

**Significant Blood Exposure:** refer for medical assessment ASAP. 5-day HIV PEP starter kits available at local hospitals if indicated (start within 1-2 hrs, maximum 72 hrs)  
**Public Health Role:** consultation/liason only  
**Follow Up:** done by primary health care provider or, if HIV PEP is given, by a physician with a special interest in HIV

## OCCUPATIONAL BLOOD AND BODILY FLUID EXPOSURES GUIDELINES FOR PRIMARY HEALTH CARE PROVIDERS

\*Not intended to replace hospital protocols\*

### 1. FIRST AID - immediately:

Remove contaminated clothes. Allow wound to bleed freely, wash thoroughly with soap and water. Thoroughly flush mucous membranes with water.

### 2. ENSURE TETANUS UP TO DATE (preferably as Tdap/Adacel™)

<i>Guide to Tetanus Prophylaxis in Wound Management <sup>1</sup></i>				
History of Tetanus Immunization	Clean, minor wounds		All other wounds	
	Td/Tdap <sup>*</sup>	TIG <sup>†</sup>	Td/Tdap <sup>*</sup>	TIG
Uncertain or < 3 doses of an immunization series	Yes	No	Yes	Yes
≥3 doses received in an immunization series	No <sup>‡</sup>	No	No <sup>§</sup>	No <sup>¶</sup>

\* Adult-type tetanus and diphtheria toxoids or combined diphtheria, tetanus and acellular pertussis. If the patient is < 7 years old, a tetanus toxoid-containing vaccine is given as part of the routine childhood immunization. (Tdap i.e., Adacel™ is preferred for adults ≥18 yrs if not yet received an adult dose of pertussis)

† Tetanus immune globulin, given at a separate site from Td/Tdap (TIG available from local hospital blood bank)

‡ Yes, if > 10 years since last booster.

§ Yes, if > 5 years since last booster.

¶ Yes, if individuals are known to have a significant humoral immune deficiency state (e.g., HIV, agammaglobulinemia), since immune response to tetanus toxoid may be suboptimal.

### 3. ASSESS IF EXPOSURE OCCURRED (for hepatitis B [HBV], hepatitis C [HCV] and HIV)

**An exposure includes the following** (if involves blood, tissue or other potentially infectious body fluids, see chart below):

- Percutaneous – e.g. skin puncture or laceration by needle or sharp object
- Mucosal – splash to mucous membranes (e.g. eyes, nose, mouth)
- Cutaneous – contact through **non intact** skin (e.g. blood on open cut or dermatitis)
- Bites where skin is broken – risk to victim for HBV from saliva; risk for HCV and HIV **only if** saliva contains blood from oral lesion or injury; biter is also at risk if the bite drew blood

**Not an exposure if:** blood/bodily fluid onto intact skin, bites without broken/bleeding skin

Bodily Fluids Potentially Infectious	Bodily Fluids NOT Potentially Infectious Unless Visibly Bloody except: HBV is found in feces, nasopharyngeal washings, saliva and sweat		
blood/plasma	vaginal secretions	amniotic fluid	Feces
Semen	CSF fluid	peritoneal fluid	sputum
pleural fluid	synovial fluid	pericardial fluid	urine
			nasal secretions
			sweat
			Saliva
			tears
			vomit

### 4. LEVEL OF RISK:

**1. Source** - highest risk includes known positive - consider viral load/treatment; if status unknown consider risk factors (prevalence rates e.g., HIV 0.2% in Canada)<sup>2</sup>: injection drug user, men who have sex with men, sexual partner of known positive, multiple sexual partners, history of incarceration, tattoo/body piercing, from endemic country, recipient of blood transfusion in Canada before 1986 for HIV, 1990 for HCV and 1970 for HBV

**2. Type** -higher to lower: hollow-bore needle > solid needle - deep injury > superficial scratch/mucous membrane

**3. Volume** - more blood = higher risk

**4. Time out of body** - fresh blood = higher risk than dried blood (survival outside the body: HBV- at least 7 days; HCV- up to 3 weeks; HIV does not live long outside the body)<sup>3,4,5,6,7</sup>

### 5. PROBABILITY OF TRANSMISSION FROM A POSITIVE SOURCE

<b>Hepatitis B</b>	Percutaneous	6-30%	1 in 3-16 people exposed (no risk if immune)
	Mucosal*	Occurs	No quantitative data, but multiple cases of transmission reported in literature
<b>Hepatitis C</b>	Percutaneous	1.8%	1 in 55 people exposed
	Mucosal*	Very rare	Extremely low risk
<b>HIV</b>	Percutaneous	0.3%	1 in 300 (99.7% will NOT contract HIV). <b>Negligible risk if blood dried e.g., discarded needle found in community; PEP generally not indicated.</b> <sup>6,7,8</sup>
	Mucosal*	0.09%	Extremely low risk, < 1 in 1000 (in other words 99.91% will NOT contract HIV)
	Cutaneous	< 0.09%	

\* mouth/eye/nose

### 6. SOURCE TESTING - Most efficient and effective way to obtain source testing is by VOLUNTARY CONSENT

#### Direct Request

- Exposed person or designate directly requests that the source be tested for blood-borne diseases
- Institutional settings – medical staff or occupational health workers can request on behalf of exposed person

#### Process

- Physician orders source testing stat: HIV Ag/Ab, Anti-HCV, HBsAg (unless exposed person immune)
- Source provides consent for hospital or MD to release results to exposed person (document consent, exposed person's contact information and process for communication of results)
- MD or designate provides exposed person with results of relevant serology testing

**Source refuses + significant exposure:** Emergency Service Workers- can submit application, Mandatory Blood Testing Act via the Ontario Ministry of Health <https://www.ontario.ca/page/mandatory-blood-testing> (within 30 days)

**7. POST EXPOSURE BLOODWORK TESTING OF EXPOSED PERSON** (can be arranged by primary health care provider)

	<b>Baseline (pre-existing infection; Hep B immunity)</b>	<b>6 weeks</b>	<b>3 months</b>	<b>4 months</b>	<b>6 months</b>
<b>Hepatitis B*</b>	HBsAg (infection) & Anti-HBs (titre) if unvaccinated or titre unknown	Titres 1-6 months after last dose of vaccine series (if HBIg was also given, wait 6 months to allow HBIg antibodies to wane) HBsAg and Anti-HBc at 3 and 6 months only if not immune			
<b>Hepatitis C</b>	Anti-HCV, ALT	HCV RNA (PCR) (if high risk)	Anti-HCV ALT 95-99% sensitivity		Anti-HCV ALT 95-99% sensitivity
<b>HIV</b>	HIV Ag/Ab combo screen If PEP: ALT, AST, CBC, platelets, BUN, creatinine, bHCG (females)	HIV Ag/Ab >99% sensitivity if not on PEP**		HIV Ag/Ab *** >99.5% sensitivity	

\*If exposed person has had a positive titre ever (and is not immunocompromised), considered immune, no testing is required. Titre levels decrease in most people over time, but a positive result at any time in the past indicates lifelong protection due to immune memory. \*\*PEP may delay HIV antibody response, consider >99% sensitive 6 weeks after completing PEP \*\*\* 4 months adequate if 4<sup>th</sup> generation combination HIV Ag/Ab test is used (Public Health Ontario Lab uses), test again at 12 months if exposed person becomes infected with HCV after exposure to a source who is co-infected with HIV and HCV

1,2,3,6,9,11

**8. PEP REGIMENS (Post Exposure Prophylaxis)**

**a) Hepatitis B Immunization**

- HBIg - hospital blood bank, Hep B vaccine complete series - obtain via primary health care provider or Public Health
- Hepatitis B titre** - protective level if anti-HBs > 10 IU/L (positive titre)

<b>Infected or High Risk Source</b>	<b>Uninfected or Low Risk Source</b>
<p><u>Determine vaccination status of exposed person</u>  <b>Unvaccinated:</b> administer HBIg AND start vaccine series  <b>Fully vaccinated:</b> Determine titre</p> <ul style="list-style-type: none"> <li>• If positive titre now or in past: No action required*</li> <li>• If negative titre: give HBIg AND give one dose of vaccine AND test for titre at 6 months (HBs antibodies). If 6 month titre is positive, no action is required. If 6 month titre is negative, complete 2<sup>nd</sup> course of vaccine</li> <li>• If unknown at 48hrs, 1 vaccine booster, follow above once titre known</li> </ul> <p><b>Known non-responders (tested ≤ 6 months after series)</b></p> <ul style="list-style-type: none"> <li>• had 1 full series - HBIg and 2<sup>nd</sup> vaccine course***</li> <li>• had 2 full series: Give HBIg X 2 (1 month apart)</li> </ul> <p><b>Partially vaccinated (for 3 dose series**):</b></p> <ul style="list-style-type: none"> <li>• 2 doses of vaccine: determine titre AND give 3<sup>rd</sup> dose of vaccine                             <ul style="list-style-type: none"> <li>○ If positive titre, no action is required*</li> <li>○ If negative titre give HBIg AND test for titre at 6 months. If 6 month titre is positive, no action is required. If 6 month titre is negative, complete 2<sup>nd</sup> course of vaccine</li> <li>○ If unknown at 48 hrs, HBIg, follow above once titre known</li> </ul> </li> <li>• 1 dose of vaccine: determine titre AND give HBIg AND complete vaccine series</li> </ul> <p>(HBIg – if indicated give as soon as possible, best &lt;48 hrs, efficacy unknown if given &gt; 7 days post exposure)</p>	<p><u>Determine vaccination status of exposed person</u>  <b>Unvaccinated:</b> Vaccinate  <b>Fully vaccinated:</b> Determine titre</p> <ul style="list-style-type: none"> <li>• If positive titre now or in past: No action required*</li> <li>• If negative titre: administer 1 vaccine booster AND test for titre at 1 month. If 1 month titre is positive, no action is required. If 1 month titre is negative, complete 2<sup>nd</sup> course of vaccine</li> </ul> <p><b>Known non-responders (tested ≤ 6 months after series)</b></p> <ul style="list-style-type: none"> <li>• had 1 full series – 2<sup>nd</sup> vaccine course***</li> <li>• had 2 full series – no action</li> </ul> <p><b>Partially vaccinated</b></p> <ul style="list-style-type: none"> <li>• complete vaccine schedule</li> </ul> <p><b>Note:</b> Hepatitis B vaccine is effective post exposure. HBIg is used as an adjunct for high risk exposures</p> <p><b>*Titre levels decrease over time. A previously positive titre indicates lifelong immunity</b> even if no antibodies are detectable, due to immune memory (unless immunocompromised)                      ** School hepatitis B vaccine program in Ontario (11-15yrs) began in 1994 – 3 dose series, then in 2000 – 2 dose series, both equally effective: 99% seroprotection                      ***Additional doses (up to 3 doses) will produce adequate protection in 50-70% of healthy non-responders</p>

See Canadian Immunization Guide for age specific vaccine schedules and further details. <sup>1</sup>

**b) Hepatitis C**

- IG and antiviral agents are **NOT** recommended for PEP after exposure to HCV-positive blood
- if infection occurs some people clear the virus on their own ≤ 6 months, studies suggest early treatment is beneficial

**c) HIV - Updated CDC/US Public Health Service Guidelines, Management of Occupational Exposures to HIV, August 2013**

- only a 3 drug PEP regimen recommended for ALL exposures if:
  - meets criteria for exposure **and** source is HIV positive or there is a reasonable suspicion for HIV infection (see sections 3 and 4 to determine if exposure is significant)
  - PEP **not** justified for exposures that pose a negligible risk for transmission e.g., discarded needle, bites
- current PEP regimen (see below) better tolerated than previous regimens
- expert opinion recommended if exposed person pregnant/breastfeeding, source HIV+ with anti-retroviral resistance or PEP is delayed >72 hours (efficacy unknown but can consider up to 1 week if extremely high risk) <sup>6</sup>

**Preferred HIV 3-drug PEP Regimen:**  
 Waterloo Region Hospitals – 5 day starter kits  
 Isentress™ (Raltegravir) 400 mg PO twice daily x 28 days  
 Plus  
 Truvada™ 1 PO daily x 28 days  
 (Tenofovir DF [TDF] 300mg + emtricitabine [FTC] 200mg)

**Refer to a physician with a special interest in HIV to monitor drug tolerance, reassess need for PEP within 3-5 days**

**References:**

1. Public Health Agency of Canada. (2024, Sept 27). Canadian Immunization Guide. Retrieved <https://www.canada.ca/en/public-health/services/canadian-immunization-guide.html>
2. Ontario Hospital Association and Ontario Medical Association. (2015). Blood-borne Diseases Surveillance Protocol for Ontario Hospitals.
3. CDC. (2013, Dec). CDC Guidance for Evaluating Health-Care Personnel for Hepatitis B Virus Protection and for Administering Postexposure Management. *MMWR*.62(10) 1-19.
4. CDC. (2015, April 15). Hepatitis C FAQs for the Public. Retrieved from: <http://www.cdc.gov/hepatitis/C/FAQ.htm#FAQ36>
5. CDC. (2015, January). HIV Transmission. Retrieved from: <http://www.cdc.gov/hiv/basics/transmission.html>
6. Kuhar, D. et al. (2013). Updated U.S. public health service guidelines for the management of occupational exposures to HIV and recommendations for postexposure prophylaxis. *Infection Control and Hospital Epidemiology* 34 (9). Retrieved from <http://www.jstor.org/stable/10.1086/672271>
7. Papenburg et al. (2008) Pediatric Injuries from Needles Discarded in the Community: Epidemiology and Risk of Seroconversion. *Pediatrics*;122(2) 487-492.
8. Ontario HIV Treatment Network and Ontario Ministry of Health (2023). Ontario Guidelines for Providers Offering HIV Testing.
9. Public Health Ontario Lab – Toronto (Personal communication, Dr. Tony Mazzulli medical microbiologist/ID specialist Sept 20, 2024).
10. St. Michael’s Hospital Positive Care Clinic. (2019). Pocket P.E.P. Clinical Management of non-occupational and occupational exposure to blood borne pathogens.
11. UpToDate (2024, Sept 27), Management of health care personnel exposed to HIV Retrieved from: <https://www.wolterskluwer.com/en-ca/solutions/uptodate>