Module: The Science and Practice of HIV Testing in Ontario

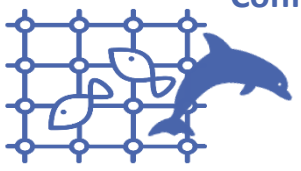
Materials is this module will help you:

- Know the difference between the rapid HIV test that screens for HIV and the standard laboratory testing that can confirm a diagnosis
- Be able to explain the process of HIV infection and how it impacts the ability of tests to detect infection
- Be able to recommend an appropriate strategy for testing to individuals in the window period
- Understand the results of HIV testing

Rapid versus Standard Laboratory Testing in Ontario

	Rapid HIV Testing	Standard Laboratory HIV Testing
How Ontario uses this test	As a screening test to rapidly assess people for HIV; reactive results must be confirmed by laboratory testing	More than one test on any reactive result is done to diagnose infection; someone diagnosed with this test should begin treatment as soon as possible
What the test involves	Collection of a small amount of blood through a finger prick	Collection of a tube of blood sent to the provincial laboratory
	Delivers immediate negative results at the testing appointment; reactive results must be confirmed	Provincial lab results usually return within one week. Client must follow-up for results (see your site's policies for details)
	A single test done in a few minutes	More than one test done on reactive results, to confirm a positive diagnosis
What is required for the test	Whole blood	Serum
	An approved POC testing facility, does not require a medical environment	An accredited testing laboratory with complex equipment and maintenance
	A trained POC testing counsellor (like you will be), acting under a medical directive from a regulated medical professional	An accredited medical laboratory technologist
	Careful quality control practices	Careful quality control practices
What it measures	HIV antibodies (IgG and IgM)	HIV antibodies (IgG and IgM) and p24 (a component of the virus)
The accuracy of the tests (after the window period)	Both the rapid and standard testing used in Ontario are highly accurate. Typically, there are two measures of a test's accuracy - sensitivity and specificity.	
	99.6% sensitivity (% of HIV infections detected)	100% sensitivity (% of HIV infections detected)
	99.3% specificity (only HIV reacts)	99.77% specificity (only HIV reacts)*

*This is the specificity for the first test used by the Public Health Labs of Ontario; positive results are confirmed with additional tests decreasing the possibility of a false positive.



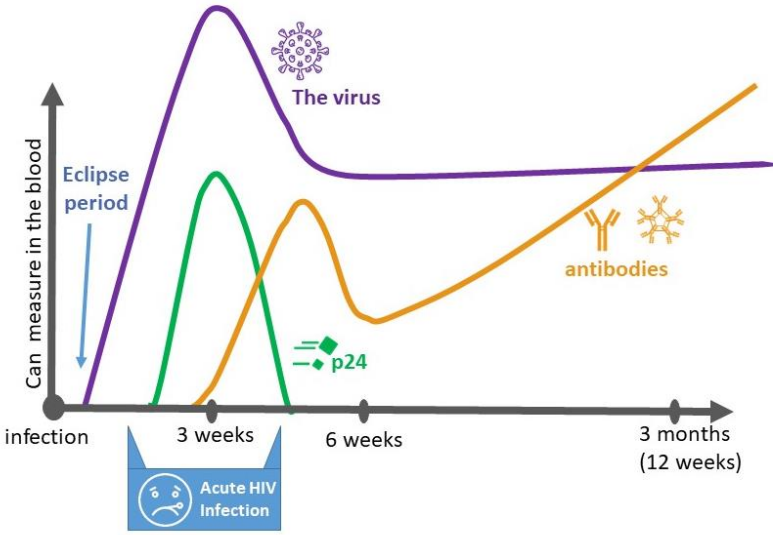
Confused about sensitivity and specificity? Think of testing for HIV like trying to catch tuna.

A **sensitive** fishing net catches all of the tuna, but perhaps some dolphins

A **specific** fishing net catches only tuna and lets the dolphins swim free

An ideal test is both sensitive and specific

The Timeline of HIV Infection



HIV

P24- a protein that is part of the HIV virus, measurable 2-3 weeks after infection.

HIV antibodies (2 types IgM and IgM) – first antibodies measurable 3-4 weeks after infection

Derived from an image in Taylor D, Durigon M et al. Probability of a false-negative HIV antibody test result during the window period: a tool for pre- and post-test counselling. *Inter J of STD & AIDS* 2015;26(4):215-224. Available at https://bit.ly/2BnpiSG [downloaded November 19, 2018].

The Symptoms of Acute HIV Infection

Some of these symptoms are experienced by 50-90% of people newly infected with HIV usually 2-4 weeks after exposure:

- Fever is the most common symptom, above 38°C, but usually mild. Lasts about 1-2 weeks.
- Other common "flu" symptoms happen with the fever: sore throat, headache, muscle and joint pain
- Two-three days after the fever starts, a rash may develop. It usually affects the face, neck, and upper chest, but may be more widespread. It usually lasts 5-8 days and may or may not be itchy. It is most typically a flat red area covered with small bumps.
- In the second week of fever, many people experience swollen lymph nodes. The swelling is usually painless and may linger.
- About half of people who have symptoms may experience GI upset (nausea, vomiting, diarrhea)
- A small proportion of people with signs of acute infection develop small open sores in/on the mouth, esophagus, genitals or anus. These are often painful.

From: Sax PE. Patient education: Symptoms of HIV infection (Beyond the Basics). UpToDate. Available at https://bit.ly/2DlmPJN [download November 13, 2018].

The Window Period

The earliest period of HIV infection when tests may not be able to detect <u>all</u> infections = **3 months**

Point of care testing focuses on working with clients from at-risk populations to identify new infections as soon as possible, and to encourage people with negative tests to protect themselves and others.

Key Messages for clients:

1. Not everyone is infected by a high-risk exposure. However, if infection occurs, the levels of virus rise quickly in the early stages. Advise abstinence, condoms and harm reduction to protect others while in the window period.
2. Point-of-care testing will identify most new infections earlier than three months, however in the first few weeks, standard laboratory testing is more likely to detect infection. At three weeks (or any time while the client still has seroconversion symptoms), perform a rapid test if requested, but also advise the client to submit a sample for standard laboratory testing.
3. Recommend at-risk clients return for testing at **3 weeks – 6 weeks – 3 months**

PrEP, PEP and the Window Period

Facts	Action
Regular and consistent use of HIV PrEP (pre-exposure prophylaxis) can reduce the risk of HIV infection significantly.	If a client is at high-risk and their test is non-reactive recommend HIV PrEP and refer them.
HIV PEP (post-exposure prophylaxis) can reduce the risk of HIV infection, if taken within 3 days of the exposure, and continued consistently (28 days).	Refer clients for HIV PEP if seen in the first 72 hours. Recommend that the client consider HIV PrEP once their course of HIV PEP is complete.
Taking HIV PEP or HIV PrEP after infection has occurred can destroy some virus making it harder to detect HIV.	Advise clients that people who took PEP/PrEP that diagnosis may not be possible until later in the window period. Stress that a client who took PEP should be tested at three months.

PrEP and PEP resources:

Tan DHS et al. Canadian Guidelines on HIV Pre-Exposure Prophylaxis and Non-Occupational Post Exposure Prophylaxis. Version 2.1, November 13, 2017. https://bit.ly/2LlGUSm

Rapid Response Service. *Effectiveness of oral pre-exposure prophylaxis (PrEP) for HIV*. Toronto, ON: Ontario HIV Treatment Network; October 2018. https://bit.ly/2Q0vCYc

Rapid Response Service. *Effectiveness of post-exposure prophylaxis (PEP) for HIV*. Toronto, ON: Ontario HIV Treatment Network; forthcoming March 2019.

Resources for More Information:

Human Immunodeficiency Virus: HIV Screening and Testing Guide – Produced by the Public Health Agency of Canada, this comprehensive guide discusses HIV testing procedures, the window period and the HIV testing technologies used in Canada. Published 2013.
https://www.catie.ca/ga-pdf.php?file=sites/default/files/EN_HIV-Screening-Guide-2013.pdf

Acute and Recent HIV Infection – A continuing medical education self-study module written by Brian R. Wood and David H Spach. Part of the National HIV Curriculum (US), updated November 16, 2018.
https://www.hiv.uw.edu/go/screening-diagnosis/acute-recent-early-hiv/core-concept/all

HIV – Diagnostic Serology – A page from Public Health Ontario describing standard laboratory HIV testing.
https://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/HIV_Diagnostic_Serology.aspx

Guidelines on HIV Pre-Exposure Prophylaxis and Non-Occupational Post Exposure Prophylaxis. Guidelines endorsed by several national Canadian medical professional bodies about the most appropriate use of pre- and post-exposure prophylaxis to prevent HIV. Published November 13, 2017.
http://www.cmaj.ca/content/cmaj/suppl/2017/11/21/189.47.E1448.DC1/170494-guide-1-at.pdf

NOTE: A one-page reference sheet on interpreting point-of-care HIV test results is included in the take home materials on Performing the INSTI™ HIV Rapid Screening Test