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>> Tsitsi: Good afternoon, everyone. This is Tsitsi Watt and I am Manager of Program Delivery at CATIE. I would like to welcome you to the first of the CATIE Building Blocks Webinar Series. Before we move into the presentation, I would like to quickly review a few tips regarding the webinar technology. If you can't hear the audio, you can dial in to the audio portion using a telephone. The toll free number and the access code are shown on the screen right now. If you are speaking -- if you're using a speakerphone, mute the microphone on your phone to improve sound quality. And if you need extra support, please call the WebEX customer support number on your screen right now. To access closed captioning, first select view then panels then manage panels. Second, select media viewer; and lastly, click the edit button to edit your current panels. To re-size the media viewer click and drag its title bar. To reorder panels, select panel by clicking on it then click on move up or move down buttons and then, click okay. For those just signing in, I would like to thank you for joining us. And once again, my name is Tsitsi and I would like to welcome you to the first of CATIE Building Blocks Webinar Series. The title for this webinar is The Basics of HIV, and it will be presented by Melissa Egan one of the Regional Health Education Coordinators here at CATIE. Before we begin this presentation, I would like to remind everyone that this webinar will be recorded and made available on the

CATIE website soon. So for now please wait a little bit while we start the recording and I'll hand you over to Melissa.

>> Melissa: Hello, everyone. Welcome to CATIE HIV's Basic Webinar. This is a first in our Building Blocks Webinar Series that will continue into 2014. Let's begin. So, why are we doing this webinar? Well, to start off with, CATIE's mission is the following: Supporting and connecting people with HIV, other individuals and organizations to develop, synthesize, share and apply HIV knowledge. Collaborating with and building the capacity of frontline organizations to use treatment and prevention knowledge affectively, and acting as a central contact point for the flow of comprehensive, accurate, unbiased, timely, and accessible HIV and hepatitis C information and community-based knowledge. We hope that the information in this and the webinars that follow will support you in your learning.

So why is it important to start with the basics? The basics of HIV are the foundation of your day-to-day work and we hope that this information will help you to answer questions that your clients may have in a simple and accessible way. Just a quick note, we are not going to be discussing epidemiology or the social determinants of health in this webinar. For more information on these topics please visit the CATIE website [www.catie.ca](http://www.catie.ca) or contact us at 1-800-263-1638.

This is what we're going to be looking at today. HIV and the immune system, the progression of untreated HIV and how we measure HIV disease progression. For some of you, this may be a review of information you already know and for others it may be new. It is important that we all have a good grasp of this information as we're often called upon to explain it in simple terms. Let's get started with the basics. HIV stands for human immunodeficiency virus. Human because the disease attacks humans, immunodeficiency because it affects and can weaken the immune system and virus because this type of germ is a virus. Generally, a virus needs to take over a human cell in order to replicate or reproduce. HIV prefers one specific human cell and we

will talk a lot more about this cell in a little bit. AIDS stands for acquired immunodeficiency syndrome. Acquired means that this is something we're not born with but something that is passed from one person to another. In this case, HIV is what is passed. Immunodeficiency results from the HIV attack on our immune system and, finally, syndrome. It is a group or cluster of associated infections or symptoms.

One of the easiest ways to explain the transmission of HIV is in the form of an equation.

Breaking it down into this + this + this might = that. It is a format that works well to keep things accessible. The transmission equation shows us that three things have to be present for a possible HIV transmission to take place. First there needs to be a source of infection. You need a fluid that contains HIV. And these fluids include semen, vaginal fluid, rectal fluid, blood and breast milk. Secondly there has to be a route of entry. Possible routes of entry include breaks in the skin, mucous membranes as well as sores or lesions on the mucous membrane. Examples of mucous membranes include inside of the vagina, rectum and mouth as well as the head of the penis. And finally, there has to be an activity that facilitates the route of entry. These include unprotected sex, sharing needles and vertical transmission during pregnancy, birth, or breastfeeding. All three of these factors - source of infection, route of entry or activity - have to be present for transmission to take place. If transmission occurs, HIV is introduced into the body and the amount of virus present in the blood can be measured. That is called a viral load test and we'll talk a lot more about that later in the webinar. Let's look at the relationship between HIV and AIDS. It is important for people to know and simply explain that HIV is the virus if left untreated usually leads to AIDS and you can be HIV-positive without having AIDS but you cannot have AIDS without having HIV.

Now we'll move on looking to how the immune system works. The immune system is a very intricate system of cells, tissues and organs that keeps us healthy and wards off germs like bacteria, parasites and viruses. The CD4 cells are just one type of immune cell and very important. They instruct other cells to attack or destroy microbes inside the body. When teaching about these cells, they're often compared to an orchestra conductor directing the

musicians or army generals ordering soldiers to attack. As you can see from the image here the immune system can be found all over the body and CD4 cells that have been taken over by HIV are soon destroyed by the process of continuous replication. This causes a decreasing number of CD4 cells in the body over time. Which means an increasingly weak immune system. When the immune system is too weak then it can no longer protect the body from disease. Or to return to one of the metaphors that I just mentioned, if the conductor is sick the musicians don't perform very well.

Now let's explore the progression of untreated HIV. These are the stages of untreated HIV infection. We've covered transmission with the transmission equation. And now we will explore acute infection, chronic infection and advanced HIV infection. Which is often called AIDS. After transmission, comes the second stage of progression of untreated HIV. Acute infection, or primary infection. Soon after a person is infected with HIV, their body starts to make antibodies to the virus. The phase between transmission and the production of antibodies usually takes between 1 and 3 months. You may have heard of acute infection, also referred to as primary infection, as I said earlier, and they are the same thing. Once someone has developed antibodies in response to HIV, they have seroconverted. If someone takes an HIV test before they have seroconverted the result will be negative as the test looks for antibodies and not the virus itself. Some people experience flu-like symptoms during acute or primary infection. Not everyone gets these. Statistics we know are between 50 and 90%. And these symptoms include fever, sore throat, a rash, muscle or joint aches, swollen glands. And they may last a few days or a few weeks.

Moving on to chronic infection. A person infected with HIV can live without any symptoms for many years; however, if this stage of HIV is left untreated, CD4 counts gradually drop as HIV continues to replicate inside the body. This stage of HIV infection may feel asymptomatic and we used to refer to it as the asymptomatic stage; however, we now know that HIV leaves the body in a switched on stage. We also know this as immune activation or chronic inflammation. In recent years we know that that continuous stress on the body and on the body's immune system

does affect organs and systems. This is one of the reasons that there has been a push to begin treatment earlier. If treatment is not started or cannot be accessed, advanced HIV infection is the next stage of untreated HIV progression. In many parts of Canada, AIDS is no longer considered terminal due to the availability of powerful antiretroviral treatment; however, with an estimated one quarter or more of people living with HIV in Canada who are undiagnosed, and some significant issues with access and availability as well as stigma, there are still people who find out they are HIV-positive when they get sick. In Canada, AIDS is defined as HIV plus one or more opportunistic infections or certain cancers. Many of these opportunistic infections can be prevented or treated. This is a list of some of them. It is important to remember that since the introduction of antiretroviral medications over 10 years ago, it can be treated before it advances to the symptomatic or AIDS stage of HIV. We no longer refer to HIV or AIDS as terminal but a manageable or chronic infection.

And now we'll talk about how we monitor HIV. This is a diagram of untreated HIV. It is just another way of looking at it. What we're going to do is breakdown this image a little bit further by exploring CD4 counts and viral load. So a CD4 count is one of the most important measurements that we use to monitor HIV disease progression. It is part of routine care so people who are HIV-positive and it is measured by the number of cells per cubic millimetre or microlitre of blood. Now let's look more specifically at CD4 cell counts over time. At the left-hand side of this image we see that soon after transmission is acute infection. During this period, which usually lasts between one and 3 months as HIV infects the CD4 cells instead of controlling the infection, the CD4 cells are quickly infected and destroyed and you can see that's where the green line dips. It is during this stage that many people experience the symptoms of seroconversion. At seroconversion, which is when the antibodies against HIV are forming, the immune system finds a way to manage HIV over a period of time. When the immune system is able to keep HIV under control, viral load levels remain relatively stable although HIV is still present and active in the body. For most people, even without treatment, this period can last many years though it is important to remember as I mentioned earlier that there is chronic

inflammation causing damage to the body. And so it is very important for people to know their HIV status. And as the immune system weakens under the threat of HIV, CD4 counts begin to decrease and viral loads increase. Where you see the green line descending, HIV has gained the upper hand. CD4 counts drop indicating an increased chance of opportunistic infections associated with advanced HIV infection or AIDS. It is important to remember that all of these stages are a general description of the progression of HIV and since the introduction of treatments the progression has changed dramatically. CD4 counts and viral load tests are useful in determining the progress of HIV and they have been used to determine when to start treatment. As you can see people with HIV tend to have their CD4 counts monitored regularly. And the guidelines are changing to encourage people to begin treatment as soon as possible. For more information on CD4 counts and when to start treatment we will be doing a "Starting Treatment" webinar in March of 2014, so please tune in.

Now let's talk about viral load. Viral load is the amount of HIV or number of virus in the bodily fluids of someone living with HIV. It's measured in blood as part of routine care just like CD4 count. Viral load in other bodily fluids is not commonly measured. This test monitors the progression of HIV infection and is also used to determine the success of treatment. A higher viral load will cause greater damage to the immune system. Now we see the image with the other line on it. This is the red line representing viral load. In the first few weeks of HIV infection, during that acute or primary stage, viral load is very high and this translates to a higher risk of HIV transmission. After antibodies are produced, a few weeks into infection, the acute HIV stage ends and the chronic HIV infection stage begins. At this point viral load has begun to drop and will eventually stabilize at a lower level where it remains relatively stable during chronic HIV infection because the immune system is controlling the replication of the virus on its own and this can be done successfully for a little while. After a time, if antiretroviral treatment is not started, the viral load again begins to increase along with the risk of transmitting HIV. The goal of treatment is usually an undetectable viral load of less than 40 copies of HIV per milliliter. Viral load can range from under 50 or under 40 to over 1 million copies per milliliter of blood. It is very

important to remember that overall trends of viral load are more important than any single measurement.

So this is what we've done today. We talked about the transmission equation, the fluids that can transmit HIV, how HIV can get into the body and activities that facilitate entrance. We've also discussed the progression of untreated HIV, and how in the absence of treatment HIV progresses in the body. We've also discussed briefly how treatment can improve health outcomes for people with HIV. We've also explored a little bit CD4 counts as well as viral load tests and how these measurements are key indicators of health and treatment success for people who are living with HIV.

And now I'm going to unmute the line and invite your questions or comments.

>> Tsitsi: Thank you, Melissa. We have quite a bit of time for questions or comments. You can dial #6 to unmute your line and please feel free to type your questions or comments on the left-hand side of your screen. It looks like we don't have any questions for now. We'll give you a couple more minutes. If we still don't have any questions or comments, we will close the webinar.

>> Gwen: Hello. I have someone else -- this is Gwen -- but I have someone else in the office here who would like to ask a couple of questions.

>> Male: I just had a question about transmission from mother to baby. So you're saying that there is three ways that transition can occur during the birthing process: Breastfeeding and while she's carrying the baby?

>> Melissa: We talked about vertical transmission and it was about defining what vertical transmission was. So it is actually only two. It is during birth and during breastfeeding.

>> Male: Okay, yeah. I just wanted to clarify that because before we used to say that while the mother was carrying the baby but is it true that HIV can't cross the placenta barrier?

>> Melissa: That's true. Did you have another question?

>> Male: That was it. That was it. Oh, the other one was, I can't remember if you had mentioned the fluids that transmit HIV, but I don't recall if you had mentioned anal secretions.

>> Melissa: We just called them rectal fluids. They're the same thing.

>> Male: Okay.

>> Tsitsi: I want to add a little bit on vertical transmission. In Canada if a person is pregnant and they have HIV and they access health care, it is recommended that they go on treatment. And if they are on successful treatment then the percentage of them or the chances of them passing HIV onto the baby are extremely low so sometimes up to 0%. So it is highly recommended that pregnant women take ARVs before they give birth. Sometimes it is difficult for them to access ARVs. So if a woman is found to be HIV-positive just before they give birth, they will be recommended to go on ARVs and babies may be put on antiretroviral treatment for about 18 months. So that reduces the chances of the baby actually acquiring HIV.

>> Male: Are they given access to like formula?

>> Tsitsi: Yes. Most health care and clinics will help the mother with formula for sure.

>> Melissa: Many provinces will cover the cost of formula for HIV-positive families for a year.

We have a couple of questions that came from the chat. The first one is: if someone receives treatment early, how many years would they stay in the chronic infection stage? This is a very difficult one to answer. We have come to the conclusion -- and there have been a number of studies that have indicated that HIV doesn't significantly shorten the life of somebody who is living with it. Usually that difference is between 5 and 10 years and that is when somebody is on treatment. I hope that answers your question. I'm not able to really define how long someone's



chronic infection stage might be. Another question from the chat is: are the CD4 numbers reduced initially because they are destroyed by production of the virus or because they are attached -- I'm assuming that means attacked -- by the actual immune system or both? CD4 count numbers are initially reduced. That dip I showed in the image -- because they are destroyed by constant and aggressive HIV viral replication. And another question that has been asked is: how effective is prep? Prep is defined as pre-exposure prophylaxis and it is when an individual takes a combination of usually one or two antiretroviral medications when they are not HIV-positive. The effectiveness of prep is significant enough that this is something that has been considered possible and something that people do in the United States. We are still waiting for approval in Canada and hope that it is coming shortly. People do have to pay for it though and so that is an important thing to consider when talking about prep. It is not generally covered by health insurance or the Province.

>> Tsitsi: Someone wants to know if the slides will be made available after the webinar?

>> Melissa: The slides will be available. The webinar will be hosted on our website and put up by the end of this week and the slides, plus the audio, will be viewable at that time.

>> Tsitsi: There is one more question there. If two HIV-positive people have unsafe sex, will it affect the viral load?

>> Melissa: When two people who have HIV have unprotected sex, there is the possibility that they could infect each other with their respective strains. And if there are two strains inside one body that would affect viral load. But having unprotected sex especially if two HIV-positive people are on treatment and have undetectable viral loads should not affect viral load.

>> Tsitsi: The last question that we have is, when CD4 counts are high, are viral loads always low and vice-versa?

>> Melissa: I think it really depends. That's the ideal is to have a high CD4 count

and a low viral load; however, high can be very difficult for some people and it is important to remember that sometimes somebody's high CD4 count is going to be around 200 whereas that could be low for somebody else. But as viral loads increase, we do tend to see a reduction in CD4 count.

>> Tsitsi: Thank you very much, Melissa. And thank you very much to everyone for joining us this afternoon. If you have more questions please call us on 1-800-263-1638 or send us an e-mail. And just a last note here, this is part of a Webinar Series that we'll be hosting in the next coming 6 months. The next webinar will be looking at "HIV testing in Canada" where we will look at testing technologies and approaches. We would also like you to evaluate this webinar. So once this webinar has ended, your browser will automatically direct you to an evaluation page. We really will appreciate your feedback and we will use it to help us improve our webinars. So on behalf of CATIE, I would like to thank you all for listening and hope that you will join us for the next webinar. Enjoy the rest of your day. Bye.

>> Melissa: Bye.

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