



**Pan American
Health
Organization**



**World Health
Organization**

REGIONAL OFFICE FOR THE **Americas**

Webinar

- Recommendations:
- Please turn off your microphone.
- There will be 40 minutes of presentation and 1 hour of questions and answers.
- Questions should be in writing, through the Chat or by email to: Infectioncontrol@paho.org
- The presentation will be available on the PAHO website in 48 hours.

Spanish: <http://bit.ly/2kszm4m>

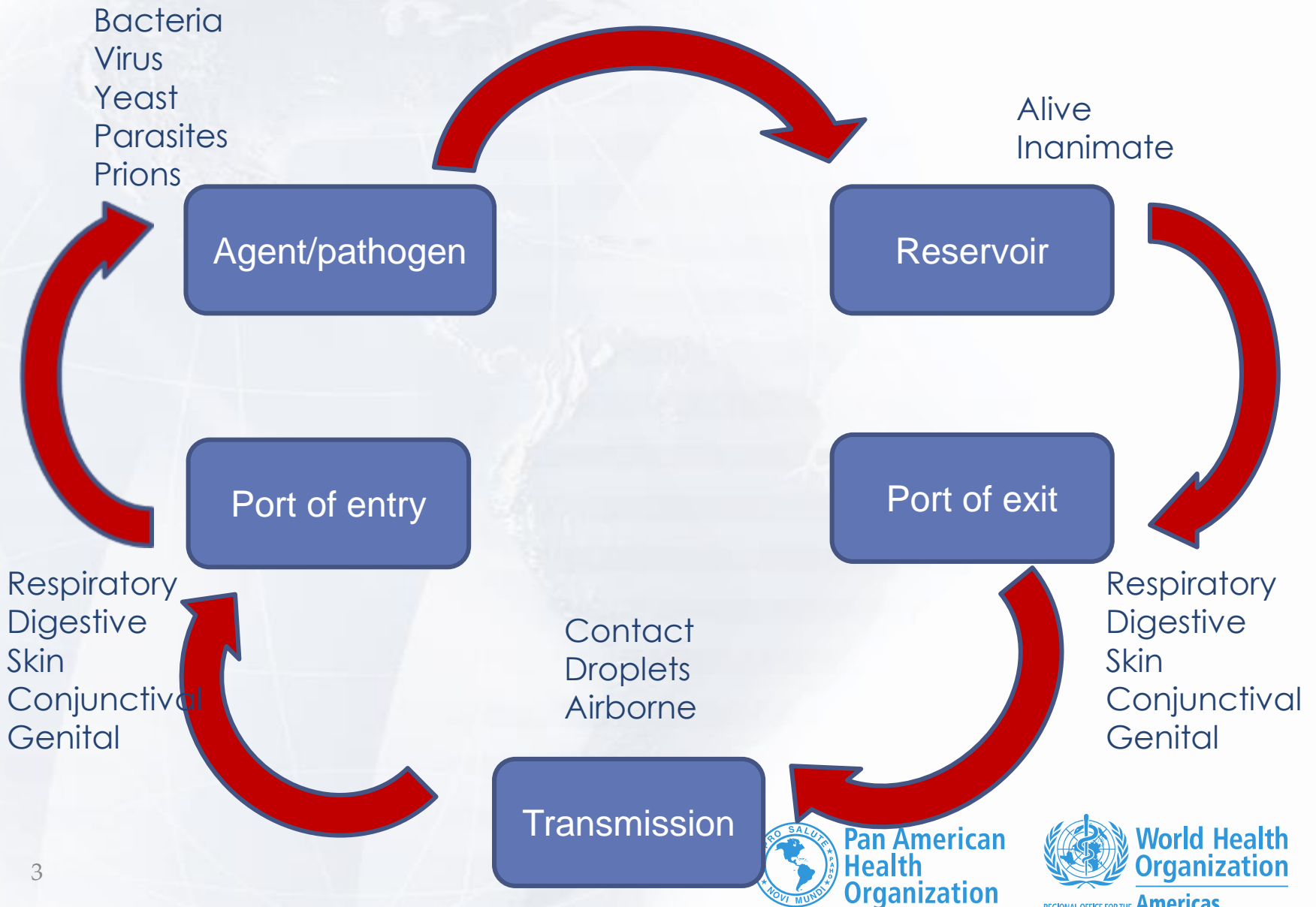
English: <http://bit.ly/2kP8wo4>



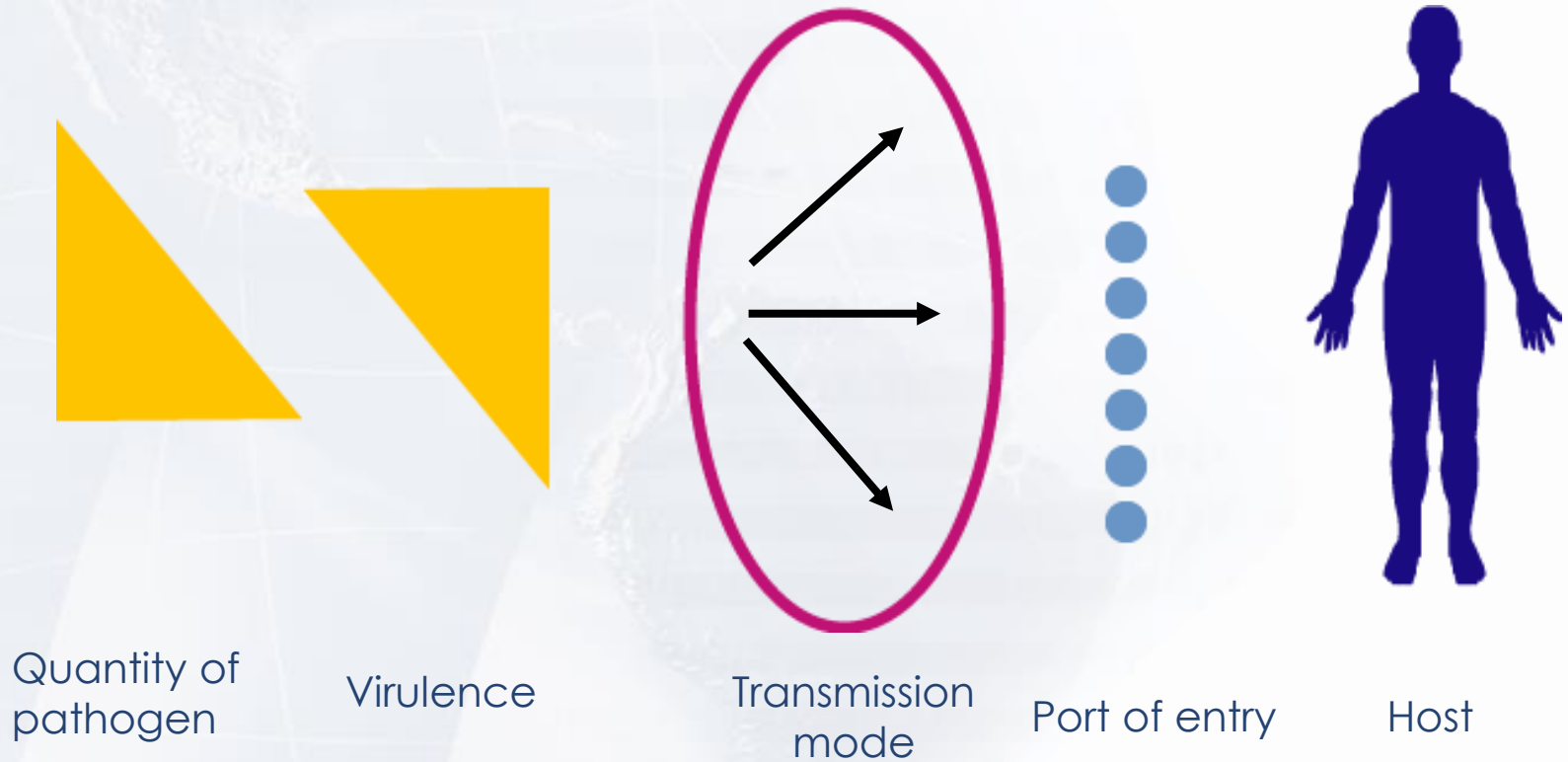
Standard precautions and Transmission based precautions



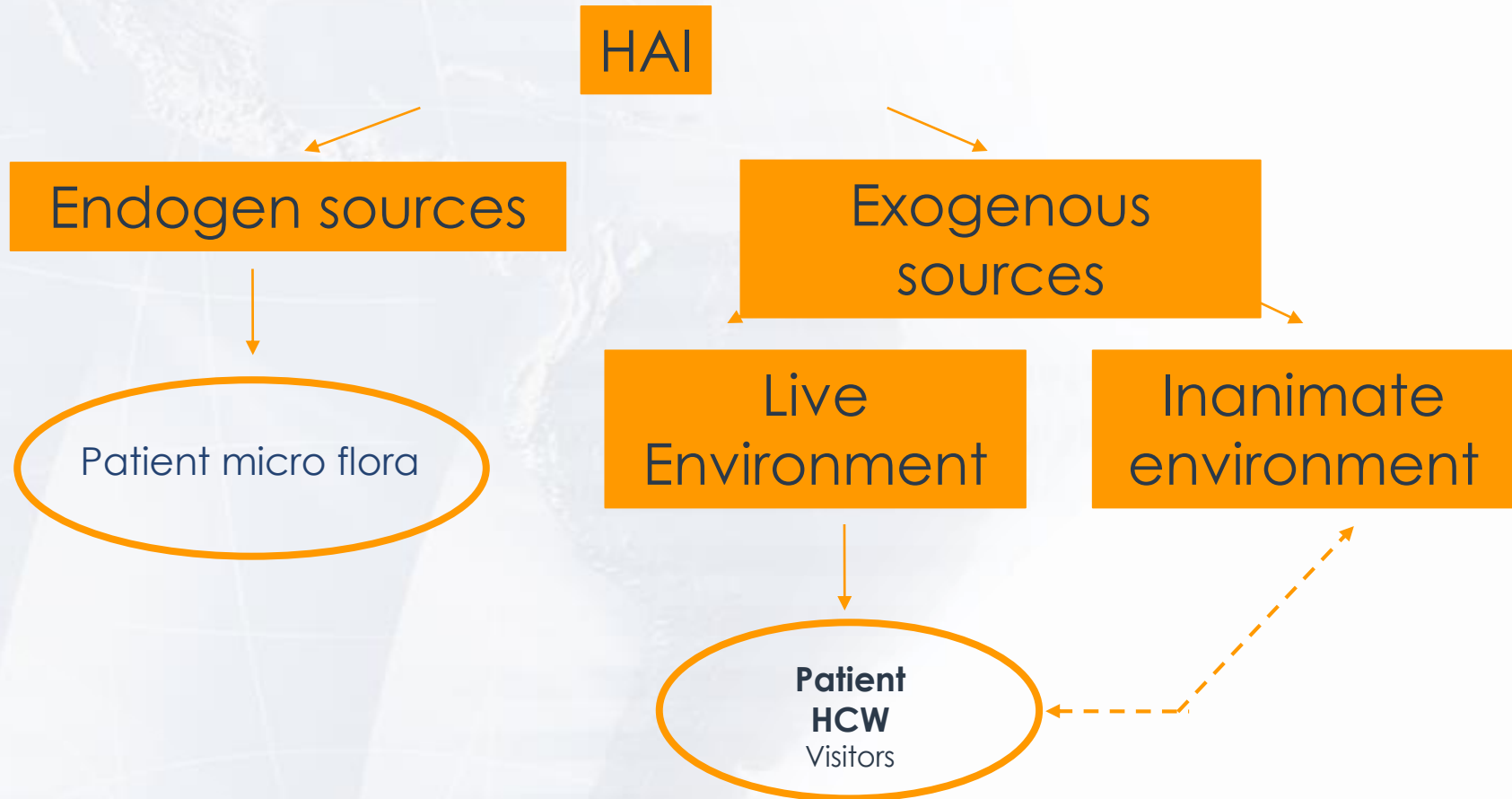
Chain of transmission of infections



Chain of transmission of infections



Sources of Infections Associated with Health Care



Standard Precautions

They must be applied to ALL patients who require health care, by ALL health workers in ALL health settings:

- Are general measures aimed at minimizing the spread of infection and avoid direct contact with blood, body fluids, secretions or non-intact skin of patients



From where it has arise?



1920

- Middle 60s to ends 70s

1981

- PCP in previously healthy homosexuals in L.A.
- Kaposi's sarcoma in N.Y.

1982 CDC

- June GRID
- Hemophilic and Haitian
- September AIDS

1983

- First group of precaution recommendations



Development of the SP

1983 "Guideline for Isolation Precautions in Hospitals" published by CDC

- Section entitled "Blood and Body Fluid Precautions."
- The recommendations in this section warned on precautions to take with blood and bodily fluids in patients with a known or suspected condition of transmission pathogen infection by blood way

1987 "Recommendations for Prevention of HIV Transmission in Health-Care Settings"

- Recommended that the precautions with blood or bodily fluids were applied in way consisting of all the patients without considering their infection transport condition in the bloodstream

1996 "Guidelines for Isolation Precautions in Hospitals"

- Incorporates the concept of Standard Precautions

2007 "Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings"

- Reaffirms the Standard Precautions as basis in order to prevent infection transmission
- Reaffirms importance of implementing Precautions based on the mode of transmission
- Incorporates Respiratory Hygiene in the Standard Precautions (SARS-CoV)



What does standard precaution include?

- Hand hygiene
- Use of gloves, masks, apron, and protection of the face depending on the exposure that can be foreseen.
- Use of gloves to handle the teams used by the patient
- Cleaning, disinfection, and appropriate sterilization of the medical devices before reuse in another patient



What does standard precaution include?

- Respiratory label and of the cough
- Safe practices of injection
- Use of mask for insertion of catheter or injection of material in epidural or rachidial opportunities via lumbar puncture (e.j., myelogram or rachidial or epidural anesthesia).



Hand Hygiene



Results:

Overall compliance as per WHO Guidelines was 78%. Nurses had an adherence rate of 63%; allied staff adherence was 86.5%. Compliance was 93% after patient contact versus 63% before patient contact. Nurses' compliance before aseptic procedures was lowest at 39%. 92% staff was aware of the facts viz. Diseases prevented by hand washing, ideal duration of HH, reduction of health care associated infections.

Conclusiones

- **El 70% del personal de salud que conforma la muestra no cumple con la adherencia al lavado de manos** (práctica tan necesaria para evitar las infecciones intrahospitalarias).
- Los profesionales de sexo femenino presentan una mayor adherencia al lavado de manos entre adecuado y regular de 19,30%, en comparación con los profesionales de la salud de sexo masculino que arrojó una adherencia de 10,20%.
- **Se observó una mayor adherencia al lavado de manos en el turno de día (23,9%) en comparación con el turno de noche (5,7%) de dicha adherencia.**
- Son los servicios de gineco-obstetricia y neonatología los que presentaron una mayor adherencia en comparación del resto de servicios.
- De acuerdo a la profesión del personal de salud, los médicos y enfermeros tuvieron una mayor adherencia al lavado de manos que los obstetras y técnicos de enfermería.
- Según los momentos del lavado de manos propuestos por la OMS, los momentos 1 y 4 son a los que más se adhieren el personal de salud.

Resultados: . *Los modelos de conducta: Las enfermeras y los estudiantes de medicina mencionan la presencia de modelos de conducta negativos, es decir, enfermeras o médicos que no cumplen con la higiene de manos. Como razones de su propio incumplimiento además, mencionan explícitamente que no pueden cumplir si el resto del grupo no cumple, de lo contrario quedarían retrasados durante las rondas.* Los médicos también mencionan la necesidad de modelos positivos. En todos los grupos, surgió un debate sobre la cultura en el hospital, en el que se acepta que los médicos, en particular a los *seniors staff*, desviarse de una serie de normas y directrices, y su importancia como la razón para la falta de cumplimiento. Todos los participantes acordaron que la creación de una norma social más sólida y más explícita y el establecimiento de un control social sería importante para mejorar el cumplimiento de la higiene de manos. En las barreras para el cumplimiento de esta práctica, los participantes mencionan principalmente la falta de disponibilidad y fácil acceso a insumos para la higiene de manos, la falta de tiempo y el olvido. Los médicos informaron que la escasez de investigación basada en la evidencia que apoya el papel de la higiene de las manos en la prevención de las infecciones nosocomiales es un barrera para el cumplimiento de esta práctica.



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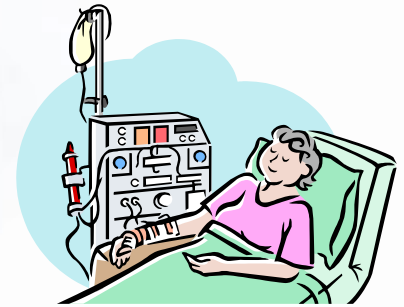


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Hand Hygiene

It is the infection prevention measure that in isolation has greater impact.



Hand Hygiene

- Before and after direct care of a patient
- Essential in all types of insulation measures

It should be done routinely:

- Immediately after the withdrawal of the EPP
- Between patient contacts
- Includes thorough handwashing with soap and water or use of an alcohol-based hand solution



Hand Hygiene

- A) Soap: Detergent products with the property of removing organic matter, stains and other organic substances from the hands.
- B) Alcohol: are germicidal and have immediate action time.



Personal protective equipment

Articles and elements of clothing that can be used by the health workers in way only one or combination, in order to create a barrier between the patient, the environment or an object

- Gloves
- Apron or gown and shirt-front
- Protection mucous nasal and pharyngeal and conjunctive
- Disposable surgical mask
- Respirator with particle filter (N95, FFP2 or equivalent)
- Eyeglasses or facial shield



Gloves

Function: impede the contact of the skin of the hands with contaminated sources and avoid that the hands can be colonized with the microbial flora of patients.



Gloves

Always carry out hygiene of hand prior to the position of gloves and immediately after its retirement. Its use does not replace the hand hygiene in any situation.

The gloves should always be changed between the attention of a patient to another one.

Use gloves only when it is indicated its use.

The gloves should always be put on the fist of the gown, in case of use of this with long sleeves.

When the attention of a patient requires intervention in different corporal areas with different risk of contamination, it is necessary to change gloves.



Gown or apron

Function: Prevent that the personnel that uses it contaminates its clothes during procedures with splatter risk of blood or other bodily fluids



Gown

Should cover the health workers that use it from the neck up to the knees and the arms up to the fists with closing system in the back



Apron

- Place over the gown, by the anterior face of the body covering with neck to knees to the operator.
- Of waterproof material to use in procedures that are foreseen there can generate important volumes of blood or bodily fluids.



Protector mucous nasal and pharyngeal

Masks

- Disposable surgical
- Used to cover nose and mouth of the health workers without being occlusive
- They should be replaced whenever they are visibly humidified by the possibility that its effect of protective barrier diminishes.

Respirator with particle filter (N95, FFP2)

- With elements that filter the air that diminish the aspiration of particles
- Requires occlusive facial adjustment
- Requires training prior to its use



Protector conjunctive

Eyeglasses

- Occlusive eye coverage in all their contour
- Is not replaceable by optic glasses

Facial shield

- Can replace eyeglasses and mask
- Gives involved cross coverage of the whole face
- Covers directly to chin



Additional Precautions: Contact

Basic principles

- HAND HYGIENE
- USE OF THE PERSONAL PROTECTIVE EQUIPMENT



Safe Injection

- Use of syringes and needles:
- Sterilized and single use for each patient and for each use.
- Avoid contamination of equipment and medications used. Do not use one dose medication such as multidose



Safe Injection

- Use of safe boxes for the disposal of syringes and needles



Environmental cleaning and disinfection

- Cleaning and disinfection are important because infectious agents can survive in the environment for variable periods of time (from hours to days)
- Cleaning can be done with water and neutral detergents and should always precede disinfection



Environmental cleaning and disinfection

- Environmental surface contamination can be reduced by using a standard hospital disinfectant (eg alcohol (70%) and chlorinated solution).
- The use of disinfectants may depend on local regulations or product availability.
- All persons who clear spills of secretions or body fluids should use a suitable PPE.



Products used for cleaning and disinfection in health services

Cleaning and disinfection products	Use indication	Indication
Water	Cleaning and dirty remotion	Wet sweep and dust removal
Water and soap		Rub soap or detergent on the surface
Water		Rinse and dry
Alcohol 70%	Disinfection of equipment and surfaces	Friction on surface to be disinfected
Composts phenols	Disinfection of equipment and surfaces	Immersion or friction after cleaning Rinse and dry
Quaternary ammonium	Disinfection of equipment and surfaces	Immersion or friction after cleaning Rinse and dry
Active chlorine releasing compounds	Disinfection of non-metallic surfaces and surfaces with organic material	Immersion or friction after cleaning Rinse and dry
Oxidants (hydrogen peroxide)	Disinfection of surfaces	Immersion or friction after cleaning Rinse and dry



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Adaptad from: Limpieza y desinfección de superficies hospitalarias (2010). Available at: <http://www.msp.gub.uy/sites/default/files/Limpiezahospitaldic2010.pdf>

Additional Precautions

Contact

Drops

Aerosols



These precautions are defined according to the routes of transmission of known infections which include:

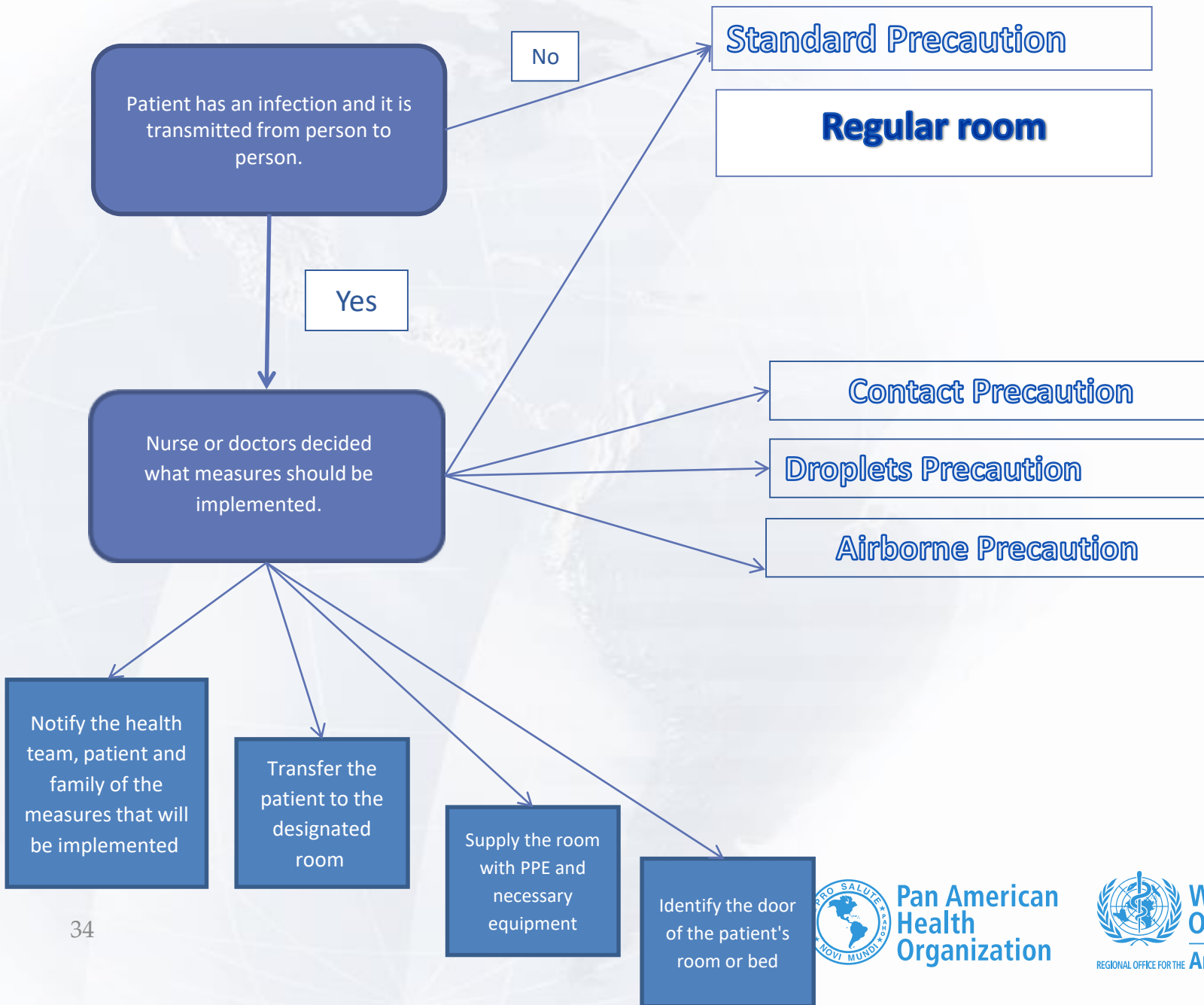
- Per contact
- By droplets and
- By air

They are add to the standard precautions applicable to every patient.



- Additional precautions apply only to those patients in whom there is a suspicion or confirmation of a particular infection, especially if it is in an infecting period, or colonization.
- The measures to be incorporated will be different according to the route of transmission that the infection has.





Additional Precautions: Contact

Applies to patients infected with:

- *Acinetobacter spp.*, *Clostridium difficile*, *Enterococcus spp.* (Including vancomycin resistant strains),
- *Pseudomonas aeruginosa*, *Klebsiella spp.*, *Staphylococcus aureus* (includes strains resistant to methicillin),
- Norovirus, respiratory syncytial virus, rotavirus,
- Gram negative bacilli and sensitive or antimicrobial resistant enterobacteria (eg, ESBL producers or carbapenemases).



Additional precautions: Contact

It is the most frequent form of transmission that can be:

- Direct infection passes of the reservoir to the susceptible person, without mediating additional elements in the transmission.
- Indirect infection is transferred through an intermediary that can be of the environment (inanimate), health workers or another patient (animated).



Additional precautions: Contact



Location of the patient

- Preferred individual room
- If is not possible and is more than one infected patient to carry out isolation in cohort
- If concerns only of an infected patient and is not available individual room
- Share room with uninfected patients placing it in order to generate a condition of separation adequate within the room (never among other patients; in extremes)
- Never share with patients with compromised immune systems or with invasive procedures

Additional precautions: Contact

Type of PPE to use and measures to fulfill

- Disposable latex gloves (or vinyl) Hygiene of hands prior to position and after retirement
- Gown of individual use. If there are not available disposable gowns, to use of textile and maintain within the room for exclusive use in the attention of a single patient up to its discharge. Change and daily washing.
- Eyeglasses and shirt-front in light of possibility of splatters by bodily fluids



Additional Precautions: Droplets

Apply for patients undergoing infectious disease by:

- Influenza
- Meningococcal meningitis
- Pertussis (*B. pertussis*)
- Adenovirus
- Rubella
- Mumps
- Coronavirus (SARS; MERS) / (air)



Additional Precautions: Droplets

Location of the patient

- Preferably in individual room
- If is not possible and is more than one infected patient to carry out isolation in cohort
- If concerns only of an infected patient and is not available individual room
- Share room with uninfected patients placing it with a condition of separation adequate within the room. Prevent to always maintain at least one meter of distance between beds.
- Never share room with patients with compromised immune systems or with invasive procedures



Additional precautions: Droplets

Conditions of the room

- Installations necessary for fulfilling standard precautions
- Consider a space where to maintain the PPE to use if should be carried out attention to less than a meter of the patient
- Maintain door closed and management of air through mechanical system of air injection and extraction or with the support of an open window that ensures an adequate change of air per hour.
- Place easily visible and understandable warning that calls attention to the condition of isolation, the type, and the measures to consider.



Additional precautions: Droplets

PPE to use and measures to fulfill

- If direct attention on the patient or at less than a meter of him:
- Disposable surgical mask and eyeglasses or
- Disposable surgical mask with facial shield
- If the facial shield is long covering chin and involvedly the face, can be used without need for mask
- Is not necessary nor recommendable use of facial shield and eyeglasses, by the inconvenience in its use
- If there is presence of abundant secretions and procedures that produce greater dispersion of these will be carried out:
- Use of gown + apron
- Single-use gloves and individual for every patient

Additional precautions: Airborne

To apply in patients undergoing infections due to:

- Pulmonary tuberculosis
- Varicella
- Measles
- Aerosol Generating Procedures



Additional precautions: Airborne

Location of the patient

Individual room

- a. System of pressure of air negative, with ventilation always toward the exterior of the establishment (never toward internal nor external hallways)
- b. Support of closed door
- c. Natural ventilation
- d. If the climatic conditions do not make it possible to ventilate opening windows can be used system of air extraction toward the exterior with 6 to 12 changes per hour
- e. The ventilation with extractor cannot go toward areas of hospitalization, closed spaces, or ventilation ducts. If there does not exist another one area where to derive the ventilation should be used filters of high efficiency in retention of particles (HEPA).



Additional precautions: Airborne

Adequacy of natural ventilation

Air exchange per hour (AEH) according to natural ventilation conditions

Open Window (100%) + Open door	37 AEH
Open Window (100%) + Closed door	4.2 AEH
Open Window (50%) + Open door	28 AEH

Natural ventilation for infection control in health-care settings. © World Health Organization 2009. Available at: http://www.who.int/water_sanitation_health/publications/natural_ventilation.pdf



Additional precautions: Airborne

Location of the patient

Shared room

- a. Only can be an alternative if exists more than a patient with diagnostic the same, pathogen, and genotype
- b. In situations as in infections by *Mycobaterium tuberculosis* with risk of development of resistance to antimicrobial drugs, if there is more than one patient with the same type of infection there should be hospitalized each in individual rooms.
- c. In case of outbreaks they will put themselves in a single room those patients who carry the same infection, selecting an area of the hospital more far from the other patients and in particular of those which have greater risk of infection (e.g. Patient immunocompromised).

Additional precautions: Airborne

Room Conditions

1. They should facilitate adherence to standard precautions regarding hand hygiene and use of PPE, with:
 1. Washbasin with adjustable temperature water
 2. Disposable paper towels and soap (or single-use textile with backwash) or other hand drying system
 3. Disposal of alcohol based solution containers for hand hygiene at the point of care
2. Space to leave aprons and breastplates to discard after care and before leaving the patient's attention area or room.
3. It will always be maintained while the patient is occupying that room, a notice easily visible on the door of the room, towards the corridor, with images and text that describes in a clear and simple way, the type of isolation and the precautions to take for its entrance



Additional precautions: Airborne

PPE to use and measures to fulfill

- Gown or apron given risk of contamination by copious secretions of the patient or if they will be carried out procedures that facilitate the dispersion of aerosols. If there are not disposable gowns they can be of more than one use, always for care of the same patient, and shared by different members of the health team who should serve that patient. Consider its washing and daily change.
- Eyeglasses if risk of contamination is foreseen with secretions. They will be placed before the entry to the room and its retirement will be made outside the same, having carried out previously hand hygiene.
- Respirator with filter of particles (N95 or FFP2) that will be placed the personnel before entering the room, carrying out previously a checkup of its adjustment to the face. Its retirement will be made outside the room having carried out previously hand hygiene.



Additional precautions: Airborne

1. Gowns or apron at risk of contamination by copious secretions of the patient or if procedures will be performed to facilitate the dispersion of aerosols. If there are no disposable gowns, they may be of more than one use, always for the care of the same patient, and shared by different members of the health team that must attend to that patient. Consider your daily washing and replacement.
2. Goggles if there is a risk of contamination with secretions. They will be placed before the entrance to the room and their removal will be done outside the same, having previously performed hand hygiene.
3. Particle filter respirator (N95 or FFP2) to be placed by the personnel before entering the room, previously performing a check of its fit to the face. Your removal will be done outside the room having previously performed hand hygiene.



Isolation in cohort

- Is understood this type of isolation to the location in a single room of two or more patients carrying a single type of infection alike pathogenic.
- This alternative makes it possible to optimize resources and concentrate efforts of work common in a single area.



Isolation in cohort

Indications

1. In order to establish measures of isolation to a significant number of patients with the same disease and agent, who require the same type of precautions (contact, droplets or aerial). It permits the installation of a single type of measures to all the patients in that group according to the mode of transmission of the infection.
2. For control of disease outbreaks of discharge communicability or of outbreaks of difficult management.



Isolation in cohort

General measures to fulfill

1. Include only confirmed cases of infection or colonization by the same infectious agent (agent, strain or `clone`).
2. Destine exclusive health workers for care of these patients, that should not serve other patients within the establishment.
3. Destine area (room or sector) exclusive for these patients, which includes nursing station, sector of inputs and baths/exclusive.
4. Maintain distance minimum of a meter between patient beds and opportunity with ease sufficient to carry out procedures in a patient without invading the space of the patient in contiguous bed.
5. The cohort is finished, setting up the area to the admission of other patients, only upon being discharged the last patient (case) of this cohort.



How do I define the term of isolation?

- The evidence that supports a specific behavior in order to define the termination of an isolation is limited. The regular practice and a shared rationality contribute orientations of behaviors to follow:
- If the infective period (contagion) it is known, the additional measures remain until the patient no longer is in a position to transmit the agent. (e.g. Time elapsed from symptom onset; number of days from beginning of therapy)
- In other cases the decision of the term of the isolation can be more complex and will be a local option on the basis of a series of internal considerations (evolution of cases; physical plant; assistance demand among others) that necessarily cannot be replicable in other scenarios.



Equipment: checklist for isolation areas

1. Face shield
2. Gloves
3. Surgical mask
4. Respirators N95
5. Long sleeve gowns
6. Alcohol hand rub solution
7. Soap (hand)
8. Disposable paper towel
9. Sharp disposable container
10. Detergent for cleaning and environmental disinfection
11. Big trash bags
12. Trash bags for biological risk
13. Bag for dirt clothes
14. Hampers for used equipment



Considerations for pediatrics and neonatology

Thomas J Sandora, MD MPH, Unique aspects of Pediatric Infection Control



Considerations for pediatrics and neonatology

Family-centered care

- Restriction of visits is limited - even when parents are sick
- Provide them with supplies to avoid transmission (masks, hand hygiene implements, among others)
- Educate parents and family
- Parents take part in childcare
- Support in the social network in the hospital - Mothers and family
- Infants and children may be asymptomatic carriers



Recommendations

- Do not allow visiting sick people. Exception for primary caregiver.
- Do not allow visits to other patients.
- Special care in handling diapers.
- Emphasis on hand hygiene.
- Personal protective equipment for family or primary caregiver.
- Care in preparing food.



General considerations

- Isolation does not represent smaller number of care for that patient
- Minimize risk of having the “abandoned” patient
 - The patient feels alone
 - The patient is bored



Application of the especially important natural ventilation for TB



Windows in both the sides



Conclusion

- The responsibility in fulfilling the practices for infection control in the health facilities is in every health personnel.
- It is the responsibility of those who promote, channel, and lead these actions to ensure that conditions necessary for fulfilling these practices are available.



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- Prevención y control de infecciones asociadas a la atención de la salud: recomendaciones básicas. OPS 2017. In press



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- Next Webminar
- March 14 – 2pm EST
- **Occupational exposure to blood borne pathogens among health workers**
- Dr. Cristiane Rapparini – Coordinator – Project Riscobiologico.org
- More information at:
- English: <http://bit.ly/2kP8wo4>



Thanks

Questions?

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