شیوه های پیشگیری از عفونت بیمارستانی ونقش بهداشت دست

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Health care-associated infection (HAI), also referred to as "nosocomial" or "hospital" infection, is an infection occurring in a patient during the process of care in a hospital or other health care facility which was not present or incubating at the time of admission. HAI can affect patients in any type of setting where they receive care and can also appear after discharge.

WHO Guidelines on Hand Hygiene in Health Care: First Global Patient Safety Challenge Clean Care Is Safer Care

HAI represents the most frequent adverse event during care delivery and no institution or country can claim to have solved the problem yet.

Based on data from a number of countries, it can be estimated that each year, **hundreds of millions of patients around the world are affected by HAI**.

The burden of HAI is several fold higher in low- and middle-income countries than in high-income ones

WHO Guidelines on Hand Hygiene in Health Care: First Global Patient Safety Challenge Clean Care Is Safer Care

HAI infections include :

central line-associated bloodstream infections (CLABSI)

catheter-associated urinary tract infections (CAUTI)

surgical site infections (SSI)

Hospital-acquired Pneumonia (HAP)

Ventilator-associated Pneumonia (VAP)

Clostridium difficile infections

Boev C, Kiss E. Hospital-Acquired Infections: Current Trends and Prevention. Crit Care Nurs Clin North Am. 2017 Mar;29(1):51-65.

The risk factors for HAI include:

- immunosuppression
- older age
- length of stay in the hospital
- multiple underlying comorbidities
- frequent visits to healthcare facilities
- mechanical ventilatory support
- recent invasive procedures
- indwelling devices
- stay in an intensive care unit (ICU)

Receipt of intravenous antibiotics within the last 90 days is 1 of the major risk factors for developing antimicrobial resistance to multiple drugs

Metersky ML, Kalil AC. New guidelines for nosocomial pneumonia. Curr Opin Pulm Med. 2017 May;23(3):211-217.

The impact of HCAI implies

prolonged hospital stay
long-term disability
increased resistance of microorganisms to antimicrobials
massive additional financial burden, high costs for patients and their families
and excess deaths

WHO Guidelines on Hand Hygiene in Health Care: First Global Patient Safety Challenge Clean Care Is Safer Care

The World Health Organization (WHO) today released its updated Bacterial Priority Pathogens List (BPPL) 2024, featuring 15 families of antibiotic-resistant bacteria grouped into critical, high and medium categories for prioritization. The list provides guidance on the development of new and necessary treatments to stop the spread of antimicrobial resistance (AMR).

Critical priority:
Acinetobacter baumannii, carbapenem-resistant;
Enterobacterales, third-generation cephalosporin-resistant; and
Enterobacterales, carbapenem-resistant;
Mycobacterium tuberculosis, rifampicin-resistant

High priority:

Salmonella Typhi, fluoroquinolone-resistant
Shigella spp., fluoroquinolone-resistant
Enterococcus faecium, vancomycin-resistant
Pseudomonas aeruginosa, carbapenem-resistant
Non-typhoidal Salmonella, fluoroquinolone-resistant
Neisseria gonorrhoeae, third-generation cephalosporin- and/or fluoroquinolone-resistant
Staphylococcus aureus, methicillin-resistant

Medium priority:

Group A streptococci, macrolide-resistant
Streptococcus pneumoniae, macrolide-resistant
Haemophilus influenzae, ampicillin-resistant
Group B streptococci, penicillin-resistant

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

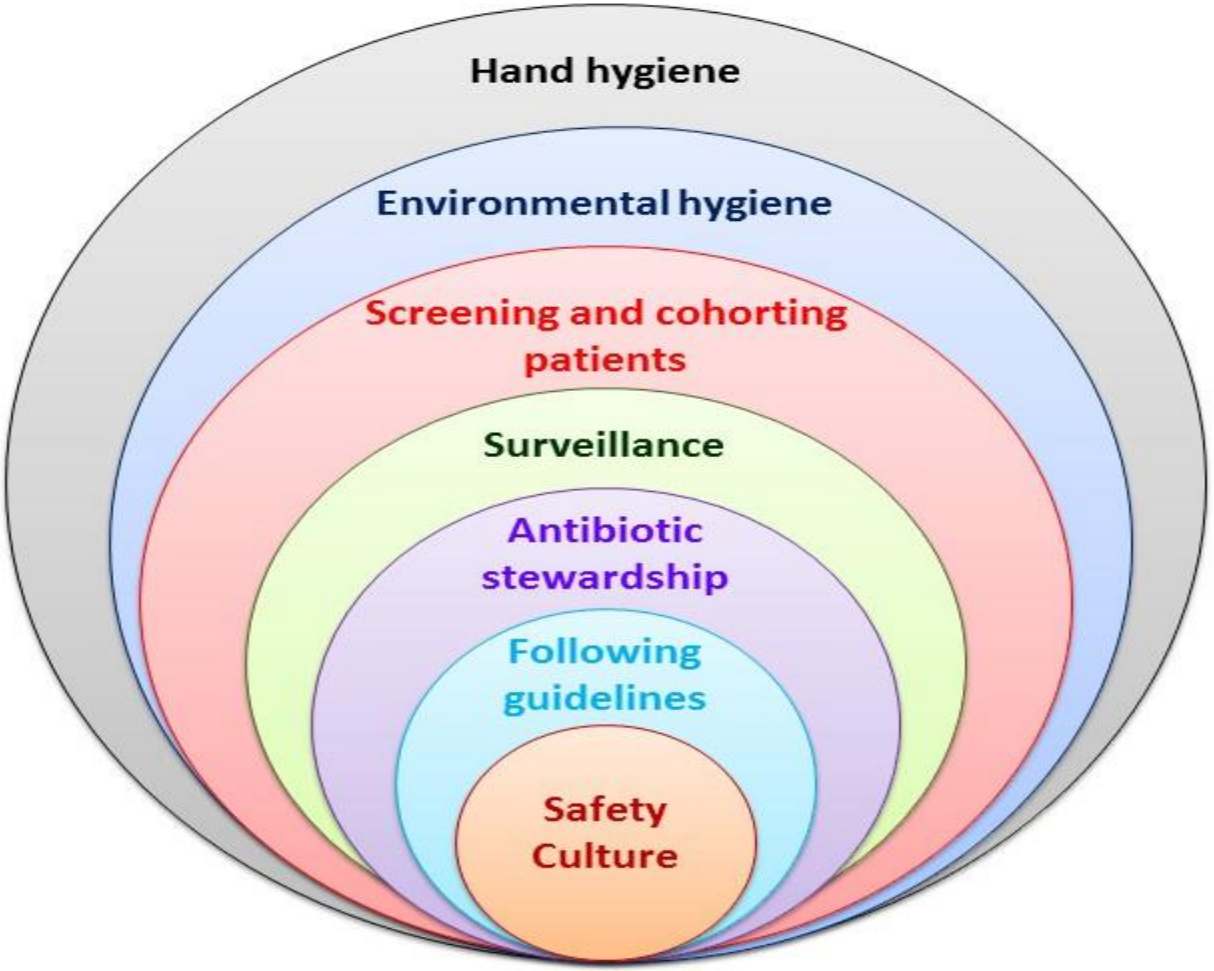
Type of bacterium	Duration of persistence (range)	Reference(s)
Acinetobacter spp.	3 days to 5 months	[18, 25, 28, 29, 87, 88]
Bordetella pertussis	3 – 5 days	[89, 90]
Campylobacter jejuni	up to 6 days	[91]
Clostridium difficile (spores)	5 months	[92–94]
Chlamydia pneumoniae, C. trachomatis	≤ 30 hours	[14, 95]
Chlamydia psittaci	15 days	[90]
Corynebacterium diphtheriae	7 days – 6 months	[90, 96]
Corynebacterium pseudotuberculosis	1–8 days	[21]
Escherichia coli	1.5 hours – 16 months	[12, 16, 17, 22, 28, 52, 90, 97–99]
Enterococcus spp. including VRE and VSE	5 days – 4 months	[9, 26, 28, 100, 101]
Haemophilus influenzae	12 days	[90]
Helicobacter pylori	≤ 90 minutes	[23]
Klebsiella spp.	2 hours to > 30 months	[12, 16, 28, 52, 90]
Listeria spp.	1 day – months	[15, 90, 102]
Mycobacterium bovis	> 2 months	[13, 90]
Mycobacterium tuberculosis	1 day – 4 months	[30, 90]
Neisseria gonorrhoeae	1 – 3 days	[24, 27, 90]
Proteus vulgaris	1 – 2 days	[90]
Pseudomonas aeruginosa	6 hours – 16 months; on dry floor: 5 weeks	[12, 16, 28, 52, 99, 103, 104]
Salmonella typhi	6 hours – 4 weeks	[90]
Salmonella typhimurium	10 days – 4.2 years	[15, 90, 105]
Salmonella spp.	1 day	[52]
Serratia marcescens	3 days – 2 months; on dry floor: 5 weeks	[12, 90]
Shigella spp.	2 days – 5 months	[90, 106, 107]
Staphylococcus aureus, including MRSA	7 days – 7 months	[9, 10, 16, 52, 99, 108]
Streptococcus pneumoniae	1 – 20 days	[90]
Streptococcus pyogenes	3 days – 6.5 months	[90]
Vibrio cholerae	1 – 7 days	[90, 109]

Hands are the main pathways of germ transmission during health care.

Hand hygiene is therefore the most important measure to avoid the transmission of harmful germs and prevent health care-associated infections.

WHO

7 strategies to prevent healthcare-associated infections



Global Alliance for Infections in Surgery

The scientific evidence overwhelmingly shows that appropriate hand hygiene is the single most effective action to stop the spread of infection

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

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.

Schreiber PW, Sax H, Wolfensberger A, Clack L, Kuster SP. The preventable proportion of healthcare-associated infections 2005-2016: systematic review and meta-analysis. Infect Control Hosp Epidemiol 2018;39:1277–95.

Ignaz Philip Semmelweis (1818 - 1865)

- Hungarian born doctor
- Worked in Vienna
- Mortality rate in Doctor led ward 3 times higher than Midwife led ward
- Doctors worked in autopsy room, then delivered women afterwards
- Semmelweis identified link in 1846 & introduced chlorinated lime for hand washing
- Mortality rate fell dramatically

In 2005, WHO launched the First Global Patient Safety Challenge Clean Care is Safer Care to which
142 countries pledged their commitment, thus allowing to initiate powerful actions to reduce infections occurring during health care delivery through the promotion of IPC measures and improvements in WASH

WASH
WATER
SANITATION
AND HYGIENE

Building on this strong foundation, the SAVE LIVES: Clean Your Hands5 global campaign was launched in 2009 by marking the first world hand hygiene day on 5 May

still continues with a different theme proposed each year.

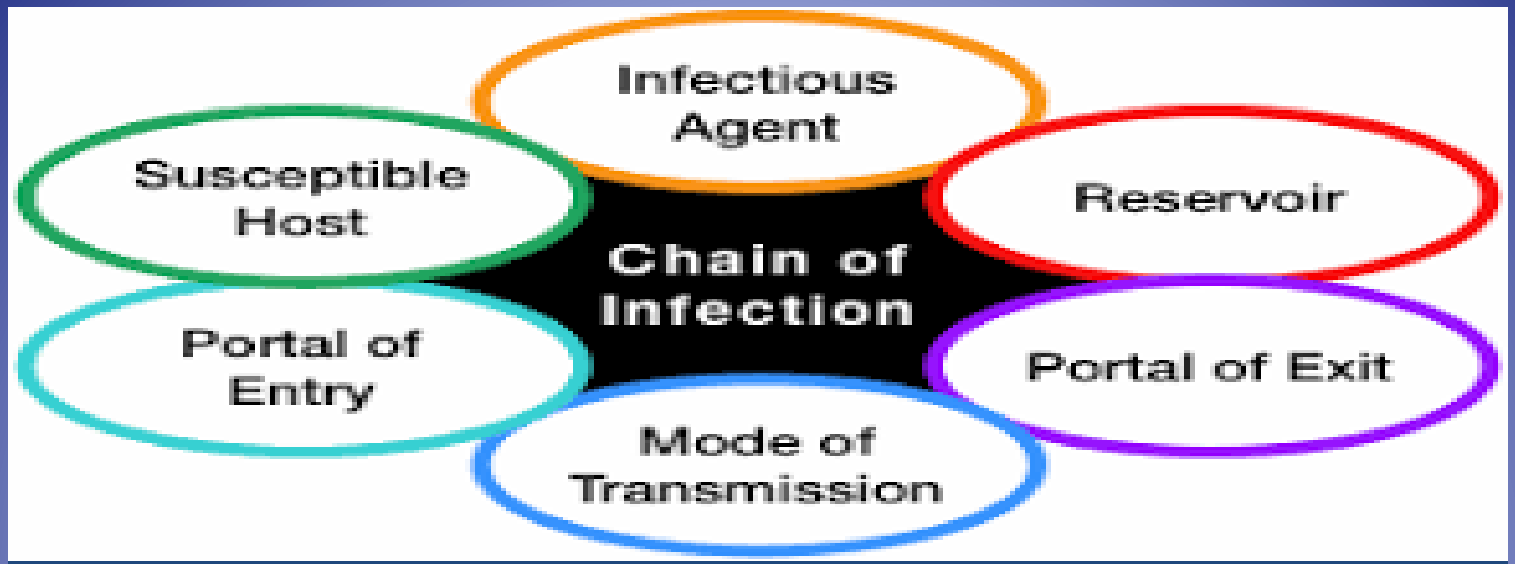
Objectives of WHHD 2025:

***Promote optimal hand hygiene practices (using the appropriate technique and according to the WHO 5 Moments)**

*** times for appropriate glove use within the health care workflow.**

***inclusion of hand hygiene within national IPC strategies**

***Raise awareness of the environmental and climate impact of gloves on waste generation and management, especially when used unnecessarily.**



Hand Washing

- Single most effective way to break the chain of infection

CDC Guidelines for Isolation Precautions In Hospitals & Healthcare Settings

***Standard Precautions**

***Transmission - Based Precautions:Supplement to Standard Precautions**

For use with patients documented or suspected to be infected or colonized with highly transmissible or epidemiologically important pathogens

Contact precautions
Droplet precautions
Airborne precautions

CDC Guidelines for Isolation Precautions In Hospitals & Healthcare Settings

Standard precautions are:

Minimum infection prevention and control practices that must always be used for all patients, in all situations Used to reduce or prevent the transmission of infectious agents/germs and to render and maintain objects and healthcare settings as free as possible from infectious agents.

Hand hygiene is one element of standard precautions.

CDC Guidelines for Isolation Precautions In Hospitals & Healthcare Settings

✓ Standard precautions involve:

hand hygiene, as consistent with the 5 moments for hand hygiene
the use of appropriate personal protective equipment
the safe use and disposal of sharps
routine environmental cleaning
reprocessing of reusable medical equipment and instruments
respiratory hygiene and cough etiquette
aseptic technique
waste management
appropriate handling of linen.

CDC Guidelines for Isolation Precautions In Hospitals & Healthcare Settings

Standard precautions

Standard precautions must always be used when caring for all patients, regardless of their infection status

Perform hand hygiene

Use personal protective equipment (PPE)*

Use respiratory hygiene and cough etiquette

Use aseptic technique

Use and dispose of sharps safely

Clean and reprocess reusable patient equipment

Perform routine environmental cleaning

Handle and store waste safely

Handle and store linen safely

*When used as part of **standard precautions**, PPE protects against probable exposure to blood and body substances. When used as part of **transmission-based precautions**, PPE services as a barrier to specific means of transmission of infectious agents.

AUSTRALIAN COMMISSION ON SAFETY AND QUALITY IN HEALTH CARE

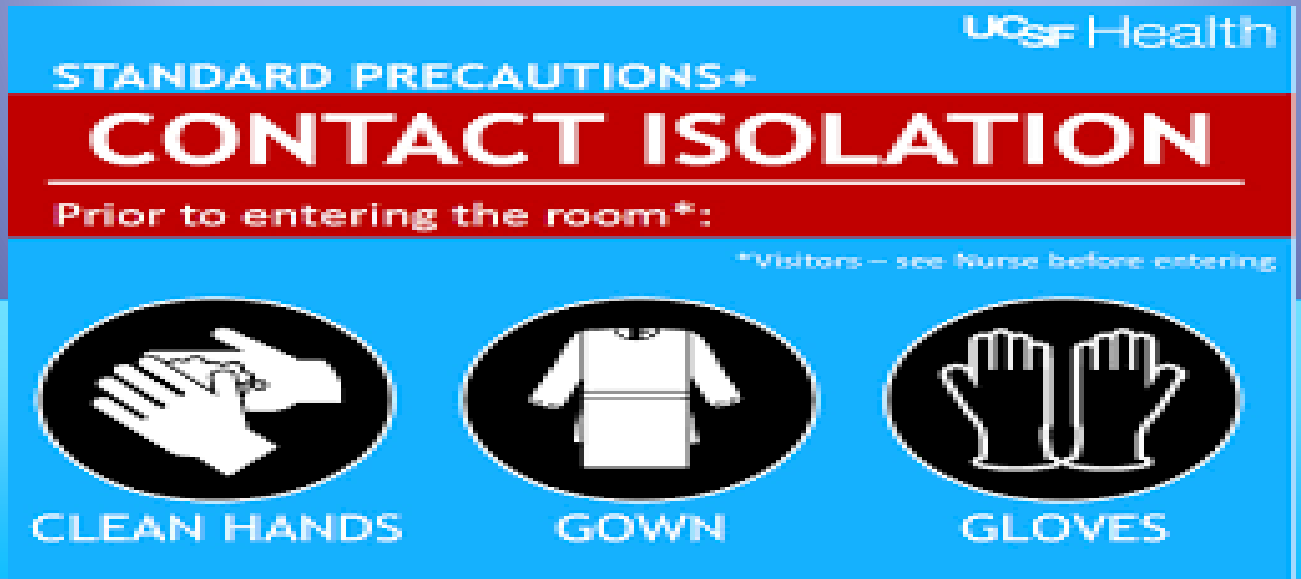
CDC Guidelines for Isolation Precautions In Hospitals & Healthcare Settings

Contact precautions

should be used in addition to Standard precautions for a patient known or suspected to be infected or colonized with epidemiologically important microorganisms that can be transmitted by

*hand or skin-to-skin contact

*or indirect contact with environmental surfaces or patient-care items in the patient's room



Acute diarrhea with likely infectious cause in incontinent or diapered patient:
E. coli 0157:H7 , HAV , HEV, Shigella, Y. enterocolitica, Enterovirus, …

Diarrhea : C. difficile Rotavirus GE

Respiratory infections in infants and young children : Parainfluenza infection , RSV infection (and immunocompromised),…

Bronchiolitis in infants and young children

Conjunctivitis,acute viral hemorrhagic : Adenovirus , Enterovirus 70, Coxackie A

Human metapneumovirus

Pneumonia: Adenovirus; B. cepacia in C.F

HSV(neonatal; disseminated; severe primary mucocutaneous)
VaricellaZoster (disseminated or immunocompromised)
Lice
Scabies
Monkeypox
Smallpox
Vaccinia
Hemorrhagic fevers (Lassa, Marburg, Ebola, CCHF)
Rubella,congenital
Enteroviral infections (infants, young children)
Anthrax, cutaneous, uncontained drainage,.
Diphtheria, cutaneous
Impetigo
Extrapulmonary TB, draining lesion

Furunculosis, S.A (infants, young children)

SSSS

Strep. Group A , S. aureus major skin, burn, or wound infection

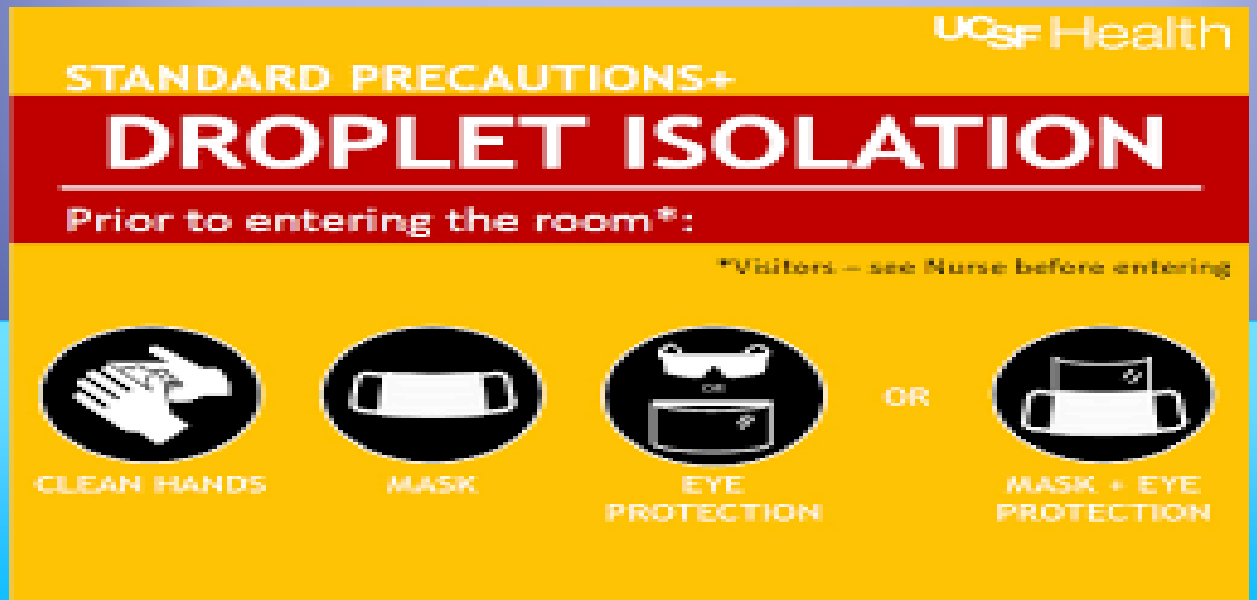
C. perfringens, extensive W. drainage

History of infection or colonization with MDR organisms ,MDR bacterial infection or colonization (MRSA,VISA,VRE,GNB,..)

Skin, wound , or urinary tract infection in patient with recent hospital or nursing home stay in facility where MDR are prevalent

Should be used in addition to Standard Precautions

for a patient known or suspected to be infected with microorganisms transmitted by droplets *larger* than 5 microns that can be transmitted by *coughing*, *sneezing* , *talking* , or by the performance of procedures such as *suctioning.*



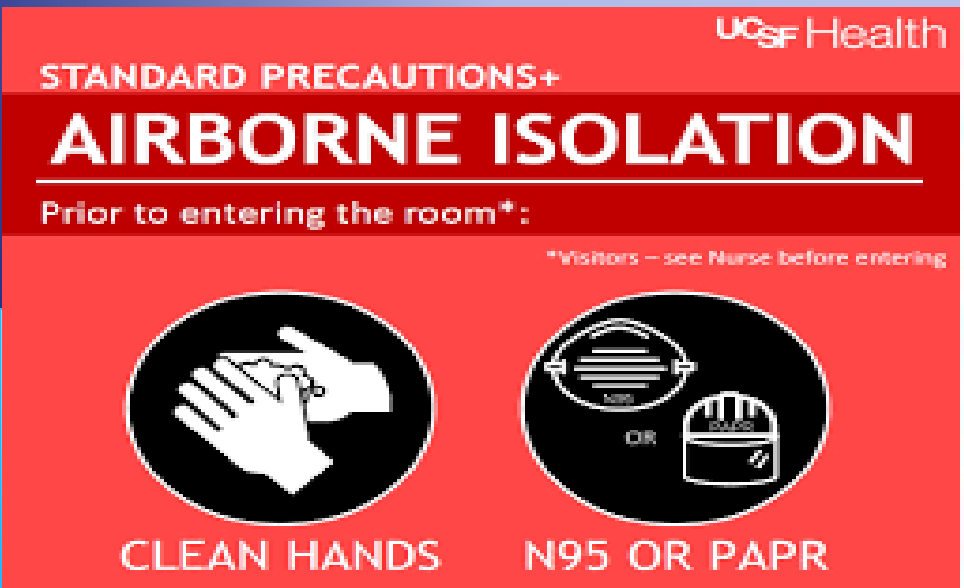
Droplet Precautions Memory Trick

"SPIDERMAN"

S	Scarlet fever, Streptococcal pharyngitis
P	Parvovirus, Pneumonia, Pertussis
I	Influenza
D	Diphtheria
E	Epiglottitis
R	Rubella, Rhinovirus
M	Mumps, Meningitis (bacterial)
AN	Adenovirus

Should be used in addition to Standard:

for patients known or suspected to be infected with microorganisms transmitted by airborne droplet nuclei (5 microns or smaller)



You can isolate a patient and wear your PPE, but if :

you DON'T CLEAN YOUR HANDS you will carry the infection to all the patients you touch

Hopefully not that!

Medical gloves can get contaminated just as easily as bare hands and do not provide 100% protection.
glove's leak rate 4 to 18 percent . (defective glove or a system that's not functioning optimally.)

Do medical gloves provide 100% protection?

No. The integrity of gloves can be affected by product quality, rips/tears and activity, meaning that hand hygiene still needs to be performed at key moments.

The WHO's 2025 slogan

EXAMINATION GLOVES
INDICATED IN CLINICAL SITUATIONS

Potential for touching blood, body fluids, secretions,
excretions and items visibly soiled by body fluids.

DIRECT PATIENT EXPOSURE: Contact with blood; contact with mucous membrane and with non-intact skin;
potential presence of highly infectious and dangerous organism;

IV insertion and removal; drawing blood; discontinuation of venous line;
pelvic and vaginal examination;
suctioning non-closed systems of endotrcheal tubes.

INDIRECT PATIENT EXPOSURE:
Emptying emesis basins; handling/cleaning instruments; handling waste;
cleaning of body fluids.

Does wearing gloves change the times for hand hygiene?

No. Glove use does not modify the times when hand hygiene in health care is indicated nor ever replace the need for hand hygiene, namely, rubbing with an alcohol-based product or by handwashing with soap and water, as per the 5 Moments for Hand Hygiene.

GLOVES NOT INDICATED (except for CONTACT precautions)

No potential for exposure to blood or body fluids, or contaminated environment Taking blood pressure, temperature and pulse;
performing SC and IM injections;
bathing and dressing the patient;
transporting patient;
caring for eyes and ears (without secretions);
any vascular line manipulation in absence of blood leakage.

INDIRECT PATIENT EXPOSURE:
Using the telephone; writing in the patient chart; giving oral medications; distributing or collecting patinet dietary trays; removing and replacing linen for patient bed;
placing non-invasive ventilation equipment and oxygen cannula;
moving patient furniture.

Efficacy of Hand Hygiene Preparations in Reduction of Bacteria

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

Alcohol-Based Preparations

Benefits

- Rapid and effective antimicrobial action
- Reduced time for hand disinfection
- Improved skin condition
- More accessible than sinks-potential to increase compliance

Limitations

- Cannot be used if hands are visibly soiled
- Follow instructions for amount to "rub"
- Flammable-implement safety precautions
- "Build-up"

Alcohol-based Preparations

Alcohols

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

Alcohols

- **Not good cleansing agents**

- **Not recommended when:**
  - **Hands are dirty** **or**
  - **Visibly contaminated** with **proteinaceous** materials

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**

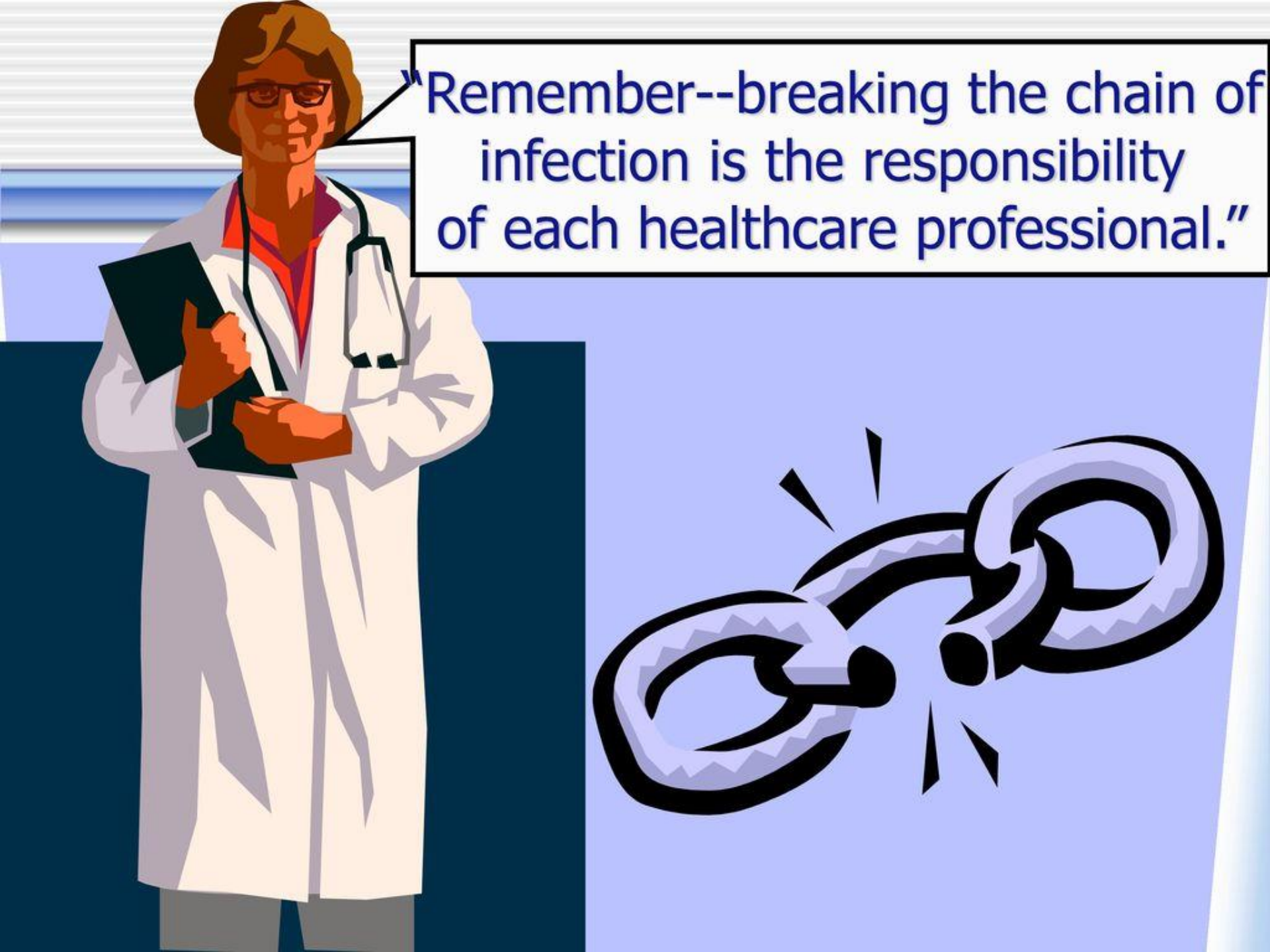
Indications for Hand Wash

*When hands are visibly soiled

*When “hand softeners” are used May “build-up” with Alcohol

*When visibly dirty or visibly soiled with blood or other body fluids

*After using the toilet


"Remember--breaking the chain of infection is the responsibility of each healthcare professional."

You are an important part of infection prevention!

CHAIN OF INFECTION