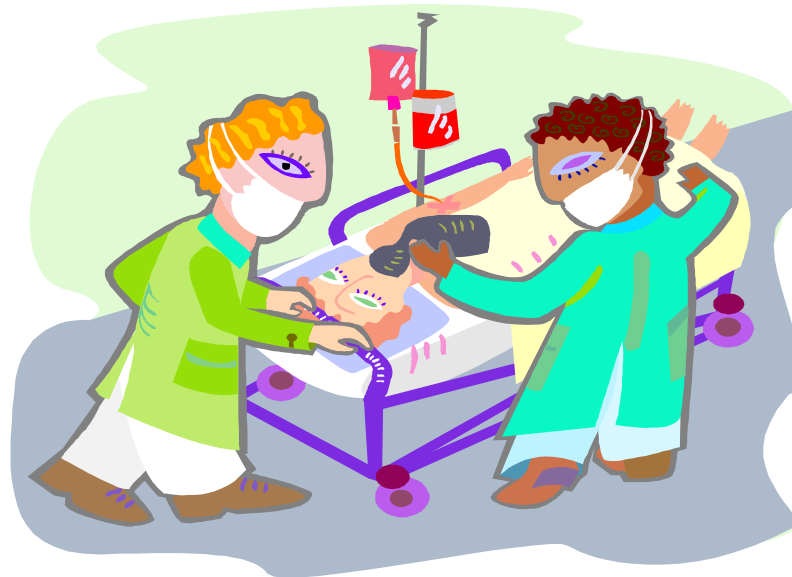
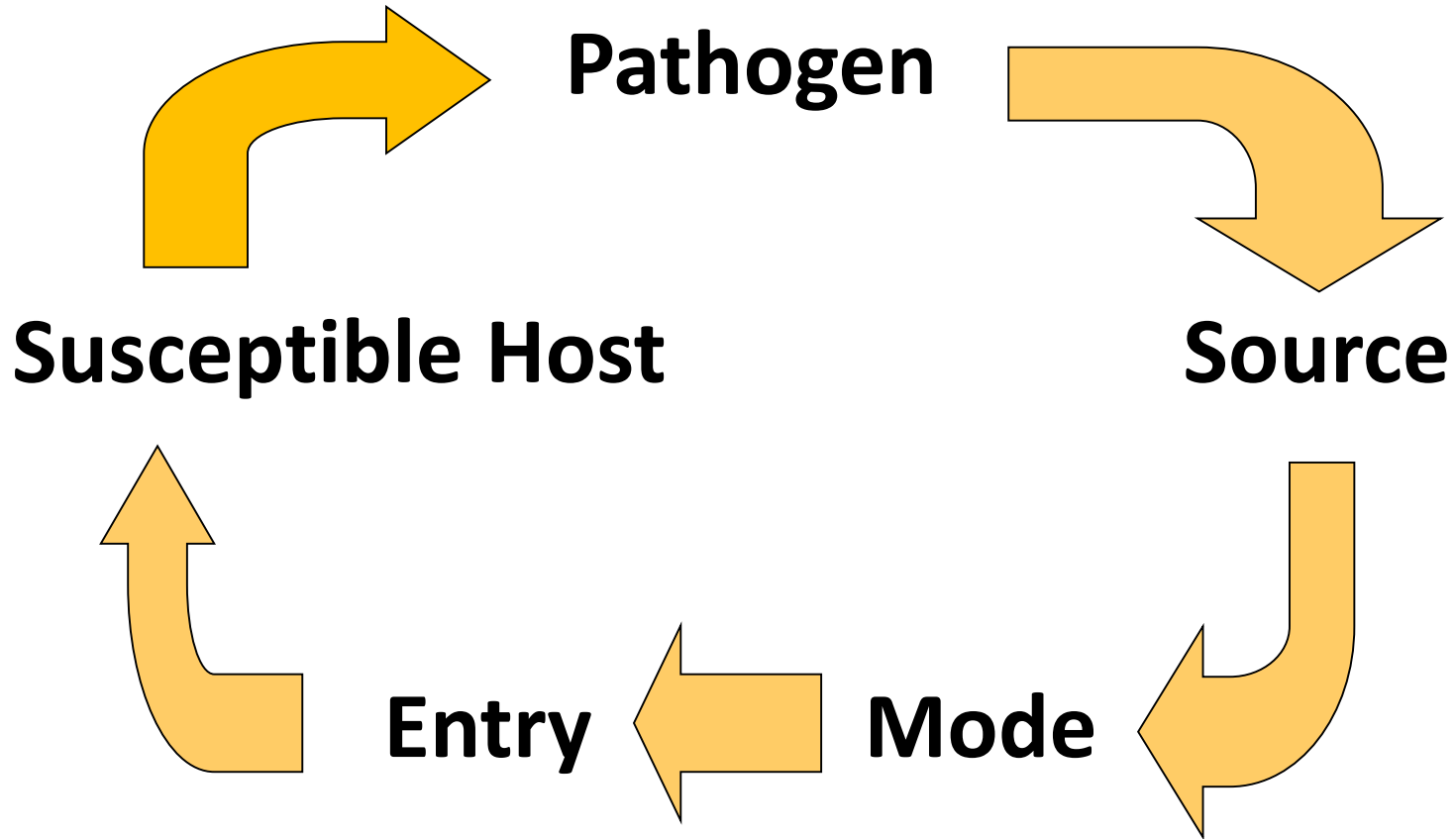


# Infection Control In Healthcare Settings

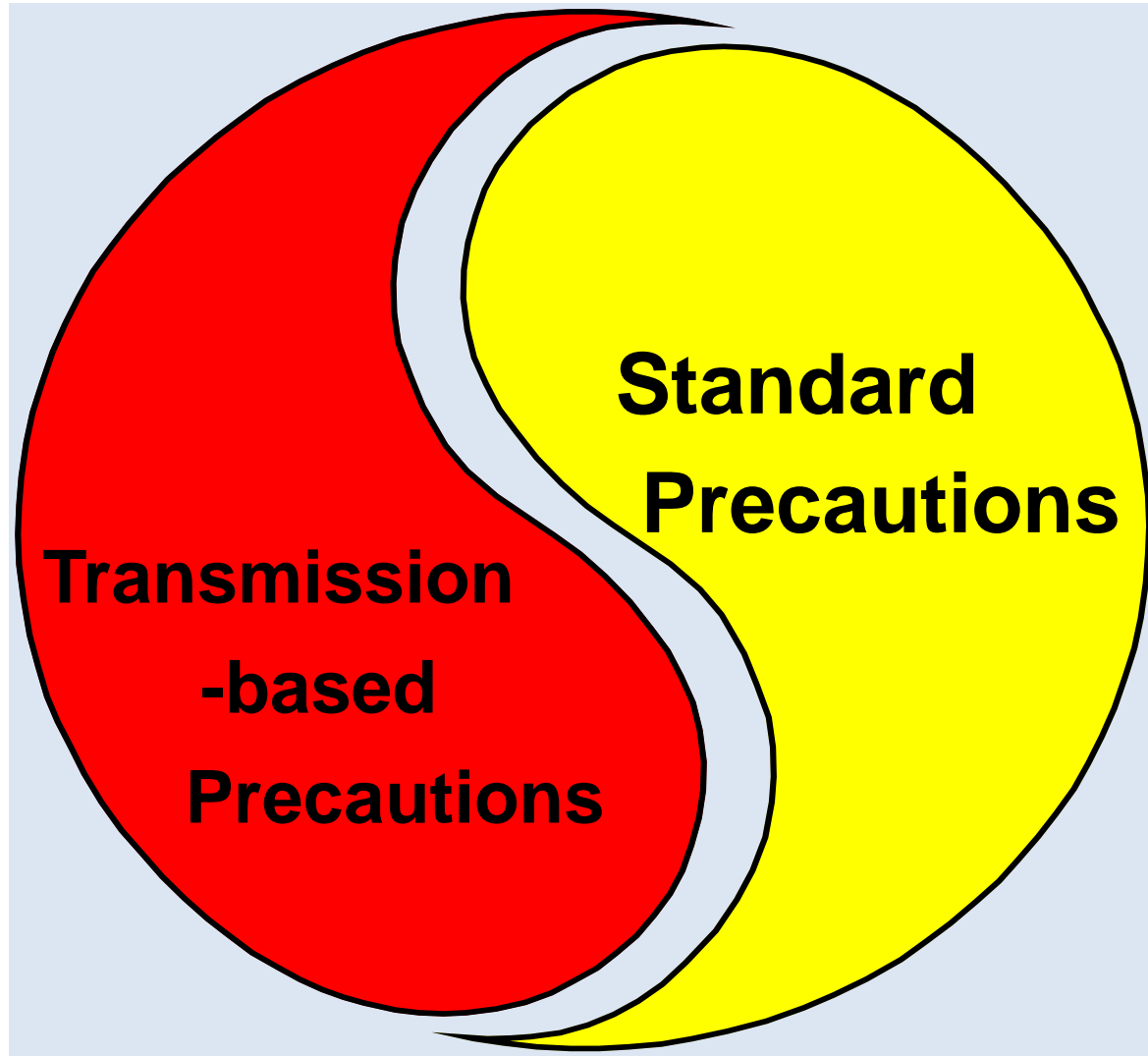
## Standard Precautions: Hand Hygiene



# Chain of Infection



# Isolation Precautions

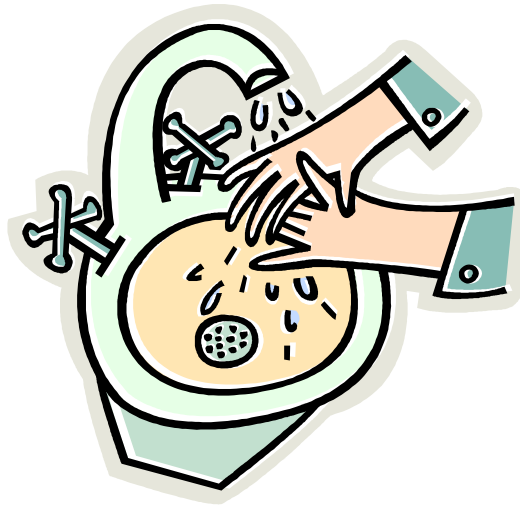


# Hand Hygiene



# Introduction

- Hands are the most common mode of pathogen transmission

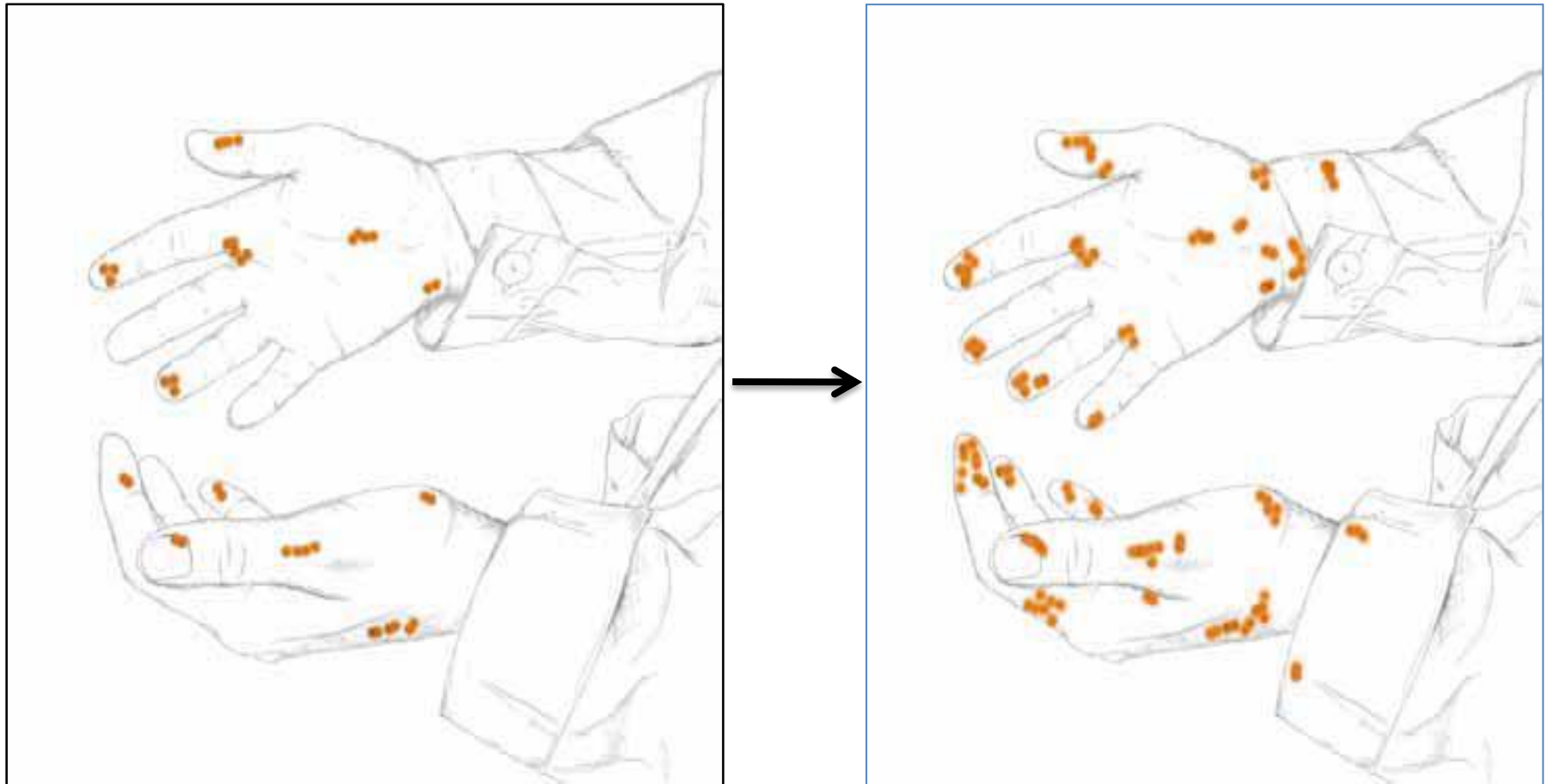


# Why Is Hand Hygiene Important?

- Hand hygiene is the most important measure in preventing the spread of infection



# Organism Survival on HCWs' Hands



# Why Is Hand Hygiene Important?

- Reduce spread of antimicrobial resistance
- Prevent health care-associated infections



## Persistence of Clinically Relevant Bacteria on Surfaces

Type of bacterium	Duration of persistence
Acinetobacter spp	3days to 5 months
Enterococcus spp.including VRE	5days-4 months
Pseudomonas aeruginosa	6hours-16 months
Staphylococcus aureus,including MRSA	7 days—7 months

# IPC - H.H

**Effective IPC measures could reduce health care-associated infections as much as by 55%.**

**Newborn survival rates could potentially increase by 44% when hand washing and clean birthing kits are in place.**

# H.H & IPC Core Components



**Hand hygiene at the heart of  
the core components  
for effective IPC programs.**



# Question 1

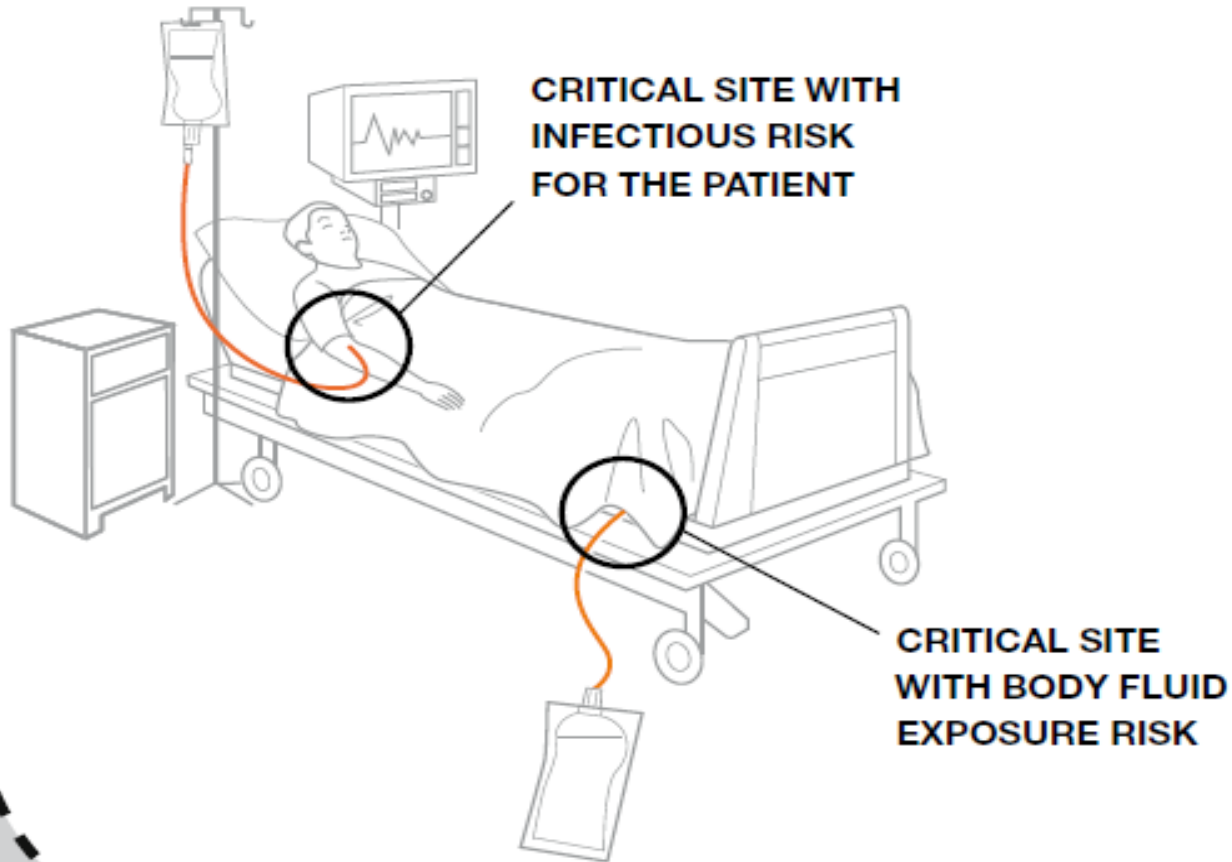
**When do you wash/rub  
your hands?**





World Health  
Organization

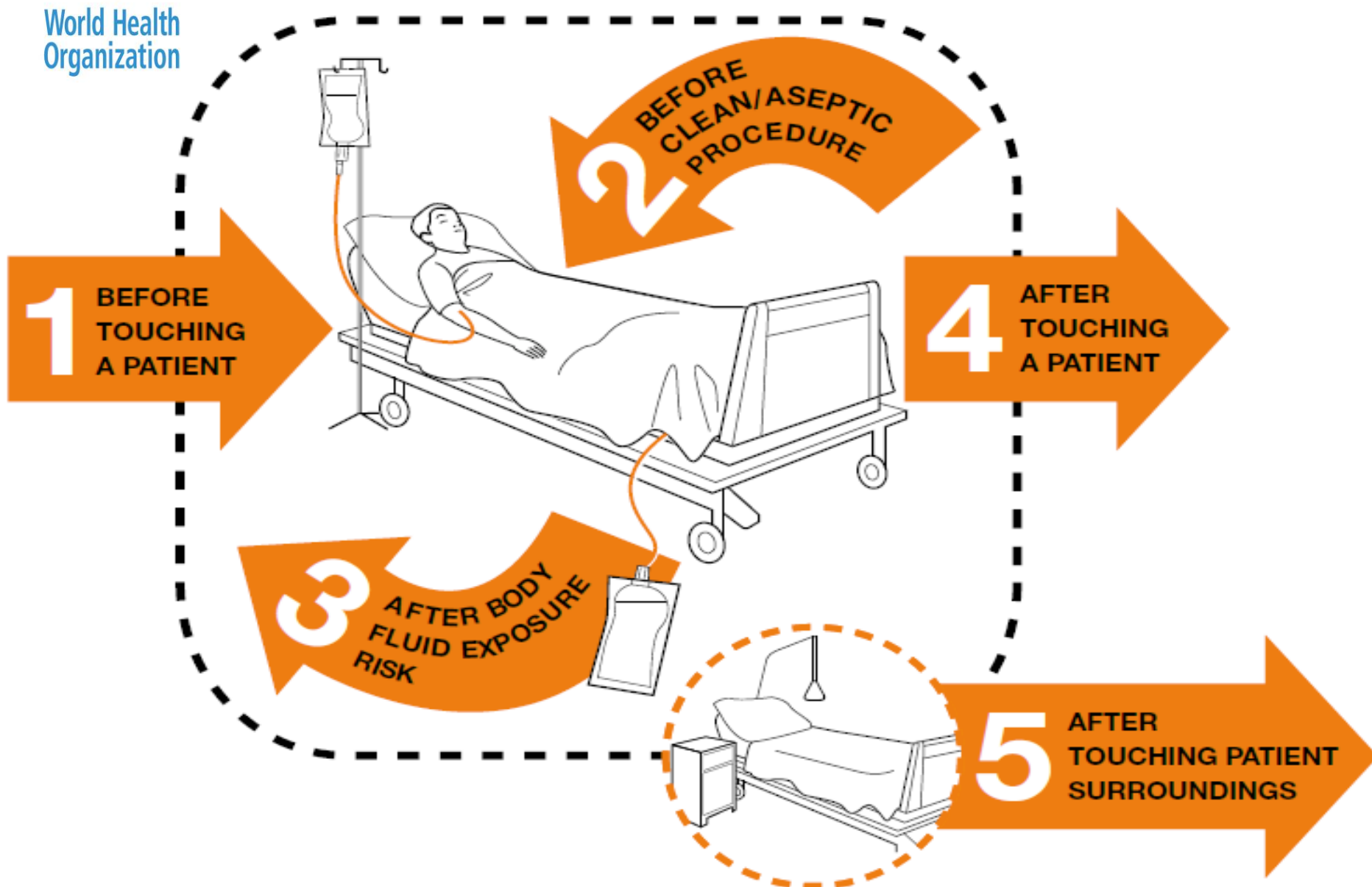
# PATIENT ZONE



# HEALTH-CARE AREA



World Health  
Organization



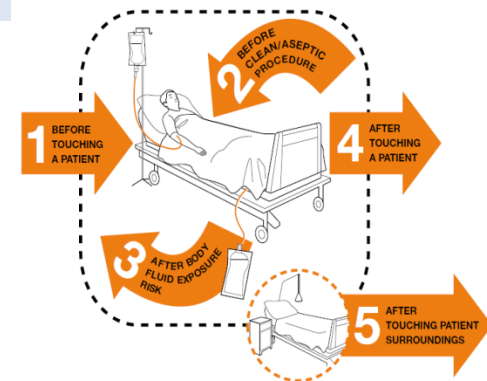
# Patient

- Refers to *any part of the patient, their clothes, or any medical device that is connected to the patient*



# Five Moments for Hand Hygiene

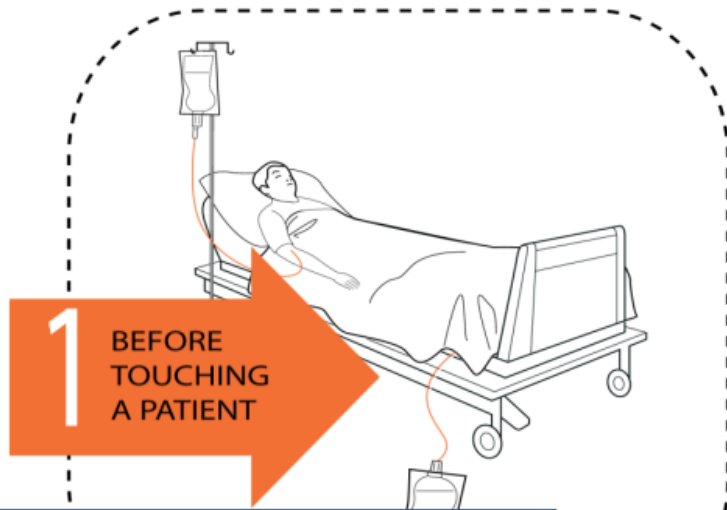
- Before touching a patient
- Before clean/ aseptic procedure
- After body fluid exposure risk
- After touching a patient
- After touching patient surroundings





# Moment 1

This indication is determined by the occurrence of the last contact with the health-care area and the next contact with the patient.



Situations illustrating the contact:

- shaking hand
- taking pulse, blood pressure
- chest auscultation
- abdominal palpation
- helping to move around

Reference point BEFORE touching a patient when approaching her/him

Since the HCW has not left the patient zone and on condition of no other indication for HH, further contact with patient's skin, clothes and surroundings do not requires any furthermore hand hygiene action

# Moment 1

<b>When:</b>	<b>Examples:</b>
<b>Touching a patient in any way</b>	<b>Shaking hands, Assisting a patient to move, most Allied health interventions, Touching any medical device connected to the patient (e.g. IV pump, IDC)</b>
<b>Any personal care activities</b>	<b>Bathing, Dressing, Brushing hair, Putting on personal aids e.g. Glasses</b>
<b>Any non-invasive observations</b>	<b>Taking a pulse, Blood pressure, Oxygen saturation, Temperature, Chest auscultation, Abdominal palpation, Applying ECG electrodes, CTG</b>
<b>Any non-invasive treatment</b>	<b>Applying an oxygen mask or nasal cannula, Fitting slings/braces, Application of incontinence aids (including condom drainage)</b>

# Moment 1

<b>When:</b>	<b>Examples:</b>
<b>Preparation and administration of oral medications</b>	<b>Oral medications, Nebulised medications</b>
<b>Oral care and feeding</b>	<b>Feeding a patient, Brushing teeth or dentures</b>

# Moment 2

This indication is determined by the occurrence of the last contact with any surface in the health-care area or in the patient zone, and any procedure involving any direct and indirect contact with mucous membranes, non-intact skin or an invasive medical device.

Situations associated with an aseptic task:

- drawing blood sample
- opening a vascular line
- endotracheal suctioning
- oro-dental care
- rectal examination
- eye drop instillation
- wound dressing
- preparing food, medication



Reference point:

**IMMEDIATELY BEFORE**  
a contact with a critical site with  
infectious risk for the patient

# Moment 2

<b>When:</b>	<b>Examples:</b>
<b>Insertion of a needle into a patient's skin, or into an invasive medical device</b>	<b>Venipuncture, Blood glucose level, Arterial blood gas, Subcutaneous or Intramuscular injections, IV flush</b>
<b>Preparation and administration of any medications given via an invasive medical device, or preparation of a sterile field</b>	<b>IV medication, NGT feeds, PEG feeds, Baby tube feeds, Dressing trolley</b>
<b>Administration of medications where there is direct contact with mucous membranes</b>	<b>Eye drop installation, Suppository insertion, Vaginal pessary</b>

# Moment 2

<b>When:</b>	<b>Examples:</b>
<b>Insertion of, or disruption to, the circuit of an invasive medical device</b>	<b>Procedures involving the following: ETT, Tracheostomy, Nasopharyngeal airways, Suctioning of airways, Urinary catheter, Colostomy/ileostomy, Vascular access systems, Invasive monitoring devices, Wound drains, PEG tube, NGT, Secretion aspiration</b>
<b>Any assessment, treatment and patient care where contact is made with non-intact skin or mucous membranes</b>	<b>Wound dressings, Burns dressings, Surgical procedures, Digital rectal examination, Invasive obstetric and gynaecological examinations and procedures, Digital assessment of newborns palate</b>

# Moment 3

This indication is determined by the occurrence of contact (even if minimal and not clearly visible) with blood or another body fluid and the next contact with any surface, including the patient, the patient surroundings or the health-care area

Situations associated to a potential or effective exposure to a body fluid :

- drawing blood sample
- oro-dental care
- vaginal examination
- removing a wound dress
- manipulating fluid sample
- clearing excreta
- cleaning soiled material and areas **xxx?**

Reference point:

**IMMEDIATELY AFTER**

the task involving exposure risk to body fluids has ended



# Moment 3

- Actual or potential contact with:
  - Blood, Lochia
  - Saliva or tears
  - Mucous, wax, or pus
  - Breast milk, Colostrum
  - Vomitus
  - Urine, faeces, semen, or meconium
  - Pleural fluid, ascitic fluid or CSF
  - Tissue samples, including biopsy specimens, organs, bone marrow, cell samples



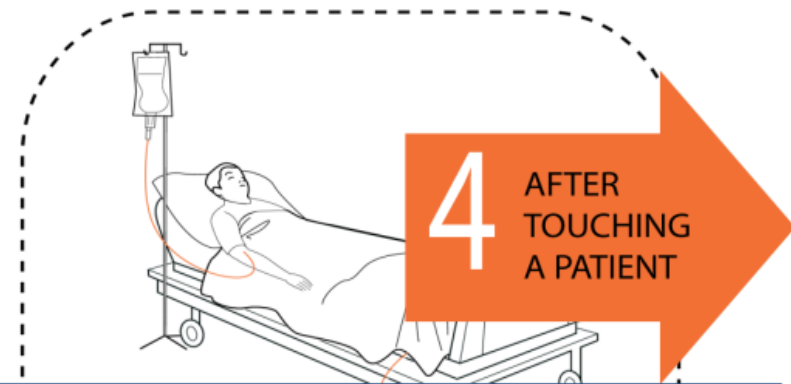
# Moment 4

This indication is determined by the occurrence of the last contact with intact skin or the patient's clothing or a surface in the patient's surroundings (following contact with the patient), and the next contact with a surface in the health-care area

Situations illustrating the contact:

- shaking hand
- taking pulse, blood pressure
- chest auscultation
- abdominal palpation
- helping to move around

Situations containing the indication “before touching a patient contact” will contain the indication “after touching a patient” necessarily



Reference point:

AFTER

having touched the patient, when leaving the patient's side

# Moment 5

The indication occurs between the last contact with the patient surroundings, without having touched the patient, and any contact with a surface in healthcare environment without having touched the patient

Situations illustrating the limited contact with inanimates:

- adjusting perfusion speed
- clearing monitoring alarm
- changing bed linen
- holding a bed rail
- clearing the bedside table

Reference point:

AFTER

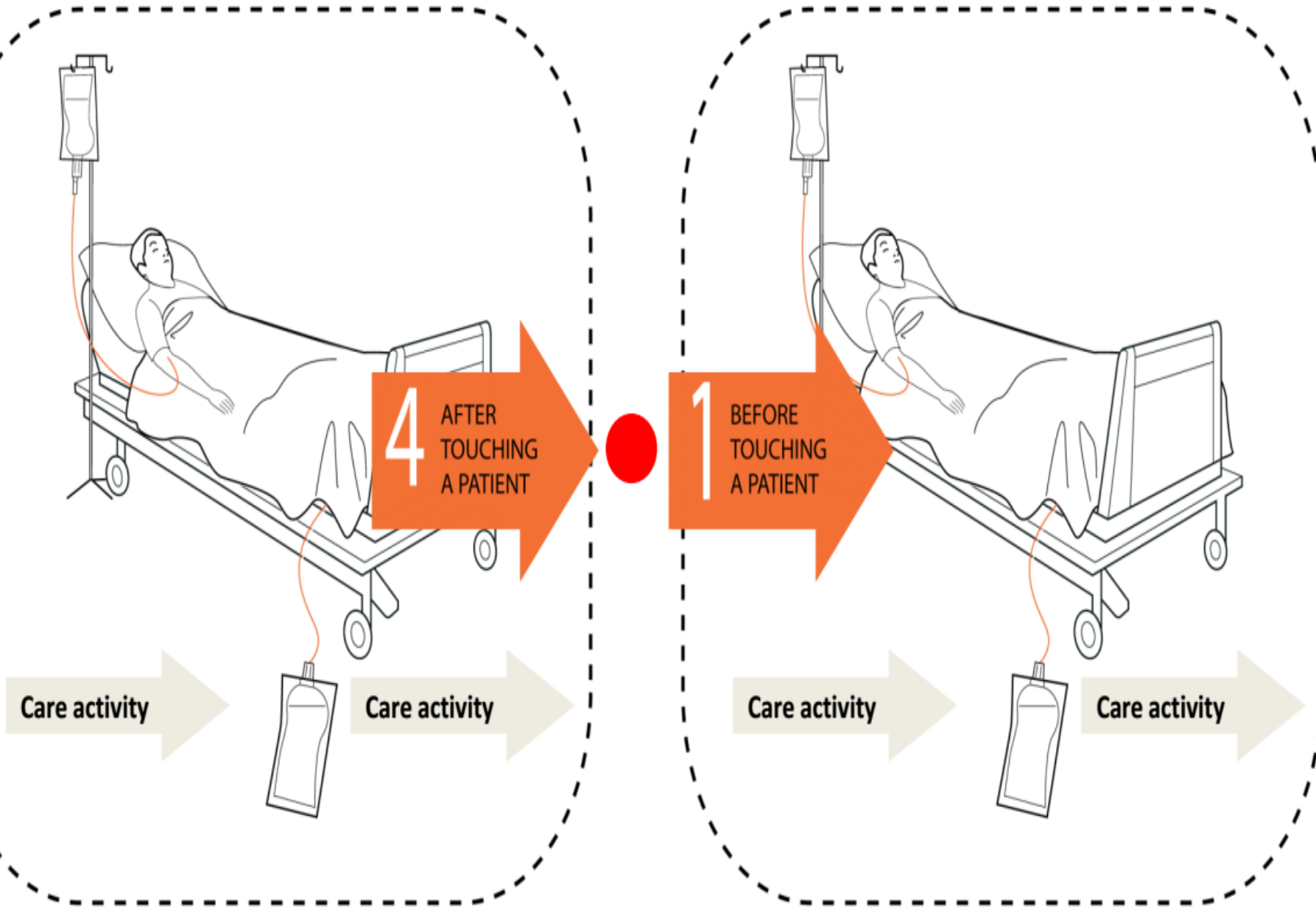
touching any object or furniture when leaving the patient surroundings



# Moment 5

<b>When:</b>	<b>Examples:</b>
<b>After touching the patient's immediate surroundings when the patient has not been touched</b>	<b>Patient surroundings include: Bed, Bedrails, Linen, Table, Bedside chart, Bedside locker, Call bell/TV remote control, Light switches, Personal belongings, Chair, Foot stool, Monkey bar</b>

# Coincidence of Two Indications



# Compliance With Hand Hygiene

- There is no indication 'Before Patient Environment'.

# Hands Need to be Cleaned When

- Visibly dirty
- After touching contaminated objects with bare hands
- Before and after patient treatment (before glove placement and after glove removal)



# Question 2

**HCWs ask you:  
“When they wear gloves,  
is it necessary  
to wash their hands?”**

# Hand Hygiene is Necessary

**1. Before patient treatment**

**2. After patient treatment**





# Hand Hygiene

**1. Before glove placement**

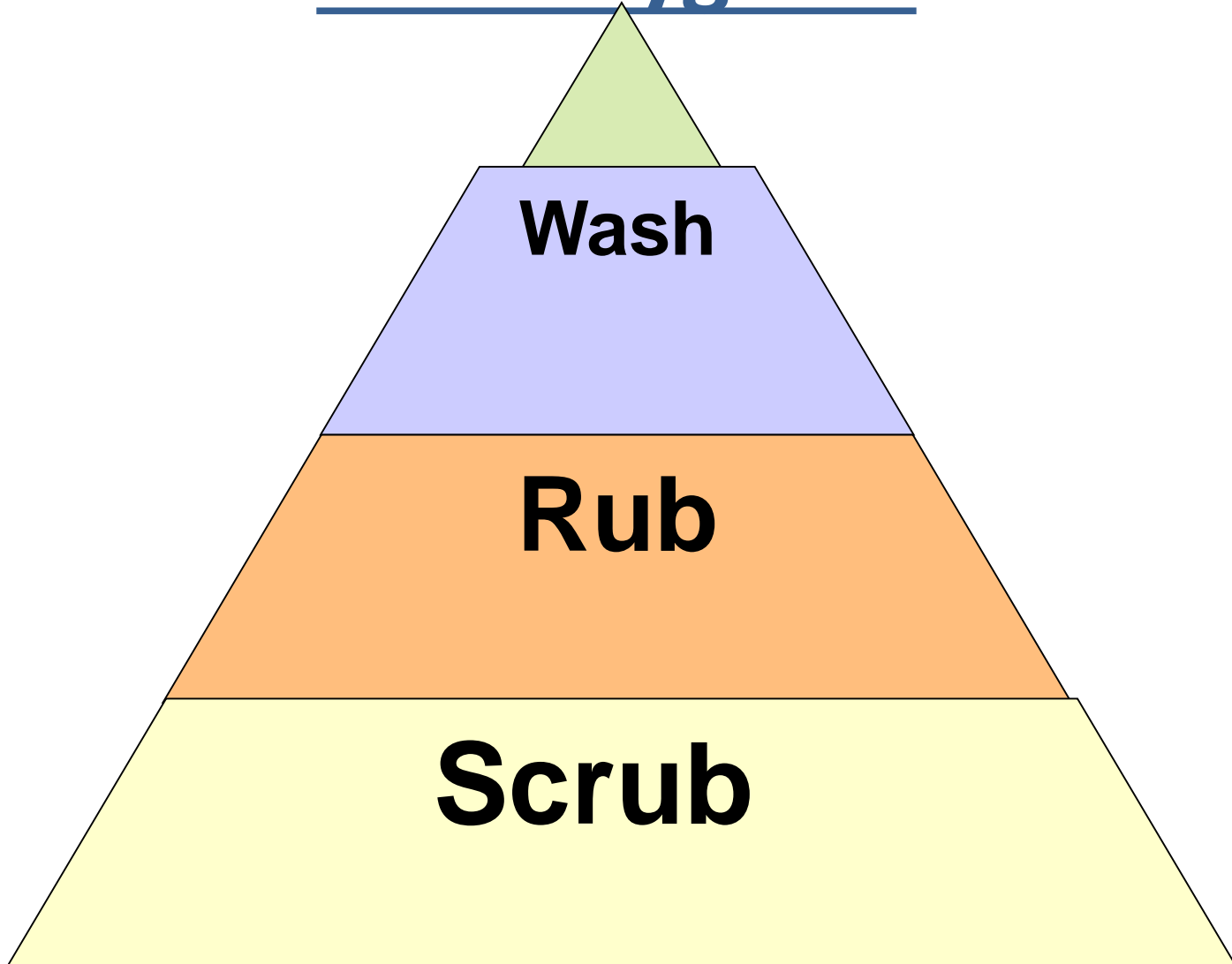
**2. After glove removal**



**Sterile or non-sterile gloves**



# Hand Hygiene



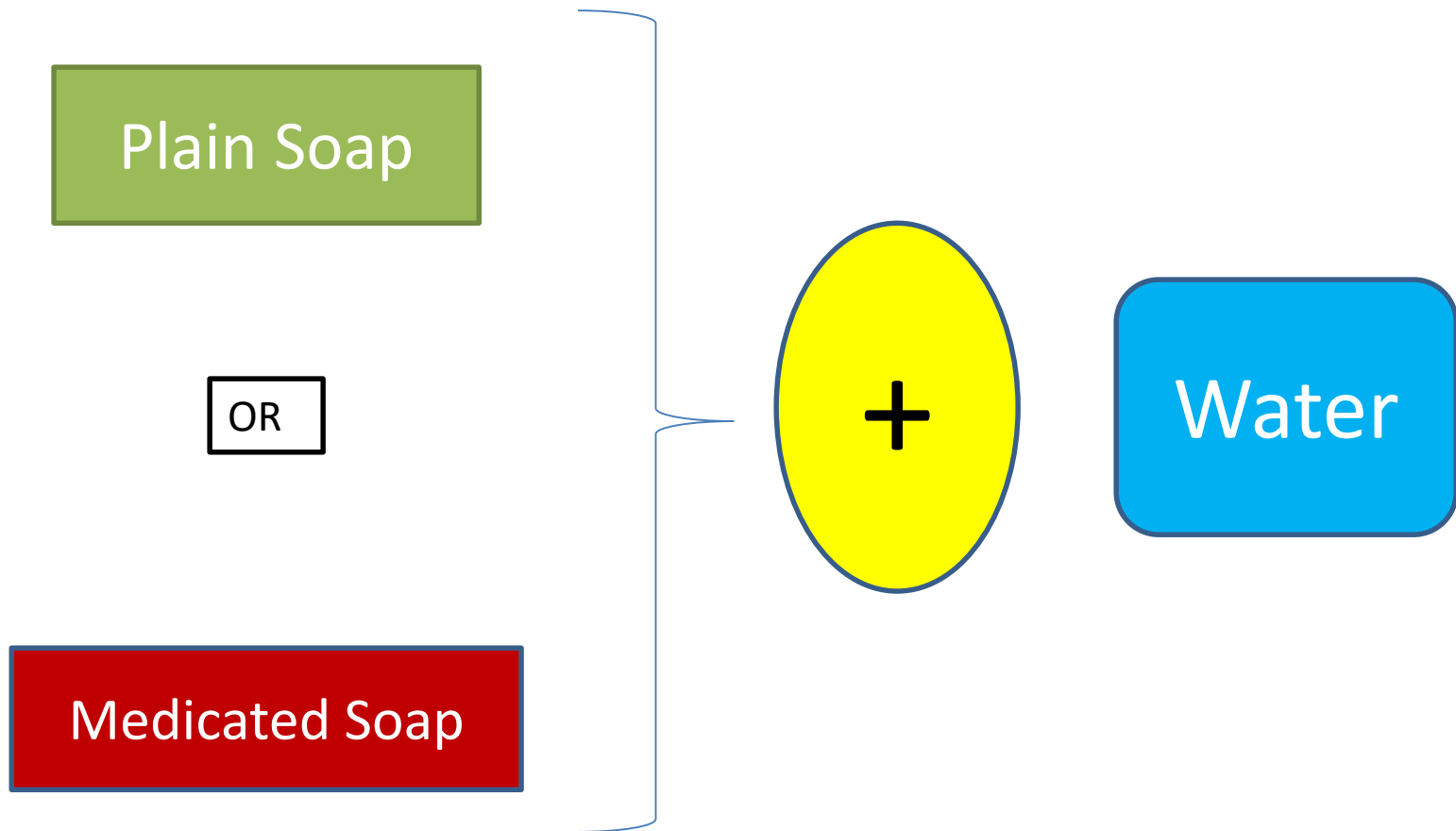
# Hand Hygiene Definitions

- **Handwashing**
  - Washing hands with plain soap and water
- **Antiseptic handwash**
  - Washing hands with water and soap or other detergents containing an antiseptic agent

# Hand Hygiene Definitions

- **Alcohol-based handrub**
  - Rubbing hands with an alcohol-containing preparation
  - Rub hands until the agent is dry
- **Surgical antisepsis**

# Preparations Used for Hand Hygiene











# Efficacy of Preparations in Reduction of Bacteria

Good

Better

Best



Plain Soap

Antimicrobial  
soap

Alcohol-based  
handrub

Source: <http://www.cdc.gov/handhygiene/materials.htm>

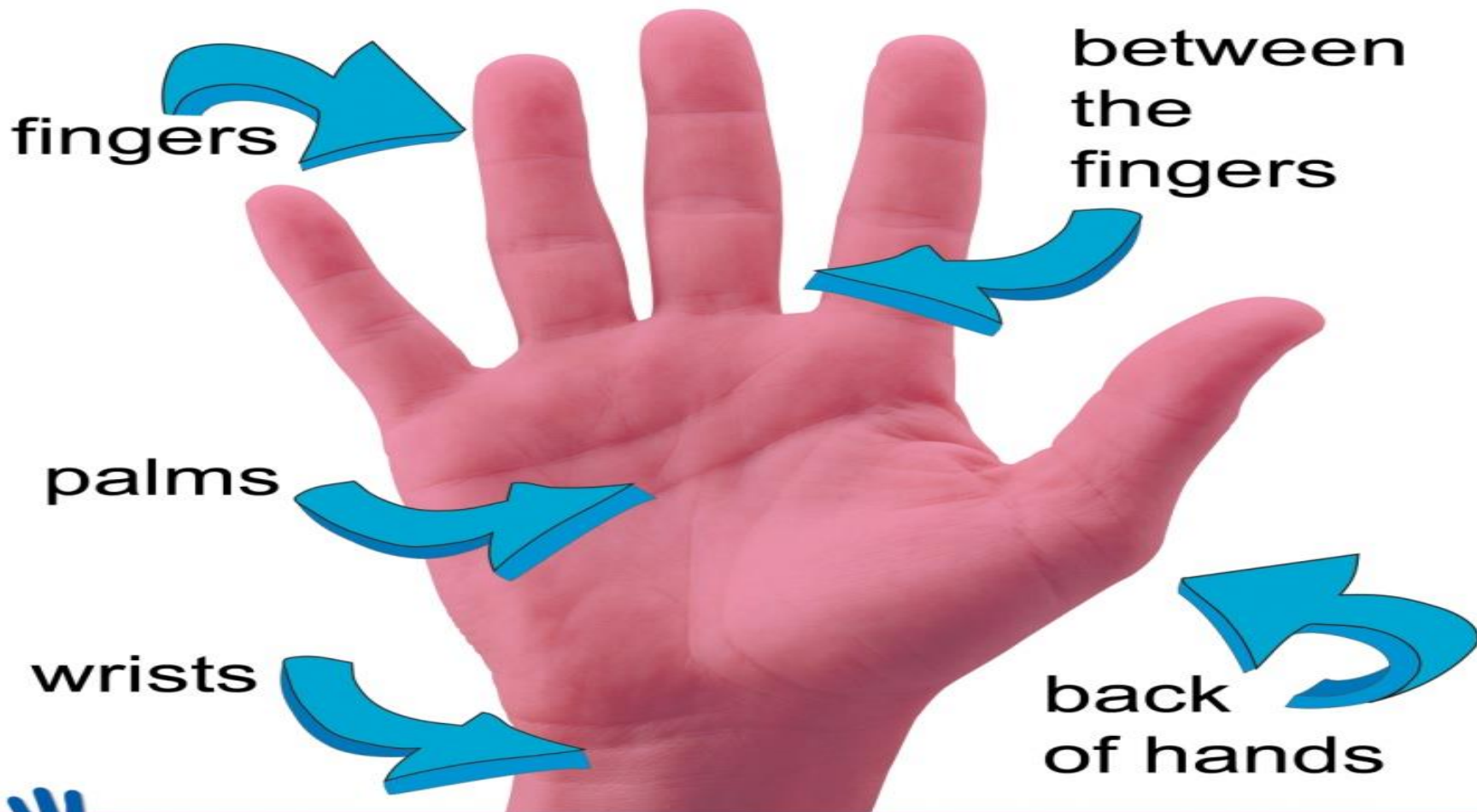
# MISSED SPOTS WHEN HAND-WASHING




- MOST FREQUENTLY MISSED
- LESS FREQUENTLY MISSED
- NOT MISSED

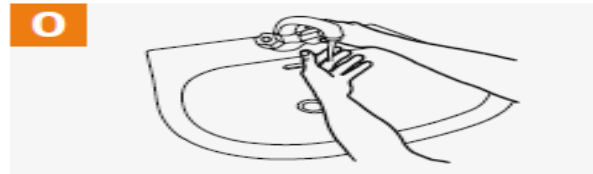
# WHERE TO WASH

*Wash all surfaces thoroughly*

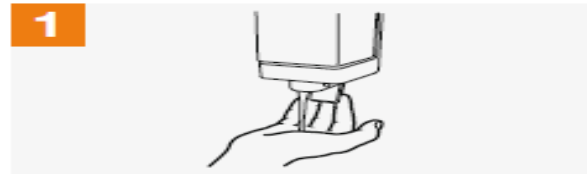


# Hand Hygiene Technique with Soap and Water

 Duration of the entire procedure: 40-60 seconds



**0** Wet hands with water;



**1** Apply enough soap to cover all hand surfaces;



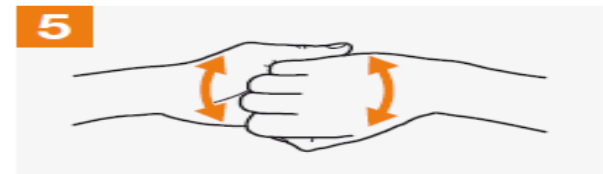
**2** Rub hands palm to palm;



**3** Right palm over left dorsum with interlaced fingers and vice versa;



**4** Palm to palm with fingers interlaced;



**5** Backs of fingers to opposing palms with fingers interlocked;



**6** Rotational rubbing of left thumb clasped in right palm and vice versa;



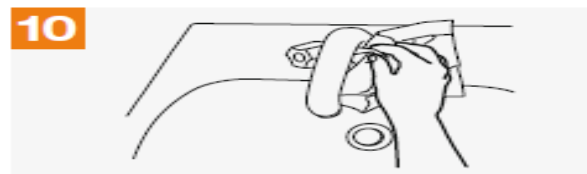
**7** Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;



**8** Rinse hands with water;



**9** Dry hands thoroughly with a single use towel;



**10** Use towel to turn off faucet;



**11** Your hands are now safe.

# CLEAN YOUR HANDS



Rub hands palm to palm.

**1**



Rub the back of both hands.

**2**



Palm to palm, fingers interlaced.

**3**



Back of fingers to opposing palm, with fingers interlocked.

**4**



Rotational rubbing of right thumb clasped in left palm. Vice versa.

**5**



Rotational rubbing backward and forward on right palm with clasped fingers. Vice Versa.

**6**



Wrap left hand over right wrist using rotational movements up to elbow. Vice versa.

**7**



Use paper towel to turn off faucet.

**8**

# Hand Rub

# Question 3

- Which antiseptic is better for hand rub?



**Pocket Bottle**





# Hand Antiseptics

**Alcohols**

**Chlorhexidine**

**Hexachlorophene**

**Iodine and iodophors**

**Quaternary ammonium compounds**

**Triclosan**

# Activity of Antiseptics

Antiseptics	Gr + bacteria	Gr - bacteria	Virus enveloped	Virus Non- enveloped	M.B	Fungi	Spore
Alcohol	+++	+++	+++	++	+++	+++	-
Chlorhexidine	+++	++	++	+	+	+	-
Iodophors	+++	+++	++	++	++	++	-/+
QACs	++	+	+	?	-/+	-/+	-
Chloroxylenol	+++	+	+	-/+	+	+	-
Triclosan	+++	++	?	?	-/+	-/+	-
Hexa- chlorophene	+++	+	?	?	+	+	-

# Properties of Antiseptics

Antiseptics	Typical conc. %	Speed of action	Residual activity
Alcohols	60-70 %	Fast	No
Chloroxylonol	0.5-4 %	Slow	Contradictory
Chlorhexidine	0.5-4%	Intermediate	Yes
Hexachlorophene	3%	Slow	Yes
Iodophors	0.5-10 %	Intermediate	Contradictory
Triclosan	0.1-2%	Intermediate	Yes
Quaternary ammonium compounds		Slow	No

# **Preparations Used for Hand Hygiene**

Alcohol-based  
hand rub

# Alcohols

- Ethanol
- Isopropanol
- N-propanol
- A combination of two of these products

# Alcohols

In general, ethanol has greater activity against viruses than isopropanol

**Ethanol**  $\geq$  **Isopropanol**

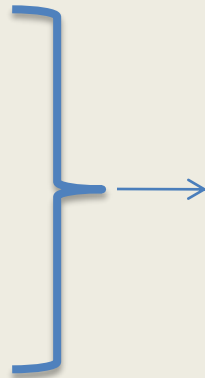
# Alcohol-based (hand) Rub

An alcohol-containing preparation:

Liquid

Gel

Foam



For application to the hands  
to inactivate microorganisms  
and/or temporarily suppress  
their growth

# Question 4

**For 5 moments of hand hygiene,  
which one is better?**

- **Hand washing?**
- **Hand rubbing?**



# Alcohol-based Preparations

## Benefits

- Rapid and effective antimicrobial action
- Improved skin condition
- More accessible than sinks

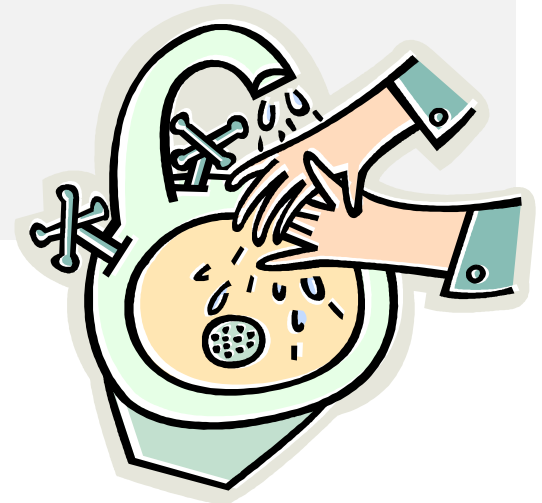


## Limitations

- Cannot be used if hands are visibly soiled
- Store away from high temperatures or flames
- Hand softeners and glove powders may “build-up”

# Indications For Hand Wash

- Wash hands with soap and water:
  - When visibly dirty or visibly soiled with blood or other body fluids
  - After using the toilet



# Alcohols

- **Not good cleansing agents**
- **Not recommended when:**
  - ▶ **Hands are dirty**      **or**
  - ▶ **Visibly contaminated with proteinaceous materials**

# Alcohols

- Virtually **no activity against:**
  - ▶ bacterial spores
  - ▶ protozoan oocysts
- **Very poor activity against:**
  - ▶ some non-enveloped(non-lipophilic) viruses

# Question 5


- A patient in ICU has developed antibiotic-associated colitis with *C. difficile*. To prevent the spread of infection, what kind of hand hygiene do you recommend?  
Wash or rub or both?

# Indications for Hand Hygiene

- If exposure to potential spore-forming pathogens is strongly suspected or proven, including outbreaks of *Clostridium difficile*, ***hand washing with soap and water is the preferred means***

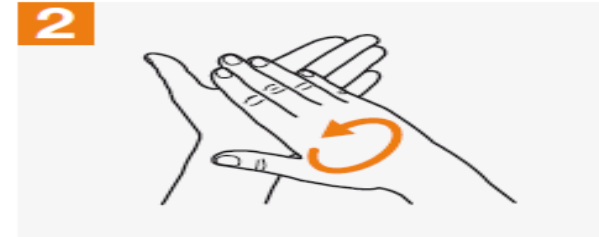


# Hand Hygiene Technique with Alcohol-Based Formulation

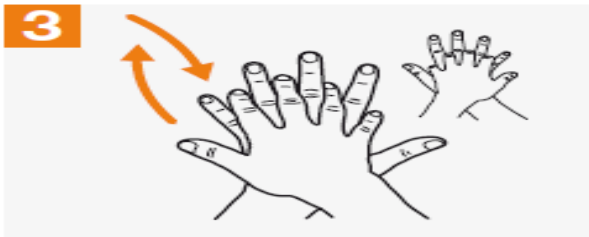
 **Duration of the entire procedure: 20-30 seconds**



**Apply a palmful of the product in a cupped hand, covering all surfaces;**



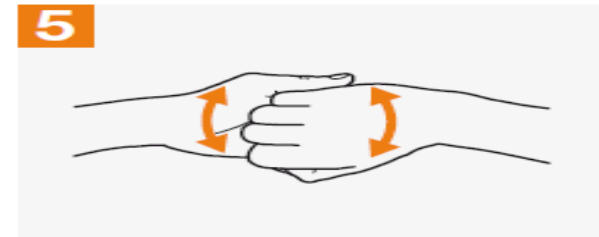
**Rub hands palm to palm;**



**Right palm over left dorsum with interlaced fingers and vice versa;**



**Palm to palm with fingers interlaced;**



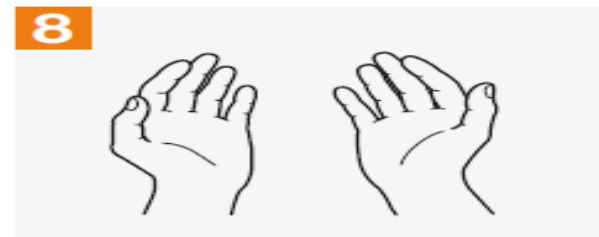
**Backs of fingers to opposing palms with fingers interlocked;**



**Rotational rubbing of left thumb clasped in right palm and vice versa;**



**Rotational rubbing, backwards and forwards with clapsed fingers of right hand in left palm and vice versa;**



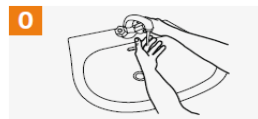
**Once dry, your hands are safe.**

# Hand Hygiene

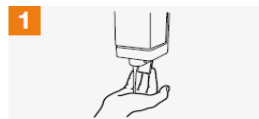
## Hand Wash

### Hand Hygiene Technique with Soap and Water

**🕒** Duration of the entire procedure: 40-60 seconds



Wet hands with water;



Apply enough soap to cover all hand surfaces;



Rub hands palm to palm;



Right palm over left dorsum with interlaced fingers and vice versa;



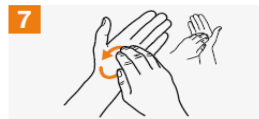
Palm to palm with fingers interlaced;



Backs of fingers to opposing palms with fingers interlocked;



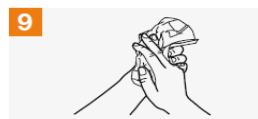
Rotational rubbing of left thumb clasped in right palm and vice versa;



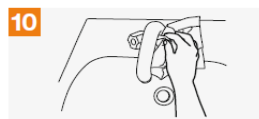
Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;



Rinse hands with water;



Dry hands thoroughly with a single use towel;



Use towel to turn off faucet;



Your hands are now safe.

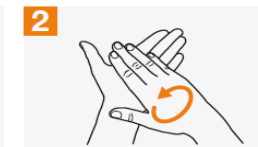
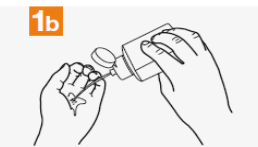
## Hand Rub

### Hand Hygiene Technique with Alcohol-Based Formulation

**🕒** Duration of the entire procedure: 20-30 seconds



Apply a palmful of the product in a cupped hand, covering all surfaces;



Rub hands palm to palm;



Right palm over left dorsum with interlaced fingers and vice versa;



Palm to palm with fingers interlaced;



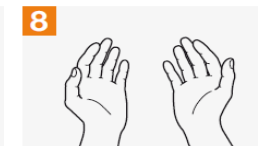
Backs of fingers to opposing palms with fingers interlocked;



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;



Once dry, your hands are safe.



# Question 6

- For skin care of HCWs, which preparation is better, petroleum or lotion?

# Special Hand Hygiene Considerations

- Keep fingernails short
- Avoid artificial nails
- Avoid hand jewelry that may tear gloves



**World Health  
Organization**

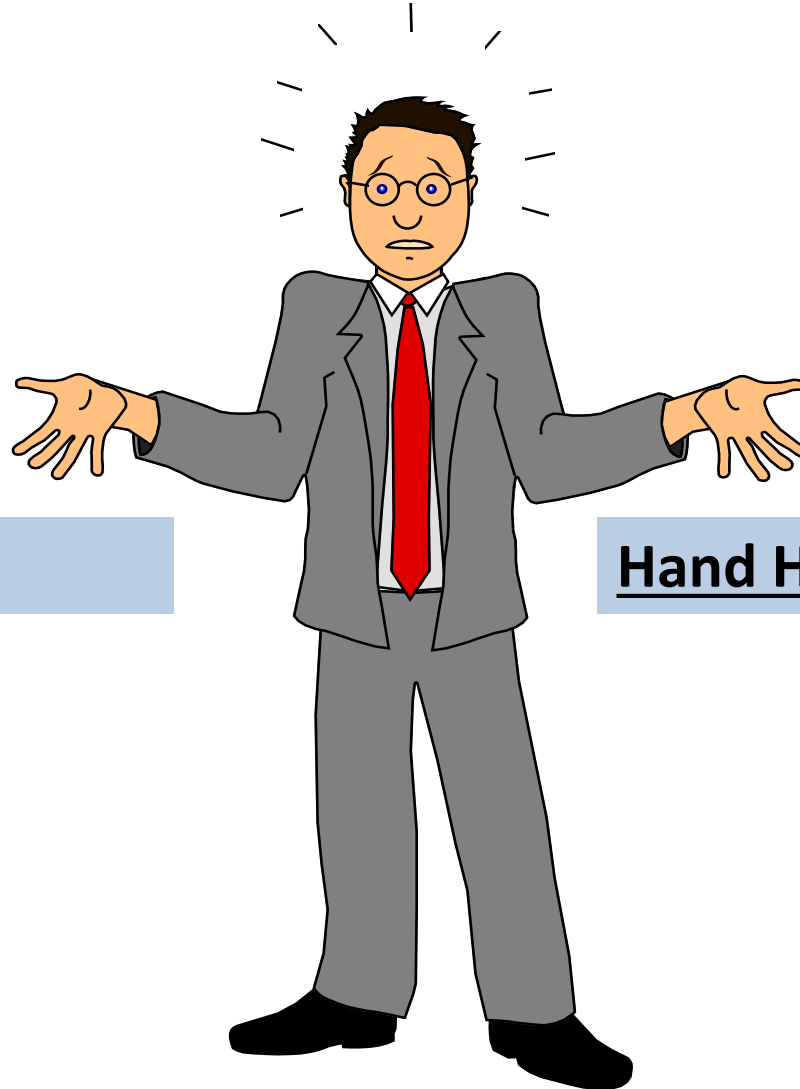
**SAVE LIVES  
CLEAN YOUR HANDS**



**UNITE  
FOR SAFETY  
CLEAN  
— YOUR —  
HANDS**

**#HandHygiene**

# What to Do To Improve Hand hygiene?

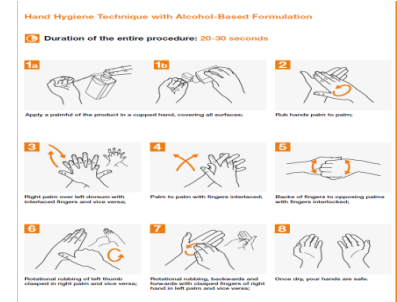
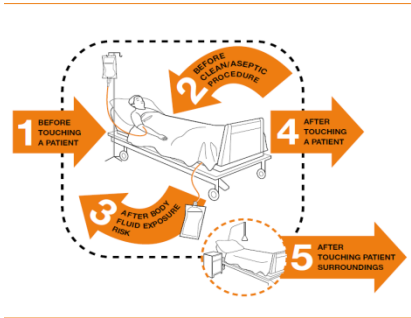


IPC Interventions

Hand Hygiene

# IPC Multimodal Strategies,

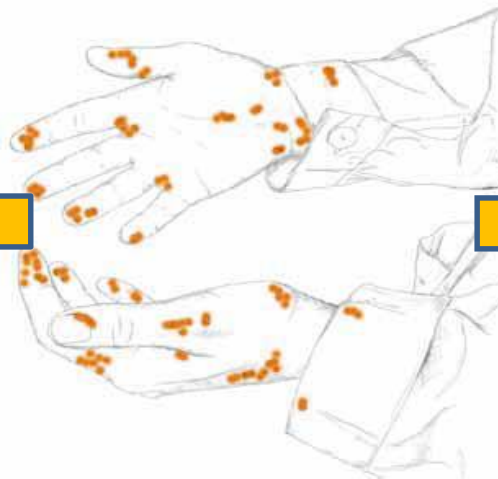
## Indicator : Hand Hygiene



# Hands

= The most common mode of pathogen transmission

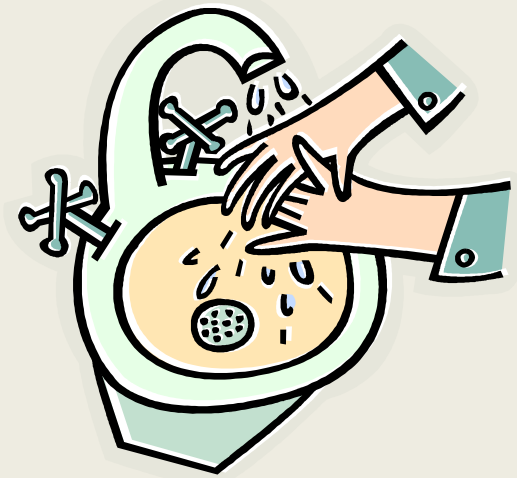
Antimicrobial  
resistance



Health care  
associated  
infections

# Conclusion

- Clean Care is Safer Care.
- Wash your hands.
- Rub your hand.



# Hand Hygiene

- Hands are the most common mode of pathogen transmission

