

# STANDARD PRECAUTION

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*Abstract: According to the World Health Organization (WHO), new diseases that a patient contracts while they are in the hospital are known as hospital-acquired infections (HAIs). In addition to handling blood and bodily fluids from patients, nurses may use needles contaminated with a variety of infectious diseases when providing nursing care. This could make getting sicker more likely. Blood-borne illnesses that are frequently contracted include viruses like HIV, hepatitis B (HBV), and hepatitis C (HCV). Therefore, it is critical that nurses are aware of and follow conventional measures in order to lower the risk of such secondary infections. Standard precautions have been shown to be somewhat troublesome in clinical settings, and the reality is distant from what is advised. Control measures are to evaluate for the effectiveness of control measures. Keywords: HAI, HCV, HCP, Hygiene, Precautions.*

## 1. INTRODUCTION

According to the World Health Organization (WHO), new diseases that a patient contracts while they are in the hospital are known as hospital-acquired infections (HAIs). This include diseases that manifest symptoms subsequent to discharge as well as illnesses that healthcare professionals (HCP) contract from patients who are afflicted. The WHO estimates that about 1.4 million people globally are afflicted with HAIs. Blood-borne illnesses that are frequently contracted include viruses like HIV, hepatitis B (HBV), and hepatitis C (HCV). Surgeons in particular are at a heightened risk of contracting these diseases. Even though healthcare professionals may not get sick, they could infect other patients—including fellow HCPs—who may be immune compromised or have open wounds. Similarly, healthcare professionals run the danger of contracting diseases if they disregard established protocols when attending to asymptomatic patients who may be infected. Needlestick recoiling and failing to use personal protective equipment are major causes of needle stick injuries and subsequent health-associated infections. HCPs who are poked by an HCV positive patient have an estimated 1.2–10% chance of contracting HCV infection [1]–[4]. The Centers for Disease Control and Prevention advise that basic precautions be taken to shield HCP from blood-borne illnesses, as many of these infections are not preventable by vaccination. One of the major issues that healthcare providers deal with when providing patient care is health-care associated infections, or HAIs. Hospitalized individuals frequently experience morbidity and mortality as a result of those infections. Reducing HAIs is one of the primary objectives of the World Health Organization's World Alliance for Patient Safety. Improving patient safety has garnered far too much attention globally. Standard precautions are used in any setting where health care is provided, and they are defined by the Centers for Disease Control and Prevention in 2011 as "the minimum infection prevention measures that should be applied to all patient care," regardless of their suspicion or confirmation of the patients' infection status [5]–[8]. Any place where health care is provided

should follow these safety measures, which are based on the assumption that patient bodily fluids such as blood have the potential to spread infection, as do secretions and excretions. In addition to handling blood and bodily fluids from patients, nurses may use needles contaminated with a variety of infectious diseases when providing nursing care. This could make getting sicker more likely. Therefore, it is critical that nurses are aware of and follow conventional measures in order to lower the risk of such secondary infections. Standard precautions have been shown to be somewhat troublesome in clinical settings, and the reality is distant from what is advised. In fact, low compliance rates among healthcare workers have been documented globally, despite the general understanding of the significance of basic measures in limiting the transmission of infectious organisms in the workplace. As of January 2021, COVID-19 was a global menace, affecting 94 million people globally and accounting for around 2 million deaths. HCWs are the most crucial resources for treating patients at the forefront of the COVID-19 pandemic's front lines of treatment as it advances. They are also more likely to contract the disease themselves, which could make controlling the pandemic extremely difficult and result in the healthcare system collapsing. According to a study, there was a 10% frequency of COVID-19 among healthcare workers, and 29% of infections were brought on by unintentional contact with patients at non-COVID-19 facilities. There is a chance that COVID-19 will spread among healthcare workers without causing any symptoms, according to recent data. In addition to the normal precautions, the WHO has recommended a number of individual and organizational workplace infection control measures to safeguard healthcare workers and improve the health systems' ability to respond to COVID-19. Workplace infection prevention measures are crucial for protecting occupational health in the healthcare industry, but they won't be effective if individual healthcare workers don't take them. Therefore, to safeguard the health of healthcare workers and lower the danger of cross-transmission and infection at work during an infectious pandemic, agreeable and accepted workplace infection control rules and practices must be put into place in healthcare settings [9][10][11].

Studies on healthcare workers' opinions of their workplace infection control procedures and policies, however, are scarce, and it is unknown how these factors relate to compliance levels during pandemics. As of January 2021, COVID-19 was a global menace, affecting 94 million people globally and accounting for around 2 million deaths. HCWs are the most crucial resources for treating patients at the forefront of the COVID-19 pandemic's front lines of treatment as it advances. They are also more likely to contract the disease themselves, which could make controlling the pandemic extremely difficult and result in the healthcare system collapsing. According to a study, there was a 10% frequency of COVID-19 among healthcare workers, and 29% of infections were brought on by unintentional contact with patients at non-COVID-19 facilities. There is a chance that COVID-19 will spread among healthcare workers without causing any symptoms, according to recent data. In addition to the normal precautions, the WHO has recommended a number of individual and organizational workplace infection control measures to safeguard healthcare workers and improve the health systems' ability to respond to COVID-19. Workplace infection prevention measures are crucial for protecting

occupational health in the healthcare industry, but they won't be effective if individual healthcare workers don't take them. Therefore, to safeguard the health of healthcare workers and lower the danger of cross-transmission and infection at work during an infectious pandemic, agreeable and accepted workplace infection control rules and practices must be put into place in healthcare settings. Studies on healthcare workers' opinions of their workplace infection control procedures and policies, however, are scarce, and it is unknown how these factors relate to compliance levels during pandemics. Precautions that are universally applied, or standard precautions, are the main line of defense against health care-associated infections (HCAI), such as the COVID-19 pandemic, and to ensure worker safety [12][13][14]. Research from both domestic and foreign literature shows that few practitioners really followed these recommendations. The behavior of non-adherence can be attributed to a number of factors, including individual factors such as comprehension of the SP measures and institutional ones such as managerial commitment, material resources, and human resources. The primary source of infection risk when providing medical care is hospitals. Airborne transmission, droplets, and touch are common ways for HCAIs to spread. Additionally, especially while a patient is in the hospital, they can spread from the infected individual to healthy individuals. A considerable proportion of HCAI cases are associated with occupational exposures.

A series of safety precautions known as "standard precautions" are intended to stop the spread of contagious blood-borne illnesses. Blood-borne infections including HIV, HBV, and HCV are the most dangerous and have been shown to pose a significant risk in the workplace. Practically speaking, standard precautions include wearing gloves, aprons, and goggles; handling contaminated equipment (needles and sharps) appropriately; maintaining housekeeping with the right cleaning procedures; and making sure that standard practices are strictly followed. This calls for the supply of safety gear, appropriate education for medical professionals, and observance of sterilisation and disinfection procedures. The term "standard precaution" refers to infection control methods used to prevent disease-causing microorganisms found in human blood that can affect humans. The usual precautions taken by healthcare professionals against blood-borne infections are crucial elements of any plan to stop infectious illnesses. Blood-borne pathogen infections can affect nurses, laboratory technicians, surgeons, housekeepers, morgue technicians, and nonnursing attendants among other healthcare professionals. Because they work closely with patients on a daily basis, nurses are more likely to come into touch with microbes. During blood tests and physical examinations, doctors are also exposed to blood-borne infections and may become infected. The varying types of training that health care workers receive may have an impact on the variations in their knowledge of standard precaution. Poor practices with conventional precaution might result from an unfavorable atmosphere in the healthcare facility, such as a lack of personal protective equipment or continuously running water. Health professionals must have a suitable attitude and possess the necessary technical knowledge and drive to comply with conventional precautionary practices for extended periods of time. Even if it's not strictly enforced, hand washing is one of the strategies used in health facilities in underdeveloped nations like Ethiopia to avoid infections. In high-income nations, standard

precautions have been heavily advocated to shield healthcare personnel from blood-borne pathogen exposure at work and the ensuing infection risk. Conventional measures are frequently implemented, in part, by placing healthcare personnel at needless danger of contracting blood-borne infections. At the facility level, preventive initiatives aimed at minimizing occupational injuries and infections receive less attention, despite the Ethiopian Federal Minister of Health having well established regulations and processes to execute standard precautionary practice. It can save lives to evaluate the understanding and application of conventional safeguards against blood-borne diseases, especially among medical workers employed in emergency rooms. There isn't a single study that focuses on routine precaution knowledge and behaviors against blood-borne infections. The minimal infection control measures known as "standard precautions" are applicable to all patient treatment in any healthcare setting, regardless of the patient's confirmed or suspected infection status. The dual goals of these measures are to safeguard healthcare professionals and stop them from infecting their patients. Hand hygiene, the use of personal protective equipment (such as gloves, gowns, and masks), needle safety, and safe handling of potentially contaminated objects or surfaces in the patient environment—including cough etiquette and the appropriate disposal of sharps, bodily fluids, and other clinical wastes—are all considered standard precautions. Health care personnel who perform routine work in wards, intensive care units, emergency/trauma triage, and other settings are at risk of contracting blood-borne pathogens. Every year, approximately three million healthcare workers (HCWs) encounter blood-borne viruses through percutaneous exposure. Blood-borne illnesses can still affect healthcare professionals even with infection control measures and the hepatitis B vaccine available. By carefully adhering to current infection control measures, receiving a hepatitis B vaccination, and having personal protective equipment available when handling crises, many exposures can be avoided. Even with the availability of comprehensive recommendations, health care workers' understanding and adherence to standard measures varies and has been proven to be insufficient in both industrialized and poor nations.

## **2. LITERATURE REVIEW**

Eliza Lai-Yi Wong et al. [15] said that in hospital settings, standard precautions stop the spread of infections. Healthcare workers' (HCWs') risk of contracting an infectious disease may rise if they disregard infection control recommendations, particularly during pandemics. The aim of this study was to evaluate HCWs' perceptions of workplace infection control measures during the COVID-19 pandemic and their degree of compliance with infection prevention and control activities in various healthcare settings. Techniques: A cross-sectional online survey was distributed to nurses in Hong Kong to gather their opinions on workplace infection and prevention policies, adherence to conventional procedures, and self-reported health during pandemics. Findings: In regards to the workplace infection and prevention policy's comprehensiveness (62%), clarity (64%), and timeliness, the respondents were not happy. When it came to protective conduct, the respondents' partial adherence to the recommended safeguards during medical care was observed. When it came to executing invasive treatments (46%) and

properly handling patients (54%), their compliance was comparatively poor. According to a multivariate analysis model, older respondents had higher levels of compliance among the inpatient and outpatient groups (coefficient range: 0.065–0.076), while the level of compliance with standard precautions was positively associated with the satisfaction on infection control and prevention policy among the high-risk group (0.020; 95% CI: 0.005–0.036). Working in a designated team and having a chronic condition were also substantially linked to higher levels of compliance among responders in the high-risk and inpatient groups. Conclusions: While satisfaction with infection control and prevention policies would promote compliance among the high-risk group, standard measures are the most critical factors to limit cross-transmission among HCWs and patients. The healthcare system should be alerted when there is generally subpar compliance and negative attitudes toward infection prevention and control protocols, particularly during pandemics.

Aide-memoire et al. [16] said that Standard precautions are designed to lessen the possibility of pathogens from both known and unknown sources spreading to patients and healthcare personnel. These are the minimal standards for infection prevention and control that all medical professionals should adhere to when providing care for patients in all situations and at all times. Standard precautions can stop the spread of pathogens among patients, medical personnel, and the environment when they are followed regularly. This aide-memoire provides a quick summary of crucial implementation tips and essential components.

Yohanis Asmr et al.[17] said that the employment of infection control methods against harmful microorganisms that can infect humans and cause sickness is part of standard precautions. Goal. This study is to evaluate the physicians' and nurses' knowledge and application of routine precautions against blood-borne pathogens in the adult emergency room in Addis Ababa, Ethiopia. Techniques. A cross-sectional study with an institutional focus was carried out in February and March of 2018. This study had 128 individuals in all, who were chosen from four public hospitals. A standardized pretested questionnaire was used to gather the data, which were then coded, entered, and examined for completeness using statistical software (SPSS version-23). The correlation between the variables was assessed using the chi-square test. P-values less than 0.05 were deemed statistically noteworthy. Outcome. Out of 14 knowledge items, the average knowledge score for standard precautions was 10.3. 86.8% (n = 79) of the 91 nurses and 93.8% (n = 30) of the 32 doctors have strong knowledge. Out of 12 practice items, the study subjects' mean practice level was 8.5. Compared to doctors (21.8%), the majority of nurses (73.6%) have good practice levels. Washing hands before touching patients, having an infection control officer present, and following infection control guidelines were all strongly correlated with knowledge level. The practice level of responders was substantially correlated with their profession, training, and the existence of infection control guidelines in the emergency room (P<0.05). In conclusion. Standard precautions are well-known to both doctors and nurses. But compared to doctors, nurses are more experienced practitioners. For newly hired health workers, orientation



during employment and ongoing training programs must to be offered. Additionally, every hospital administration should have access to sustainable supply systems.

Sangini Punia et al. [18] said that Health care workers (HCWs) and patients can both avoid infections by carefully adhering to established measures. The current study evaluated the factors influencing noncompliance among the healthcare workers working in an emergency and trauma triage center, as well as their perceptions and compliance with the usage of standard precautions. Techniques. To gather the necessary data from the study participants, a semistructured questionnaire was used in a cross-sectional study. Conclusions. A total of 162 health care workers were enrolled in the study, and they gave different answers on how well they followed recommended safeguards. The majority of them reported using gloves (77%) and hand rub (95%) while relatively few reported using protective eyewear or outerwear (22% and 28%, respectively). 8% of the healthcare workers had not received all recommended doses of the hepatitis B vaccination, despite a recognized risk of exposure to blood-borne illnesses. In the last year, about 17% of people reported having at least one needle stick injury; however, only 5.6% of those people sought medical assistance. In conclusion. Health care professionals' inadequate adherence to conventional precautions calls for innovative approaches to monitoring and training. The best course of action may be to establish an efficient occupational health cell with these components, including regular surveillance.

Dhedhi et al. [19] said that Hospital-acquired infections (HAIs) are infections that people get that they had never had before when they are in the hospital. This encompasses infections that medical personnel contract while tending to patients who are infected. It is necessary to take routine precautions religiously in order to reduce the danger of illness spread, as both patients and healthcare staff might be sources of infection. The purpose of this study was to evaluate the medical staff's expertise at The Indus Hospital, a tertiary care facility in Karachi, Pakistan.

### **3. METHODOLOGY**

#### **COMPONENTS**

- HAND HYGEINE
- PERSONAL PROTECTIVE EQUIPMENTS(PPE)
- ROUTINE ENVIRONMENTAL CLEANING
- RESPIRATORY HYGIENE AND COUGH ETIQUETTE
- APPROPRIATE HANDLING OF LINEN
- BIOMEDICAL WASTE MANAGEMENT\
- SAFE USE AND DISPOSAL OF SHARPS

Purpose for Hand Hygiene

- The most important elements of infection control.

- Great way to prevent cross infection
- Health care providers are at risk while they are treating patients.

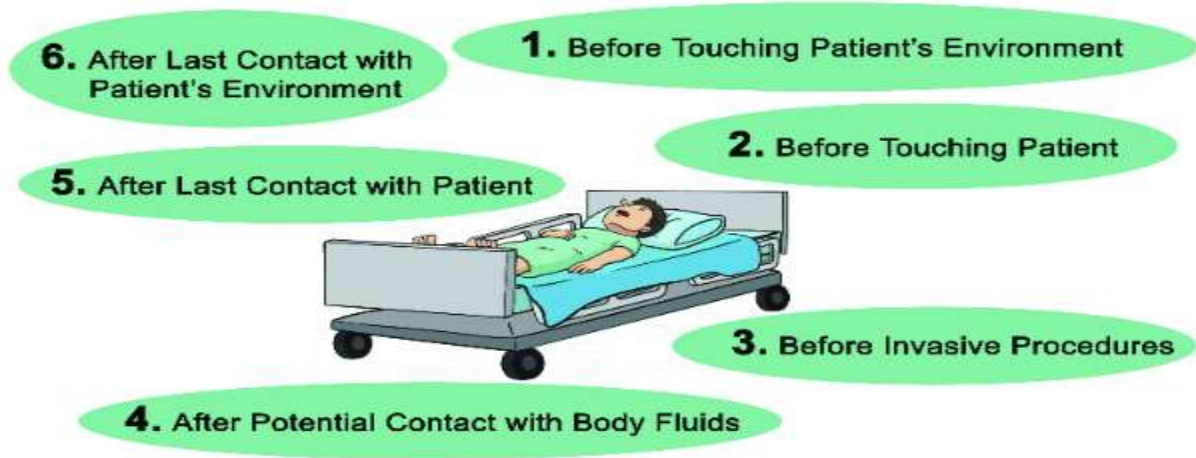


Fig 1 shows six moments for Hand Hygiene

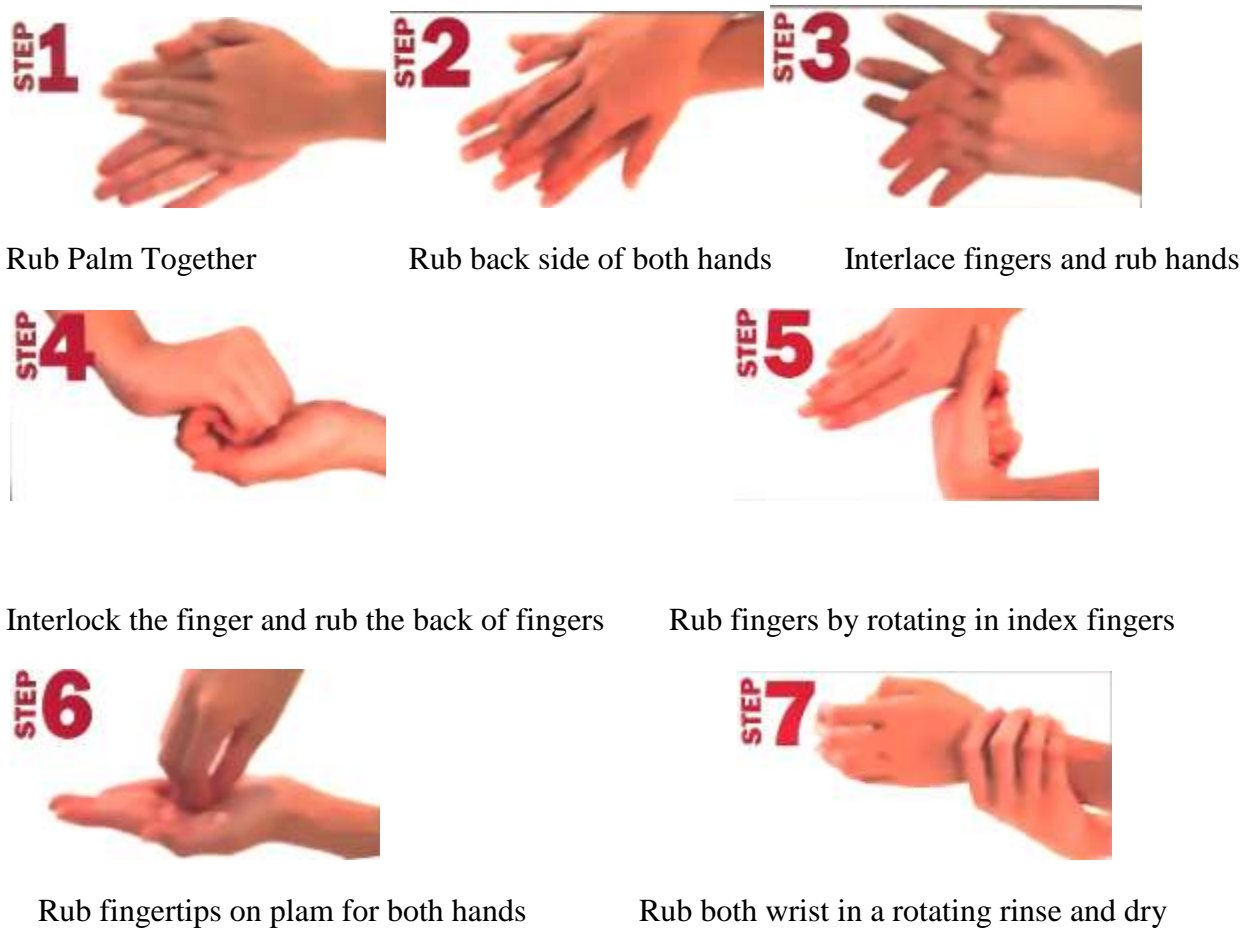


Fig 2 shows Steps of Hand washing

Total number of times hand hygiene was performed

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Total opportunities for hand hygiene

X100

Fig 3 shows Calculations for compliance rates

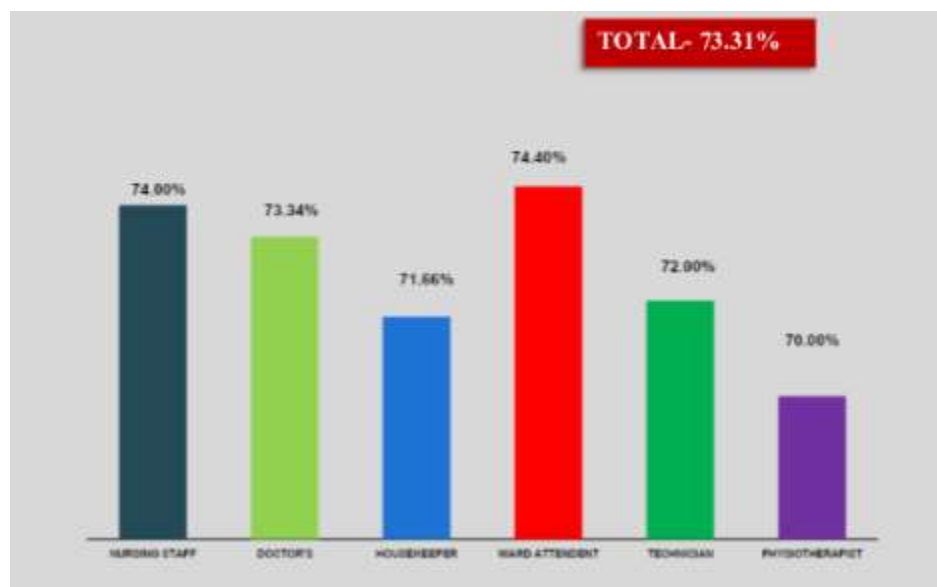


Fig 4 shows hand hygiene survey august 2019

### Key Points About PPE

- Don before contact with the patient, generally before entering the room
- Use carefully – don't spread contamination
- Remove and discard carefully, either at the doorway or immediately outside patient room; remove respirator outside room
- Immediately perform hand hygiene





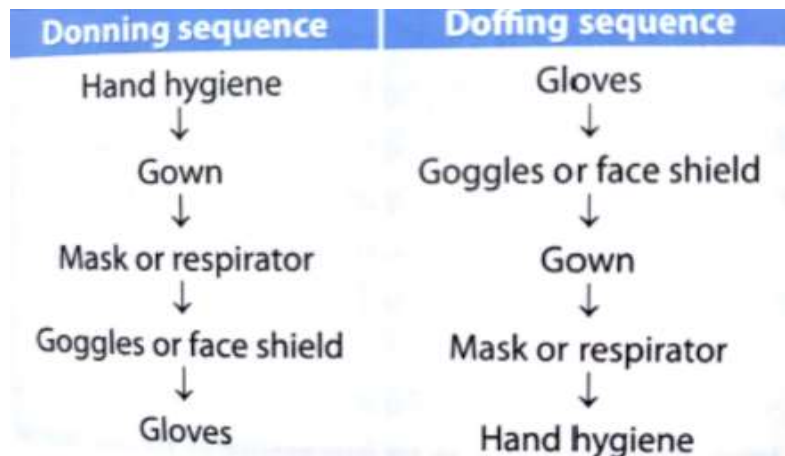
Fig 5 shows sequence for putting on personal protective equipment (PPE)

**Gloves not recommended**

- For routine pt. care activities eg. Measuring B.P., temp. and pulse and during maintenance of IV cannula.
- Giving oral medications and serving food.
- During bathing, giving care to pts. and also while transporting pt.
- For routine entry into isolation room when contact with pt. and environment is not anticipated.
- Using computer keyboard, telephone, writing in the pt.’s chart & replacing linen for pt.’s bed.

**4. RESULTS AND DISCUSSION**

**Table 1 shows sequence of donning and doffing**



### How to Safely Use PPE

- Keep Gloved Hands Away From Face
- Avoid Touching Or Adjusting Other Ppe
- Remove Gloves If They Become Torn; Perform Hand Hygiene Before Donning New Gloves
- Limit Surfaces And Items Touched

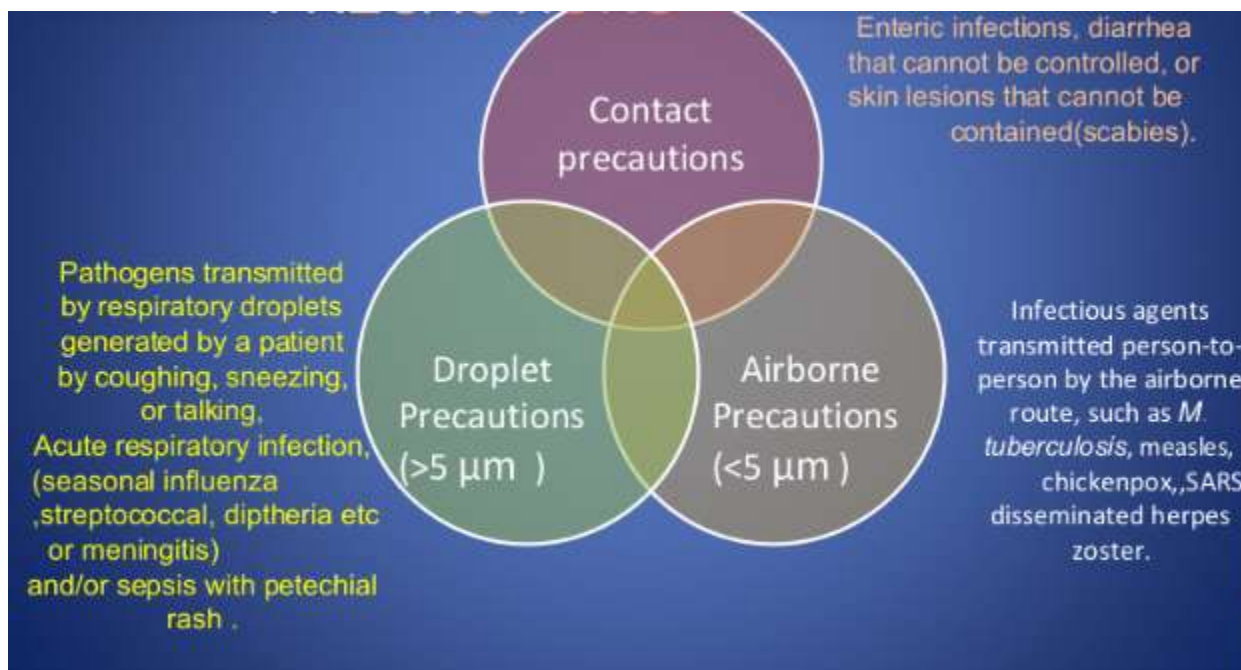


Fig 6 shows transmission based precautions

#### Airborne Precautions

- HCWs must wear N95 or higher level respirator.
- Pts. Should be placed in airborne infection isolation room (with negative pressure ventilation, UV irradiation & HEPA filters)

#### Droplet Precautions

- Hand hygiene should be followed
- Use of appropriate PPEs ( surgical mask)
- Follow respiratory hygiene and cough etiquette.
- A single room is preferred for patients who require droplets precautions.
- Transfer of pts. should be limited.
- Proper disinfection of the rooms

Contact Precautions

- Strict adherence to hand hygiene.
- PPEs should be used.
- Single used patient dedicated equipment must be used or preferred but if unavoidable then regularly disinfect them.
- Patient placement: Single isolation room if not possible then cohorting to be done, if even cohorting not possible then, minimum 3 feet distance b/w beds with privacy curtains.
- Transfer of the patients should be limited.
- Disinfection of the rooms must be done frequently

Type	Isolation room or cohorting	Hand hygiene	Gloves	Apron or gown	Mask	Eye protection	Handling of equipment	Visitors
Standard	Not required	Yes	As required*	If soiling likely*	As required <sup>s</sup>	As required <sup>s</sup>	Single use or reprocessed	No additional precautions
Contact	Essential	Yes	Essential	Essential	As required <sup>s</sup>	As required <sup>s</sup>	Same as standard	Same precautions as for HCWs
Droplet	Essential	Yes	As required*	If soiling likely*	Surgical mask is essential	As required <sup>s</sup>	Same as standard	Restricted. Precautions same as for HCWs
Airborne	Essential (negative pressure)	Yes	As required*	If soiling likely*	N95 respirator essential	As required <sup>s</sup>	Same as contact	Same as for droplet

Fig 7 shows application of standard and transmission Based precautions

Precaution for patients with MDROs

- Minimize ward transfers
- Ensure early case detection
- Isolate infected or colonized patients in a single room
- Reinforce hand wash after contact
- Consider treating nasal carriers with mupirocin
- Consider daily wash or bath by antiseptic detergents for carrier and infected patients.
- Ensure careful handling and disposal of medical devices, linen, waste etc.

## **5. CONCLUSION**

Outbreak investigations

Step 1. Prepare for field work

Step 2. Recognize the outbreak and prepare to investigate

- Establish the existence of an outbreak
- Determine if immediate control measure are needed
- Notify and communicate
- Formation of Outbreak control team(OCT)

Outbreak investigations

- Step 3. Verify the diagnosis and confirm that an outbreak exists
- Step 4. Construct a working case definition
- Step 5. Find cases systematically and record information.
- Step 6. Perform descriptive epidemiology with respect to time , place and person

Outbreak investigations

- Step 7. Develop hypotheses.
- Step 8. Evaluate hypotheses epidemiologically.
- Step 9. Reconsider, refine, and re-evaluate hypothesis.
- Step 10. Compare and reconcile with lab/environmental studies.

Outbreak investigations

Step 11. Implement infection control measures.

Step 12. Initiate or maintain surveillance.

Step 13. Communicate findings

- Communicate within the hospital
- Prepare the final report
- Look back investigations

Control measures

- Identification and elimination of the contaminated product.
- Modification of nursing procedures.
- Identification and treatment of carriers.
- Correction of lapses in technique or procedure

- Monitor: Continue follow-up cases after the outbreak clinically as well as microbiologically

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