Learning Unit 5:

HIV tests

BOTH TRACKS

[TABLE OF CONTENTS]

Table of Contents

Learning Unit 5 – HIV tests

- Introduction
- Do I need to know my HIV status?
- Which HIV test should we take?
- Assessment

Introduction

[TABLE OF CONTENTS]

I want to take you back in history to January 1985. What was your awareness of Aids then? I remember a world of denial and blaming at the one end of the scale, to extreme fear at the other. At the beginning of 1985, we knew that Aids was caused by HIV and that the virus was spread mainly through sexual intercourse and contact with infected blood. By then it had also been firmly established that Aids was not a homosexual disease and that it also spread through heterosexual contact.

People were worried about past sexual behaviour, sex partners and the safety of blood transfusions. And they had reason to worry, because there was no test available to diagnose HIV infection. It was only later that year (1985) that the first kits for HIV antibody testing became commercially available. In the beginning, HIV testing was used mainly to diagnose people who were already showing symptoms of Aids to confirm their diagnoses (and, of course, to test donated blood). It is only in the last decade that testing has become more general and that we hear the motto “know your status”.

You will learn about HIV testing in various contexts in this course. In this learning unit we will investigate the tests themselves as well as the testing procedures. We will discuss pre- and post-HIV test counselling in Learning Unit 13.

Key questions

Use the following questions as pointers to ensure that you retain your focus on the important issues in this learning unit:

- Do I need to know my HIV status?
- What test should I take?
- What is the impact of HIV testing on society?
- Which HIV testing algorithms (procedures) are used in South Africa?

[NEXT]

Key concepts

While working your way through this learning unit, look out for the following key concepts. Make sure that, after you have completed this learning unit, you know what they refer to and how they are used (or look up their definitions in the glossary):

HIV antibodies	PCR test (technique)
ELISA test	Window period
Western Blot test	Indeterminate test result
Rapid HIV antibody test	HIV testing algorithms
HIV p24 antigen test	False negative

[NEXT]

Do I need to know my HIV status?

[TABLE OF CONTENTS]

Let's start this section on a personal note and do some self-reflection on HIV testing.

ACTIVITY 5.1 – DO I NEED TO KNOW MY STATUS?

In this activity you will reflect on the "know your status" campaigns and how they have affected you. Go to Activity 5.1.

Feedback: Going for an HIV test is one of the hardest things to do and remains a personal decision to be made. No one may be pressured into going for a test.

Demonstration of an HIV home test

[NEXT]

Which HIV test should we take?

[TABLE OF CONTENTS]

The world of HIV testing sounds a daunting one if you are not involved in the medical profession. Here is a tip to make it easy: There are basically only two main classes of HIV tests:

- those that react to antibodies that have been formed by the immune system in reaction to the virus
- those that react directly to the HI virus in the body

The following metaphor from nature might help you to remember the two main classes of HIV tests. You know that there are animals in the veld when you:

a. see their spoor (or footprints)

b. see the animals themselves

Well, HIV tests work the same. They either look for the spoor (HIV antibodies) or for the animals themselves (HI virus).

After reading the relevant sections in your prescribed book and doing the activity that follows, I believe that you will never again battle to explain the difference between the tests to your clients.

Study	**Prescribed book: pp. 130-138**
	**Section 5.1: HIV testing as diagnostic tool.** This section will give you a peek into the history of the development of the HIV test, and you will also get to know the uses of the test. Make sure that you know how the use of the HIV test has changed over time. Also remember the differences between sensitivity and specificity of tests. Make sure that you know the various reasons for HIV testing, as well as the two main approaches to diagnosing HIV (identification of the virus and detection of an immune response to HIV. **Section 5.2: HIV antibody tests.** This section will help you to answer patients' questions regarding antibody tests. Pay special attention to: • How an antibody test works. (See the pictures below.) • Well-known HIV antibody tests.What a rapid HIV antibody test is and how it works. • The differences between the rapid and the ELISA antibody tests. • What the window period is. **Section 5.3: HIV virus tests.** Pay special attention to: • How an HI virus test works. • The HIV viral tests available on the market. • The difference between the HIV p24 antigen test, proviral DNA detection and viral RNA detection.

	• The difference between the qualitative and the quantitative PCR test. • What a dried blood spot test is. Prepare yourself to be able to answer any of the questions (marked with a question mark icon in your prescribed book) if a client asks them. Use Figure 5.1 in your prescribed book to help you to remember the HIV tests and their uses.

What does a rapid HIV antibody test look like?

 The contents of a rapid HIV antibody test kit	 The testing device. Note the two lines marked 'T' and 'C'. T stands for test and C for control.
 Prick the finger with the lancet included in the test kit	 Press the finger lightly to draw a drop of blood
 Press the pipette to absorb the drop of blood	 Place the drop of blood in the circle on the device
 Add the drops of the reagent (chemical substance in clear bottle) in the circle on top of the drop of blood.	 There should always be a red line on the 'C'. This means that the test is working (e.g. it has not expired). If the test is positive, there will be a clear red line on 'T'. If the test is negative, there will be no red line on the 'T'.

You have now completed a difficult chunk of work and it is time for a recap.

I want you to consider what you have read so far about the different HIV tests available. The best way to demonstrate the differences between the HIV antibody test and the HIV viral test is to use a table.

ACTIVITY 5.2 – HIV ANTIBODY AND HI VIRAL TESTS

This activity will require you to indicate the differences between HIV antibody tests and HI viral tests. Go to Activity 5.2.

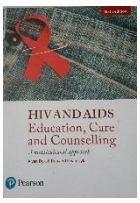
Feedback: Know the differences between the main HIV tests. You may have to explain this to someone, or assist with decision-making regarding HIV tests.

You might now be wondering where exactly the antibodies or the viral particles are that are detected by the HIV tests. The next activity will take you back to some pictures.

ACTIVITY 5.3 – WHAT DO THE ANTIBODIES AND VIRAL PARTICLES LOOK LIKE?

This activity will require you to page to certain figures in your prescribed book in order to see what is detected by HIV tests. Go to Activity 5.3.

Feedback: I bet you will never again forget the differences between HIV antibody tests and HIV viral tests, and that you cannot wait to explain them to a friend!

Study	**Prescribed book: pp. 138-144**
	**Section 5.4: HIV counselling and testing algorithms.** This section will give you some guidelines to the testing and counselling policy used in South Africa for various groups, namely (a) adolescents and adults (including pregnant and breastfeeding women), (b) children younger than 18 months, and (c) children of 18 months and older.

You have probably realised by now that being an Aids counsellor involves so much more than knowing a few basic facts about HIV, Aids and counselling. HIV and Aids challenges us on various levels and we need to get involved in various debates – especially about public and human rights. You will also find that it is almost impossible not to become an activist of one sort or another to fight for the rights of our patients.

But more about this in Learning Unit 13. Let's apply what we have learned to a real-life situation in Activity 5.4.

ACTIVITY 5.4 – SIZWE'S STORY: TESTING DAY

This activity will require from you to read a piece and to reflect on your emotions. Go to Activity 5.4.

"Aids is not a death sentence"

Click on the link http://goo.gl/L0PyS4 to watch a video on a South African community talking about Aids.

You are now finished with this learning unit. Click on Assessment to do some self-assessment questions.

Assessment

[TABLE OF CONTENTS]

Study reflection

After completing Learning Unit 5 (HIV tests), you should have acquired the following knowledge and understanding and be able to:

- explain what each one of the key terms mentioned under “picking up useful words” at the beginning of this learning unit means to you.
- explain to a client what the difference is between an HIV antibody and an HIV viral test.
- counsel clients about the implications of negative and positive test results.
- draw a picture to explain to a friend what is meant by the window period.
- explain the various algorithms for testing individuals for HIV infection.

Self-Assessment 5

Now is the time to pause briefly and to assess whether you have acquired the necessary knowledge and skills. Click on the link Self-Assessment 5 to do a few questions on this learning unit. Please note these self-assessment questions do not contribute to your year mark or your admission to the exams. The feedback to the questions will be given to you immediately after you have completed each question.

You are now finished with the assessment. Now go to Learning Unit 6.

APPENDICES

- Activities
- Self-Assessments
- Glossary

ACTIVITY 5.1 – DO I NEED TO KNOW MY STATUS?

A "know your status" billboard

"Know your status" campaigns have become part of many HIV prevention programmes in Africa. These campaigns take many forms, and I am sure that you are familiar with billboards with the "know your status" messages. Reflect on the influence that "know your status" campaigns have had on you personally by answering the following questions:

1. Do you think a billboard with a "know your status message" can change an individual's behaviour? Give reasons for your answer. (Think critically about this question!)
2. Would a billboard with a "know your status message" motivate you to go for HIV testing? Give reasons for your answer.
3. Do you know your HIV status?
   If you know your status, please answer questions 4 to 9.
   If you do not know your HIV status, answer questions 10 to 12.
4. What were your reasons for taking the test?
5. How did you feel when you walked into the testing site or doctor's rooms to be tested?
6. What went through your mind while waiting for your test results?
7. What positive things came from you knowing your status?
8. What negative things came from you knowing your status?
9. If a friend asks you: "Do you think I should go for an HIV test?" what would be your answer?
   If you do not know your HIV status:
10. What is holding you back from being tested?
11. Will you consider being tested for HIV in the foreseeable future?
12. Do you think it is a good thing that people should be "coerced" to go for testing by media campaigns? Why do you think it is a good or a bad thing?

[FEEDBACK]

FEEDBACK 5.1

Going for an HIV test is one of the hardest things to do. I remember very well how I felt when I went for testing the first time. My mind kept telling me: “You have nothing to fear – you know that you are HIV negative”, but my heart said: “What if ...”. People who have been for testing are usually very glad that they did because it gives them a new start: if they are negative, they resolve to stay negative, and if they are positive, they resolve to start living a positive life and access help. But please remember that the decision to go for testing should be a personal one. No one may pressurise you into going for testing. We will further explore your experiences and feelings about testing later on in the course. For now, let’s concentrate on the test itself and the testing procedures.

[BACK]

ACTIVITY 5.2 – HIV ANTIBODY AND HI VIRAL TESTS

Draw the following table and fill in the missing cells:

Differences between HIV antibody and HI viral tests

	HIV antibody test	**HIV viral test**
Body fluids used for testing		
Particles detected		
Types of tests (name them)		
Window period		
Cost		
Reliability		
Available in rapid test		

[FEEDBACK]

FEEDBACK 5.2

Your table should clearly illustrate the following:

- Blood is used for both tests, but the HIV antibody test is also available for testing on saliva and urine.
- The window period is much shorter for HI viral tests than for HIV antibody tests.
- The HI viral test is much more expensive than the antibody test.
- Both tests are very reliable, but only the antibody test is available in a rapid format.
- HIV antibody tests react to antibodies, while the HI viral tests react to viral antigens such as p24, or to viral nucleic acid such as viral RNA or viral DNA.

[BACK]

ACTIVITY 5.3 - WHAT DO THE ANTIBODIES AND VIRAL PARTICLES LOOK LIKE?

To see exactly what is detected by HIV tests, let's look back at some pictures.

1. Go to figure 2.4 in your prescribed book and look for the antibodies in phase 2 in the picture. Draw a circle around them. Do you remember that the immune system manufactures these antibodies to fight the HI virus that enters the body? Well, the HIV antibody tests are made to react to or pick up these antibodies.

2. Go to figure 2.6 in your prescribed book and look for the p 24 antigen in the picture. Draw a circle around this antigen. The p 24 antigen test reacts to this antigen and picks it up. Reflect on the following:

    - When do we usually use the p 24 antigen test?

3. Why is it not a good idea to use this test for a patient who has already been infected with HIV for many years?
4. Go to figure 2.6 and draw a circle around the viral RNA. Now go to figure 2.7 (where the virus has already infected a CD4 cell) and draw a circle around the viral RNA and around the proviral DNA. These are the viral components that are picked up by the HIV viral test.

[FEEDBACK]

FEEDBACK 5.3

I bet you will never again forget the differences between HIV antibody tests and HIV viral tests, and that you cannot wait to explain them to a friend! Let's now put the theory into practice. For the next activity I am using a real-life scenario and I want you to imagine yourself as the counsellor who will have to make decisions that will suit the situation the best.

[BACK]

ACTIVITY 5.4 – SIZWE'S STORY: TESTING DAY

You are probably already reading the book, *Three-letter plague* by Jonny Steinberg. Listen to what Sizwe told Jonny about testing day in Ithanga (pp 30–31).

The six deaths Sizwe had identified remained his formative experience of Aids until a Saturday morning in early February 2005. On that morning, the Médecins Sans Frontières (MSF) treatment programme came to Ithanga for the first time. By late afternoon, the meaning of the virus in Ithanga had changed forever.

Ithanga is an outlying village, among the most peripheral in Lusikisiki. The nearest clinic is an arduous fifteen-kilometre journey. A group of MSF counsellors visited the local chief to ask his permission to set up a mobile HIV testing centre at Ithanga's school. The chief reluctantly gave his consent. MSF lay workers then spread word across the village that they would be staffing a testing centre at the school for the duration of the following Saturday. The idea was to bring news of antiretroviral treatment to Ithanga. This is not the way Sizwe understood what happened that day. For him, that Saturday had little to do with medicine; it was about shame and fear.

"The whole village knew that people would be coming to test," he told me. "The previous week, the young counsellors had been all around the village telling everyone. They came the next Saturday to set up their testing centre at the school. Many, many people came to test, young people and not such young people. And to know who was positive and who was negative, you just had to stand and watch."

"For what?"

"For how long the people stay. You see, there is counselling before the test, and counselling after the test."

"The counselling before the test, it's the same for everybody: a few minutes. But the counselling after the test, for some it lasts two minutes, for others, it is a long, long, time. They don't come out for maybe half an hour, even an hour. And then you know."

"By the time the day ended, the whole village knew who had tested HIV positive?"

"The whole village."

"You went to the school to watch, not to test? You went to see who was HIV-positive?"

"No. Not to watch. They said that you could come and learn without being tested. There was a room on the side, and if you went there, somebody would answer all your questions, but you would not have to be tested. That is what I did. I stayed in that room for maybe an hour."

The following morning, the people of Ithanga awoke to a different village. In the course of a few hours, eight or nine healthy, ordinary-looking villagers, most of them young women, had been marked with death. In the weeks and months that followed, those who had tested positive were silently separated from the rest of the village. They were watched: whether they coughed, or lost weight, or stayed at home ill; whether they boarded a taxi, and if so, whether that taxi was going to the clinic; above all, with whom they slept. These observations were not generous; they issued from a gallery of silent jeerers.

[FEEDBACK]

FEEDBACK 5.4

It is hard to describe the feelings that this text evoked in me. I can't even think of questions to formulate. I only want you to stay in the moment for a while, and think deeply about what you have read. We will talk more about this in Learning Unit 11 when we discuss pre- and post-HIV test counselling.

[BACK]

SELF-ASSESSMENT 5

Read the following scenario (or story) about a clinic in rural KwaZulu-Natal where you have to counsel two clients on testing for HIV and related issues. Fill in the missing word or sentences in the spaces provided.

You are working as a counsellor in a clinic in rural KwaZulu-Natal. Your closest town with laboratory facilities is very far from your clinic. Therefore, you use _____ tests to diagnose HIV infection in your clients. This test reacts to the _____ in the client's blood which can usually be detected in the blood _____ days/weeks after infection with HIV. If this test is HIV positive, your rural clinic's policy is to use _____ to confirm the results and to make sure that you do not give your client a false positive result. Recently, you had two clients, John and Mary, with inconclusive or indeterminate test results. An indeterminate result means that _____ .

Both John and Mary practised unsafe sex in the past, but John shows no symptoms of HIV infection at all, while Mary shows the following symptoms: swollen glands, weight loss, persistent fever and oral as well as vaginal thrush. In John's case you decide to confirm his HIV results by _____ . You further counsel him to _____ . The best course of action in Mary's case is to _____.

Tip: Context is very important when you work in the Aids field. Your first clue in the story that should lead you to the correct answers is that you are working in a rural clinic very far from a laboratory. You will therefore probably only have the rapid HIV antibody test available. Your clue on how to handle Mary and John's cases (which have some similarities) should be the fact that Mary already shows symptoms of Aids, while John has no symptoms.

[FEEDBACK]

FEEDBACK 5

The paragraph should read as follows:

You are working as a counsellor in a clinic in rural KwaZulu-Natal. Your closest town with laboratory facilities is very far from your clinic. Therefore, you use *rapid HIV antibody* tests to diagnose HIV infection in your clients. This test reacts to the *antibodies* in the client's blood which can usually be detected in the blood *3 to 6 weeks (or sooner depending on the test)* after infection with HIV. If this test is HIV positive, your rural clinic's policy is to use *a second rapid test* to confirm the results and to make sure that you do not give your client a false positive result.

Recently, you had two clients, John and Mary, with inconclusive or indeterminate test results. An indeterminate result means that *it is not clear if the test result is positive or negative*. Both John and Mary practised unsafe sex in the past, but John shows no symptoms of HIV infection at all, while Mary shows the following symptoms: swollen glands, weight loss, persistent fever and oral as well as vaginal thrush. In John's case you decide to confirm his HIV results by *sending blood to the lab for an ELISA test*. You further counsel him to *practise safer sex and to check his health*. The best course of action in Mary's case is to *treat her opportunistic infections, send blood away for a CD4 count and get her ready for an antiretroviral programme. She should also be educated about safer sex practices and healthy living to boost her immune system.*

[BACK]

Glossary

HIV antibodies

Special protein complexes produced by the immune system that attack and neutralise specific disease-causing organisms. The antibodies which the body creates in response to HIVare, unfortunately, powerless to protect the body against the long-term destructive effects of the HI-virus.

[BACK]

ELISA test

ELISA stands for “enzyme-linked immunosorbent assay”. This is a laboratory test (technique) to detect antibodies in the blood.

[BACK]

Western Blot test

A blood test that detects the antibodies to HIV infection. It is sometimes used to confirm an ELISA test that has produced a (HIV) positive result.

[BACK]

Rapid HIV antibody test

An HIV antibody test that produces rapid or fast results. Rapid HIV tests are relatively easy to use (they involve pricking a finger with a lancet), and the results are usually available within 10 to 30 minutes.

[BACK]

HIV p24 antigen test

A test to detect a core protein found in the HI virus. The presence of this antigen in the blood is evidence that HIVis present in the body. These antigens are usually detectable in the early and very late stages of HIV infection.

[BACK]

PCR test (technique)

A method of testing for the presence of HIV in the body. The PCR technique does not have to rely on the formation of antibodies in order to diagnose HIV infection – it detects the viral DNA and viral RNA itself in the blood. A qualitative PCR is used for diagnostic purposes while a quantitative PCR is used after diagnosis and during treatment to measure the viral load (or amount of viruses in a particular body fluid).

[BACK]

Window period

The time between infection with HIV and the development of detectable HIV antibodies. Any HIV test done during this time will render false negative results (see False negative), even though the person is actually already infected with HIV.

[BACK]

Indeterminate test result

A test result that does not clearly indicate whether a person has an HIV-infection or not.

[BACK]

HIV testing algorithms

A protocol indicating in steps how the process of HIV-testing should take place.

[BACK]

False negative

An HIV test result that is HIV negative when the person is actually HIV positive. A test can show a false negative result when the person is still in the window period or (in rare cases) when the test is faulty.

[BACK]