INFECTION CONTROL PROTOCOLS

CMH LAHORE MEDICAL COLLEGE & INSTITUTE OF DENTISTRY

SOP

1. **Purpose:** To establish effective Guidelines to prevent to spread of infection.

2. **Scope:** CMH Lahore Medical College & Institute of Dentistry

3. **Responsibility:** All Staff on duty

4. **Infection Control:**

   a. Infection Control in a Health Care facility is the prevention of the spread of micro-organisms from:-

      (1) Patient to Patient

      (2) Patient to Staff Member.

      (3) Staff member to Patient.

      (4) Staff member to Staff member.

   b. **AIM**

      (1) To minimize the risk of spread of infection amongst the patient, staff, trainees, students and general public.

      (2) To lay down effective ways and means to minimize the spread of infection at CMH LMC & IOD.

      (3) To reduce the possible risk of transmission of infection while carrying out various medical & dental procedures.

c. **Infection Control Committee (ICC)**

A dedicated Infection control team along with full participation of all the staff of CMH LMC & IOD is the key to have an effective infection control:-

(1) Prof. / Brig Abdus Sattar (R) – Professor & HOD Pathology

(2) Prof. Muhammad Saeed Anwar – Microbiologist, Pathology Dept

(3) Lt Col (R) Muhammad Ashraf Chaudhry – Professor & HOD Community Medicine

(4) Additional Dean – IOD

(5) Lt Col Khizer Iqbal Mufti (R) – MO I / C Infirmary

d. **Identification of Areas for effective infection control:-**

(1) Effective hand Hygiene

(2) Use of Personal Protective Equipment

(3) Avoiding Needle Stick Injury

(4) Waste Management and Disposal (Separate policy initiated)

(5) Cleaning and Disinfection

(6) Managing spills in various Departments

(7) Safety in injection practices

(8) Hepatitis B Vaccination

(9) Standard Precautions

(10) Nosocomial Infections and precautions

(11) Instructions to patients to prevent infections

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e. Infection Control policy

(1) The hospital / Clinics / various department's environment is flooded with different types of patients, visitors and staff. On daily basis there is a huge turnover of patients in OPDs. Many patients come in Clinics & various Departments with multiple infections which are either treated in outdoor or Indoor. These Infections can be easily transferred from patients to patients, patients to staff and from staff to patients if basic precautions are not taken.

(2) It is mandatory that all health care workers working in the CMH LMC & IOD follow the procedures which can control the hospital related infections. All the consultants post graduate registrars, house officers, AFNS officers, paramedical staff and support staff who are involved in patient management must follow and train their subordinates in the procedures mentioned in the following sections.

(3) This policy covers the topics mentioned in subsequent page and has been prepared keeping in view the guidelines of World Health Organisation (WHO), Pakistan Biological Safety Association (PBSA), guidelines adopted in hospital of United kingdom like King's College and Infection Control Guidelines of Pakistan Kidney and Liver Institute.

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- May be used in combination with goggles or face shield to protect the mouth, nose and eyes.
- When placing a catheter or injection material into the spinal canal or subdural space (to protect patients from exposure to infectious agents carried in the mouth or nose of healthcare personnel)
- Wear a facemask to perform intrathecal chemotherapy.

4. **Goggles, Face Shield**

- Wear eye protection for potential splash or spray of blood, respiratory secretions, or other body fluids. Personal eyeglasses and contact lenses are not considered adequate eye protection. One can use goggles with facemasks or face shield alone to protect the mouth, nose and eyes.

5. **Respirators**

- Wear N95 or higher respirators for potential exposure to infectious agents transmitted via the airborne route (e.g. tuberculosis).
- All heath care personnel that use N95 or higher respirator are tested at least annually and according to OSHA requirements.

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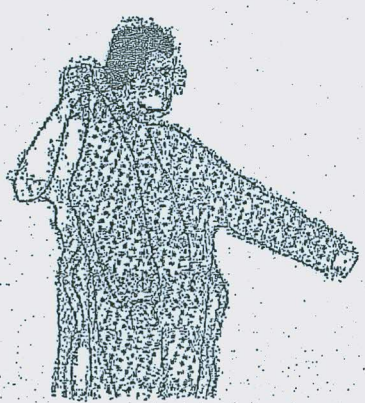
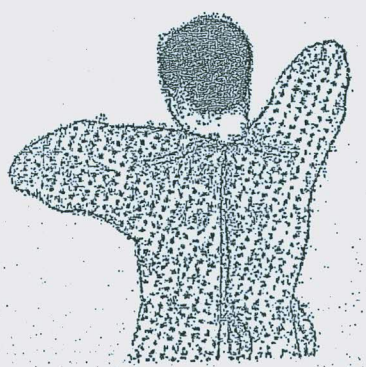
SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions require, such as standard and contact droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

1. Gowns

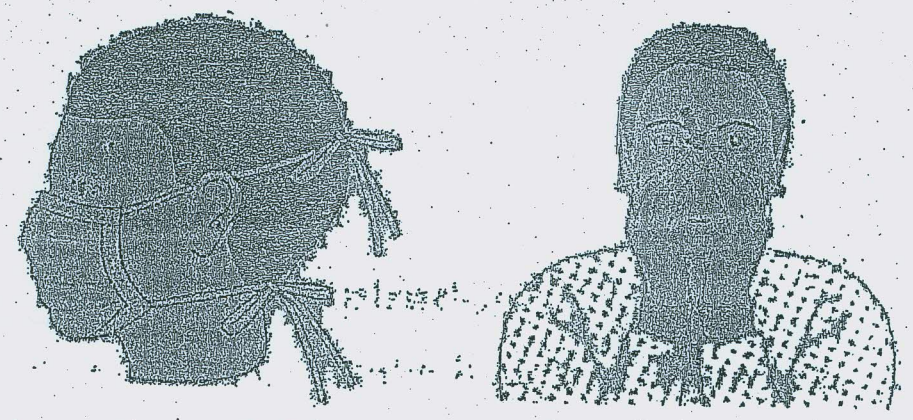
- Full cover torso from neck to knees, arms to end wrists, and wrap around the back.
- Fasten in back at neck and waist.





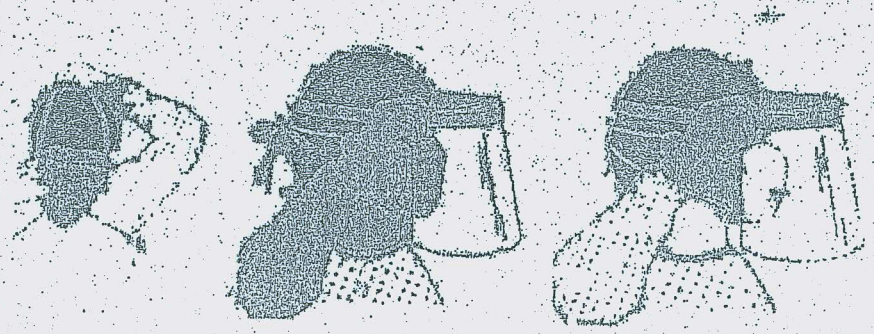
2. Mask or Encapsulation

- Secure ties or elastic bands at the middle of head and neck.
- Fit flexible band to nose bridge.
- Fit snug to face and below chin.
- Fit check compliance.



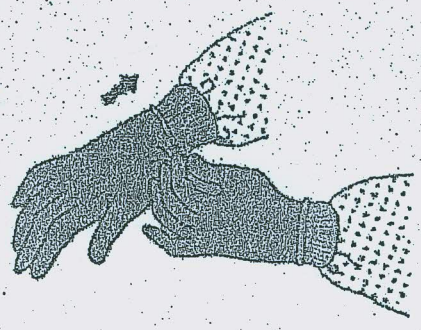
3. Goggles or Face Shield

- Place over face and eyes and adjust to fit.



4. Gloves

- Extend to cover wrist of isolation gown.



HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE)

There are variety of ways to safely remove PPE without contaminating your clothing, skin or mucous membranes with potentially infectious materials. Here is one example. Remove all PPE before exiting the patient room except a respirator, if worn. Remove the respirator after leaving the patient room and closing door. Remove PPE in the following sequence :

1. Gloves

- Outside of the gloves are contaminated.
- if your hands contaminated during gloves removal,immediately wash your hands and use an alcohol based hand sanitizer.
- Using a gloved hand, grasp the palm area of the other gloved hand and peel off first glove.
- Hold removed glove in gloved hand.
- Slide finger of ungloved hand under remaining glove at wrist and peel off second glove over first glove.
- Discard gloves in a waste container.

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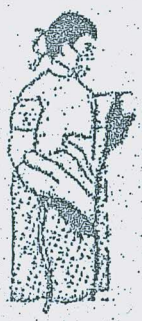
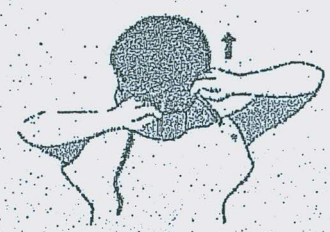
2. Gowns

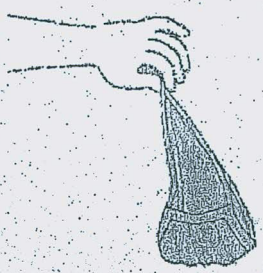
- Gown front and sleeves are contaminated!.
- if your hands contaminated during gown removal,Immediately wash your hands and use an alcohol based hand sanitizer.
- Unfasten gown ties, taking care that sleeves do not contact your body when reaching for ties.
- Pull gown away from neck and shoulders, touching inside of gown only.
- Turn gown inside out.
- Fold or roll into a bundle and discard in a waste container.



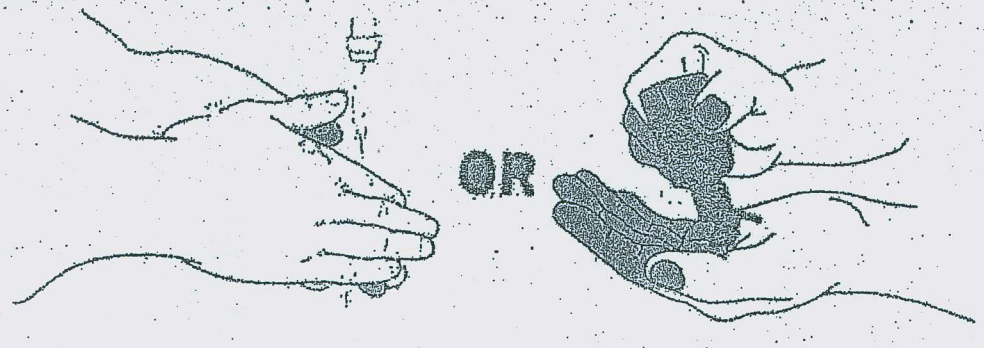
3. Mask or Respiration

- Front mask/respirator is contaminated - DO NOT TOUCH .
- if your hands contaminated during mask/ respirator removal,immediately wash your hands and use an alcohol based hand sanitizer.
- Grasp bottom ties or elastics of the mask/ respirator, then the ones at the top, and remove without touching the front .
- Discard gloves in a waste container.





4. Wash Hands and use Alcohol based Hand sanitizer immediately after removing all PPE



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AVOIDING NEEDLE STICK INJURIES (NSI)

If anyone gets needle stick injury while working in hospital it should not be hidden and should be reported as soon as possible to your immediate supervisor or infection control department.

1. **Steps to be followed in case of needle stick injuries:**

- Do not squeeze.
- Wash with soap and water and cover with water-proof dressing.
- Get the medical record of the patient and check status if possible.
- Inform infection control department within few hours (within 24 hours) of injury.
- Further course of action as regards investigations to be carried out are decided by infection control team and microbiologist.
- If the needle stick injury involves contact with Hepatitis "B" infected patient than section of this SOP pertaining to Hepatitis "B" vaccination can be consulted.

2. **Average risk of transmission:**

- Hepatitis B virus (HBV) 6-30%
- Hepatitis C virus (HCV) 1.3%
- Human Immunodeficiency virus (HIV) 0.3%

WASTE

Hospital waste is generated in all the departments, OPDs and wards of the hospital. It is required that such waste is collected properly, transported properly and disposed off according to laid down procedures.

1. Sharps

Sharps include:-

- Needles, Syringes, Ampules, Broken glass, Scalpels and blades, Razors, Staples, Trocars, Guide wires, other sharps
- All sharps shall be collected in puncture proof containers, easy to handle on dedicated trolley.
- Syringes and needles shall be cut with needle cutter and send needle cutter and sharp collector for incineration when 3/4th filled after sealing and proper labelling.

2. Infectious waste

Infectious waste includes:

- Swabs, bandages and dressings stained with blood and body fluids.
- Contaminated personal protective equipment
- IV tubing after cutting.
- Drips and infusion bags after cutting.
- Incontinence diapers.
- Urine bag.
- Cultures

All the infectious waste shall be collected in red container or any other color designated by hospital. Infectious waste bin bag shall be tied when 3/4th full and sent for incineration after proper labelling. Incinerator is being managed by waste management officer and station health organisation representative.

3. **Non Infectious Waste**

This includes:

- Paper, Cardboard, Packaging, Food Waste

All the non infectious waste will be collected in blue/black or any other color designated by hospital. Such waste should not be transported to incinerator site but is collected in specially designated points in the hospital. This waste is collected by Cantonment board authorities in close liaison with PHA staff of hospital.

4. **Pharmaceutical Waste**

This includes:

- Expired medicine (Pills and antibiotics)
- Vaccines
- Contaminated drugs

All the Pharmaceutical waste shall be collected in separate container clearly labelled "Pharmaceutical waste only". Large quantity of pharmaceutical waste shall be returned to the supplier by pharmacy department and small quantities shall be crushed and placed in yellow bag.

5. Pathological Waste

Pathological waste includes:

- Human tissue, fluids and organs
- Body parts
- Placenta

This waste shall be collected in doubled thick red bags and placed in red container containing proper labelling stating "Pathological Waste" and shall be buried. Such burial pits must be clearly sign posted. Bleaching powder should be coplously used at such places for disinfection. In some infections like viral hemorrhagic fevers, the pathological waste shall be disinfected before burial.

ENVIRONMENTAL CLEANING AND DISINFECTION

Environment also plays important role in transmitting infections and thus all environmental surfaces should be cleaned and disinfected properly.

1. **Approved Disinfectants**
   - Hypochlorite (Bleach)
   - Dimethyl ammonium chloride

2. **Hypochlorite (Bleach)**
   - Use 0.5% hypochlorite or bleach tablet for environmental disinfection.
   - Bleach 1 part and water 9 parts.
   - Bleach tablet.
   - Use according to recommendation label on the box.

3. **Dimethyl ammonium chloride**
   - For general disinfection and cleaning
     Prepare disinfectant by diluting 1:100 with water (10 ml in 1L)
   - For slightly soiled and dirty condition
     Prepare disinfectant by diluting 1:50 with water.

MANAGING SPILL - CLINICS / DEPARTMENTS

At times blood, urine, infected secretions and body fluids get accidentally spilled on the floors, working stations or other places which are potentially hazardous and thus must be managed in proper way.

1. Principle

Spill management is a set of practices used to confine, contain and evacuate an accidental spill of blood and other body fluids regardless of infectious status.

a. Principle and procedure of spill management

- Promptly clean and decontaminate spills of blood or other potentially infectious materials.
- Follow proper procedures for site decontamination or spills of blood or blood-containing or other body fluids.
- Use protective heavy duty gloves and other personnel protective equipment (PPE) like gown and mask.
- Put copious amount of disinfectant like hypochlorite solution (bleach) on the spill and cover it with absorbent material like gauze. Leave it there for 10-15 minutes and then discard the absorbent material in infectious waste bin.
- Swab the area with a cloth or paper towels moderately wetted with disinfectant, and allow the surface to dry.
- Use EPA-registered sodium hypochlorite granules or Haz Tab is preferred.

- Use a 1:100 dilution (500-615 ppm available chlorine) to decontaminate nonporous surfaces a cleaning a spill of either blood or body fluids in patient-care setting.
- If a spill involves large amounts of blood or body fluids, or if a blood or culture spill occurs in the laboratory, use a 1:10 dilution (5,000-6,150 ppm available chlorine) for the first application of germicide before cleaning.

b. **Hand washing with soap and water after managing spill**

- Wash hands first with water (avoid using hot water)
- Apply soap to hands
- Rub hands vigorously for at least 15 seconds, covering all surfaces of hands and fingers
- Rinse hands with water and dry thoroughly with paper towel. Use paper towel to turn on/off water faucet/tap.

2. **Spot Cleaning at work station**

- Wipe up spot immediately with disinfectant wipe.
- Place contaminated absorbent material into plastic bag for disposal.
- Clean the area with detergent solution, using disposable cloth or sponge.
- Wipe the area with sodium hypochlorite and allow drying.
- Perform hand hygiene after the procedure.

SAFETY IN INJECTION PRACTICES

1. Vide variety of injections are commonly used in healthcare settings for the prevention, diagnosis, and treatment of various illnesses. Unsafe injection practices put patients and healthcare providers at risk of infectious and non-infectious adverse events.
2. This is harmful and preventable. Safe injection practices are part of standard precautions and are aimed at maintaining basic levels of patient safety and provider protections.

MYTHS & REALITIES ABOUT INJECTION PRACTICES

Listed below are some examples of dangerous misperceptions about safe injection practices.

Myth	Truth
Changing the needle makes a syringe safe for reuse	Once they are used, both the needle and syringe are contaminated and must be discarded. A new sterile needle and a new sterile syringes should always be used for each patient and to access medication vials.
Syringes can be reused as long as an injection is administered through an intervening length of IV tubing	Everything from the medication bag to the patient's IV catheter is a single interconnected unit. Distance from the patient's gravity, or even infusion pressure do not ensure that small amounts of blood won't contaminate the syringe once it has been connected to the unit. Syringes should never be reused for more than one patient or to access medication vials.

If you don't see blood in the IV tubing or syringe, it means that those supplies are safe for reuse.	Pathogens including hepatitis C virus, hepatitis B virus, and HIV can be present in sufficient quantities to produce injection without any visible blood.
Single dose vials with large volumes that appears to contain multiple doses can be used for more than one patient	Single dose vial should not be used for more than one patient regardless of the vial size.

HEPATITIS - B VACCINATION

1. Since Hepatitis "B" is quite common in our country so prevention against Hepatitis "B" is of paramount importance for health care workers.

- All healthcare workers should be vaccinated against Hepatitis B.
- If anyone is pre-vaccinated he/she has to submit a copy of his vaccination card to concerned authorities.
- If someone is not vaccinated, she/he should receive the 1st dose of Hepatitis B vaccine before joining the duty (specially workers who have direct contact with patient's care / blood and body fluids)
- The regimen can be 0,1 and 6 month/0,1 and 3 month and it should be administrated intramuscularly in the deltoid muscle.
- Antibody titers preferably should be checked one to four months after the completion of a primary course of vaccine.
- In case of any query, please contact infection control team.

2. **Post Exposure Measures**

Evaluate exposure source:

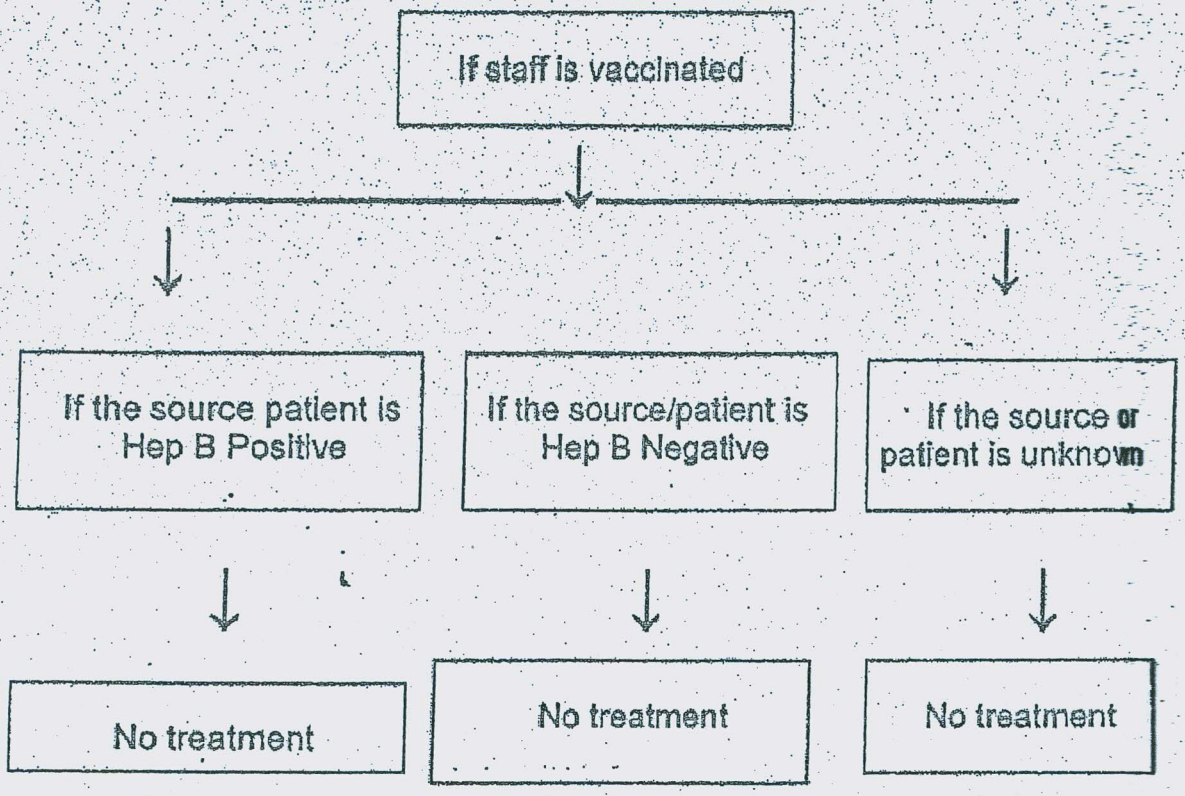
- Assess the risk of infection
- Test known sources for
  Presence of HBs Ag
  Presence of HCV antibody
  Presence of HIV antibody

If the source of exposure is HBs Ag. positive or exposure source is unknown for HBs Ag status then flow diagram mentioned at serial no 3 and 4 of this section should be followed:

3. **HBs Ag Positive exposure source**

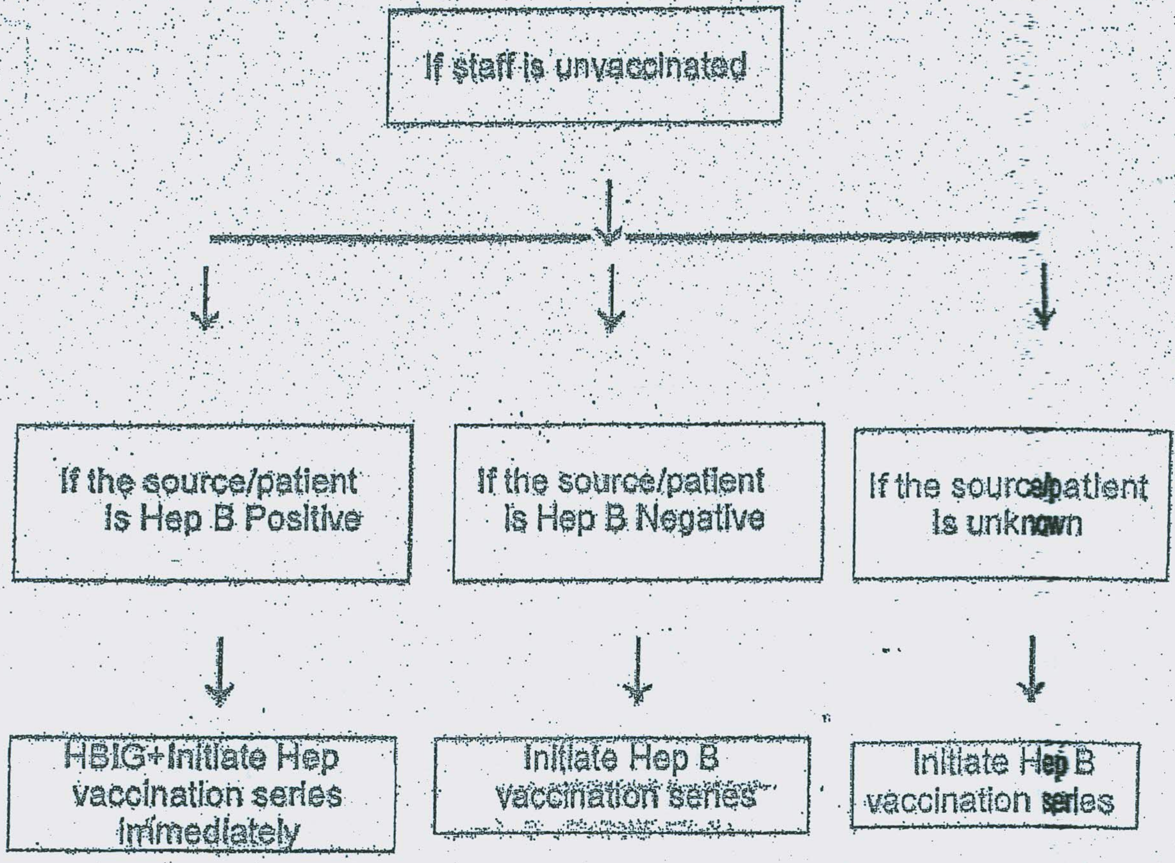
- Health care persons who have written documentation of a complete hepatitis B vaccine series and who did not receive post vaccination testing should receive a single vaccine booster dose.
- Persons who are in the process of being vaccinated but who have not completed the vaccine series should receive the appropriate dose of hepatitis B immune globulin (SHBIG) and should complete the vaccine series.
- Unvaccinated persons should receive both SBIG and hepatitis B vaccine as soon as possible after exposure (preferably within 24 hours). Hepatitis B vaccine may be administered simultaneously with HBIG in a separate injection site.

- The hepatitis B vaccine series should be completed in accordance with the age appropriate vaccine dose and schedule.



4. **Exposure source with unknown HBsAg status**

- Health care persons with written documentation of a complete hepatitis B vaccine series require no further treatment.
- Health care persons who are not fully vaccinated should complete the vaccine series.
- Unvaccinated health care persons should receive the hepatitis B vaccine series with the first dose administered as soon as possible after exposure, preferably within 24 hours. The vaccine series should be completed in accordance with the age appropriate dose and schedule.



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STANDARD PRECAUTIONS USED FOR CARE OF ALL PATIENTS

1. **Wash hands with soap and water**
   - When touching blood body fluids, secretions, and contaminated equipment
   - After gloves are removed
   - Before and after patient contact
   - Alcohol based hand gel is not recommended for use when the skin is visibly soled.

2. **Wear gloves**
   - When touching blood body fluids, secretion, excretions, mucus membranes non Intact skin and contaminated items/equipment

3. **Change gloves**
   - Between tasks/procedures on the same patient after contact with contaminated surfaces

4. **Remove gloves**
   - Promptly after use
   - Before touching non-contaminated items and environmental surfaces

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5. **Wear a mask, eye protector or face shield**

- To protect mucous membranes of the eyes, nose and mouth during procedures likely to generate splashes/sprays of blood fluids, secretions and excretion.

6. **Wear gown**

- During procedures likely to generate splashes or spray of blood, body fluids, secretions or excretion.

7. **Remove gown**

- Promptly after use to avoid transfer of microorganisms to other patients or
- Clean common use places and equipment before removing from room.

NOSOCOMIAL INFECTIONS & PRECAUTIONS

An Infection that a patient acquires in hospital, after 48 hours or more of admission is called nosocomial infection. Health care workers should follow transmission based precautions for a patient with confirmed/diagnosed infection. It consists of contact precautions, droplet precautions or airborne precautions according to the mode of transmission of that infection.

1. Contact Precautions

It consists of standard precautions, plus precautions for direct and indirect contact. Contact precautions are used to prevent transmission of infectious microorgnasims, which are spread by direct or indirect contact with the patient or the patient

- Perform hand hygiene before and after patient contact
- Wear gloves upon entering patient room
- Wear a gown upon entering patient room
- Use dedicated or single use disposable patient equipment

2. Droplet Precautions

Droplet precautions are used to prevent transmission of pathogens spread through close respiratory or mucous membrane contact with respiratory secretions.

Droplet infection can be spread by coughing, sneezing, talking, Procedures such as suctioning and bronchoscopy

Note: Use simple disposable mask when care for the patient.

3. **Airborne Precautions**

Airborne precautions are used for reducing the risk of airborne transmission of infectious agents. Airborne droplet nuclei consist of small-particles residue (5um or smaller in size) of evaporated droplets that may remain suspended in air for a long time. Special air handling and ventilation are required to prevent airborne transmission. Airborne precautions apply to patients known or suspected to be infected with pathogens that can be transmitted by the airborne route.

- Pulmonary tuberculosis
- Measles
- Varicella zoster virus infections
- Disseminated zoster

Airborne Precautions Include

- Perform hand hygiene before and after patient contact
- Always keep patient room door shut/closed
- Anyone entering patient room must wear an N95 respirator
- Give surgical mask to patient while transportation
- Contact infection prevention department if you have questions

4. **Protective Precautions** (To prevent spread of infections)

- Perform hand hygiene before and after patient contact
- Wear a mask / gown upon entering patient room
- Do not visit patient if you are ill
- Do not bring dried or fresh flowers or potted plants

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TUBERCULOSIS

Tuberculosis (TB) is caused by a bacteria called mycobacterium tuberculosis. A person who has disease in his/her lung can release tiny particles into air by coughing, sneezing, talking or breathing. Tiny particles can transmit the disease (TB) to others.

- A patient with TB positive should use N-95 respirator
- Instruct the patient to cover his/her mouth with tissue while coughing
- Patient should place in negative pressure room or in open area
- HCWs should follow airborne precautions, consisting:
  - N-95 mask
  - Hand hygiene

Sputum induction procedure

- Induction of sputum should only be conducted in a single room with a good ventilation system / open area
- Staff must wear the recommended N-95 mask while in the room and disposable gloves when handling sputum specimen
- Do not allow any person without N-95 mask
- Instruct patient that do not throw mask and container in open place, it should be discarded in a dustbin

After the procedure

- Use disposable masks and tubings and discard contaminated supplies in approved biohazard containers.
- Clean the nebulizer with 1:10 bleach solution
- Wash hands removal of gloves

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INSTRUCTIONS TO PATIENTS TO PREVENT INFECTIONS

HCPs should Instruct patient to:

- Avoid poor ventilated environment or wear masks when in overcrowded area.
- Active participation in physical activities.
- Dietary medication like avoid raw foods and junk food
- Maintenance of medication discharge (Immunosuppressive agent)
- Laboratory studies should be done according to set duration
- General health maintenance such as vaccination, avoidance of sun and cancer screening
- Extensive teaching regarding his or her medications and Immunosuppressive agents and their potential side effects
- Notify the transplantation program, about abnormal fever, diarrhea, headaches

Prevention: HCW should Instruct patient to:

- Keep away from the area with a lot of dust like construction or excavation site
- Stay inside during dust storm
- Stay away from areas with birds and bat droppings. This included places like chicken coops and caves
- Wear gloves when handling material such as soil, mass and manure.
- Keep away from people being vaccinated with live attenuated vaccine.
- Wear shoes, Tousers and a long sleeved shirt when doing outdoor activities such as gardening, yard work, or visiting wooded area.

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