



8. Infection Prevention And Control


Objectives:

- List The Modes Of Infection Transmission In Health-care Settings
- Explain Main Causes And Types Of Health Care-associated Infection (HCAI)
- Identify The Potential Social, Economic And Emotional Burden Of HCAI On Patients
- Describe The Main Principles And Methods For HCAI Prevention And Control
- Demonstrate Hand Wash Technique As An Infection Control Measure
- Explain What To Do If Exposed To Blood Or Other Bodily Fluids

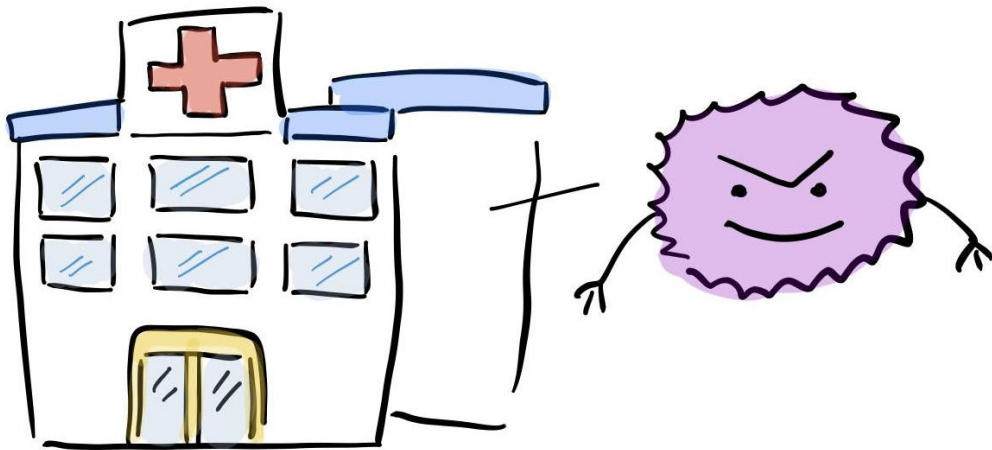
Important | **Doctors' notes** | **Extra** | **New terminology**

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Health-Care Associated infections



HAND WASH TECHNIQUE



Focus On Definitions, Reasons & Classifications

For This Lecture: The Questions Will come From The Handout.

1. List The Modes Of Infection Transmission In Health-care Settings

From The Handout

Health Care-associated Infection (HCAI) Definition

- An infection acquired in a hospital by a patient who was admitted for a reason other than that infection and/or an infection occurring in a patient in a hospital or other facility in whom the infection was not (latently) present at admission.

Modes Of Infection Transmission In Health-care Setting

HCAIs are caused by bacteria, viruses and fungi from human or environmental sources.

Transmission through direct contact	Indirect transmission	Droplet transmission	Airborne transmission	Percutaneous exposure
<ul style="list-style-type: none">• Person-to-person transmission can occur when microbes present in blood or other bodily fluids of a patient are transmitted to a health-care worker (or vice versa) through contact with a mucous membrane or breaks (cuts, abrasions) in the skin.	<ul style="list-style-type: none">• Infections can be transmitted indirectly through devices such as thermometers, stethoscopes, other inadequately decontaminated equipment, medical devices or toys, which health-care workers pass from one patient to another. (probably the most common mode in health-care settings)	<ul style="list-style-type: none">• Respiratory droplets carrying pathogens are generated when an infected person coughs, sneezes, or talks, as well as during procedures such as suctioning or intubation.	<ul style="list-style-type: none">• Occurs through the dissemination of either airborne droplet nuclei (particles arising from desiccation of suspended droplets) or small particles in the respirable-size range containing infectious agents that remain infective over time and distance (e.g. spores of <i>Aspergillus</i> spp. and <i>Mycobacterium tuberculosis</i>).	<ul style="list-style-type: none">• Occurs through contaminated sharps.

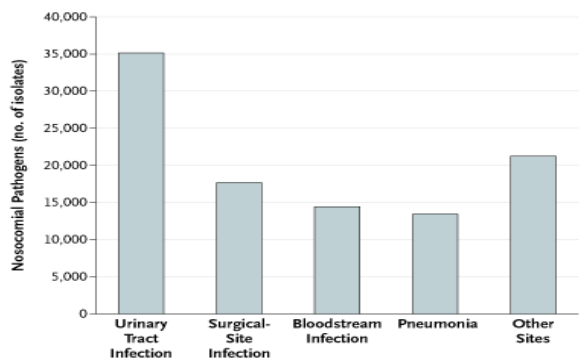
2. Explain Main Causes And Types Of Health Care- Associated Infection (HCAI)

Main Causes Of Infection

- Person-to-person via hands of health-care providers, patients and visitors
- Personal equipment (e.g. stethoscopes, personal digital assistants) and clothing
- Airborne transmission
- Rare common-source outbreaks
- Environmental contamination
- Device contamination (e.g. catheters)
- Hospital staff carriers

Main Types Of Infections

- Urinary tract infections usually associated with catheters
- Blood stream infections associated with the use of an intravascular device
- Surgical infections
- Pneumonia associated with ventilators
- Other sites



3. Identify the potential social, economic and emotional burden of HCAI on patients

What Is The Urgency?

- Can no longer rely on antibiotics
- Increased rates of nosocomial infections
- Infected patients:
 - Stay longer in hospital → Economical burden
 - Die
 - Are treated with more toxic and less effective drugs
 - Are prone to surgical site infections

Global Response: Campaigns To Decrease Infection Rates

- WHO “SAVE LIVES: Clean Your Hands” campaign
- Centers for Disease Control and Prevention campaign to prevent antimicrobial resistance in health-care settings
- Institute for Healthcare Improvement “5 million lives” campaign

The economic burden

From The Handout

The costs associated with treating patients suffering from HCAI are significant. Longer hospital stays and the need for a higher level of care add to health-care budgets, as well as the economic burden borne by patients and families.

4. Describe The Main Principles And Methods For HCAI Prevention And Control

From The Handout

Precautions

Two levels of precautions:

- **Standard precautions:**

Can be applied to all patients in all health-care settings, regardless of a suspected or confirmed infectious agent. These precautions constitute the primary strategy for infection prevention. They are based on the principle that all blood and other bodily fluids, secretions and excretions, excluding perspiration, may contain transmissible infectious agents. These precautions include: hand hygiene, the wearing of gloves, a gown, a mask, eye protection or a face shield, depending on the anticipated exposure; and safe injection practices.

- **Transmission-based precautions:**

Should be used when treating patients who are known or suspected of being infected or colonized with infectious agents. Precautions are applied according to the clinical syndrome and the likely etiologic agents, and then modified based on test results. There are three categories: contact precautions; droplet precautions; and airborne precautions.

4. Describe The Main Principles And Methods For HCAI Prevention And Control

Priority areas :

1. Environmental Cleanliness

- The environment:
 - Visibly clean
 - Increased cleaning during outbreaks
 - Use hypochlorite and detergents during outbreaks

Environmental cleanliness in the hospital is essential for minimizing infections. The choice of disinfecting agents will depend on many factors and each facility should have existing policies and procedures on these issues

From The Handout

2. Sterilization/disinfection of equipment, devices and instruments

Equipment, devices and instruments must be sterilized/disinfected, strictly following recommendations.

3. Medical devices labelled “for single use”

Devices labelled “for single use” are designed by manufacturers with the intention of not being reused. For example, single-use injection syringes should never be re-used because the risk of infection is very high. Sterile, single-use injection devices include sterile hypodermic syringes, sterile hypodermic needles, auto-disable syringes for immunization purpose, syringes with a reuse prevention feature for general purpose, and syringes with needle stick prevention features (e.g. safety syringes) for general purposes.

From The Handout

4. Describe The Main Principles And Methods For HCAI Prevention And Control

4. Personal Protective Equipment

GLOVES

From The Handout

The WHO Glove Use Information Leaflet recommends the following behaviours:

- * the use of gloves does not replace the need for hand hygiene by either hand rubbing or hand washing;
- * wear gloves when it can be reasonably anticipated that contact with blood or other potentially infectious materials, mucous membranes, or non-intact skin will occur;
- * remove gloves after caring for a patient. Do not wear the same pair of gloves for the care of more than one patient;
- * when wearing gloves, change or remove gloves during patient care if moving from a contaminated body site to either another body site (including non-intact skin, mucous membrane or medical device) within the same patient or the environment;
- * the reuse of gloves is not recommended. In the case of glove reuse, implement the safest reprocessing method.

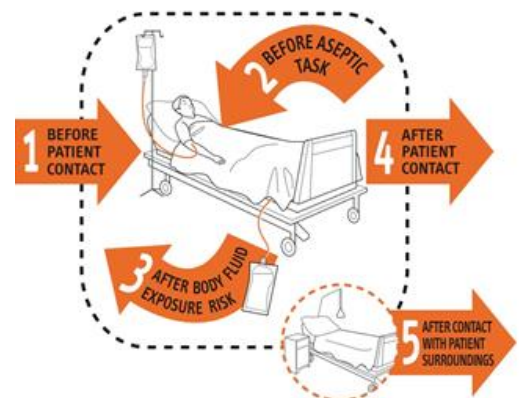
GOWNS

FACE MASK

Gowns prevent contamination of clothing with blood, bodily fluids and other potentially infectious material. Guidelines suggest that health-care providers should:

- * wear disposable plastic aprons when in close contact with patients, material or equipment, or when at risk of contamination;
- * dispose of plastic aprons after each procedure. Non-disposable protective clothing should be sent for laundering;
- * wear full-body, fluid-repellent gowns when there is a risk of extensive splashing of blood, bodily fluids, secretions or excretions, with the exception of perspiration;
- * face masks and eye protection should be worn when there is a risk of blood, bodily fluids, secretions and/or excretions splashing into the face and eyes.

5. Hand Hygiene To Minimize Spread Of Infection



5. Demonstrate hand wash technique as an infection control measure

WHO's 'My 5 Moments for Hand

Hygiene':

1. Before Touching a Patient
2. Before Clean/Aseptic Procedure
3. After Body Fluid Exposure Risk
4. After Touching a Patient
5. After Touching Patient Surroundings

Hand washing or Hand rubbing?

- Routine situation → Rub
- Spores/C. difficile → Wash
- Visibly soiled → Wash

Technique:

- Duration: Washing: 40-60 sec.
Rubbing: 20-30 sec.
- Fingernails should be cut short & Jewelry removed

Hand rubbing or hand washing

Hand rubbing with an alcohol-based hand rub is the preferred method in most routine clinical situations, because alcohol acts more quickly than soaps, to inactivate microorganisms, its effect lasts longer and the cleaning procedure takes less time to perform. On repeated use in health-care settings, drying and scaling of skin are less severe if correct formulations of hand rubs are used. Hand rubbing is more easily done at the point of care since it is not dependent on the availability of clean water and soap. There are specific situations in which hand washing is recommended, however.

From The Handout

WHO Guidelines on Hand Hygiene in Health Care

The recommendations in the WHO Guidelines on Hand Hygiene in Health Care are:

- * before routine clinical work begins, remove all wrist and hand jewellery and cover cuts and abrasions with waterproof dressings;
- * fingernails should be kept short and false nails should not be worn;
- * wash hands with soap and water whenever they are visibly dirty or visibly soiled with blood or other bodily fluids and after using the toilet;
- * when exposure to potential spore-forming pathogens is suspected/proven, and during outbreaks of Clostridium difficile, hand washing with soap and water is preferred;
- * use an alcohol-based hand rub as the preferred means for routine hand antisepsis when hands are not visibly soiled;
- * if an alcohol-based hand rub is not available, wash hands with soap and water.

6. Explain What To Do If Exposed To Blood Or Other Bodily Fluids

6. The safe use and disposal of sharps

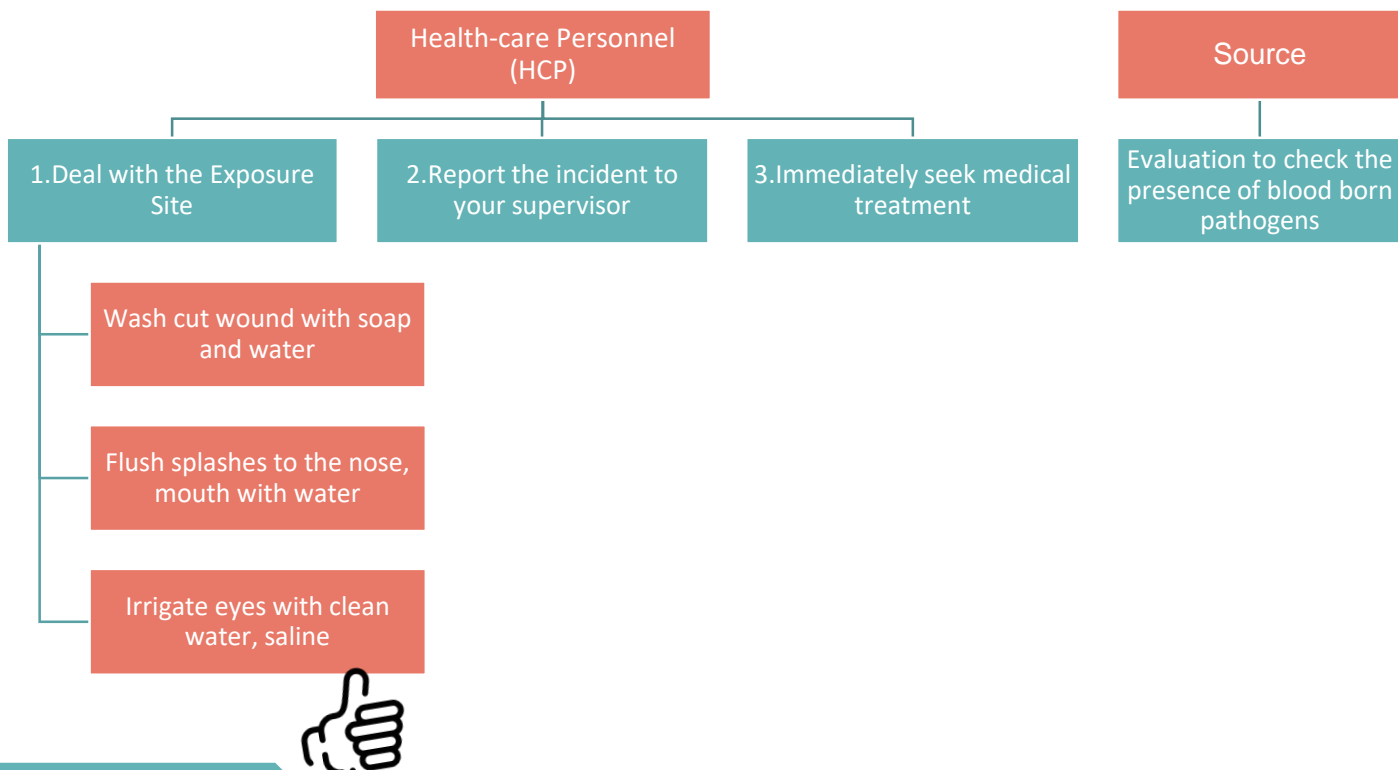
From The Handout

Health-care providers should be aware of the significant problem of needle-stick injuries. The use of the following practices is recommended to avoid these injuries:

- * keep handling of sharps to a minimum;
- * do not recap, bend or break needles after use;
- * discard each needle directly into a sharps container at the point of use immediately after use;
- * do not overload a sharps bin if full;
- * do not leave a sharps bin where children can reach it;
- * needles collected from patients should be placed in a sharps container inside a safe box to minimize the risk to community pharmacists;
- * always report injuries from needles in line with local policy.

Exposure

- A percutaneous injury or contact of mucous membrane or non-intact skin with blood ,tissue and body fluids Human bites
- saliva, sputum, sweat, tears, and vomitus are not considered potentially infectious unless they contain blood.



HCAI

Method of infection	* Transmission through direct contact : (Person-to-person) bodily fluids contact with a mucous membrane or breaks.
	* Indirect transmission : devices and other decontaminated equipment (most common)
	* Droplet transmission : Respiratory droplets carrying pathogens (coughing, sneezing, talking , suctioning or intubation.
	* Airborne transmission : remain infective over time and distance (e.g. spores of Aspergillums spp. and Mycobacterium tuberculosis)
	* Percutaneous exposure : through contaminated sharps.
Main Causes	1) Person-to-person via hands. 2) Personal equipment. 3) Rare common-source outbreaks. 4) Environmental contamination. 5) Device contamination 6) Hospital staff carriers
Types	*UTI → (catheter) *blood stream infections → intravascular device *pneumonia → ventilators *surgical sites
Precautions	* Standard precautions : (for all patients regardless of a suspected or confirmed infection) precautions includes : hand hygiene, the wearing of gloves, a gown, a mask, eye protection or a face shield, depending on the anticipated exposure; and safe injection practices.
	* Transmission-based precautions : (for patients who are known or suspected of being infected) precautions includes : contact precautions; droplet precautions; and airborne precautions
Principles for prevention	1. Environmental Cleanliness 2. Personal Protective Equipment 3. Safe Disposal Of Sharps 4. Sterilization/disinfection of equipment 5. Medical devices labeled “for single use” 6. Hand Hygiene To Minimize Spread Of Infection
what to do if exposed	* Health-care Personnel : 1.Deal with the Exposure Site 2.Report the incident to your supervisor 3.Immediately seek medical treatment
	* Source : Evaluation to check the presence of blood born pathogens

Questions

Q1: Define Health care-associated Infections:

An infection acquired in a hospital by a patient who was admitted for a reason other than that infection and/or an infection occurring in a patient in a hospital or other facility in whom the infection was not (latently) present at admission.

Q2: Enumerate three modes of infection transmission:

1. Airborne transmission
2. Droplet transmission
3. Indirect transmission

Q3: Enumerate two causes of infection:

1. Rare common-source outbreaks
2. Environmental contamination

Q4: Enumerate two main types of infections

1. Urinary tract infections
2. Blood stream infections

Q5: Which patients are more susceptible to HCAI?

Those with severe underlying medical conditions, those having recently undergone surgery, or those with indwelling devices

Q6: Why is it urgent to enforce Infection Control & Prevention?

- Can no longer rely on antibiotics. - Increased rates of nosocomial infections. - Longer hospital stays

Q7: What are the two levels of precautions?

- Standard precautions - Transmission-based precautions

Q8: Name three priority areas in preventing HCAI:

1. Environmental Cleanliness
2. Safe Disposal Of Sharps
3. Hand Hygiene

Q9: Enumerate three WHO moments of hand hygiene:

1. Before Touching a Patient
2. Before Clean/Aseptic Procedure
3. After Touching a Patient

Q10: What is the third step for Health-care personnel after exposure to a patient's body fluids?

- Report the incident to his supervisor

Q11: Enumerate two requirements of effective infection prevention:

- Knowledge about The extent of the problem - Knowledge about Modes of transmission in health-care settings



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References: Doctors' slides (WHO, Patient Safety Curriculum Guide) + notes.