENE

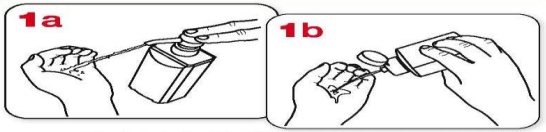
5 Moments of Hand hygiene



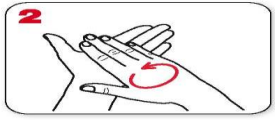
How to clean your hands

- Handrubbing with alcohol-based handrub is the preferred routine method of hand hygiene if hands are not visibly soiled
- Handwashing with soap and water – essential when hands are visibly dirty or visibly soiled (following exposure to body fluids)

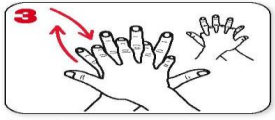
How to handrub?
WITH ALCOHOL-BASED FORMULATION



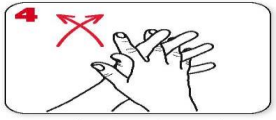
Apply a palmful of the product in a cupped hand and cover all surfaces.



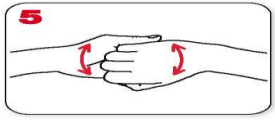
Rub hands palm to palm



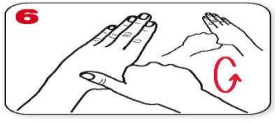
right palm over left dorsum with interlaced fingers and vice versa



palm to palm with fingers interlaced



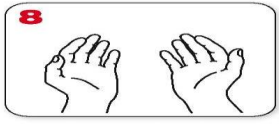
backs of fingers to opposing palms with fingers interlocked



rotational rubbing of left thumb clasped in right palm and vice versa

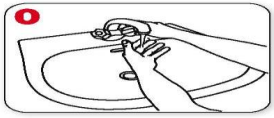
rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa

20-30 sec

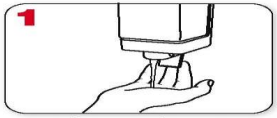


...once dry, your hands are safe.

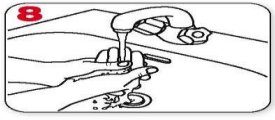
How to handwash?
WITH SOAP AND WATER



Wet hands with water

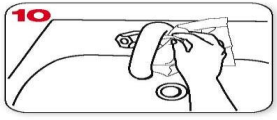


apply enough soap to cover all hand surfaces.



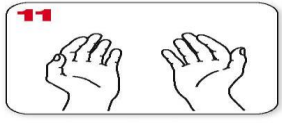
rinse hands with water

dry thoroughly with a single use towel



use towel to turn off faucet

40-60 sec



...and your hands are safe.

WHO acknowledges the Hôpitaux Universitaires de Genève (HUG), in particular the members of the Infection Control Programme, for their active participation in developing this material.

World Health Organization

October 2006, version 1.

Hand hygiene and glove use

- The use of gloves does not replace the need to clean the hands
- Remove gloves to perform Hand hygiene, when an indication occurs while wearing gloves
- Wear gloves only when indicated, otherwise they become a major risk for germ transmission

ISOLATION PRECAUTIONS

Mode of transmission

- A microorganism may be spread by a single or multiple routes.
  - Contact, direct or indirect
  - Droplet
  - Airborne
  - Vector-borne (usually arthropod) and
  - Common environmental sources or vehicles - includes food-borne and waterborne, medications e.g., contaminated IV fluids

Types of Isolation Precautions

- Standard precautions
- Transmission-based precautions
  - Contact precautions
  - Airborne precautions
  - Droplet precautions

TRANSMISSION-BASED PRECAUTIONS - Contact Precautions

- Infections spread by direct or indirect contact with patients or patient-care environment –C. difficle, MRSA, VRE, ESBL, CRE and MDR GNR
- Limit patient movement
- Private/SINGLE room or cohort with patients with same infection
- Wear disposable gown and gloves when entering the patient room
- Remove and discard used gown and gloves inside the patient room
- Wash hands immediately after leaving the patient room
- Use dedicated equipment if possible (e.g., stethoscope)

Contact precautions signs

CONTACT PRECAUTIONS

STOP ALTO

Visitors must report to Nursing Station before entering.


☑ Perform hand hygiene before entering and before leaving room.


☑ Wear gloves when entering room or cubicle, and when touching patient's intact skin, surfaces, or articles in close proximity


☑ Wear gown when entering room or cubicle and whenever anticipating that clothing will touch patient items or potentially contaminated environmental surfaces.


☑ Use patient-dedicated or single-use disposable shared equipment or clean and disinfect shared equipment (BP cuff, thermometers) between patients.

PRECAUCIONES DE CONTACTO

Los visitantes deben presentarse primero al puesto de enfermeria antes de entrar. Lávese las manos. Póngase guantes al entrar al cuarto.

CONTACT PRECAUTIONS

To prevent the spread of infection,

ANYONE* ENTERING THIS ROOM MUST WEAR:


Gloves ✓


Gown ✓

Applies whether or not contact with the patient or the patient's environment is anticipated.

***Patient visitors do not need to wear gloves and a gown, but must wash hands upon entering and leaving this room.**

Questions? Please call the Department of Infection Control & Prevention at 936-0725

Vanderbilt Infection Control and Prevention

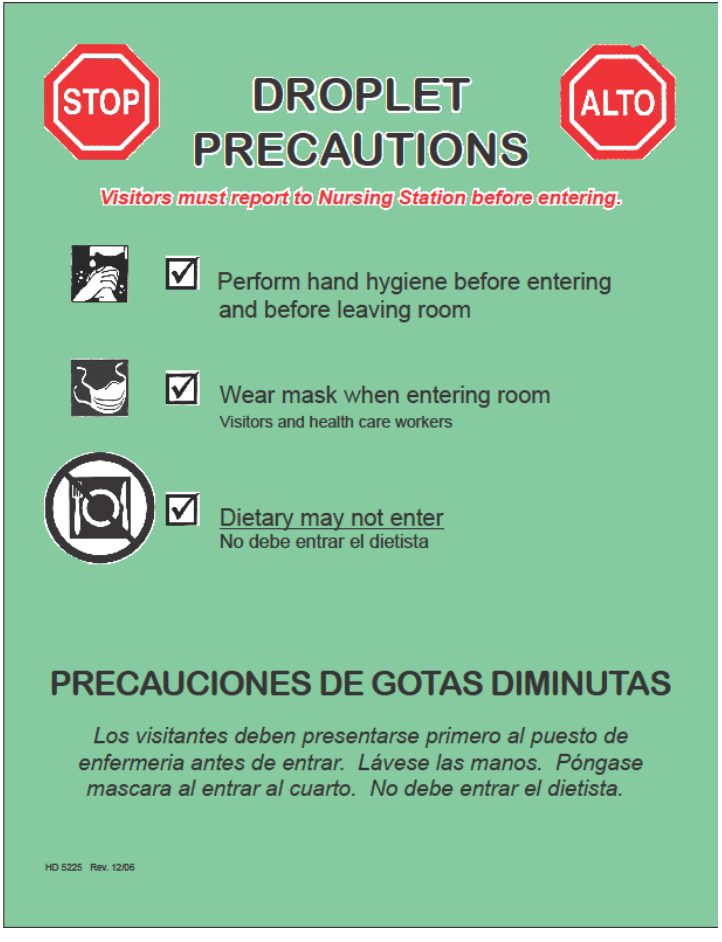
Droplet Precautions

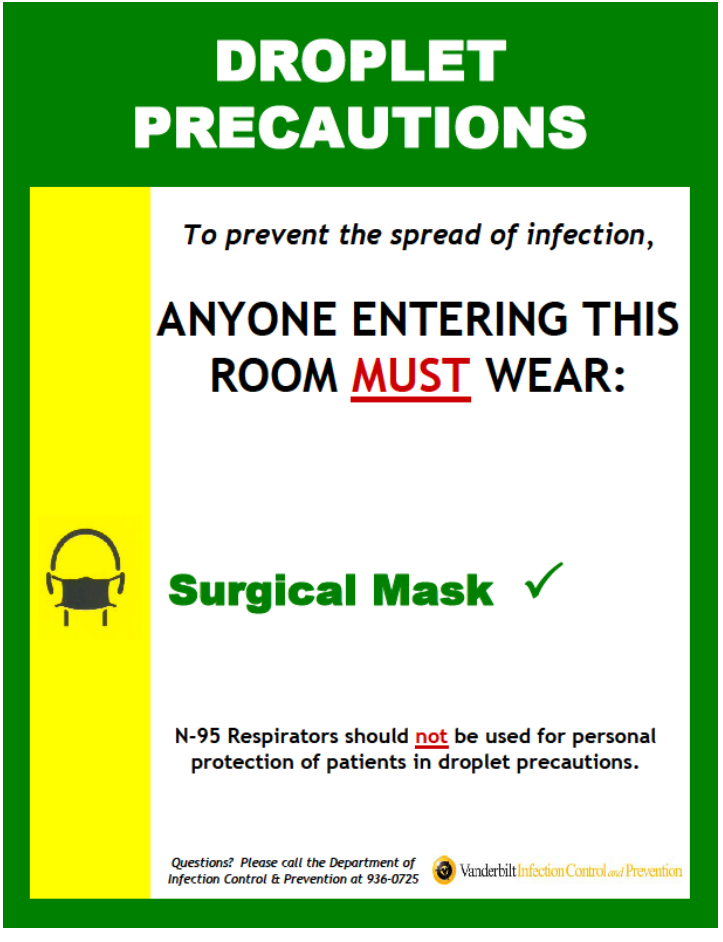
- ✖ Reduce the risk of transmission by large particle droplets (larger than 5 μ in size).
- ✖ Requires close contact between the source person and the recipient
- ✖ Droplets usually travel 3 feet or less
- ✖ E.g., influenza, MERS-CoV, other respiratory viruses, rubella, parvovirus B19, mumps, *H. influenzae*, and *N. meningitidis*

Droplet Precautions cont.

- A private/single room or
- Cohort with patient with active infection with same microorganism
- Use a mask when entering the room especially within 3 feet of patient
- Limit movement and transport of the patient. Use a mask on the patient if they need to be moved and follow respiratory hygiene/cough etiquette

Droplet precautions signs

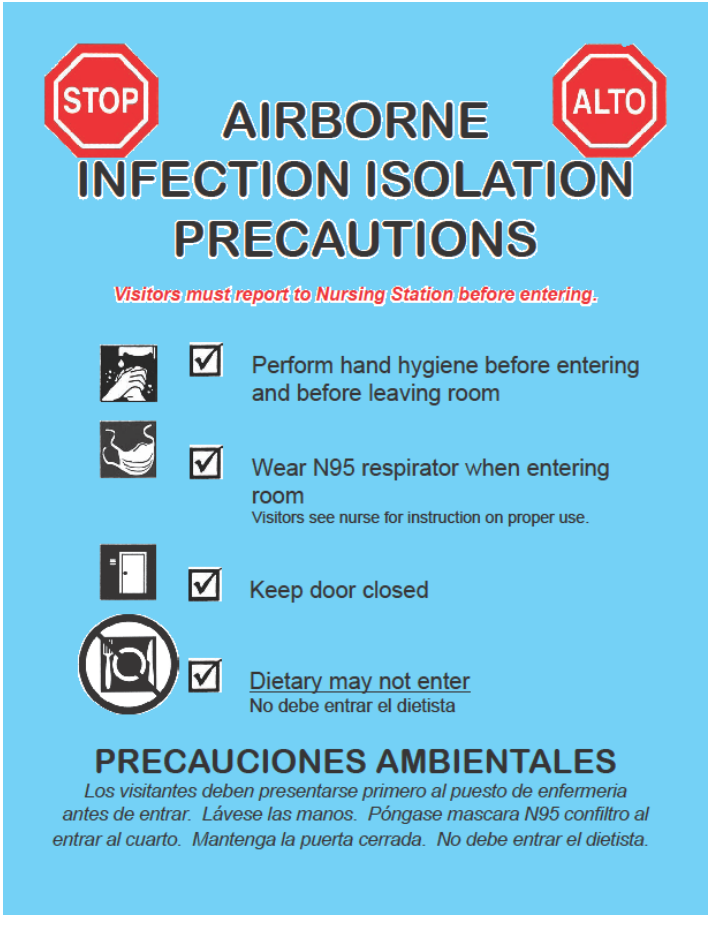


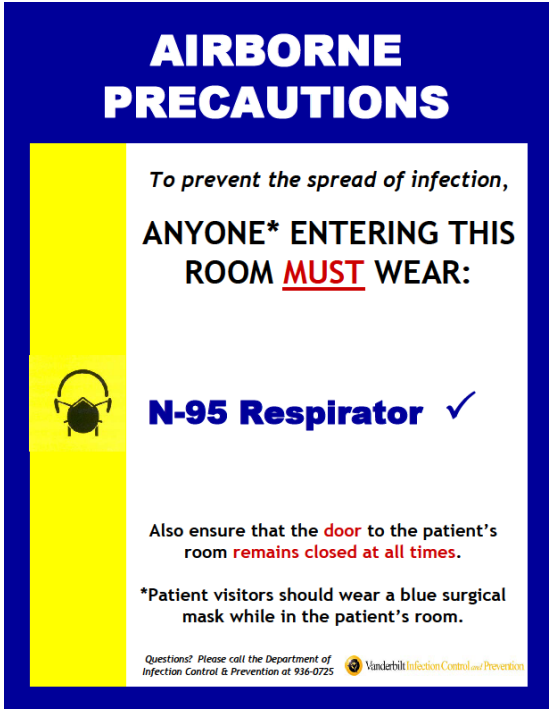


Airborne Precautions

- ✖ Tuberculosis, measles, varicella, MERS-CoV (severe)
- ✖ Place the patient in an airborne infection isolation room (AIIR)
- ✖ Pressure should be monitored with visible indicator
- ✖ Use of respiratory protection (e.g., fit tested N95 respirator) or powered air-purifying respirator (PAPR) when entering the room
- ✖ Limit movement and transport of the patient. Use a mask on the patient if they need to be moved
- ✖ Keep patient room door closed.

Airborne precautions signs





Safe injection practices

- Safe needle practice
- Reporting of needle stick and sharp injuries to infection control department

Serologies and Vaccination

- HBSAB titre (above 10)
- VZV
- MMR
- Td
- Seasonal Influenza Vaccine