HIV Testing in Canada
Technologies and Approaches

Presented by:
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Date:
Thursday November 14th, 2013, 1-2pm EST
Objectives

1. Discuss different HIV diagnostic testing technologies

2. Explain the reason for different window periods

3. Explain the meaning of different HIV testing options
Getting tested for HIV

• Why do people get tested for HIV?

Testing needs are varied:

- benefit of knowing own and partner(s) status
- new or end of a relationship
- possible or known exposure to HIV
- family planning purposes
- immigration process
TYPES OF HIV TESTS
Types of HIV Tests

• **Antibody tests**
  - ELISA/EIA test
  - Western Blot

• **Tests that directly detect HIV**
  - NAAT
  - HIV p24 antigen test
Antibody tests : ELISA/ EIA

- Tests detect antibodies

- Has high sensitivity and is used as a screening test
• The **sensitivity** of a clinical test refers to the ability of the test to correctly identify those patients **with** the disease.

• The **specificity** of a clinical test refers to the ability of the test to correctly identify those patients **without** the disease.
Antibody tests : Western Blot test

- Is currently considered the gold standard for confirmation of HIV infection
- Any reactivity/HIV positive result on antibody tests is sent on to a Western blot to confirm the result
- Combination of EIA and Western Blot is estimated to have 99.9% sensitivity
Tests that directly detect HIV: NAAT

- Nucleic acid amplification testing = NAAT or NAT

- Detects HIV genetic material (RNA) in the blood

- If viral RNA is detected but antibody tests are not reactive/negative or unclear, then the person may be in acute HIV infection
Tests that directly detect HIV: NAAT

- Used to confirm infection in babies born to HIV positive mothers as they have inherited maternal antibodies.

- Some labs provide pooled viral load testing (e.g. donated blood) without testing individual samples. BC is investigating the use of this technique for general testing.
Tests that directly detect HIV: p24 antigen

- Detects a protein (the p24 protein) associated with HIV

- The p24 protein peaks at around 3-4 weeks after exposure to HIV will not be detectable after that
THE WINDOW PERIOD
Window period

- In HIV testing- the time interval between the point when a person is infected and the point when the lab tests can detect HIV infection

- In antibody testing - the amount of time it takes the body to make antibodies to HIV after an exposure to the virus to when the tests can detect those antibodies
Window period

For antibody tests to detect HIV infection:

1. HIV antibodies must be present in the blood

2. The HIV antibody test must be sensitive enough to detect the antibodies
*~7 day difference
btwn 3rd & 4th Gen tests

3rd Gen test detects:
HIV antibodies

4th Gen test detects:
p24 protein
+ HIV antibodies

Adapted from: Fiebig et al. AIDS 2003; 17:1871
Window period

Adapted from: Fiebig et al AIDS 2003; 17:1871
Window period

Adapted from: Fiebig et al AIDS 2003; 17:1871
Window period

HIV exposure

Days 0 10 20 30 40 50 60 70 80 90 100

HIV p24 protein

Adapted from: Fiebig et al. AIDS 2003; 17:1871
Window period

Adapted from: Fiebig et al AIDS 2003; 17:1871
Window period – 3rd Generation tests

3rd Gen test detects:
HIV antibodies

Adapted from: Fiebig et al AIDS 2003; 17:1871
Window period - 3rd Generation tests

HIV exposure

Days: 0 10 20 30 40 50 60 70 80 90 100

HIV antibodies

HIV p24 protein

3rd Gen test detects:
HIV antibodies

Adapted from: Fiebig et al AIDS 2003; 17:1871
Window period - 4th Generation tests

HIV exposure

Days 0 10 20 30 40 50 60 70 80 90 100

HIV antibodies

HIV p24 protein

3rd Gen test detects:
HIV antibodies

4th Gen test detects:
p24 protein + HIV antibodies

Adapted from: Fiebig et al AIDS 2003; 17:1871
Window period - 4th Generation tests

3rd Gen test detects: HIV antibodies

4th Gen test detects: p24 protein + HIV antibodies

Adapted from: Fiebig et al. AIDS 2003; 17:1871
Window period

HIV exposure

Days 0 10 20 30 40 50 60 70 80 90 100

HIV p24 protein

HIV antibodies

*~7 day difference between 3rd & 4th Gen tests

3rd Gen test detects:
HIV antibodies

4th Gen test detects:
p24 protein + HIV antibodies

Adapted from: Fiebig et al AIDS 2003; 17:1871
Even shorter window period?

Adapted from: Fiebig et al AIDS 2003; 17:1871
Window period (cont)

- Window periods are estimates - there are individual variations
- Usually based on averages from studies of sero-converting individuals
- Important for providing appropriate information regarding:
  - pre/post test counseling
  - interpretation of HIV test results
  - testing/re-testing after a potential exposure to HIV
Standard and Rapid Testing
Standard and Rapid testing

• The standard test: a small sample of blood is extracted from the arm and then sent to a medical lab for analysis.

• The rapid (POC) HIV test is administered through a small lancet, which is poked into a fingertip.
  - It will give almost immediate results.
POC testing: Rapid testing

- Point Of Care (POC) setting refers to settings where HIV testing is offered at the point of care but where the test is performed outside of a designated laboratory.

- Any rapid HIV test kit licensed by Health Canada for POC HIV testing will have similar sensitivity, specificity, and other performance characteristics to HIV diagnostic test kits licensed for laboratory use.
HIV TESTING FLOW CHARTS
Typical lab testing flow chart

Adapted from PHAC's HIV Screening and Testing Guide (2012)
TESTING OPTIONS
Testing options

Testing terminology

• Nominal/name based
• Non-nominal/non-identifying
• Anonymous
• Opt-in (client initiated)
• Opt-out (provider initiated)
## Type of HIV testing by province/territory

<table>
<thead>
<tr>
<th>Province/territory</th>
<th>Anonymous HIV testing</th>
<th>Non-nominal/ non-identifying HIV testing</th>
<th>Nominal/name-based HIV testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Columbia</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Yukon</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Northwest Territories</td>
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<td>✓</td>
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<tr>
<td>Nunavut</td>
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<td>Alberta</td>
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<td>Manitoba</td>
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<td>Ontario</td>
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<td>Quebec</td>
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<td>Prince Edward Island</td>
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<tr>
<td>Newfoundland and Labrador</td>
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</tr>
</tbody>
</table>

HIV/AIDS Epi Updates. Centre for Communicable Diseases and Infection Control, 2010
Reporting and partner notification

- HIV infection is reportable/notifiable under public health legislation in all provinces and territories.
- Reporting requirements for all types of positive and negative HIV tests differ from one province and territory to another.

“A notifiable disease is one that is considered to be of such importance to public health that its occurrence is required to be reported to public health authorities.” PHAC 2010.
## Summary:

<table>
<thead>
<tr>
<th>Type of Test</th>
<th>Looks for</th>
<th>Estimated window period</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening Test 3rd generation (ELISA)</td>
<td>HIV antibodies</td>
<td>~ 4 weeks</td>
<td>Widely available</td>
</tr>
<tr>
<td>4th generation (p24 antigen)</td>
<td>HIV antibodies and p24 protein</td>
<td>~ 3 weeks</td>
<td>Widely Available</td>
</tr>
<tr>
<td>Confirmatory Test (Western Blot)</td>
<td>HIV antibodies directed at specific HIV proteins</td>
<td>~ 4 - 6 weeks</td>
<td>Widely Available</td>
</tr>
<tr>
<td>Confirmatory Test (NAAT/NAT)</td>
<td>Viral genetic material, confirming presence of HIV infection</td>
<td>~ 10-12 days</td>
<td>Available in some places</td>
</tr>
</tbody>
</table>

Adapted from the BCCDC, 2010
Of special interest...

- When to test
- Access to testing services
- Missed opportunities
- Informed consent and confidentiality
- Home testing
HIV testing strategies, guidelines and recommendations
An estimated 26% of HIV infections in Canada remain undiagnosed, according to the Public Health Agency. Low HIV testing rates have contributed to this development. Many Manitobans are diagnosed late in their HIV progress, after they have been living with HIV for many years. Being aware of one's HIV status supports people to keep themselves and their partners healthy.

The Manitoba HIV program strongly encourages increased HIV screening. In particular, adults who are sexually active are advised to make HIV testing a normal part of their health care. Health care professionals are also encouraged to make HIV testing a routine part of their medical practice.

The presence of certain illnesses can be indicative of undiagnosed HIV. HIV testing is strongly recommended in persons found to have the following condition(s):

- Sexually transmitted infections, including: Syphilis, Gonorrhea and Chlamydia
- Tuberculosis
- Lymphoma (Hodgkins and non-Hodgkins)
- Cervical and Anal dysplasia/Cancer
- Herpes Zoster (Shingles)
- Blood borne infections, including: Hepatitis B & C
- Ongoing mononucleosis-like illness
- Seborrheic dermatitis
- Leukopenia or thrombocytopenia lasting at least 4 weeks
- Recurrent Candida esophagitis/oral thrush or Candida vaginitis
- Community acquired pneumonia requiring hospitalization
- Severe or recalcitrant psoriasis (newly diagnosed)
- Unexplained lymphadenopathy
- Unexplained weight loss
Guidelines for HIV Counselling and Testing

SAY YES TO KNOWING

March 2008

Ontario
Routine Testing: Client Information
Human Immunodeficiency Virus (HIV)

What You Need To Know

- HIV testing is now routine.
- Your health care provider will offer you a test.
- Knowing your HIV status is important.
- The only way to know your results for sure is to have a test.
- You may also want to be tested for Hepatitis B and Hepatitis C.
- Early care and/or treatment for HIV helps people to live longer, healthier lives.
- Positive test results are sent to the Medical Health Officer.

Routine HIV testing is recommended in Saskatchewan.

Why is HIV testing offered?

Close to 200 people are diagnosed with HIV in Saskatchewan each year.

Knowing you are HIV negative is just as important as knowing you are HIV positive. The only way to know for sure is to have a test.

Having HIV can affect your current health care. This includes how infections and cancers are treated.

Routine testing for HIV helps you:
- Access services and care earlier.
- Live longer, healthier lives with early treatment.
- Become actively involved in care.
- Decrease worry about possible infection.
- Prevent the spread of HIV to others.
- Avoid discrimination.

What do you need to know?

Human Immunodeficiency Virus (HIV) is a virus that attacks the immune system. The immune system helps your body fight off infection.

HIV can lead to an Acquired Immunodeficiency Syndrome (AIDS) if not treated with medication.

There is no cure for HIV, but it can be treated.
Thank you

~ Next Webinar ~

Building Blocks
A CATIE Webinar Series

The Basics of Hepatitis C

Presenter: Barb Panter, Regional Health Education Coordinator, CATIE
Date: Monday December 2nd, 2013, 1-2pm EST

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Please evaluate this webinar!