وزارة الصحة
Ministry of Health

Employee Health Program Policy 2018

Employee Health Program 2018

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01 Ministry of Health Message:

Our employees and patients are the most important assets we have and we work hard to keep them safe and in good health. Our aim with developing the employee health program is to maintain our employees well-being and health and keep it at its best, to help them perform in a safe and healthy environment, and to help them get to their best ability and productivity.

02 Introduction and Executive Summary:

A healthcare facility is a workplace as well as a place for receiving and giving care. Healthcare workers are exposed to a complex variety of health and safety hazards everyday including biological, physical, chemical, and radiological hazards. A medical program should be developed for each site based on the specific needs, location, and potential exposures of employees at the site. The program should be designed by an experienced occupational health physician or other qualified occupational health consultant in conjunction with the site Safety Officer. The director of a site medical program should be a physician who is board-certified in occupational medicine or a medical doctor who has had extensive experience managing occupational health services.

A director and/or examining physician with such qualifications may be difficult to find, due to the shortage of doctors trained in occupational medicine. If an occupational health physician is not available, the site medical program may be managed, and relevant examinations performed, by a local physician with assistance from an occupational medicine consultant. These functions may also be performed by a qualified Registered Nurse, preferably an Occupational Health Nurse, under the direction of a suitably qualified physician who has responsibility for the program.

All medical test analyses should be performed by a laboratory that has demonstrated satisfactory performance in an established inter-laboratory testing program The clinical or diagnostic laboratory to which samples are sent should meet either (1) minimum requirements under the Clinical Laboratories Improvement Act of 1967 (42 CFR Part 74 Subpart M Section 263[a]), or (2) the conditions for coverage under Medicare.

03 Important Definitions:

Healthcare Worker (HCW): All paid and unpaid persons working in health-care settings who have the potential for exposure to patients and/or to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces, or contaminated air. HCW might include (but are not limited to) physicians, nurses, nursing assistants, therapists, technicians, emergency medical service personnel, dental personnel, pharmacists, laboratory personnel, autopsy personnel, students and trainees, contractual staff not employed by the health-care facility, and persons (e.g., clerical, dietary, housekeeping, laundry, security, maintenance, administrative, billing, and volunteers) not directly involved in patient care but potentially exposed to infectious agents that can be transmitted to and from HCP and patients

Exposure Prone Procedures (EPP): Any invasive procedures where there is a risk that injury to the worker may result in exposure of the patient's open tissues to the blood of the worker. There include procedures where the worker's gloved hands may be in contact with sharp instruments, needle tips or sharp tissues (e.g. speculae of bone or teeth) inside a patient's open body cavity, wound or confined anatomical space where the hands or fingertips may not be completely visible at all times.

04 Policy:

Each healthcare facility must establish an employee health care program to ensure the wellbeing and safety of all workers in the institution and protect patients from contracting communicable infections from the healthcare workers.

05 Procedure:

05.1 Administrative procedures:

a. The employee health program is supervised by the occupational health directorate.
b. Each healthcare institution must dedicate a suitable space for an Employee Health Clinic. The clinic is administratively under the medical director of the hospital or the medical director of the outpatient department.
c. During off-duty hours, weekends and national holidays, the emergency medical services department will be responsible for employee health matters that need urgent attention (e.g. post-exposure management of sharps and needle stick injuries, evaluating and treating work related injuries).
d. The clinic staffing should be the following:
    i. Physician, preferably with experience or certification in occupational or public health or family medicine.
    ii. Nurse, preferably with experience or certification in occupational or public health.
    iii. Clerk.
    iv. Information technologist (IT).
e. Clinic equipment:
    i. Specific space in outpatient clinic department.
    ii. Equipped with examination and treatment requirements (purified protein derivative (PPD), injections, etc.).
    iii. Desktop and internet connection for data entry (Epinet, Health Electronic Surveillance Network (HESN).
    iv. Software for data entry and saving.
    v. Clinical examination room supplied with:
        1. Examination table and chair.
        2. Ladder for the patient.
        3. Desk for the physician and chair for the patient.
        4. Hand washing basin and alcohol-based hand rub dispenser.
        5. Cupboard for saving supplies.
        6. Vaccination refrigerator.
        7. Bedside table for patient equipment.
        8. Bedside light source.
        9. Sphygmomanometer, pulse counter, medical thermometer and device for measuring arterial blood gas levels.
        10. Desktop for the physician.
        11. Administrative room for the administrative clerk equipped with:
            a. Desks for the clerk and nurses.
            b. Two computers, a printer, a fax, a scanner, and a photocopy machine.

c. Cupboard for keeping stuff medical files.
d. Files, papers, pens and pencils, etc.

f. The clinic will generate reports on the following:

I. Reportable infections in the HCW as per public health policy.
II. Sero-conversion rates Hepatitis B (HB), Hepatitis C virus (HCV), Human Immunodeficiency Virus (HIV).
III. PPD/IGRA conversion rates.
IV. Needle stick injuries.
V. Work related injuries and illnesses.

05.2 Scope of service:

The employee health program will perform the following duties through Employee Health Clinic (EHC):

i. Record keeping.
ii. Medical and Occupational history.
iii. Pre-employment screening.
iv. Periodic medical examinations (and follow-up examinations when appropriate).
v. Vaccination according to most recent and updated international standards.
vi. Management of needle stick injuries and body fluids exposures.
vii. Post exposure prophylaxis, follow up and treatment in cases of incidents.
viii. In case of incident with potential transmission of infectious disease, the case should be referred to the infectious diseases department in the institution.
ix. Management of work-related injuries and occupational illnesses, and referral as needed.
x. Referral in case of usual non-emergency cases and chronic diseases.
xi. Applying work restriction rules according to international references.
xii. Training.
xiii. Occupational health risk management.
xiv. Investigation or participation in the investigation of occupational incidents.
xv. Treatment, rehabilitation and compensation services.

05.3 Record-keeping:

Each employee should have a medical file. The employee health program will create a medical file for each HCW. The files are kept confidential in a secure place and separate from the hospital patient's files. The HCW file contain the following:

a. HCW bio-data.
b. Initial medical history and examination.
c. Occupational history.
d. Vaccination record.
e. Results of all investigations.

f. Record of each EHC clinic visit, work restrictions, and sick leave.
g. Any unusual physical or psychological conditions should be brought to the physician's attention.
h. Annual required investigations.
i. All needle stick or body fluid exposure incidents.

05.4 Medical and Occupational History:

A. The employee health program will perform and record a pre-employment health assessment for all newly hired healthcare workers. The pre-employment assessment include but not limited to the following elements:
    1. Complete medical history and physical examination.
    2. Complete occupational history.
    3. Vaccination history.
    4. Investigations:
        i. Chest X-ray, complete blood count (CBC), liver and renal function tests.
        ii. HBV, HCV, and HIV screening.
        iii. If vaccinated against HBV, a HBsAb titer should be performed.
        iv. If vaccinated or has previous natural infection with Measles, Mumps, Rubella or Varicella, a document of the presence of protective serum IgG against those infections is mandatory.
        v. A purified protein derivative (PPD) (2 step) skin test for tuberculosis or Interferon-gamma release assay (IGRA) - Assure employees of confidentiality.

B. Make sure the worker fills out an occupational and medical history questionnaire.
C. Review past illnesses and chronic diseases, particularly atopic diseases such as eczema and asthma, lung diseases, and cardiovascular disease.
D. Review symptoms, especially shortness of breath or labored breathing on exertion, other chronic respiratory symptoms, chest pain, high blood pressure.
E. Identify individuals who are vulnerable to particular exposures (e.g. surgeons, gynecologists and obstetricians, anesthesiologists, and technicians, laboratory and blood bank workers exposed to blood and other body fluids, radiologists and technicians exposed to radiations, etc.).

05.5 Pre-employment screening, periodic medical examination:

05.5.1 Pre-employment screening:

It has two major functions:

1. Determination of an individual's fitness for duty, including the ability to work while wearing protective equipment.
2. Provision of baseline data for comparison with future medical data
   These functions are discussed below.

05.5.2 Tuberculin skin testing:

Administration and interpretation:

All new hires or new volunteers should undergo baseline testing for tuberculosis using Tuberculin Skin Testing (TST) or Interferon Gamma Release Assay (IGRA). There are two types of testing for TB in healthcare workers:

1. Initial baseline testing upon hire.
2. Annual or serial screening: determined by risk assessment of the healthcare facility and activity.

1- Pre-employment screening:

i. Question candidates regarding past positive test results prior to the actual planting of the TST.

ii. Exclude persons who have had the following from testing:

a. Live vaccine administered within the past 3 weeks or on the same day as the TST because live-virus vaccines may cause a false negative reaction.

b. Current febrile illness.

c. Smallpox vaccination within the past month.

d. Documented positive PPD.

2- Pre-employment procedure:

The procedure is as follows:

Testing for Latent TB Infection:

1. The Tuberculin Skin Test (TST) detects individuals infected with Mycobacterium tuberculosis. The skin test is administered intradermal using the Mantoux technique by injecting 1.0 ml containing 5 TU of purified protein derivative (PPD) solution. If a person is infected, a delayed-type hypersensitivity reaction is detectable 2 to 8 weeks after infection. The reading and interpretation of TST reactions should be conducted within 48 to 72 hours of administration by trained healthcare professionals.

2. Equipment and materials 1 cc tuberculin syringe, 26- or 27-gauge needle, ½ inch (16 mm) long, alcohol swabs and a measuring tool marked in millimeters.

3. Administration:

The Mantoux test is the recommended TST. It is administered by injecting 1.0 ml containing 5 TU of purified protein derivative (PPD) solution intradermal into the volar surface of the forearm using a 27-gauge needle with a tuberculin syringe.

a. Obtain results of all previous TSTs. Ask the patient to describe what the test area looked like 2 to 3 days after administration; obtain documentation.

b. Avoid areas of skin with veins, rashes, or excess hair.

c. Cleanse hands with alcohol hand rub.

d. Cleanse the area with an alcohol swab, allowing the area to dry.

e. Clean the rubber top of vial before drawing up solution.

f. Inject the entire antigen just below the surface of the skin on the volar surface of the forearm, forming a 6-10 mm wheal (a pale, raised area with distinct edges; has orange peel-like appearance and does not disappear immediately).

g. Avoid covering the area with a bandage or applying pressure to the injection site.

h. If minor bleeding occurs, dab the injection site with a cotton swab.

i. If no wheal forms, or if a wheal forms that is less than 6 mm, the test should be repeated immediately, approximately 2 inches from the original site or on the other arm.

j. Record the date, time, and location of the TST.

k. Instruct the patient not to scratch the site but to use a cool compress to relieve any itching or swelling.

l. Give a written appointment card for TST reading. Inform the patient of the importance of returning for a reading of the TST within 48 to 72 hours (2 to 3 days).

m. Provide written information about the TST (a pamphlet or brochure).

4. Measurement:

a. Measure the induration (hard bump) rather than the erythema.

b. Palpate the area with the fingertips, measuring the diameter of induration perpendicular to the long axis of the arm.

c. Use a ballpoint pen to mark the edges of the induration.

d. Use a tuberculin skin test ruler or a ruler with millimeter marks to measure the distance between the two points.

5. Recording and documentation:

a. Record the date that the TST was administered.

b. Record the brand name of the PPD solution, lot number, manufacturer, and expiration date in the patient's records.

c. Record results in millimeters of induration (0 mm if there is no induration) rather than as positive or negative.

d. Record the date and time of reading and the name of the person reading the TST.

e. Provide the patient and ordering physician with written documentation.

6. Storage and handling:
    a. PPD solution must be kept refrigerated at 36–46°F.
    b. Avoid fluctuations in temperature; do not store in the refrigerator door.
    c. Syringes must be filled immediately prior to administration.
    d. Store and transport the tuberculin in the dark as much as possible and avoid exposure to light.
7. Notes:
    a. The TST should not be performed on a person who has a documented history of either a positive TST result or treatment for TB disease.
    b. TST is contraindicated only for persons who have had a severe reaction (e.g. necrosis, blistering, anaphylactic shock, or ulcerations) to a previous TST.
    c. TST results should only be read and interpreted by a trained healthcare professional. Patients or family members should not be relied upon to measure TST results.
    d. TB disease must be ruled out before initiating treatment for Latent Tuberculosis Infection (LTBI) to prevent inadequate treatment of TB disease.

4- Table 1: TST interpretation

TST reaction induration size	≥ 5mm induration	≥10 mm of induration	≥15 mm induration
Considered positive in	1. HIV-infected persons. 2. Recent contacts of infectious TB cases. 3. Persons with fibrotic changes on chest radiograph consistent with prior TB. 4. Organ transplant recipients. 5. Those who are immunosuppressed for other reasons (taking an equivalent of ≥ 15	1. Recent immigrants (within last 5 years) from high-prevalence countries. 2. Injection drug users. 3. Residents or employees of high-risk congregated settings (prisons, jails, long term care facilities for the elderly, hospitals and other healthcare facilities, residential facilities for patients with AIDS, and homeless shelters). 4. Mycobacteriology laboratory personnel. 5. Persons with the clinical conditions previously mentioned. 6. Children younger than 4 years of age.	1. Persons with no risk factors for TB

	mg/day of prednisone for 1 month or more or taking TNF-α antagonists).	7. Infants, children, or adolescents exposed to adults at high risk for TB disease.	

5- Chest Radiograph:

a. Chest radiographs help differentiate between LTBI and pulmonary TB disease in individuals with positive TST results.

a) For TST-positive individuals:

1. Clinical evaluation to exclude active tuberculosis:

a. Order chest radiography as part of a medical evaluation for a person who has a positive TST.

b. Determine baseline CBC and liver function test (LFT).

2. Refer to the primary care consultant for evaluation and possible prophylaxis. After baseline testing, routine periodic retesting is recommended for persons who had abnormal initial results and other persons at risk for hepatic disease.

3. At any time during treatment, whether or not baseline tests were done, laboratory testing is recommended for patients who have symptoms suggestive of hepatitis (e.g., fatigue, weakness, malaise, anorexia, nausea, vomiting, abdominal pain, pale stools, dark urine, and chills) or those who have signs of jaundice. Patients should be instructed at the start of treatment and at each monthly visit to stop taking treatment and to seek medical attention immediately if symptoms of hepatitis develop and not to wait until a clinic visit to stop treatment.

6- Special Considerations during Pregnancy:

a. Consider immediate treatment for LTBI if the woman is HIV-infected or has had recent contact with a TB case and monitor the patient.

b. In the absence of risk factors, wait until after the woman has delivered to avoid administering unnecessary medication during pregnancy.

c. INH administered daily is the preferred regimen.

d. Supplementation with 50 mg pyridoxine (vitamin B6) is recommended.

05.5.3 Interferon Gamma Release Assay Testing (IGRA)

Overview Prior to 2001, the diagnosis of Latent Tuberculosis Infection (LTBI) was based on history, chest x-ray (CXR) and Tuberculin Skin Tests (TSTs). Limitations inherent in using these criteria for diagnosis led to both an over- and under-diagnosis of LTBI in some patient groups e.g. over-diagnosis in those previously vaccinated with Bacillus Calmette - Guerin (BCG) and under-diagnosis of LTBI in immunocompromised patients.

Although TST is the preferred test for diagnosing LTBI, TSTs do have limited predictive value for LTBI in BCG vaccinated and immune-compromised individuals. For over a decade, Interferon Gamma Release Assays (IGRAs) have been in use as adjunct tests for Mycobacterium tuberculosis (TB) diagnosis.

What are IGRAs?

1. An IGRA is a blood test that can determine if a person has been infected with TB bacteria.
2. An IGRA measures how strong a person's immunity reacts to TB bacteria by testing the person's blood in a laboratory. and it differs from TSTs in that:

They are not influenced by prior (BCG) vaccine or with most non tuberculous mycobacteria. Consequently, IGRA can aid in LTBI diagnosis in those with prior BCG vaccine and in those who have been exposed to non tuberculous mycobacteria. IGRA testing does not replace the TST but rather, is used in specific populations that require additional information to better determine LTBI status. IGRAs and TSTs are imperfect tests which must be interpreted within the context of the risks the individual faces of TB infection and the risks for progression to active TB disease.

Two IGRAs Approved by the United States Food and Drug Administration (FDA):

1. QuantiFeron-TB Gold In-Tube test (QFT-GIT).
2. T-spot TB test (T-Spot).

Procedure:

1. A physician discusses IGRA recommendation with employee.
2. Health Centre/Unit provides IGRA pre-test counseling and advice the client about the site for testing.
3. Ensure that patient has received no live vaccines in the 4 previous weeks. If the patient has, delay testing until 4 weeks after live vaccine was received.
4. Samples to be drawn using an incubator to transport IGRA
5. Samples must be maintained at specified temperature during transport.
6. IGRA results are recorded under the Immunization tab in the TB module

(CDC 2010 &CTC, 2010).

Interpretations of IGRA results:

1. Positive IGRA: This means that the person has been infected with Mycobacterium tuberculosis bacteria (MTB).
2. Additional tests are needed to determine if the person has LTBI or MTB disease.
3. A healthcare provider will then provide treatment as needed.
4. Negative IGRA: This means that the person's blood did not react to the test and that LTBI of MTB disease is not likely.

Indications for IGRA Testing:

Avoid IGRA if patient:

1) Is suspected to have active TB disease or if confirmed in the past;
2) Is on treatment or has been treated for LTBI;
3) Requires serial testing for employment.
4) Is a returning traveler or immigrant at low risk of exposure
5) Clinical management will not be influenced by result. Epidemiologic evidence exists for sequential test based on result but not for parallel testing.

Indications for IGRA:

A. TST positive and BCG vaccinated and Low risk TB exposure
B. TST positive and BCG vaccinated and High risk TB exposure
C. TST negative, Immuno-compromised and High risk of TB exposure
D. Unlikely to return for TST read and High risk TB exposure
E. Specific medical conditions e.g. New dialysis clients, before renal or bone-marrow transplants
F. Client for Tumor necrosis Factor (TNF) inhibitors
G. Previous indeterminate IGRA
H. At discretion of TB Physician

05.5.4. Treatment regimens for T.B:

Table 2: Treatment regimens for T.B

Isoniazide **OR**	Adult: 5 mg/kg Children: 10-20 mg/kg Maximum dose: 300 mg	Daily x 9 months
Rifampin	Adults: 10 mg/kg Children: 10-20 mg/kg Maximum dose: 600 mg	Daily x 4 months

05.5.5. Required Pre-employment and periodic medical examinations:

Table 3: Required Pre-employment tests for all new hires and volunteers:

Test	Tests required as Pre-employment test for all new hires and volunteers
Physical examination	Complete general examination
Blood	Screening for Hepatitis B virus (HBV), Hepatitis C Virus (HCV), Human Immunodeficiency Virus (HIV)
Serology	Immunization status for measles, mumps, varicella
Blood function	Blood tests Complete blood count (CBC) with differential and platelet evaluation, including white blood cell count (WBC), red blood cell count (RBC), hemoglobin (HGB) Reticulocyte count may be appropriate if there is a likelihood of exposure to hemolytic chemicals
Urinalysis	Color; appearance; specific gravity; pH; qualitative glucose, Protein, bile, and acetone; occult blood; microscopic examination of centrifuged sediment. Tests for drugs.
TB screening	HCWs should receive baseline TB screening upon hire, using two-step TST or IGRA
Chest X - ray	As pre-employment screening

Table 4: Tests required as periodic medical examinations:

Test	Periodic testing	Category	Periodicity
Physical examination	Complete general examination	All HCW	Annually
Blood	Screening for HBV, HCV, HIV	HCW in places that require direct contact with patient's blood or body fluids e.g. anesthesiologists, surgeons	Routine or mandatory HIV, HBV, and/or HCV testing of all HCWs is NOT recommended,
Serology	Immunization status for measles, mumps, varicella	Repeating not required if proved immunity or pre-employment vaccination established	
Blood function	Blood tests Complete blood count (CBC) with differential and platelet evaluation, including white blood cell count (WBC), red blood cell count (RBC), hemoglobin (HGB)	Physicians and technicians working in radio diagnostic or radio therapeutic departments	Biannually
	Reticulocyte count may be appropriate if there is a likelihood of exposure to hemolytic chemicals	Physicians and technicians working in chemotherapeutic departments.	
Urinalysis	Color; appearance; specific gravity; pH; qualitative glucose, Protein, bile, and acetone; occult blood; microscopic examination of centrifuged sediment. Tests for drugs.	Repeating not recommended	

TB screening	Two-step TST or IGRA	HCW who are suspected to be exposed to acquire T.B infection during work e.g. chest physicians and those working in isolation depart-ments.	After baseline testing for infection with M. tuberculosis, HCWs should receive TB screening annually (i.e., symptom screen for all HCWs and test-ing for infection with M. tuberculosis for HCWs with baseline negative test results).
Chest X - ray		Recommended for workers with positive PPD	HCWs with a baseline positive or newly posi-tive test result Chest radiographs help differentiate between LTBI and pulmonary MTB disease in Individuals with positive TST results.

Note: to cope with the administrative system in KSA, Pre-employment blood, blood function, urine analysis and chest x-ray are mandatory and a copy of the report should be kept in the worker's local EHC as the baseline data for his medical record after completing the other investigations required and mentioned above.

05.6 Vaccination:

Because of their contact with patients or infective material from patients, many HCW are at risk for exposure to (and possible transmission of) vaccine-preventable diseases. Employers and HCW have a shared responsibility to prevent occupationally acquired infections and avoid causing harm to patients by taking reasonable precautions to prevent transmission of vaccine preventable diseases. Vaccination programs are therefore an essential part of infection prevention and control for HCW. Optimal use of recommended vaccines helps maintain immunity and safeguard HCW from infection, thereby helping protect patients from becoming infected.

Table 5: Applying pre-employment immunizations as recommended by CDC and GCC manual 2009 recommended immunizations.

Vaccine	Indication	Route/ Schedule	Booster dose
Hepatitis B	All health care staff	3 doses intra muscular (I.M) 0,1 month, 6 month	Not recommended
Influenza	All health care staff	1 I.M dose of inactivated injectable vaccine annually	Vaccine repeated annually
MMR (Measles, Mumps, Rubella)	HCP without serologic evidence of immunity or prior vaccination (Documented immunity)	2 doses of MMR 4 weeks apart are given Subcutaneous (S.C)	
Varicella (Chickenpox)	HCP who have no serologic proof of immunity, prior vaccination or history of varicella disease (Documented immunity)	2 doses of varicella vaccine 4 weeks apart are given S.C	
Tdap (tetanus, diphtheria & pertussis)	Persons without documented immunity.	3 doses I.M 0, 1-2 months, 6 months	○ Td booster doses every 10 years ○ If exposed to a dirty wound regardless of the last booster dose
Meningococcal	Microbiologists who are routinely exposed to isolates of N. meningitidis	Single dose	

CDC (2011)

05.6.1 Hepatitis B vaccine:

Hepatitis B Unvaccinated healthcare workers (HCW) and/ or those who cannot document previous vaccination should receive either a 2-dose series of Heplisav-B at 0 and 1 month or a 3-dose series of either Engerix-B or Recombivax HB at 0, 1, and 6 months. HCP who perform tasks that may involve exposure to blood or body fluids should be tested for hepatitis B surface antibody (anti-HBs) 1–2 months after dose #2 of Heplisav-B or dose #3 of Engerix-B or Recombivax HB to document immunity.

If anti-HBs is at least 10 mIU/mL (positive), the vaccinee is immune. No further serologic testing or vaccination is recommended.

If anti-HBs is less than 10 mIU/mL (negative), the vaccinee is not protected from hepatitis B virus (HBV) infection, and should receive another 2-dose or 3-dose series of HepB vaccine on the routine schedule, followed by anti-HBs testing 1–2 months later. A vaccinee whose anti-HBs remains less than 10 mIU/mL after 2 complete series is considered a "non-responder." For non-responders: HCP who are non-responders should be considered susceptible to HBV and should be counseled regarding precautions to prevent HBV infection and the need to obtain HBIG prophylaxis for any known or probable parenteral exposure to hepatitis B surface antigen (HBsAg)-positive blood or blood with unknown HBsAg status.

It is also possible that non responders are people who are HBsAg positive. HBsAg testing is recommended.

HCW found to be HBsAg positive should be counseled and medically evaluated.

For HCP with documentation of a complete 2-dose (Heplisav-B) or 3-dose (Engerix-B or Recombivax HB) vaccine series but no documentation of anti-HBs of at least 10 mIU/mL (e.g., those vaccinated in childhood): HCW who are at risk for occupational blood or body fluid exposure might undergo anti-HBs testing upon hire or matriculation.

05.6.2 Influenza vaccine:

All HCW, including physicians, nurses, paramedics, emergency medical technicians, employees of nursing homes and chronic care facilities, students in these professions, and volunteers, should receive annual vaccination against influenza. Live attenuated influenza vaccine (LAIV) may be given only to non-pregnant healthy HCW age 49 years and younger.

Live attenuated influenza vaccine (LAIV) is preferred over LAIV for HCW who are in close contact with severely immunosuppressed patients (e.g., stem cell transplant recipients) when they require protective isolation.

05.6.3 Measles, Mumps, Rubella (MMR):

HCW who work in medical facilities should be immune to measles, mumps, and rubella.

HCW born in 1957 or later can be considered immune to measles, mumps, or rubella only if they have documentation of (a) laboratory confirmation of disease or immunity or (b) appropriate vaccination against measles, mumps, and rubella (i.e., 2 doses of live measles and mumps vaccines given on or after

The first birthday and separated by 28 days or more, and at least 1 dose of live rubella vaccine). Health care professionals (HCP) with 2 documented doses of MMR are not recommended to be serologically tested for immunity; but if they are tested and results are negative or equivocal for measles, mumps, and/or rubella, these HCP should be considered to have presumptive evidence of immunity to measles, mumps, and/or rubella and are not in need of additional MMR doses.

Although birth before 1957 generally is considered acceptable evidence of measles, mumps, and rubella immunity, 2 doses of MMR vaccine should be considered for unvaccinated HCW born before 1957 that do not have laboratory evidence of disease or immunity to measles and/or mumps. One dose of MMR vaccine should be considered for HCP with no laboratory evidence of disease or immunity to rubella. For these same HCP who do not have evidence of immunity, 2 doses of MMR vaccine are recommended during an outbreak of measles or mumps and 1 dose during an outbreak of rubella.

05.6.4 Varicella:

It is recommended that all HCP be immune to varicella.

Evidence of immunity in HCW includes documentation of 2 doses of varicella vaccine given at least 28 days apart, laboratory evidence of immunity, laboratory confirmation of disease, or diagnosis or verification of a history of varicella or herpes zoster (shingles) by a healthcare provider.

05.6.5 Tetanus/Diphtheria/Pertussis (Td/Tdap):

All HCWs who have not or are unsure if they have previously received a dose of Tdap should receive a dose of Tdap as soon as possible, without regard to the interval since the previous dose of Td.

Pregnant HCP should be revaccinated during each pregnancy.

All HCWs should then receive Td boosters every 10 years thereafter.

05.6.6 Meningococcal Vaccination:

With MenACWY and MenB is recommended for microbiologists who are routinely exposed to isolates of N. meningitidis. The two vaccines may be given concomitantly but at different anatomic sites, if feasible
Immunization Action Coalition 2017
CDC 2018 - IAC 2018

05.7 Training:

A periodic regular training program for all HCWs (old and new-hire) should be executed actively including:

1. Training of HCWs in proper infection control practices.
2. All HCWs should receive training on standard precautions.
3. Personal protective equipment, indications and proper usage.
4. Continuous training, at least every 6 months should be conducted to continually reinforce proper infection control practices and to inform practitioners of any new infection control procedures and safety devices.

The employee health program will initiate and maintain a program to monitor, manage and prevent occupational injuries related to sharp and needle-stick injuries, blood and body fluid exposure incidents, and their follow up.

05.8 Key Performance Indicators:

Each employee health program is required to have leading and training key performance indicators as determined by the institution or the administration and should have periodic reporting of those indicators.

05.8.1 Leading:

Leading occupational health and safety measures are indicators of where the organization is headed; they are measure of future performance and they are focused primarily on improving safety performance.

Each employee health program should have a set of leading key performance indicators and should report them regularly to administration.

1. Employee Health Program Policy – written and accessible on each unit (yes/no)
2. Trained person in charge of employee health program (yes/no)
3. Employee Health Committee – meeting at least quarterly, with members trained, keeping minutes and addressing action items
4. Percentage of Employee Health Committee recommendations implemented
5. HCW with open files – percent of HCW with files in employee health clinic
6. Training in safe practices – percent of staff who received training during previous 12 months on:
    a) Infection control measures.
    b) Universal precautions measures.

c) Occupational and Environmental Health and safety.
d) Any other mandatory staff training set by the hospital.

7. Workplace assessment conducted – (yes/no)

a) Percent with recommendations written including need for equipment, supplies, repairs)

8. Immunizations percentage

a) Percent of HCW immunized for Hep. B, MMR, and others

9. Availability of personal protective equipment – (yes/no)

05.8.2 Trailing:

Trailing occupational health and safety measures are indicators of past performance and they are focused on indicating progress toward compliance with safety rules.

Number, rate, duration plus times loss and cost if possible for the following:

1. Overall injuries.
3. Overall time-loss injuries.
4. Musculoskeletal injuries.
5. Needle stick injuries and body fluids exposures.
6. Violent incidents against staff.
7. Occupational diseases/illnesses.
8. Workers who had to be quarantined.
9. New cases of TB among HCW.
10. Percent of staff screened for TB.
11. Death of HCW (occupational and non-occupational).
12. Permanent disability/loss to workforce of HCW.

06. MANAGEMENT OF CERTAIN OCCUPATIONAL INFECTIONS:

For management, treatment, and prophylaxis, consult with the infectious diseases department or the infectious diseases consultant in the hospital and refer the exposed HCW to the infectious diseases department. Continue to follow up the treatment plan with the HCW while being treated by the infectious diseases department until resolution.

06.1 Airborne & Droplet infections:

06.1.1 MYCOBACTERIUM TUBERCULOSIS (TB):

Transmission of tuberculosis (TB) is a risk in healthcare and other congregate settings where many people share the same space for extended periods of time. TB is a contagious and potentially life-threatening infectious disease.

Spread is from person to person through the air. People with TB disease of the lungs or larynx release the bacteria into the surrounding area when they cough, sneeze, talk, or otherwise expel air, dispersing droplets that contain M. tuberculosis. These droplets can dry into tiny particles called droplet nuclei that remain suspended in air for long periods of time. Other people can breathe the infectious particles into their lungs and become infected. Infection usually requires prolonged sharing of airspace with a person actively spreading TB bacteria into the area. In rare cases, TB infection has been documented after short exposures to such persons with active TB. After becoming infected, most people's immune systems are able to contain the infection, but are not able to eliminate it without help from anti-TB drugs. These people have latent TB infection and remain infected until corrective treatment is completed. Latent TB infection does not cause symptoms and is not contagious. However, without treatment, infected people can lose control of the infection and develop active, clinical disease. People with active TB have symptoms and can spread the disease. The risk of developing active TB disease is greatest in the first few years after infection, but some risk remains throughout life. TB is preventable and, in most cases, treatable. Infection control practices can help reduce the risk of TB transmission. Treatment of persons with latent TB infection can prevent the subsequent development of active TB, and TB disease can usually be cured by available anti-TB drugs. Even persons with drug-resistant strains can often be cured by alternative regimens of medications.

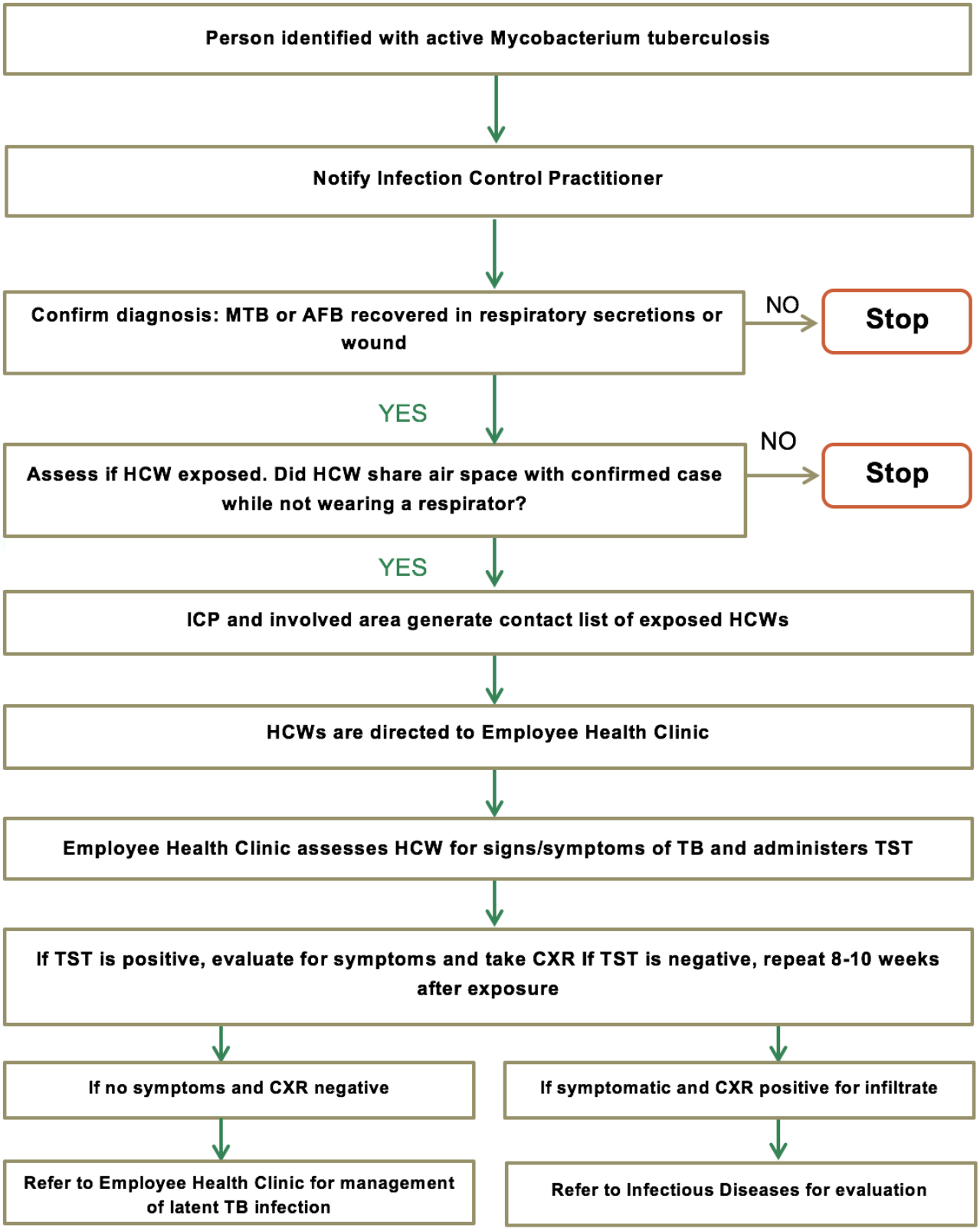
1. Incubation period
   2 to 10 weeks after exposure to detection of positive Tuberculin skin test (TST) or Interferon-gamma release assay (IGRA).
   Risk of developing active disease is greatest in the first 2 years after exposure.
2. Exposure criteria
   Spending time in a room with a person who has active disease without properly wearing an N95 respirator.
   Packing or irrigating wounds infected with Mycobacterium Tuberculosis (MTB) without wearing an N95 respirator.
3. Period of communicability
   Persons whose smears are Acid Fast Bacilli (AFB) positive are 20 times more likely to cause secondary infections than persons who are smear negative. Children with primary pulmonary MTB are rarely contagious.
4. Employee health
   Obtain baseline TST results by doing 2 step TST if these have not been performed recently and if the HCW was previously negative; perform post-exposure TST test at 8 to 10 weeks; if the TST test result comes out positive prescribe MTB prophylaxis. Positive IGRA result is also an indication for MTB prophylaxis.
   a. Work restrictions
      Persons whose TST results and IGRA test results are positive
      Infected:
      Restrict HCWs with active MTB from duty until after they have taken 2 to 3 weeks of effective anti-tuberculosis chemotherapy and they have had 3 AFB-negative sputum samples taken over 8 to 24 hours (one must be an early morning specimen).
   b. Prophylaxis
      Prescribe Isoniazid 300 mg daily for 9 months (or 12 months for HIV-infected persons) and pyridoxine 20-40 mg daily. Consult with Infectious disease consultant for verification of the most appropriate prophylaxis regimen.

Table 6: Treatment Regimens of TB

Isoniazide **OR**	Adult: 5 mg/kg Children: 10-20 mg/kg Maximum dose: 300 mg	Daily x 9 months
Rifampin	Adults: 10 mg/kg Children: 10-20 mg/kg Maximum dose: 600 mg	Daily x 4 months

(GCC, 2013)

Figure 1: Mycobacterium Tuberculosis Exposure



06.1.2 VARICELLA (CHICKENPOX) Exposure

1. Incubation period

Usually 14-16 days; range, 10-21 days

Up to 28 days in persons who have received varicella zoster immunoglobulin (VZIG).

2. Exposure criteria

Varicella

A household contacts, face-to-face contact for more than 5 minutes with an infected person without wearing a surgical mask, or direct contact with vesicle fluid without wearing gloves

Shingles

Direct contact with vesicle fluid without wearing gloves.

3. Period of communicability

Varicella

Affected persons are most contagious 1-2 days before and shortly after vesicles appear. Transmission can occur up to 5 days after onset of rash.

Immunocompromised persons may be contagious as long as new vesicles are appearing.

Shingles

Affected persons are most contagious from 24 hours before the first vesicle appears and up to 48 hours after the final vesicle appears

4. Employee health

Assess immunity: HCW is susceptible unless he or she has a history of varicella or has serological evidence of immunity.

Consider checking varicella Immunoglobulin G (IgG) antibody titer to determine the immune status of the HCW.

A. Work restrictions

Exposed:

From days 1-7 of exposure no restrictions is required.

HCW should be excluded from duty on day 8th after 1st exposure through day 21st of last exposure (28th day if VZIG was given after the last exposure).

Infected:

HCW may return to work after all lesions have crusted over.

B. Prophylaxis

Consider giving VZIG to non-immune, immune compromised persons or pregnant women within 96 hours of exposure.

06.1.3 MEASLES EXPOSURE:

Measles is a highly contagious rash illness that is transmitted from person to person by direct contact with respiratory droplets or airborne spread.

1. Incubation period:

The average incubation period for measles is 10 to 12 days from exposure to prodrome and 14 days from exposure to rash (range: 7–21 days).

2. Infectivity:

Persons with measles are infectious 4 days before through 4 days after rash onset.

3. Complications:

Pneumonia

Otitis media

Diarrhea

Measles illness in pregnancy might be associated with increased rates of spontaneous abortion, premature labor and preterm delivery, and low birth weight among affected infants. [Centers for Disease Control and Prevention (CDC), 2013)]

4. Employee health

Assess immunity; an HCW is susceptible unless he or she was born before 1957, provides serological evidence of immunity, or has two documented doses of measles vaccine. Obtain blood for IgG antibody titers as needed. For staffs who have not received two doses of measles vaccine, consider initiating or completing the vaccine series.

A. Work restrictions

Exposed:

From days 1-4 no restrictions required.

From days 5 to 21 for a single exposure or day 5 of the first exposure through day 21 of the last exposure the HCW either must not work or must have no direct patient contact or must only work with immune persons away from patient care areas.

Infected:

HCW may return to work 4 days after developing a rash.

B. Prophylaxis

Consider giving susceptible HCWs the vaccine within 3 days or Immunoglobulin (IG) within 6 days of exposure to modify severity of infection; vaccine or IG given after exposure does not change work restrictions. (GCC, 2018)

06.1.4 RUBELLA EXPOSURE

Rubella (German measles) is classified as a Rubi virus in the Togaviridae family. Rubella is an illness transmitted through direct or droplet contact from nasopharyngeal secretions and is characterized by rash, low-grade fever, lymphadenopathy, and malaise. Symptoms are often mild and up to 50% of rubella infections are subclinical. However, among adults infected with rubella, transient arthralgia or arthritis occurs frequently, particularly among women. Other complications occur infrequently; thrombocytopenic purpura occurs in approximately one out of 3,000 cases and is more likely to involve children, and encephalitis occurs in approximately one out of 6,000 cases and is more likely to involve adults.

Rubella infection in pregnant women, especially during the first trimester, can result in miscarriages, stillbirths, and Congenital Rubella Syndrome (CRS), a constellation of birth defects that often includes cataracts, hearing loss, mental retardation, and congenital heart defects. In addition, infants with CRS frequently exhibit both intrauterine and postnatal growth retardation. Infants who are moderately or severely affected by CRS are readily recognizable at birth, but mild CRS (e.g., slight cardiac involvement or deafness) might not be detected for months or years after birth or not at all. The risk for congenital infection and defects is highest during the first 12 weeks of gestation, and the risk for any defect decreases after the 12th week of gestation. Defects are rare when infection occurs after the 20th week. Subclinical maternal rubella infection also can cause congenital malformations. Fetal infection without clinical signs of CRS can occur during any stage of pregnancy. (CDC, 2013)

1. Incubation period

Usually 16-18 days; range, 14-21 day

2. Exposure criteria

Contact within 3 feet of an infected person without wearing a mask; contact with nasopharyngeal secretions from an infected person or items contaminated with these secretions without wearing gloves; contact with nasopharyngeal secretions or urine from an infant with congenital rubella without wearing gloves.

3. Period of communicability

From 7 days before the rash to 7 days after the rash appears; up to 1 year for infants with congenital rubella.

4. Employee health

Assess immunity; an HCW is susceptible unless he or she was born before 1957, provides serological evidence of immunity, or has one documented dose of rubella vaccine. Obtain blood for IgG antibody titers as needed. For staffs who have not received two doses of rubella vaccine, consider initiating or completing the vaccine series.

A. Work Restrictions

Exposed:

From days 1-6 no restrictions required. From 7th day after the 1st exposure through the last exposure on the 23rd day, the HCW either must not work or must have no direct patient contact or must only work with immune persons away from patient care areas.

Infected:

HCW may return to work 7 days after developing rash.

B. Prophylaxis

None; the rubella vaccine does not prevent infection after exposure. IG does not prevent infection.

(GCC, 2018)

06.1.5 MUMPS EXPOSURE

Mumps is an acute viral infection characterized by fever and inflammation of the salivary glands. Parotitis is the most common manifestation, with onset an average of 16 to 18 days after exposure (range: 12–25 days). In some studies, mumps symptoms were described as nonspecific or primarily respiratory; however, these reports based findings on serologic results taken every 6 or 12 months, making it difficult to prove whether the respiratory tract symptoms were caused by mumps virus infection or if the symptoms happened to occur at the same time as the mumps infection.

1. Incubation period

Usually 16-18 days; range, 12-25 days.

2. Exposure criteria

Being within 3 feet of an infected person without wearing a mask; contact with saliva or items contaminated with saliva from an infected person without wearing gloves.

3. Period of communicability

Patients are most communicable 48 hours before the onset of illness, and continue until 5 days after the onset of parotitis.

4. Employee health

Assess immunity; an HCW is susceptible unless he or she was born before 1957, provides serologic evidence of immunity, or has one documented dose of mumps vaccine. Obtain blood for IgG antibody titers as needed. For staff who has not received two doses of mumps vaccine, consider initiating or completing the vaccine series.

A. Work restrictions

Exposed:

From days 1-11, no restrictions required. Restrict from workday 12th after first exposure through day 25th of last exposure or 5 days after onset of parotitis.

The HCW either must not work or must have no direct patient contact, or work only with immune persons away from patient care areas.

Infected:

HCW may return to work 5 days after the onset of parotid gland swelling.

B. Prophylaxis

None; the mumps vaccine is not proven to prevent infection after exposure; mumps IG does not prevent infection.

06.1.6 MENINGOCOCCAL DISEASE EXPOSURE

1. Incubation period

Usually <4 days; range, 1-10 days.

2. Exposure criteria

Extensive contact with respiratory secretions from an infected person without wearing a mask, particularly when suctioning, resuscitating, or intubating.

3. Period of communicability

Persons are infectious until they have taken 24 hours of effective antibiotic therapy.

4. Employee health

Prescribe prophylaxis; educate exposed HCWs about the signs and symptoms of meningitis.

A. Work restrictions

Exposed:

None.

Infected:

HCW should be restricted from work until they have taken 24 hours of effective antibiotic therapy.

B. Prophylaxis

Rifampin 600 mg every 12 hours for 2 days (contraindicated in pregnancy) or Ciprofloxacin 500 mg single dose (contraindicated in pregnancy) or Ceftriaxone 250 mg I.M single dose (safe during pregnancy).

06.1.7 PERTUSSIS EXPOSURE

1. Incubation period

Usually 7-10 days; range, 5-21 days.

2. Exposure criteria

Face-to-face contact without wearing a mask for more than 10 min.

Spending 1 hour in a room with a confirmed case without wearing a mask.

3. Period of communicability

Patients are most contagious during the catarrhal stage; communicability diminishes rapidly after the onset of coughing but can persist for as long as 3 weeks.

4. Employee health

If the HCW has no symptoms, he/she should begin prophylaxis and return to work. If the HCW is symptomatic, he/she should begin therapy and exclude from work until test results are available.

A. Work restrictions

Exposed:

Post-exposure (asymptomatic): No restrictions, prophylaxis recommended.

Post-exposure (symptomatic): Exclude from duty until 5 days after initiating effective therapy or until the disease is excluded by negative serology and negative nasopharyngeal culture.

Active:

Exclude from duty from the beginning of the catarrhal stage through the 3rd week after the onset of paroxysm or until 5 days after the start of effective antimicrobial therapy.

B. Prophylaxis

The recommended drug is erythromycin (40 mg/kg/day in 4 divided doses, maximum of 2 gm/day) for 14 days (estolate preparation is preferred). Azithromycin or clarithromycin may be tolerated better than erythromycin. If the HCW is allergic to the macrolide group, Cotrimoxazole DS (1 tablet twice daily for 14 days) can be administered.

06.1.8 SCABIES EXPOSURE

1. Incubation period

During 4-6 weeks if no previous infestation; 1-3 days in cases of re-infestation.

2. Exposure criteria

Direct skin-to-skin contact; minimal direct contact with crusted scabies can result in transmission.

3. Period of communicability

Transmission can occur before the onset of symptoms.

A person remains infectious until treated.

4. Employee health

Prescribe scabicide for all exposed HCWs.

Do not use Lindane for pregnant women.

A. Work restrictions

Exposed:

No restriction after one application of scabicide

Infested:

Immediate restriction for 24 hours following treatment

B. Prophylaxis

Drug of choice: 5% permethrin; alternative drugs: lindane or crotamiton

06.1.9 PEDICULOSIS (LICE) EXPOSURE

1. Incubation period

7-10 days.

2. Exposure criteria

Head lice

Hair-to-hair contact with an infected person.

Sharing of personal items such as hats, helmets, brushes, combs and headsets, or earphones.

Body lice

Contact with the bedding or clothes of an infected person

Pubic lice

Sexual contact.

3. Period of communicability

As long as lice or eggs remain alive on an infected person, clothing, or personal items.

Head lice die within 24 to 48 hours after leaving a host.

Body lice may survive for up to 30 days in a patient's clothing or linen. Survival time for lice away from the host ranges between 2 days and 1 month.

4. Employee health

Treat HCWs only if infested.

A. Work restrictions

Exposed:

No restrictions.

Infested:

Immediate restriction until 24 hours after treatment

B. Prophylaxis

Not recommended

06.2 Needle-stick, body fluids and blood-borne exposure:

06.2.1 Emergency management of cases:

1. HCW who experience a needle stick or sharps injury or are exposed to the blood or other body fluid of a patient during the course of work, should immediately follow these steps:

a. Do not apply pressure to the wound; allow it to bleed freely.

b. Wash the wound or the fluids with soap and water. If exposure is to the eyes wash with eyes solution or running tap water for 1 minute at least.

c. Identify the patient involved so that they can be evaluated for an infection

d. Immediately report the injury to the supervisor; do not wait until the end of the shift or the end of the procedure

e. Immediately seek medical treatment. and get a medical assessment.

f. Follow the directions for any necessary blood tests, vaccinations, or medications to prevent infection.

g. Document the incident on the forms at the Employee Health Clinic (EHC)
h. A risk assessment should be made based on the significance of the exposure, the HCW prior immunity to Hepatitis B and the known or likely status of the patient for blood born viruses. This should be carried out by EHC and/or Emergency.
i. If the source patient is known, every attempt should be made to obtain a blood specimen for testing for blood borne viruses. Check the source patient blood testing status for HIV, Hep B and Hep C, if the patient have testing done in the last two weeks, use those test results, if not, order HIV, Hep B and Hep C serology for the source patient. All source patients should be offered tests for the three main blood born viruses, Hepatitis B, Hepatitis C and HIV. Appropriate pre-test, counseling and informed consent is a prerequisite of testing the source; this should be arranged by the manager.
j. Where the risk is high the recipient should be offered prophylaxis medication as soon as possible; preferably within an hour of the incident.
k. Bloods from the recipient will also be required for serum save. The taking of blood specimens and the approach to the source for permission to test should be managed by a third party, i.e. somebody other than the recipient of the injury.
l. The exposed HCW should always get a baseline testing for HIV, Hep B (HBsAg, HBsAb), and Hep C. Follow up testing at 4, 12, and 24 weeks should be done if the source patient is positive for HIV, Hep B or Hep C or if the source patient is unknown.

2. Perform follow-up anti-HBs testing in persons who receive hepatitis B vaccine.
3. Test for anti-HBs 1 – 2 months after last dose of vaccine.

06.2.2 HIV post-exposure management:

Post exposure to HIV

Post-exposure prophylaxis and consultation with infectious diseases consultant or department should be offered, and initiated as early as possible, to all individuals with exposure that has the potential for HIV transmission, and ideally within 72 hours.

Summary of Recommendations

PEP is recommended when occupational exposures to HIV occur.

Determine the HIV status of the exposure source patient to guide need for HIV PEP, if possible.

Start PEP medication regimens as soon as possible after occupational exposure to HIV and continue them for a 4-week duration.

PEP medication regimens should contain 3 (or more) antiretroviral drugs (listed in appendix A) for all occupational exposures to HIV.

Provide close follow-up for exposed personnel (Box 2) that includes counseling, baseline and follow-up HIV testing, and monitoring for drug toxicity.

Follow-up appointments should begin within 72 hours of an HIV exposure.
If a newer 4th generation combination HIV p24 antigen-HIV antibody test is utilized for follow-up HIV testing of exposed HCP, HIV testing may be concluded at 4 months after exposure (Box 2).
Expert consultation is recommended for any occupational exposures to HIV and at a minimum for situations described in (Box 1).
If a newer testing platform is not available, follow-up HIV, testing is typically concluded at 6 months after an HIV exposure.

Table 7: HIV Postexposure Prophylaxis Regimens:

PREFERRED HIV PEP REGIMENR	
altegravir (Isentress®; RAL) 400mg PO Twice Daily PlusTruvada™,1 PO Once Daily[Tenofovir DF (Viread®; TDF) 300mg + tricitabine (Emtriva™; FTC) 200mg])	
ALTERNATIVE REGIMENS (May combine one drug or drug pair from the left column with 1 pair of nucleoside/nucleotide reverse transcriptase inhibitors from the right column.	
Raltegravir (Isentress®; RAL)	Tenofovir DF (Viread®; TDF) + emtricitabine (Emtriva™; FTC); available as Truvada
Darunavir (Prezista®; DRV) + ritonavir (Norvir®; RTV)	Tenofovir DF (Viread®; TDF) + lamivudine (Epivir®; 3TC)
Etravirine (Intelence®; ETR)	Zidovudine (Retrovir™; ZDV; AZT) + lamivudine (Epivir®; 3TC); available as Combivir®
Rilpivirine (Edurant™; RPV)	Zidovudine (Retrovir®; ZDV; AZT) + emtricitabine (Emtriva™; FTC)
Atazanavir (Reyataz®; ATV) + ritonavir (Norvir®; RTV)	
Lopinavir/ritonavir (Kaletra®; LPV/RTV)	

The following alternative is a complete fixed-dose combination regimen and no additional antiretrovirals are needed: Stribild™ (elvitegravir, cobicistat, tenofovir DF, emtricitabine)

(CDC, 2013)

BOX 1. Situations for Which Expert Consultation for Human Immunodeficiency Virus (HIV) Postexposure Prophylaxis (PEP) is Recommended

Delayed (i.e., later than 72 hours) exposure report
•Interval after which benefits from PEP are undefined

Unknown source (e.g., needle in sharps disposal container or laundry) •Use of PEP to be decided on a case-by-case basis
•Consider severity of exposure and epidemiologic likelihood of HIV exposure
•Do not test needles or other sharp instruments for HIV

Known or suspected pregnancy in the exposed person
•Provision of PEP should not be delayed while awaiting expert consultation

Breastfeeding in the exposed person
•Provision of PEP should not be delayed while awaiting expert consultation

Known or suspected resistance of the source virus to antiretroviral agents
•If source person's virus is known or suspected to be resistant to one or more of the drugs considered for PEP, selection of drugs to which the source person's virus is unlikely to be resistant recommended
•Do not delay initiation of PEP while awaiting any results of resistance testing of the source person's virus

Toxicity of the initial PEP regimen
•Symptoms (e.g. Gastrointestinal (GI) symptoms and others) often manageable without changing PEP regimen by prescribing antimotility or antiemetic agents
•Counseling and support for management of side effects is very important as symptoms are often exacerbated by anxiety.

Serious medical illness in the exposed person
•Significant underlying illness (e.g. renal disease) or an exposed provider already taking multiple medications may increase the risk of drug toxicity and drug-drug interactions

BOX 2. Follow-Up of Health-Care Personnel (HCP) Exposed to Known or Suspected Human Immunodeficiency Virus (HIV)-Positive
Sources
Counseling (At the time of exposure, and at follow-up appointments) Exposed HCP should be advised to use precautions (e.g., use of barrier contraception, avoid blood or tissue donations, pregnancy, and if possible, breastfeeding) to prevent secondary transmission, especially during the first 6–12 weeks Postexposure.

For exposures for which PEP is prescribed, HCP should be informed regarding:
•possible drug toxicities (e.g. rash and hypersensitivity reactions which could imitate acute HIV seroconversion and the need for monitoring) •possible drug interactions, and
•the need for adherence to PEP regimens.

Early Reevaluation after Exposure
Regardless of whether a healthcare provider is taking PEP, reevaluation of exposed HCP within 72 hours after exposure is strongly recommended, as additional information about the exposure or source person may be available

Follow-up Testing and Appointments Follow-up testing at a minimum should include:
•HIV testing at baseline, 6 weeks, 12 weeks, and 6 months postexposure; Alternatively, if the clinician is certain that a 4th generation combination HIV p24 antigen-HIV antibody test is being utilized, then HIV testing could be performed at baseline, 6 weeks, and concluded at 4 months postexposure.
•Complete Blood counts, Renal and Hepatic Function Tests (At baseline and 2 weeks postexposure; further testing may be indicated if abnormalities were detected)

HIV testing results should preferably be given to the exposed healthcare provider at face to face appointments

06.2.3 Hepatitis B Virus post-exposure management:

Post-exposure prophylaxis and consultation with infectious diseases consultant or department should be offered, and initiated as early as possible, to all individuals with exposure that has the potential for Hepatitis B transmission.

Table 8: Post-exposure management of health-care personnel after occupational percutaneous and mucosal exposure to blood and body fluids, by health-care personnel Hep B vaccination and response status

Health-care personnel status	Post-exposure testing		Post-exposure prophylaxis		Post-vaccination serologic testing
	Source patient (HBsAg)	HCP testing (anti-HBs)	(HBIG) Hepatitis B immunoglobulin	Vaccination	
Documented responder after complete series (≥3 doses)	No action needed				
Documented non-responder after 6 doses	Positive/ unknown	—	HBIG x2 separated by 1 month	—	No
	Negative	No action needed			
Response unknown after 3 doses	Positive/ unknown	<10mIU/mL	HBIG x1	Initiate revaccination	Yes
	Negative	<10mIU/mL	None		
	Any result	≥10mIU/mL	No action needed		
Unvaccinated/incompletely vaccinated or vaccine refusers	Positive/ Unknown	—	HBIG x1	Complete vaccination	Yes

(CDC, 2013)

06.2.4 Hepatitis C post-exposure management:

Neither immunoglobulin nor antiviral agents are recommended for HCV post-exposure prophylaxis. Post-exposure consultation with infectious diseases consultant or department and/or gastroenterology consultant should be offered, and initiated as early as possible, to all individuals with exposure that has the potential for Hepatitis C transmission.

When HCV infection is identified, the HCW should be referred for medical management to a gastroenterologist or other clinician with experience in treating HCV.

Currently, no effective prophylaxis for HCV has been identified. However, if an individual becomes acutely infected with hepatitis C and is diagnosed at that time, immediate referral to a gastroenterologist or other specialist experienced in the treatment of hepatitis C is strongly recommended. Recent data suggest that early treatment of acute hepatitis C with interferon is highly effective, perhaps as high as 95%.

SECTION 1: Baseline Management

Following an exposure to blood or body fluid, the clinician should assess the risk for exposure to HCV. Wounds should be washed with soap and water, and should not be squeezed. Mucous membranes should be flushed with water.

Once the clinician has determined that exposure to blood or body fluid has occurred, the following baseline tests should be obtained (see Table below for follow-up according to baseline results)

Source Patient:

HCV antibody test (e.g., Enzyme immunoassay (EIA)/ enzyme-linked immunosorbent assay (ELISA)), and if positive, HCV RNA test or Recombinant immunoblot assay (RIBA)

Exposed HCW:

Liver panel including liver enzymes

HCV antibody, and if positive, HCV RNA test

Table 9 : Hepatitis C Post-Exposure Management According to Baseline Test Results

Clinical Scenario	Follow-Up
Source patient is HCV-antibody negative	No further testing or follow-up is necessary for source patient or the exposed HCW [a]
Source patient is unavailable or refuses testing	Follow-up HCV antibody at 3 and 6 months [a]
Source patient is HCV-antibody positive and HCV RNA negative	Manage the exposed HCW as if the source patient has chronic hepatitis C (see Section 2: Post-Exposure Follow-Up) [b]
Source patient is positive for both HCV antibody and HCV RNA and Exposed HCW is HCV-antibody negative	Source patient: Counsel and manage as chronic hepatitis C regardless of status of exposed person Exposed HCW: Follow up as outlined in Section 2: Post Exposure Follow-Up
Exposed HCW tests positive for both HCV antibody and HCV RNA	Counsel and manage as chronic hepatitis C

[a] If at any time the serum ALT level is elevated in the exposed HCW, the clinician should test for HCV RNA to assess for acute HCV infection.

[b] A single negative HCV RNA result does not exclude active infection.

SECTION 2: Post-Exposure Follow-Up for HCV

If the source patient is known to be positive for HCV antibody and/or HCV RNA, the follow-up schedule for the exposed HCW should be as follows:

Week 4: HCV RNA and liver panel

Week 12: HCV RNA and liver panel

Week 24: Liver panel and HCV antibody

If at any time the serum Alanine transaminase Level (ALT level) is elevated, the clinician should repeat HCV RNA testing to confirm acute HCV infection.

At any time that exposed HCWs test positive for HCV RNA, the clinician should refer for medical management by a gastroenterologist or other clinician with experience in treating HCV.

In the HCW exposed to a hepatitis C-infected source patient, regular follow-up with HCV RNA testing is recommended in addition to HCV antibody testing, because HCV RNA testing can identify acute infection within 2 weeks of exposure, whereas accuracy of the antibody test can be delayed up to several months after acute infection (i.e., “window period”).

06.3 Management of Healthcare Workers infected with bloodborne pathogens:

Table 10: Summary Recommendations for Managing Healthcare Providers Infected with Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), and/or Human Immunodeficiency Virus (HIV) (SHEA 2010).

Circulating viral burden	Categories of clinical activities [a]	Recommendation	Testing
HBV			
$<10^4$ GE/mL	Categories I, II, and III	No restrictions [b]	Twice per year
$\geq 10^4$ GE/mL	Categories I and II	No restrictions [b]	NA
$\geq 10^4$ GE/mL	Category III	Restricted c	NA
HCV			
$<10^4$ GE/mL	Categories I, II, and III	No restrictions [b]	Twice per year
$\geq 10^4$ GE/mL	Categories I and II	No restrictions [b]	NA
$\geq 10^4$ GE/mL	Category III	Restricted c	NA
HIV			
$< 5\times10^2$ GE/mL	Categories I, II, and III	No restrictions [b]	Twice per year
$\geq 5\times10^2$GE/mL	Categories I and II	No restrictions [b]	NA
$\geq 5\times10^2$ GE/mL	Category III	Restricted [d]	NA

Note. These recommendations provide a framework within which to consider such cases; however, each such case is sufficiently complex that each should be independently considered in context by the expert review panel (see text).
GE, genome equivalents; NA, not applicable.
a See categorization of clinical activities.
b No restrictions recommended, so long as the infected healthcare provider
(1) is not detected as having transmitted infection to patients;
(2) obtains advice from an Expert Review Panel about continued practice;
(3) undergoes follow-up routinely by Occupational Medicine staff (or an appropriate public health official),who test the provider twice per year to demonstrate the maintenance of a viral burden of less than the recommended threshold (see text);
(4) also receives follow-up by a personal physician who has expertise in the management of her or his infection and who is allowed by the provider to communicate with the Expert Review Panel about the provider's clinical status;
(5) consults with an expert about optimal infection control procedures (and strictly adheres to the recommended procedures, including the routine use of double-gloving for Category II and Category III procedures and frequent glove changes during procedures, particularly if performing technical tasks known to compromise glove integrity [e.g., placing sternal wires]), and
(6) agrees to the information in and signs a contract or letter from the Expert Review Panel that characterizes her or his responsibilities.
c These procedures permissible only when viral burden is $< 10^4$ GE/mL.
d These procedures permissible only when viral burden is $< 5\times10^2$ GE/mL.

Table 11: Categorization of Healthcare-Associated Procedures According to Level of risk for Blood borne Pathogen Transmission (SHEA 2010)

Category I: Procedures with minimal risk of blood borne virus transmission	
1.	Regular history-taking and/or physical or dental examinations, including gloved oral examination with a mirror and/or tongue depressor and/or dental explorer and periodontal probe.
2.	Routine dental preventive procedures (e.g., application of sealants or topical fluoride or administration of prophylaxis), diagnostic procedures, orthodontic procedures, prosthetic procedures (e.g., denture fabrication), cosmetic procedures (e.g., bleaching) not requiring local anesthesia.
3.	Routine rectal or vaginal examination.
4.	Minor surface suturing.
5.	Elective peripheral phlebotomy.
6.	Lower gastrointestinal tract endoscopic examinations and procedures, such as sigmoidoscopy and colonoscopy.
7.	Hands-off supervision during surgical procedures and computer-aided remote or robotic surgical procedures.
8.	Psychiatric evaluations.
Category II: Procedures for which blood borne virus transmission is theoretically possible but unlikely	
1.	Locally anesthetized ophthalmologic surgery.
2.	Locally anesthetized operative, prosthetic, and endodontic dental procedures
3.	Periodontal scaling and root planning.
4.	Minor oral surgical procedures (e.g., simple tooth extraction [i.e., not requiring excess force], soft tissue flap or sectioning, minor soft tissue biopsy, or incision and drainage of an accessible abscess).
5.	Minor local procedures (e.g., skin excision, abscess drainage, biopsy, and use of laser) under local anesthesia (often under bloodless conditions).
6.	Percutaneous cardiac procedures (e.g., angiography and catheterization).
7.	Percutaneous and other minor orthopedic procedures.
8.	Subcutaneous pacemaker implantation.
9.	Bronchoscopy.
10.	Insertion and maintenance of epidural and spinal anesthesia lines.
11.	Minor gynecological procedures (e.g., dilatation and curettage, suction abortion, colposcopy, insertion and removal of contraceptive devices and implants, and collection of ova).
12.	Male urological procedures (excluding transabdominal intrapelvic procedures).
13.	Upper gastrointestinal tract endoscopic procedures.

14.	Minor vascular procedures (e.g., embolectomy and vein stripping).Amputations, including major limbs (e.g., hemipelvectomy and amputation of legs or arms) and minor amputations (e.g., amputations of fingers, toes, hands, or feet).
15.	Breast augmentation or reduction.
16.	Minimum-exposure plastic surgical procedures (e.g., liposuction, minor skin resection for reshaping, face lift, brow lift, blepharoplasty, and otoplasty).
17.	Total and subtotal thyroidectomy and/or biopsy
18.	Endoscopic ear, nose, and throat surgery and simple ear and nasal procedures (e.g., stapedectomy or stapedotomy, and insertion of tympanostomy tubes).
19.	Ophthalmic surgery.
20.	Assistance with an uncomplicated vaginal delivery.
21.	Laparoscopic procedures.
22.	Thoracoscopic procedures.
23.	Nasal endoscopic procedures.
24.	Routine arthroscopic procedures.
25.	Plastic surgery.
26.	Insertion of, maintenance of, and drug administration into arterial and central venous lines.
27.	Endo tracheal intubation and use of laryngeal mask.
28.	Obtainment and use of venous and arterial access devices that occur under complete antiseptic technique, using universal precautions, “no-sharp” technique, and newly gloved hands.
Category III: Procedures for which there is definite risk of blood borne virus transmission or that have been classified previously as “exposure-prone”	
1.	General surgery, including nephrectomy, small bowel resection, cholecystectomy, subtotal thyroidectomy other elective open abdominal surgery.
2.	General oral surgery, including surgical extractions hard and soft tissue biopsy (if more extensive and/or having difficult access for suturing), apicoectomy, root amputation, gingivectomy, periodontal curettage, mucogingival and osseous surgery, alveoplasty or alveoectomy, and endosseous implant surgery.
3.	Cardiothoracic surgery, including valve replacement, coronary artery bypass grafting, other bypass surgery, heart transplantation, repair of congenital heart defects, thymectomy, and open-lung biopsy.
4.	Open extensive head and neck surgery involving bones, including oncological procedures.
5.	Neurosurgery, including craniotomy, other intracranial procedures, and open-spine surgery.
6.	Non elective procedures performed in the emergency department, including open resuscitation efforts, deep suturing to arrest hemorrhage, and internal cardiac massage.

7. Obstetrical/gynecological surgery, including cesarean delivery, hysterectomy, forceps delivery, episiotomy, cone, biopsy, and ovarian cyst removal, and other transvaginal obstetrical and gynecological procedures involving hand-guided sharps
8. Orthopedic procedures, including total knee arthroplasty, total hip arthroplasty, major joint replacement surgery, open spine surgery, and open pelvic surgery.
9. Extensive plastic surgery, including extensive cosmetic procedures (e.g., abdominoplasty and thoracoplasty).
10. Transplantation surgery (except skin and corneal transplantation).
11. Trauma surgery, including open head injuries, facial and jaw fracture reductions, extensive soft-tissue trauma, and ophthalmic trauma.
12. Interactions with patients in situations during which the risk of the patient biting the physician is significant; for example, interactions with violent patients or patients experiencing an epileptic seizure.
13. Any open surgical procedure with a duration of more than 3 hours, probably necessitating glove change.

Note. Modified from Reitsma et al.1

a Does not include subgingival scaling with hand instrumentation.

b If done emergently (eg, during acute trauma or resuscitation efforts), peripheral phlebotomy is classified as Category III.

c If there is no risk present of biting or of otherwise violent patients.

d Use of an ultrasonic device for scaling and root planing would greatly reduce or eliminate the risk for percutaneous injury to the provider. If significant physical force with hand instrumentation is anticipated to be necessary, scaling and root planing and other

Class II procedures could be reasonably classified as Category III.

e Making and suturing an episiotomy is classified as Category III.

f If unexpected circumstances require moving to an open procedure (eg, laparotomy or thoracotomy), some of these procedures will

be classified as Category III.

g If moving to an open procedure is required, these procedures will be classified as Category III.

h If opening a joint is indicated and/or use of power instruments (eg, drills) is necessary, this procedure is classified as Category III.

i A procedure involving bones, major vasculature, and/or deep body cavities will be classified as Category III.

j Removal of an erupted or nonerupted tooth requiring elevation of a mucoperiosteal flap, removal of bone, or sectioning of tooth

and suturing if needed.2

06.4 Work restriction rules:

Table 12: Summary of suggested work restrictions for health care personnel exposed to or infected with infectious diseases of importance in health care settings, (modified from ACIP recommendations) GCC manual 2013.

Disease/ problem	Work restriction	Duration
Conjunctivitis	Restrict from patient contact and contact with the patient's environment.	Until discharge ceases.
Cytomegalovirus	No restriction.	
Diarrheal diseases · Acute stage (diarrhea with other symptoms) · Convalescent stage, Salmonella spp	Restrict from patient contact, contact with the patient's environment, or food handling. Restrict from care of high-risk patients, for example immunocompromized patients.	Until symptoms resolve. Until symptoms resolve; consult with employee health.
Diphtheria	Exclude from duty.	Until antimicrobial therapy completed and 2 cultures obtained > 24 hours apart are negative.
Enteroviral infections	Restrict from care of infants, neonates, and immunocompromised patients and their environments.	Until symptoms resolve.
Hepatitis A	Restrict from patient contact, contact with patient's environment, and food handling.	Until 7 days after onset of Jaundice.

Herpes simplex · Genital · Hands (herpetic whitlow) · Orofacial	No restriction. Restrict from patient contact and contact with the patient's environment. Evaluate for need to restrict from care of high risk patients.	 Until lesions heal. Consult with employee health.
Measles · Active · Postexposure (susceptible personnel)	Exclude from duty. Exclude from duty.	Until 9 days after onset of parotitis. From 12th day after 1st exposure through 26th day after last exposure or until 9 days after onset of parotitis.
Pediculosis	Restrict from patient contact	Until treated and observed to be free of adult and immature lice
Pertussis · Active · Postexposure (asymptomatic personnel) · Postexposure (symptomatic personnel	Exclude from duty. No restriction, prophylaxis recommended; Management of Airborne and Droplet Infectious Disease Exposure in Healthcare Workers (Chickenpox, Measles, Rubella, Mumps, MTB, N. meningitis, Pertussis). Exclude from duty.	From beginning of catarrhal stage through 3rd wk after onset of paroxysms or until 5 days after start of effective antimicrobial therapy. Until 5 days after start effective antimicrobial therapy.
Rubella · Active	Exclude from duty.	Until 5 days after rash appears.

· Postexposure (susceptible personnel)	Exclude from duty	From 7th day after 1st exposure through 21st day after last exposure
Scabies	Restrict from patient contact	Until cleared by medical evaluation
Staphylococcus aureus infection ·Active, draining skin lesions · Carrier state	Restrict from contact with patients and patient's environmental or food handling No restriction, unless personnel are epidemiologically linked to transmission of the organism	Until lesions have resolved
Streptococcal group A infection	Restrict from patient care, contact with patient's environment, or food handling	Until 24 hours after adequate antimicrobial therapy
Tuberculosis · Active disease · PPD converter	Exclude from duty No restriction	Until proven noninfectious by physician
Varicella · Active · Postexposure (susceptible personnel	Exclude from duty Exclude from duty	Until all lesions dry and crust From 10th day after 1st exposure through 21st day (28th day if VZIG given) after last exposure

Zoster · Localized, in healthy person ·Generalized or localized in immunosuppressed person ·Postexposure (susceptible personnel)	Cover lesions; restrict from care of high-risk patients + Restrict from patient contact Restrict from patient contact	Until all lesions dry and crust Until all lesions dry and crust From 10th day after 1st exposure through 21st day (28th day if VZIG given) after last exposure or, if varicella occurs, until all lesions dry and crus
Viral respiratory infections, acute febrile	Consider excluding from the care of high risk patients ++ or contact with their environment during community outbreak of Respiratory Syncytial Virus (RSV) and influenza	Until acute symptoms resolve

+ Those susceptible to varicella and those who are at increased risk of complications due to varicella, such as neonates and immunocompromised persons of any age

++ High-risk patients as defined by the Advisory committee on Immunization Practices (ACIP) for complications due to influenza

07 PREGNANT HEALTHCARE WORKERS:

07.1 Table 13: Pregnant healthcare workers exposed to infections
Disease-causing agents that have reproductive hazards for women in the workplace (Quoted from GCC, 2013).

Agent	Observed effects	Potentially exposed workers	Preventive measures
Cytomegalovirus (CMV)	Birth defects, low birth weight, developmental disorders	Health care workers in contact with infants and children	Good hygienic practices such as hand washing
Hepatitis B virus	Low birth weight	Health care workers	Vaccination
Human immuno-deficiency virus (HIV)	Low birth weight, Childhood cancer	Health care workers	Practice universal precautions
Human parvovirus B19	Miscarriage	Health care workers, workers in contact with infants and children	Good hygienic practices such as hand washing
Rubella (German measles)	Birth defects, low birth weight	Health care workers in contact with infants and children	Vaccination before pregnancy if no prior immunity
Toxoplasmosis	Miscarriage, birth defects, developmental disorders	Animal care workers, veterinarians	Good hygiene practices such as hand washing
Varicella-zoster virus (chickenpox)	Birth defects, low birth weight	Health care workers, in contact with infants and children	Vaccination before pregnancy if no prior immunity

Workers with immunity through vaccinations or earlier exposures are not generally at risk from diseases such as hepatitis B, human parvovirus B19, German measles, or chicken pox. But pregnant workers without prior immunity should avoid contact with infected children or adults. Workers should also use good hygienic practices such as frequent hand washing to prevent the spread of infectious diseases among workers in elementary schools, nursery schools, and daycare centers. In addition, they should use universal precautions. Such as glove wearing and safe disposal of needles.to protect against disease-causing agents found in blood.

07.2 Pregnant healthcare workers exposed to radiation

A pregnant worker can continue working in an X-ray department as long as there is reasonable assurance that the fetal dose can be kept below 1 mGy during the pregnancy. It is important to ensure that pregnant women are not subjected to unnecessary discrimination. Both worker and the employer carry responsibility towards safety.
The first responsibility for the protection of the conceptus lies with the woman herself, who should declare her pregnancy to management as soon as the condition is confirmed. The following recommendations are taken from International Commission on Radiological Protection (ICRP Publication 84):

- Restricting dose to the conceptus does not mean that it is necessary for pregnant women to avoid work with radiation or radioactive materials completely, or that they must be prevented from entering or working in designated radiation areas. It does, however, imply that the employer should carefully review the exposure conditions of pregnant women. In particular, their working conditions should be such that the probability of high accidental doses and radionuclide intakes is insignificant;
- When a medical radiation worker is known to be pregnant, there are three options that are often considered in medical radiation facilities: 1) no change in assigned working duties; 2) change to another area where the radiation exposure may be lower; or 3) change to a job that has essentially no radiation exposure. There is no single correct answer for all situations, and in certain countries, there may even be specific regulations. It is desirable to have a discussion with the employee. The worker should be informed of the potential risks, local policies, and recommended dose limits;
- Changing to a position that may have lower ambient exposure is also a possibility. In diagnostic radiology, this may involve transferring a technician from fluoroscopy to CT scanning or some other area where there is less scattered radiation to workers. In nuclear medicine departments, a pregnant technician can be restricted from spending a lot of time in the radiopharmacy or working with radioiodine solutions. In radiotherapy with sealed sources, pregnant technicians or nurses might not participate in manual brachytherapy;
- An ethical consideration is involved in both of these last two alternatives since another worker will have to incur additional radiation exposure because a co-worker became pregnant;

- There are many situations in which the worker wishes to continue doing the same job, or the employer may depend on her to continue in the same job in order to maintain the level of patient care that the work unit is customarily able to provide. From a radiation protection point of view, this is perfectly acceptable providing the fetal dose can be reasonably accurately estimated and falls within the recommended limit of 1 mGy fetal dose after the pregnancy is declared. It would be reasonable to evaluate the work environment in order to provide assurance that high-dose accidents are unlikely; (International Atomic Energy Agency (IAEA) 2000).

07.3 Table 14: Pregnant healthcare workers exposed to chemotherapeutic agents

Hazardous Drug (HD) Handling Activities in Healthcare Workers that can Result in Exposure	
Workers Potentially Exposed Activity	Workers Potentially Exposed Activity
Pharmacists, pharmacy technicians Handling drug-contaminated vials	Handling drug-contaminated vials Reconstituting powdered or lyophilized drugs and further diluting either the reconstituted powder or concentrated liquid forms of hazardous drugs Expelling air from syringes filled with hazardous drugs Compounding HD powders into custom-dosage forms Transferring drug solution to Intravenous (IV) bag or bottle.
Pharmacists, pharmacy technicians, nursing	Counting out individual, uncoated oral doses from multidose bottles Unit-dosing uncoated tablets in a unit-dose machine Crushing tablets or opening capsules to make oral liquid dose Opening ampoules Preparing topical drugs
Nursing personnel	Administering antineoplastic drugs by injection (intramuscular, subcutaneous or intravenous (IV)), by inhalation or by nasogastric tube Spiking the IV set into an HD-containing IV bag (without a closed system) Priming the IV set with a drug-containing solution at the administration location Connecting and disconnecting the IV set to an IV pump or patient
Nursing personnel, support staff, housekeeping personnel, laundry personnel	Handling body fluids or body-fluid-contaminated clothing, dressings, linens, bedpans, urinals and

	other materials Handling contaminated wastes generated at any step of the preparation or administration process
Pharmacists, pharmacy technicians, nursing personnel, housekeeping personnel, environmental services personnel	Contacting hazardous drugs present on drug vial exteriors, work surfaces, floors, and final drug products (bottles, bags, cassettes, and syringes) Handling unused antineoplastic drugs or antineoplastic drug-contaminated waste Decontaminating and cleaning drug preparation or clinical areas Cleaning hazardous drug spills
Physicians, nursing personnel, operating room	Performing certain specialized HD administration procedures such as intraperitoneal chemotherapy (in the operating room or other locations), bladder instillation, isolated limb perfusion
Support staff	Transporting hazardous throughout the facility
Nursing personnel, housekeeping personnel, waste disposal personnel	Transporting hazardous waste containers.
Pharmacists, pharmacy technicians, nursing personnel, housekeeping personnel	Removing and disposing of personal protective equipment after handling hazardous drugs or waste.

Recommendations

Use of Industrial Hygiene Practices to Reduce Exposure to Hazardous Drugs

1. National institute for occupational safety and Health (NIOSH) recommends that a workplace be safe for all workers, regardless of their reproductive status
2. Several organization's [Occupational Safety and Health Administration (OSHA) 1999; NIOSH 2004; ASHP 2006; United States Pharmacopeia (USP) 2008; ONS 2011] recommendations include:

a) The proper use of engineering controls,
b) Administrative controls, and
c) Personal protective equipment [NIOSH 2009].
d) Training of personnel and other critical work practices are instrumental in protecting workers from exposure [NIOSH 2004, 2013].

Additional information on adverse reproductive effects of these drugs can be found in the drug package inserts and in the Safety Data Sheets (SDS for the drugs.

Implementation of an Alternative Duty or Temporary Reassignment

One such additional precaution is to offer employees who are pregnant, breast-feeding, or actively trying to conceive the option of alternative duty.

Alternative duty does not mean the worker is excused from work It does suggest some reassignment of duties, often within the same job, to avoid handling hazardous drugs. For example, various nursing or pharmacy duties can be redistributed among a team of workers, or the organization of work can be altered to allow those needing reassignment to still work in many aspects of their jobs (CDC, 2012).

08 Acronyms (Abbreviations):

ACIP: Advisory committee on Immunization Practices.
AFB: Acid Fast Bacilli.
ALT: Alanine transaminase (also, called alanine aminotransferase (ALAT) was formerly called serum glutamate-pyruvate transaminase (SGPT) or serum glutamic-pyruvic transaminase (SGPT)).
BCG: Bacillus Calmette – Guerin.
CBC: complete blood count.
CBC: Complete blood count.
CDC: Centers for Disease Control and Prevention.
CRS: Congenital Rubella Syndrome.
CXR: chest x-ray.
EHC: Employee Health Clinic.
EIA: Enzyme immunoassay.
ELISA: enzyme-linked immunosorbent assay.
EPP: Exposure Prone Procedures.
FDA: Food and Drug Administration.
GI: gastrointestinal.
HB: Hepatitis B.
HBIG: Hepatitis B immunoglobulin.
HBV: Hepatitis B virus.
HCP: Health care professionals / Health-Care Personnel.
HCV: Hepatitis C virus.
HCW: Healthcare Worker.
HD: Hazardous DrugI.
HESN: Health Electronic Surveillance Network.
HGB: Hemoglobin.
HIV: Human Immunodeficiency Virus.
I.M: intra muscular.
IAEA: International Atomic Energy Agency.
ICRP: International Commission on Radiological Protection.
IG: Immunoglobulin.
IgG: Immunoglobulin G.
IGRA: Interferon-gamma release assay.
IT: Information technologist.
IV: Intravenous.
LAIV: Live attenuated influenza vaccine.
LFT: lever function test.
LTBI: Latent Tuberculosis Infection.

MMR: Measles, Mumps, Rubella.
MTB: Mycobacterium tuberculosis bacteria.
NIOSH: National institute for occupational safety and Health.
OSHA: Occupational Safety and Health Administration.
PFP: Postexposure Prophylaxis.
PPD: purified protein derivative.
RBC: Red blood cell count (RBC).
RIBA: Recombinant immunoblot assay.
RSV: Respiratory Syncytial Virus.
S.C: Subcutaneous.
Tdap: Tetanus, diphtheria & pertussis.
TNF: Tumor necrosis Factor.
TST: Tuberculin Skin Testing.
TSTs: Tuberculin Skin Tests.
USP: United States Pharmacopeia.
VZIG: Varicella zoster immunoglobulin.
WBC: White blood cell count.

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