

Employee and Occupational Health

Published: June 2024

Long Term Care Certification in Infection Prevention (LTC-CIP) Preparation Series

Sources

- Content of this module was informed and used with permission from the Association for Professionals in Infection Control and Epidemiology resources:
 - APIC LTC-CIP™ Learning System
 - APIC Text Online

Association for Professionals in Infection Control and Epidemiology (APIC). APIC LTC-CIP™ learning system, book 1. Washington, DC: APIC; 2023.

Association for Professionals in Infection Control and Epidemiology (APIC). APIC text online [Internet]. Washington, DC: APIC; 2023 [cited 2024 Feb 14]. Available from: <https://text.apic.org/>

Exam Content

1. Long-Term Care Settings (15 items)
2. Management and Communication of the Infection Prevention Program (16 items)
3. Identification of Infectious Diseases (18 items)
4. Surveillance and Epidemiologic Investigation (24 items)
5. Prevention and Control of Infectious and Communicable Diseases (24 items)
6. Environment of Care (18 items)
7. Cleaning, Disinfection, Sterilization of Medical Devices and Equipment (15 items)
8. Antimicrobial Stewardship (11 items)
9. **Employee/Occupational Health (9 items)**

Objectives

In this review session, the main topics that will be covered are:

1. Components of an Occupational Health Program
2. Occupational risks and infection prevention strategies, such as immunization
3. The regulatory requirements related to occupational exposures and infections



Occupational Health and Safety

Establishing and Creating a Safety Culture

- Creation, maintenance and measurement of safety culture is a health system regulatory requirement
- Safety should be an organizational priority – identification and resolution of safety issues is encouraged
- Staff must be able to speak out without fear of reprisal
- Patient/staff safety must be tracked, assessed and evaluated over time
- Education should be provided to prevent future safety issues
- Facility design should take into account safety considerations (i.e., ergonomics, characteristics of the physical environment, human safety factors)

Safety Culture: Risk and Incident Reporting

- To reduce harm in healthcare the root cause of adverse events must be identified
- Incident reporting program is one way of determining effectiveness of a patient safety program and should include the following components:
 - Be confidential and voluntary
 - Use standard definitions
 - Target specific and/or high-risk populations
 - Have dedicated staff for data collection
 - Have a large sample size
 - Disseminate data back to providers to improve future outcomes
 - Monitor rates to inform prevention programs



Occupational Health and Safety Legislation

- Legal framework to protect workers from health and safety hazards on the job
- Employers have a general obligation or duty to ensure that the health and safety of every person employed by the employer is protected while they are working
- Employees have legislated rights:
 - the right to refuse dangerous work and know that you're protected from reprisal
 - the right to know about workplace hazards
 - have access to basic health and safety information

Occupational Health and Safety Programs

- Every health care organization must have occupational health policies, procedures, and practices in place
- Administration and staff should support the following infection prevention and control (IPAC) elements of an occupational health program:
 - Staff education and training for Infection control
 - Collaboration with IPAC department in exposure monitoring and outbreak management
 - Management of work-related illnesses or exposures, including testing protocols and return to work guidelines.
 - Identify work-related infection risk and institute measures.
 - Immunization of staff
 - Contain costs by reducing absenteeism and disability



Blood borne Pathogen Exposure Management

What Constitutes an Exposure to a Blood Borne Pathogen?

- Percutaneous injury (needlestick or cut from sharp object) that has been in direct contact with mucous membrane or non-intact skin with blood, tissue or other infectious body fluids
- Infection after exposure is dependent on:
 - Route of exposure
 - Concentration of infectious agents on the body fluid
 - Volume of infective material
 - Susceptibility of the exposed health care worker (e.g., hepatitis B virus (HBV))

Responsibilities of the Employer

- Employers must protect workers who are at risk of exposure to blood borne pathogens or other potentially infectious material via the following:
 - Establish an occupational exposure control plan and update the plan annually
 - Implement the use of Standard Precautions/Routine Practices
 - Identify and use engineering controls and workplace practice controls
 - Provide personal protective equipment (PPE)
 - Make available HBV vaccinations to all workers with occupational exposure
 - Make available post-exposure testing, evaluation and follow-up to any occupationally exposed worker
 - Provide information and training to workers, use labels and signs to communicate hazards
 - Maintain confidential employee health and training records

Bloodborne Pathogen Control Measures in Healthcare Facilities

- Cleaning and disinfection of surfaces and equipment
- Separate storage of clean and soiled linens, safe handling of soiled linens
- Proper labelling and storage of laboratory specimens
- PPE availability at point of care
- Use of safety-engineered medical devices and administrative controls (e.g., use retracting, sheathing or blunting needles, needless systems)
- Proper storage, handling and disposal of sharps (i.e., do not recap needles, discard sharps at point of use)
- HBV vaccination administration to healthcare workers (HCWs)
- Post-exposure follow up



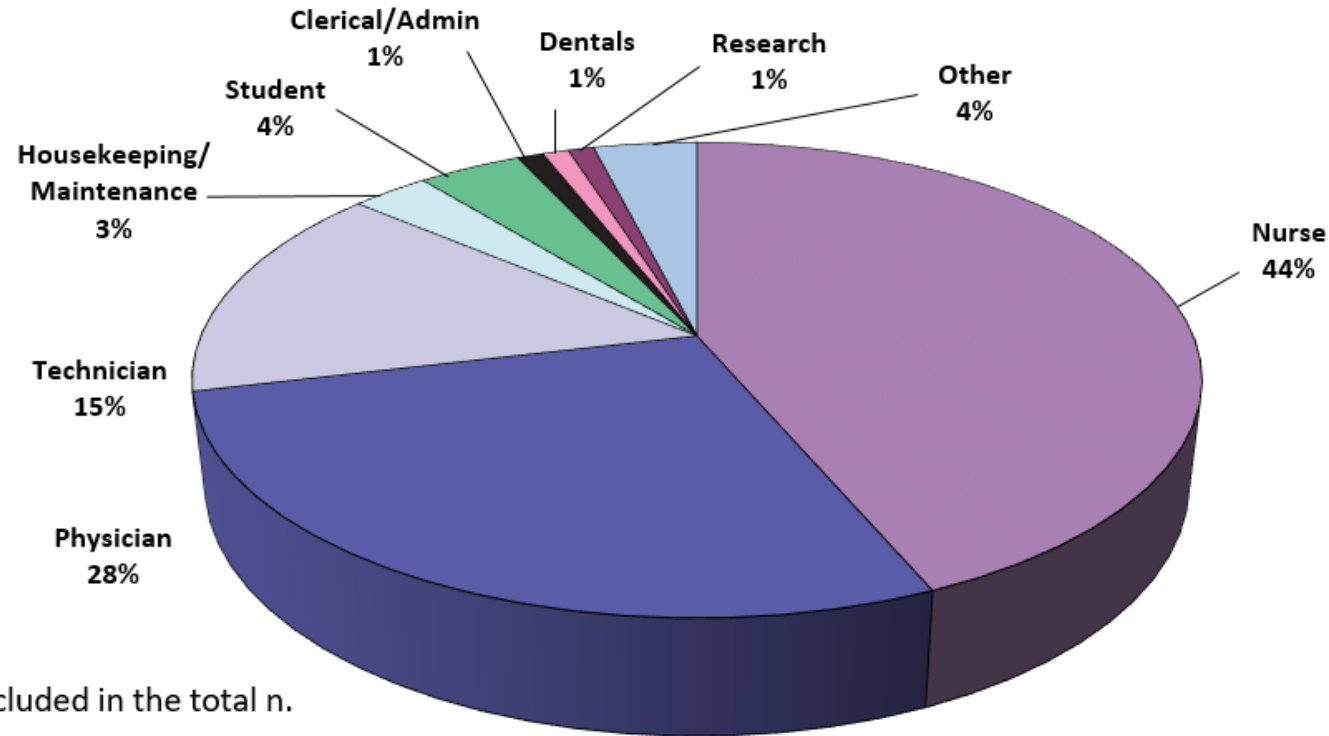
Requirements and Considerations for Sharps Containers

- Puncture-resistant
- Tamper-resistant
- Leak-proof
- Biological hazard label
- Easily accessible
- Point of use disposal
- Do not fill with disinfectant
- Close lid at $\frac{3}{4}$ capacity
- Dispose as biomedical waste



Who Gets Exposed?

Figure 1. Occupational Groups of Healthcare Personnel Exposed to Blood/Body Fluids; NaSH, 6/95 to 12/03 (N=23,197)*



What to do Following a Needle Stick Injury

- Report to supervisor/manager/delegate and complete an incident report as per protocol; and
- Occupational Health and Safety (OHS) (or designate) will assess the exposed HCW
 - Review immunization status
 - Assess hepatitis B immunity
 - Provide Td booster if more than 5 years since last booster dose, if wound was caused by a dirty object or is a deep puncture that cannot be adequately cleansed
 - Determine need for baseline post-exposure testing and follow-up testing for HBV, hepatitis C virus (HCV) or human immunodeficiency virus (HIV)
 - Determine the source. If the resident is the source to determine infection status and verify diagnosis

Interpretation of Hepatitis B Serological Test Results

Test and Result	Interpretation	Action
HBsAg — Positive Total anti-HBc — Positive IgM anti-HBc — Positive Anti-HBs — Negative	Acute infection	Link to hepatitis B care
HBsAg — Positive Total anti-HBc — Positive IgM anti-HBc — Negative ¹ Anti-HBs — Negative	Chronic infection	Link to hepatitis B care
HBsAg — Negative Total anti-HBc — Positive Anti-HBs — Positive	Resolved infection	Counsel about HBV infection reactivation risk
HBsAg — Negative Total anti-HBc — Negative Anti-HBs — Positive ²	Immune from receipt of prior vaccination (if documented complete series)	If no documentations of full vaccination, then complete vaccine series per ACIP recommendations

HIV Exposure

- HIV exposure in the long-term care (LTC) setting, while rare, can happen through needle-sticks and other contact with infected blood/body fluid
- After exposure immediate reporting and access to post-exposure prophylaxis (PEP) is recommended
- Exposed HCW should undergo baseline testing and follow-up testing for 6 months after exposure
- Risk of transmission of HIV:
 - 0.3% for percutaneous
 - 0.1% for mucous membrane contact
 - Less than 0.1% for non-intact skin contact

Discussion/Knowledge Check





Pre-placement Immunizations

Pre-Placement Assessment and Requirements

Before placement (on hire) employees must be reviewed for the following or must complete:

- Immunization history
 - Update as recommended
- Tuberculosis (TB) status
- Medical history
- Review of risks for and prevention of occupational acquired infections
- Review of work restrictions, if applicable
- Health and safety education

Recommended Immunizations for Health Care Workers

- Hepatitis B
- Influenza
- Measles
- Mumps
- Rubella
- Tetanus
- Diphtheria
- Polio
- Pertussis
- Varicella zoster (chickenpox)

Hepatitis B Vaccine

- Hepatitis B is a vaccine-preventable liver infection caused by the hepatitis B virus
- Recommended for all HCWs due to potential occupational exposure to blood, blood products and bodily fluids that may contain HBV
- If HCW does not have evidence of HBV vaccination or serologic immunity to Hepatitis B then a full vaccination series should be administered
- Vaccination schedule: 3 doses 0.1 ml intramuscularly (IM) at 0, 1 and 6-12 months

Measles Vaccine

- Vaccine recommended for HCW born 1957 or later without:
 - Documentation of receiving two doses of live measles containing vaccine on or after first birthday, or laboratory evidence of immunity or physician diagnosed measles
- Vaccination Schedule: 0.5 mL subcutaneous at 0 and at least 1 month later
- Contraindications: pregnancy, immunocompromised state, anaphylaxis to gelatin, neomycin
- Work restriction: non-immune staff are excluded from duty 5 days after 1st exposure to 21 days after last exposure



Mumps Vaccine

- Vaccination recommended for HCW regardless of their year of birth without:
 - Documentation of receiving two doses of mumps-containing vaccine on or after first birthday, or laboratory evidence of immunity or laboratory confirmed mumps disease
- Vaccination Schedule: 0.5 mL subcutaneous at 0 and at least 1 month later
- Contraindications: pregnancy; immunocompromised state, anaphylaxis to gelatin; neomycin
- Work restriction: non-immune staff are excluded from duty the 9th day after the first exposure to the 26th day after the last exposure

Rubella Vaccine

- Vaccine recommended for HCW regardless of age without:
 - Documentation of receiving one dose of rubella-containing vaccine on or after first birthday; laboratory evidence of immunity; or a history of laboratory confirmed rubella disease
- Vaccination schedule: one dose 0.5 mL subcutaneous
- Contraindications: pregnancy; immunocompromised state, anaphylaxis to gelatin; neomycin
- Work restriction: Non-immune staff are excluded from 7th day after the first exposure, through the 21st day after the last exposure
 - Pregnant HCWs regardless of immune status should not provide care to infected residents

Tetanus, Diphtheria, Pertussis Vaccine

- Vaccine recommendations Pertussis:
 - All adult HCW, regardless of age, should receive tetanus toxoid-reduced diphtheria toxoid-reduced acellular pertussis-containing vaccine (Tdap) for pertussis protection if not previously received in adulthood
 - No work restrictions for exposed personnel
 - Personnel with symptoms should be excluded until 5 days after start of appropriate therapy
- Vaccine recommendations Diphtheria and Tetanus:
 - All HCW should be immune
 - Administer primary series if no previous immunization
 - Booster doses of Td vaccine are required every 10 years



Varicella Zoster Virus (VZV)/Chickenpox Vaccine

- Vaccine recommendation for HCW without:
 - Documented evidence of immunization with 2 doses of a varicella-containing vaccine or laboratory evidence of immunity
- Vaccination schedule: 0.5 mL subcutaneously at 0 and 4-8 weeks later
- Contraindications/Precautions: Pregnancy, immunocompromised state, anaphylaxis to neomycin or gelatin and avoid use of salicylates (Aspirin) for six weeks post vaccine
- Work restriction:
 - Exclude susceptible worker from duty from 10th day through 21st day after exposure or up to 28 days, if individual received varicella zoster immune globulin
 - If varicella occurs, until all lesions are dry and crusted

Polio Vaccine

- A primary series of inactivated poliomyelitis vaccine recommended for all HCW who have not received a primary series of poliomyelitis vaccine
- Vaccination schedule: 3 doses of 0.5 mL subcutaneously, first two doses separated by 4-8 week apart, third dose 6-12 months after second dose
- Contraindications: safety not determined in pregnancy; anaphylactic reaction after streptomycin or neomycin

Influenza Vaccine

- Influenza vaccines are given annually for protection against Influenza A and B
- Strains covered in vaccine change year to year based on the epidemiology
- Trivalent (3-strain) vaccines contain one A(H1N1) strain, one A(H3N2) strain, and one influenza B strain from one of the two lineages
- Quadrivalent (4-strain) vaccines is designed to protect against four different flu viruses, including two influenza A and two influenza B viruses
- Live attenuated flu vaccines are made with weakened live flu virus
- Safe in pregnancy, except live attenuated flu vaccine (LAIV)



TB Management Program

Tuberculosis Management Program

- All healthcare settings, regardless of risk category, should have a TB Management Program
- As part of the program, rates of Tuberculin Skin Test (TST) conversion of HCW needs to be calculated annually
- Working in a healthcare setting puts you at higher risk of Tuberculosis (TB) exposure, so it's important to know your TB status at the start of a new job

TB Baseline Testing

- There are two different tests that are commonly used for TB baseline testing: Mantoux TST or the Interferon-Gamma Release Assays (IGRA)
- The TST is a two-part test – the first step at hire and the 2nd step - 1 to 3 weeks later in opposite arm. But if you had a documented two-step TST in a previous job, you'll only need the first step done
- The TST can show a reaction in people who have had the BCG vaccine (commonly given in some countries outside Canada). In this case, a different test – the QuantiFERON-TB Gold (QFT-G) also known as IGRA can be used.



TST Interpretation: >15mm

- An induration (area of firm swelling) of 15 mm or more is considered positive in healthy individuals without any risk factors for TB
- Following a positive TST, active TB disease in the HCW should be ruled out. This includes: medical evaluation of risk factors for TB and presence of symptoms, chest radiography if symptoms present, sputum test for acid fast bacilli smear and culture
- Individual with a positive test is exempt from further tuberculin skin tests
- Document previous treatment for latent tuberculosis infection (LTBI) or for active TB
- Chest X-ray (CXR) does not need to be repeated unless worker is symptomatic

TST Interpretation: ≥ 10 mm

- An induration of 10 mm or more is considered positive in:
 - Recent arrivals (< 5 years) from high-prevalence countries
 - Injection drug users (HIV-negative)
 - Residents and employees of high-risk congregate settings: healthcare facilities, prisons, shelters, etc.
 - Mycobacteriology lab personnel
 - Persons with high-risk clinical conditions (e.g., chronic renal failure, silicosis, gastrectomy, malnutrition)
 - Medically underserved high-risk populations
 - Children < 4 years of age or infants and children exposed to adults in high-risk categories

TST Interpretation ≥ 5 mm

- Induration of 5 mm and more is considered positive in:
 - HIV-positive persons
 - Recent contacts of a person with TB
 - Fibrotic changes on CXR consistent with old TB
 - Patients with organ transplants and other immunosuppressed residents

Respiratory Protection Program

- A respiratory protection program should include procedures for the following:
 - Hazard identification, assessment, and control
 - Selection and use of respirators
 - Respirator fit testing and user training
 - Inspecting, cleaning, maintaining and storing respirators
- Respirators should be selected according to:
 - The filtering efficiency of the respirator
 - The potential infectious agents
 - Other hazards present, and according to the type of procedure to be carried out



Respiratory Safety

- Before using a respirator an employee must be fit tested and complete respirator training
- A seal check needs to be performed every time a respirator is worn.
- Disposable respirators or masks should never be reused
- Replace the respirator if it becomes wet or soiled
- Remove the respirator correctly and discard into an appropriate receptacle.
- Perform hand hygiene after removing the respirator



Work Restrictions for Exposed or Infected HCW

Post-Exposure Intervention Process

- Workplaces are required to have policies in place that outline work restrictions for HCWs exposed or infected with certain infectious diseases
- Policies should include steps to assess if:
 - The index case (resident/staff) was infectious
 - Proper routine and/or additional precautions were used
 - Susceptible individuals were exposed
 - Disease has the potential for ongoing transmission
 - There are treatment options (i.e., prophylaxis) for exposed individuals.

Work Restrictions

- Active TB: exclude until proven non-infectious
- Enteric diseases (e.g., *Escherichia coli*, Norovirus, Salmonella): HCWs experiencing vomiting and/or diarrhea should be excluded from work until symptom-free for 24-48 hours depending on the pathogen
- HIV: no restrictions for infected HCW, may require counsel from an expert review panel with respect to exposure-prone invasive procedures for their own health care
- Hepatitis B, Hepatitis C: no restrictions for infected HCW
- Hepatitis A (HAV): restrict from high risk settings for 14 days after onset of symptoms, or 7 days after onset of jaundice, whichever comes earlier
- Herpes:
 - Oro-facial- evaluate need to restrict care to high-risk residents
 - Herpetic whitlow- restrict from resident care and environment until lesion heals

Pregnant Health Care Worker

- Should receive all recommended vaccines prior to conception
- Influenza vaccine is recommended during pregnancy
- Live virus vaccines are not recommended during pregnancy. Avoid the following vaccines:
 - Measles, mumps and rubella (MMR)
 - Varicella
 - Bacillus Calmette-Gueirn (BCG)
 - Anthrax
 - Vaccinia (smallpox)
 - Yellow fever

Discussion/Knowledge Check



Disclaimer

This learning module was developed by Public Health Ontario (PHO). PHO provides scientific and technical advice to Ontario's government, public health organizations and health care providers. PHO's work is guided by the current best available evidence. PHO assumes no responsibility for the results of the use of this learning module by anyone. This learning module may be reproduced without permission for non-commercial purposes only and provided that appropriate credit is given to Public Health Ontario. No changes and/or modifications may be made to this learning module without explicit written permission from Public Health Ontario.

References (1/3)

- Slide 12:
 - Centers for Disease Control and Prevention (CDC). Standard precautions [Internet]. Atlanta, GA: CDC; 2018 [cited 2024 Feb 13]. Available from: <https://www.cdc.gov/oralhealth/infectioncontrol/summary-infection-prevention-practices/standard-precautions.html>
 - Public Health Agency of Canada. Routine practices and additional precautions for preventing the transmission of infection in healthcare settings [Internet]. Ottawa, ON: Government of Canada; 2017 [modified 2017 Sep 26; cited 2024 Feb 13]. Available from: <https://www.canada.ca/en/public-health/services/publications/diseases-conditions/routine-practices-precautions-healthcare-associated-infections.html>
- Slide 15:
 - Centers for Disease Control and Prevention (CDC). Workbook for designing, implementing, and evaluation a sharps injury prevention program [Internet]. Atlanta, GA: CDC; 2008 [cited 2023 Apr 14]. Figure 1, Occupational groups of healthcare personnel exposed to blood/body fluids; NaSH, 6/95 to 12/03 (N=23,197). Available from: https://www.cdc.gov/sharpssafety/pdf/sharpsworkbook_2008.pdf

References (2/3)

- Slide 17:
 - Centers for Disease Control and Prevention (CDC). Interpretation of hepatitis B serologic test results [Internet]. Atlanta, GA: CDC; 2023 [cited 2023 Apr 14]. Available from: <https://www.cdc.gov/hepatitis/hbv/interpretationOfHepBSerologicResults.htm>
- Slide 22:
 - Public Health Agency of Canada, National Advisory Committee on Immunization. Canadian immunization guide [Internet]. Evergreen ed. Ottawa, ON: Government of Canada; 2015 [modified 2023 Jun 27; cited 2023 Aug 08]. Part 3, Vaccination of specific populations: immunization of workers. Table 1, Recommended immunization, health care workers. Available from: <https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-3-vaccination-specific-populations/page-11-immunization-workers.html#p3c10t1>
 - Centers for Disease Control and Prevention. Immunization of health-care personnel: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep. 2011;60(7):1-46. Available from: <https://www.cdc.gov/mmwr/pdf/rr/rr6007.pdf>

References (3/3)

- Slide 32:
 - Centers for Disease Control and Prevention (CDC). IGRAs – blood tests for TB infection fact sheet [Internet]. Atlanta, GA; CDC; 2016 [cited 2023 Apr 14]. Available from: <https://www.cdc.gov/tb/publications/factsheets/testing/igra.htm>
- Slide 37:
 - CSA Group. CAN/CSA-Z94.4-18. Selection, use, and care of respirators. Toronto, ON: CSA Group; 2018.

For More Information About This Presentation, Contact:

For questions about content, contact IPAC at PHO at ipac@oahpp.ca

For questions about the LTC-CIP examination, contact CBIC at
<https://www.cbic.org/CBIC/Contact-Us.htm>

For questions about this session, contact your session facilitator

© King's Printer for Ontario, 2024

Public Health Ontario keeps Ontarians safe and healthy. Find out more at
[PublicHealthOntario.ca](https://www.ontario.ca/public-health)

How to Cite this Presentation

Ontario Agency for Health Protection and Promotion (Public Health Ontario);
Infection and Prevention Control Canada. Employee and occupational health.
Toronto, ON: King's Printer for Ontario; 2024.

Public Health Ontario keeps Ontarians safe and healthy. Find out more at
[PublicHealthOntario.ca](https://www.publichealthontario.ca)