



**GUIDELINE FOR THE PREPLACEMENT COMMUNICABLE DISEASE SCREENING
OF
HEALTHCARE WORKERS**

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TABLE OF CONTENTS

<i>Definitions</i>	4
1.0 Responsibilities	6
1.1 Employers	6
1.2 Occupational Health Nurses	6
1.3 Healthcare Workers	6
2.0 Screening Protocol	7
2.1 Preplacement Immunization screening	7
2.2 Consent	7
2.3 HCWs' personal immunization record	7
2.4 Confidentiality	7
3. Vaccination Recommendations	8
3.1 Diphtheria/Tetanus	8
3.2 Hepatitis B	8
3.3 Influenza	8
3.4 Measles	8
3.5 Meningococcal Disease	9
3.6 Mumps	9
3.7 Pertussis	9
3.8 Pneumococcal polysaccharide vaccine	10
3.9 Rubella (German Measles)	10
3.10 Tuberculosis	10
3.11 Typhoid Fever	10
3.12 Varicella	11
<i>References</i>	12
<i>Appendix A</i>	13
HCW Baseline Testing for Hepatitis B	13
<i>Appendix B</i>	14
HCW Pre-employment screening for tuberculosis	14

The purpose of this guideline is to provide a comprehensive, consistent provincial approach to the screening of healthcare workers (HCWs) for specific communicable diseases and to provide evidence based recommendations for the vaccination of HCWs for vaccine preventable diseases.

These recommendations are intended to minimize the risk of occupationally acquired communicable diseases to the HCWs and the HCWs' families, to protect patients and other staff from exposure to infected workers, and to sustain the work force during outbreaks of communicable diseases. Healthcare workers are at risk of exposure to and possible transmission of vaccine preventable disease because of their contact with patients or infective materials from patients. Additionally, patients and residents may be placed at risk if the healthcare workers are not adequately screened and immunized against vaccine preventable diseases. Maintenance of immunity against vaccine-preventable diseases is identified as an integral part of the infection prevention Occupational Health (OH) Program.

All routine vaccines, vaccines for high risk individuals and all vaccines recommended for government employees are publicly funded. In private industry the employer or employee is responsible for any costs related to immunization for non-publicly funded programs.

This guideline has been developed by Department of Health & Community Services, Public Health Division, in collaboration with a provincial ad hoc committee with representatives from the Medical Officers of Health, Infection Control, Communicable Disease Control, Occupational Health and the Public Health Laboratory.

Definitions

Bacille Calmette-Guèrin (BCG) - A vaccine effective in preventing disseminated and meningeal tuberculosis disease in infants and young children.

Droplet Precautions - These are precautions required when the infectious organism is transmitted through large droplets from the infected person during coughing or sneezing. More information on Droplet Precautions are available in Public Health Agency Guideline (1999).

Exposure - This is the potential to become infected, and exposure assessment requires an understanding of such key factors such as:

- The distribution of an infectious agent in the human population, animal population and/or environment of interest
- Modes of transmission
- Information from previous outbreaks of unknown etiology
- Information from outbreaks caused by novel infectious agents

Exposure prone procedures (EPPs) - procedures where there is potential for contact between the skin of the healthcare worker and sharp surgical instruments, needles or sharp tissues (splinters/pieces of bone/tooth) in body cavities or in poorly visualized or confined body sites including the mouth. They are procedures which transmission of HBV, HIV or HCV from a HCW to a patient is more likely to occur and includes the following:

- digital palpation of a needle tip in a body cavity (a hollow space within the body or one of its organs) or the simultaneous presence of the HCW's fingers and a needle or other sharp instrument or object in a blind or highly confined anatomic site, e.g. during major abdominal, cardiothoracic, vaginal and/or orthopedic operations, or
- repair of major traumatic injuries, or
- major cutting or removal of any oral or perioral tissue, including tooth structures, during which there is a potential for the patient's open tissues to be exposed to the blood of an injured HCW (PHAC, 1998).

Healthcare facility refers to a variety of healthcare settings, including hospitals, ambulatory care facilities, out patient clinics, child health clinics, home care settings, long-term care or residential facilities and medical areas of correctional facilities.

Healthcare workers (HCWs) - A healthcare worker is an individual who may have the potential to acquire or transmit an infectious agent during the course of his or her work in the healthcare setting while providing direct care. It may include all paid and unpaid persons working in the healthcare facility and in the community including staff, physicians, home-care workers, laboratorians, and students. In some settings, volunteers might provide care and would be included as a healthcare worker.

HCWs clinical contact - All HCWs who have the possibility of potential exposure to infectious substances of a patient.

HCWs nonclinical contact - Clerical staff and many other occupational groups who have no greater exposure to infectious diseases than does the general public. These employees do not need to be included in vaccination programs or other programs aimed at protecting clinical contact staff. However, where there is public health benefit in facilitating population recommendations against vaccine preventable disease, it is best practice to ensure all staff are appropriately immunized eg., diphtheria, tetanus, influenza, measles, mumps and rubella vaccination.

Interferon gamma release assay (IGRA) – This is a test for cell mediated immunity responses to antigens that simulate mycobacterial proteins. The proteins used in IGRA are absent from all BCG strains and from non-tuberculous mycobacteria with the exception of *M.kansasii*, *M. szulgai*, and *M. marinum*. Individuals infected with *M.tuberculosis* complex (*M. tuberculosis*, *M. bovis*, *M. africanum*, *M. microti*, *M. canetti*) usually have lymphocytes recognizing the protein antigens. The recognition process involves generation and secretion of the cytokine, IFN- γ . The detection and quantification of IFN- γ forms the basis of this test.

Nontuberculous mycobacteria (NTM) - refers to mycobacterium species other than those included as *Mycobacterium tuberculosis* complex.

Patient is used to identify the individual (patient, client or resident) who receives care in a healthcare facility or in the community.

Routine Practices - Routine Practices are the infection prevention and control practices for use in the routine care of all patients at all times in all healthcare settings and are determined by the circumstances of the patient, the environment and the task to be performed.

Tuberculin skin test (TST) - is a diagnostic tool used to identify people infected with *Mycobacterium tuberculosis* (TB). It is a measure of cell mediated immune responsiveness and possible infection with the TB organism. It is the intradermal injection of 5 tuberculin units (TU) of purified protein derivative (PPD) into the anterior aspect of the forearm (Mantoux test).

Two-step TST - Procedure used for the baseline skin testing of persons who will receive serial TSTs to reduce the likelihood of mistaking a boosted reaction for a new infection. If an initial TST result is classified as negative, a second step of a two-step TST should be administered 1-3 weeks after the first TST was read. There is no indication for two-step TST testing in the setting of a contact investigation (Health Canada, 2000).

1.0 Responsibilities

1.1. Employers

- Implement and maintain an infectious disease education, screening and vaccination program
- Provide employees with adequate information, education and pre and post test counseling to make informed decisions about screening results and the vaccinations
- Establish guidelines for the placement of HCWs who remain non-immune due to: failure to seroconvert, have medical contraindications to vaccination, or immunization refusal
- Maintain a database/file that contains details of HCW vaccine preventable disease history, serological test results, vaccinations received, consents, and refusals
- Ensure that the database/file is maintained in a confidential manner and is accessible by authorized personnel when needed
- Ensure that all newly employed and recently placed susceptible HCWs with patient contact are immunized against vaccine preventable diseases for which they are at risk of exposure
- Consider a “catch-up” program for other susceptible HCWs; workplaces may vary in how they put this into operation as determined by individual circumstances.
- Activate an expert panel when a HCW who performs exposure-prone procedures is found to be infected with a bloodborne pathogen

1.2. Occupational Health Nurses/Designate

- Provide a pre-placement assessment of all healthcare workers
- Present the healthcare workers with the appropriate education and vaccinations as recommended
- Follow the Provincial Immunization Manual for the latest recommendations on vaccinations available at:
http://www.health.gov.nl.ca/health/publichealth/cdc/health_pro_info.html#immunization
- Provide healthcare workers, deemed to have high risk conditions, with the recommended vaccines

1.3. Healthcare Workers

- Provide previous records of health screening and vaccination history to OH prior to placement

- Comply with the employer's screening, education, vaccination program, and acknowledge in writing either consent for vaccinations or refusal of vaccinations
- Inform OH of any exposure to an infectious disease
- Abide by the recommendation of OH regarding work restriction due to an infectious disease

2.0 Screening Protocol

2.1 *Preplacement Screening*

- Screening includes:
 - Taking a health and immunization history
 - Reviewing documented records of immunizations
 - Using serology to determine infectious risks as indicated by antibody status
 - Documenting the immune status
 - Determining if the HCW has any contraindications to vaccines or previous adverse reactions to vaccines

2.2 *Consent*

- A written informed consent must be obtained from the HCW prior to screening and vaccination
- Consent must be documented on the HCW's health screening record
- If recommended vaccines are refused a signed documentation of refusal must be obtained including evidence that the HCW understands the implication involved in refusal (e.g., work restrictions)

2.3 *HCWs' Personal Immunization Record*

- A personal immunization record will be given to each HCW indicating the screening results and the vaccinations given

2.4 *Confidentiality*

- OH/Designate staff work within strict guidelines of confidentiality
- OH/Designate staff are obliged ethically and professionally not to release information without the informed written consent of the HCW, except when required by law

3. Disease Specific Recommendations

3.1 *Diphtheria/Tetanus*

- Ensure that HCWs have completed a primary series of 3 doses of a combined tetanus and diphtheria (Td) preparation
- Provide a booster dose of Td every 10 years (see pertussis recommendation)

3.2 *Hepatitis B*

- All HCWs with clinical contact should be vaccinated against hepatitis B infection
- The assessment protocol for hepatitis B is available in Appendix A
- To document hepatitis B immunity, test for surface antibody (anti-HBs) 1 month after the third dose of the series
- Routine booster doses are not necessary for HCWs following achievement of serological confirmed immunity
 - Antibody levels do not require monitoring
- If any employee is infectious with hepatitis B he/she must not perform EPP

3.3 *Influenza*

- Consider unvaccinated HCWs to be susceptible to influenza
- Educate HCWs on the importance of annual influenza vaccine
- Provide all HCWs with influenza vaccine prior to/during influenza season

3.4 *Measles*

- Consider HCWs immune to measles with one of the following criteria:
 - Born before 1970
 - Written documentation of vaccination with 2 doses of live vaccine administered at least 28 days apart
 - Laboratory evidence of immunity
 - Laboratory confirmation of disease
- Immunize all susceptible HCWs with two doses of live measles containing vaccine given as measles, mumps and rubella (MMR)
- Ensure that a second dose of measles vaccine (MMR) is given to HCWs born 1970 or later who have previously received only one dose
- Do not exclude from work recently vaccinated HCW who develops a vaccine-related rash

- Do not perform routine post vaccine serology on recently immunized HCWs
- Advise susceptible HCWs that they must not work with patients suspected or confirmed to have measles

3.5 Meningococcal Disease

- Immunize clinical microbiologists, research microbiologists and clinical laboratory personnel who process cultures of *Neisseria meningitides* on a regular basis with one dose of quadrivalent (A, C, Y and W-135) conjugate meningococcal vaccine
- The vaccine does not provide complete protection, i.e., serogroup B is not in the vaccine, so laboratory safety practices must be maintained
- The need for a booster is unknown at this time
- Provide the vaccine to HCWs with high risk medical conditions as recommended in the Provincial Immunization Manual
- Routine meningococcal vaccine is not recommended for all HCWs

3.6 Mumps

- Consider HCWs immune to mumps with one of the following criteria:
 - Born before 1970
 - Written documentation of vaccination with 2 doses of vaccine administered at least 28 days apart
 - Laboratory evidence of immunity
 - Laboratory confirmation of disease
- Immunize all susceptible HCWs with two doses of mumps containing vaccine given as measles, mumps and rubella (MMR)
- Do not perform routine post vaccine serology on recently immunized HCWs
- In the event of an outbreak of mumps consider providing one dose of vaccine for those born before 1970 impacted by this outbreak
- Advise HCWs who are susceptible that they must not work with patients suspected or confirmed to have mumps

3.7 Pertussis

- Consider HCWs susceptible to pertussis since immunity wanes
- Advise HCWs who are susceptible that they must follow Droplet Precautions if caring for patient with pertussis

3.8 *Pneumococcal polysaccharide vaccine*

- Provide pneumococcal polysaccharide vaccine (Pneu-P-23) to HCWs with high risk conditions as identified in the Provincial Immunization Manual
- Provide Pneu-P-23 vaccine to any HCWs aged ≥ 65 years

3.9 *Rubella*

- Consider HCWs immune to rubella with one of the following criteria:
 - Written documentation of vaccination with one dose of live rubella given as MMR
 - Laboratory evidence of immunity
 - Laboratory confirmation of disease
- Immunize all HCWs without documentation of prior immunization with one dose of rubella containing vaccine given as measles, mumps and rubella (MMR)
 - Due to the 2 dose requirement for measles and mumps, the use of MMR will result in the majority of HCWs receiving 2 doses of rubella-containing vaccine
- Review in detail all female employees of childbearing age to ensure immunity
- Advise susceptible HCWs that they must not work with patients suspected or confirmed to have rubella

3.10 *Tuberculosis*

- All HCWs must be assessed for tuberculosis (TB) at the preplacement assessment
- The assessment protocol is defined in Appendix B
- HCWs with active TB must be excluded from work until:
 - Three consecutive daily AFB smears are negative with substantial improvement in symptoms
 - Clearance from Occupational Health/Designate is required before returning to work
- HCWs with extra pulmonary tuberculosis may work if concurrent pulmonary tuberculosis has been excluded
- HCWs with latent TB can report to work unless symptoms develop

3.11 *Typhoid Fever*

- Immunize microbiologists and others who work frequently with *Salmonella* Typhi
- Typhoid is rare in Canada, so routine microbiology laboratories process *S. typhi* only rarely, i.e., not frequently

3.12 Varicella

- Consider HCWs immune to varicella with one of the following criteria:
 - Written documentation of vaccination with two doses of varicella vaccine administered at least 28 days apart
 - Laboratory evidence of immunity
 - Laboratory confirmation of disease
 - Diagnosis or self report of a history of varicella disease
 - Diagnosis or verification of a history of herpes zoster by a healthcare professional
- Obtain recommendations for the immunization of a susceptible immunocompromised HCW from his/her attending physician
- Do not perform routine post vaccine serology on recently immunized HCWs
- Advise HCWs who are susceptible that they must not work with patients suspected or confirmed to have varicella or zoster

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Appendix A

HCW Baseline Testing for Hepatitis B

Hepatitis B vaccination status	Action
Documented HB vaccine series <ul style="list-style-type: none"> Post vaccination anti-HBs serology is \geq 10 mIU/ml 	<ul style="list-style-type: none"> No further action
Documented HB vaccine series <ul style="list-style-type: none"> No post vaccination anti-HBs documented 	<ul style="list-style-type: none"> Test for anti-HBs If anti-HBs \geq10 mIU/ml - no further action If anti-HBs < 10 mIU/ml give one dose of vaccine and retest
Unsure if HB vaccine series completed	<ul style="list-style-type: none"> Test for antiHBs If antiHBs < 10 IU/ml - vaccinate If antiHBs \geq10 IU/ml - no further action
One or 2 doses of hepatitis series given	<ul style="list-style-type: none"> Complete series Test for antibody response 1 -2 months post series
Hepatitis series (x1) completed <ul style="list-style-type: none"> Non responder 	<ul style="list-style-type: none"> Give an additional dose and retest Repeat above until 6 doses completed If unresponsive to 2 series of vaccine (x 6 doses) document as non-responder No further doses recommended Advise that post exposure prophylaxis required
Two completed hepatitis B series <ul style="list-style-type: none"> Non responder 	<ul style="list-style-type: none"> Document as non-responder No further doses recommended Post exposure prophylaxis required
Prior known HBsAg positive	<ul style="list-style-type: none"> Refer to expert review committee if HCW performing EPP

Legend

Anti-HBs = antibody to hepatitis B

HBsAg = hepatitis B surface antigen

Primary hepatitis B series = 3 doses of vaccine

mIU/L=milli-International Units per Liter (mIU/L)

Appendix B

HCW Pre-employment screening for tuberculosis

TST Status	Action
<ul style="list-style-type: none"> Unknown or no previous TST 	<ul style="list-style-type: none"> Do two-step TST (second test 7-21 days after the first test) Note: If 1st step is negative and there are no identified risk factors, can be cleared to work while awaiting 2nd step
<ul style="list-style-type: none"> Documented prior negative TST, <u>within the last year</u>, with no previously documented two-step 	<ul style="list-style-type: none"> If no risk factors, can be cleared to work Do one TST and consider this the second step of the two-step method
<ul style="list-style-type: none"> Documented prior negative TST, <u>greater than one year</u>, with no previously documented two-step 	<ul style="list-style-type: none"> Do two-step TST Note: If 1st step is negative and there are no identified risk factors, can be cleared to work while awaiting 2nd step
<ul style="list-style-type: none"> Previously documented two-step TST <u>greater than one year ago</u> and no TST testing within the last year 	<ul style="list-style-type: none"> Do one TST
<ul style="list-style-type: none"> Previously documented two-step TST <u>greater than one year ago</u> and a negative TST within the last year 	<ul style="list-style-type: none"> Assess for recent exposure to TB or symptoms and if negative, TST not required at this time
<ul style="list-style-type: none"> Documented prior positive or baseline positive TST 	<ul style="list-style-type: none"> See follow-up action below
<ul style="list-style-type: none"> Previous treatment for TB /preventative treatment for LTBI 	<ul style="list-style-type: none"> See follow-up action below
<ul style="list-style-type: none"> Prior positive TST, inadvertently tested (for example -documentation of previous TST not known) 	<ul style="list-style-type: none"> If ≥ 10 mm, do not repeat If < 10 mm, use result as test #1 of two-step TST; and complete the two-step process
Follow-up Action	
<ul style="list-style-type: none"> If TST negative 	<ul style="list-style-type: none"> Document – No further action required
<ul style="list-style-type: none"> If TST positive 	<ul style="list-style-type: none"> If positive, consider previous BCG vaccination and non tuberculosis mycobacterium infection Review history for TB disease or infection and assess for signs and symptoms of TB IGRA may be used as a confirmatory test for a positive baseline TST in an immunocompetent HCW who is considered to have a low pretest probability of LTBI and high risk factors for TB Refer to attending medical provider for chest x-ray, medical exam if signs and symptoms present, and/or new conversion noted. Discuss with medical provider if there is an indication for LTBI treatment. Document action

Interpretation of TST size

TST Reaction Size	Situation in which positive
0-4 mm	<ul style="list-style-type: none"> • HIV Infection with immune suppression AND the likelihood of TB infection is high • From high prevalence area • Close contact of active contagious case • Has abnormal x-ray
5-9 mm	<ul style="list-style-type: none"> • HIV infection • Close contact of active contagious case • Children suspected of having tuberculosis disease • Abnormal chest x-ray with fibronodular disease • Other immune suppression: TNF-alpha inhibitors, chemotherapy
≥ 10 mm	<ul style="list-style-type: none"> • All others