

Condoms for the prevention of HIV and STI transmission

Summary

Condoms are physical barriers that can reduce the risk of a sexual exposure to HIV and sexually transmitted infections (STIs). They are made of materials that do not allow HIV or STIs to pass through them. Condoms can be highly effective against HIV and STI transmission when used consistently and correctly. They are much less protective if used inconsistently and/or incorrectly.

What types of condoms are available to prevent HIV transmission?

Two types of condoms are available to prevent the sexual transmission of HIV and other STIs:

- The male condom, also known as the external condom, is a sheath made from polyurethane, latex, or polyisoprene that covers the penis during sexual intercourse. There are many types and brands of male condoms available. They vary in shape, colour, size, texture and flavour.
- The female condom, also known as the internal or insertive condom, is a pouch made of polyurethane or a synthetic latex material called nitrile. The pouch is open at one end and closed at the other end. It has a flexible ring at both ends. The ring at the closed end is used to insert the condom into the vagina and hold it in place. The ring at the open end of the pouch remains outside of the vagina and covers the external parts of the female genitalia. There are only two types of female condoms available. The

difference is in the material used. The FC1 condom is made of polyurethane, and a cheaper version, called the FC2, is made of nitrile.

How do condoms prevent the sexual transmission of HIV and STIs?

Condoms prevent transmission by reducing the risk that an exposure to HIV or STIs occurs during sex. Laboratory studies show that the materials used to make most condoms (such as nitrile, latex, polyurethane and polyisoprene) do not allow bacteria, viruses or other germs to pass through them. Therefore condoms act as a barrier to HIV and STI infection by preventing the mouth, vagina, penis and rectum from being exposed to:

- bodily fluids (such as semen, vaginal fluid and rectal fluid) that can contain HIV and STIs
- and/or
- skin infected by an STI (such as herpes and syphilis sores or genital warts).

Some condoms are made from a thin membrane of sheep intestine, also known as lambskin condoms. These condoms are not effective at reducing the risk of HIV or STI transmission because bacteria, viruses and other germs can pass through this membrane.

How important is it to use condoms correctly and in what ways can they be used incorrectly?

Incorrect use of condoms can compromise their effectiveness, thereby increasing the risk of HIV and STI transmission, even when they are used consistently. There are many ways condoms can be used incorrectly and research shows incorrect condom use is common.

Some types of incorrect use can cause condoms to break, slip or leak, thereby increasing the risk of HIV or STI transmission. This type of incorrect use includes using condoms that are too small or too large; using damaged or expired condoms; unrolling male condoms before putting them on; reusing condoms; not pinching the tip of the male condom when putting it on; using sharp objects to open condom packages; not using enough lubrication in combination with condoms; using oil-based lubrication with latex or polyisoprene condoms (oil-based lubrication is safe to use with nitrile and polyurethane condoms); or not holding the rim of the male condom when pulling out.

Other types of incorrect condom use can increase the risk of HIV or STI transmission even though the condom does not break, slip or leak. For example, some people may put a condom on late (after intercourse has started), remove the condom early (before ejaculation has occurred), or put the condom on inside out and then flip it over to use. These types of incorrect use can increase the risk of exposure to HIV and/or STIs.

Female condoms can fail in other ways that may increase the risk of HIV and STI transmission. For example, the erect penis can miss the outer ring and enter between the vaginal wall and the condom. It is also possible

for the outer ring to be pushed, either partially or fully, into the vagina. These can all increase the risk of exposure to HIV and/or STIs.

How effective are condoms at preventing the sexual transmission of HIV and STIs?

The effectiveness of condoms depends on how consistently and correctly they are used. If condoms are not used consistently and correctly, then the risk of an exposure to, and transmission of, HIV and STIs increases.

HIV

HIV is transmitted through contact with fluids that contain HIV, including semen, vaginal fluid and rectal fluid. Research shows that *male* condoms can reduce the risk of HIV transmission when used for oral, vaginal and anal sex. The effectiveness of *female* condoms at reducing HIV transmission has not been directly studied.

Observational studies have investigated the effectiveness of male condoms in reducing the risk of HIV transmission between heterosexual serodiscordant couples (where one partner is HIV positive and the other is HIV negative). An analysis of these studies found that the rate of HIV transmission was 80% lower among couples who said they *always* used condoms compared to couples who said they *never* used condoms. Other studies suggest consistent use of male condoms provides a similar level of protection for gay men and other men who have sex with men.

There are several reasons why the level of protection in these studies may not reflect how effective condoms can be at reducing the risk of HIV transmission:

- Although couples reported using the condoms *consistently*, they may not have been using the condoms *correctly*.
- Couples who reported using condoms consistently may have had trouble remembering their condom use or did not

feel comfortable telling the complete truth. It may be that they did not use a condom for every sex act.

- Couples who used condoms may have engaged in behaviours that put them at higher risk of HIV transmission compared to those who were not using condoms. For example, people who chose to use condoms consistently may have been having sex more often or having sex with a higher number of casual partners.

For these reasons, the effectiveness of condoms at reducing the risk of HIV transmission through oral, anal and vaginal sex is likely much higher than 80% when used consistently and correctly.

Other STIs

STIs can be transmitted in two ways. Gonorrhoea, chlamydia and trichomoniasis are primarily transmitted through contact with infected fluids, such as semen, vaginal fluid and rectal fluid. Genital herpes (herpes simplex Type 2 or HSV-2), syphilis and genital warts (human papillomavirus or HPV) are primarily transmitted through contact with infected skin.

Several studies suggest *male* condoms can reduce, but not eliminate, the oral, vaginal and anal transmission of genital warts, genital herpes, syphilis, chlamydia, gonorrhoea and trichomoniasis. However, other studies have found that condom use did *not* reduce the risk of STI transmission. These results were likely due to inconsistent and incorrect use of condoms among study participants.

Also, the effectiveness of condoms may depend on how the STI is transmitted. Condoms do not completely cover all parts of the body that can become infected, or are infected, by STIs that are primarily transmitted through skin–skin contact (such as herpes, syphilis and genital warts). Therefore, condoms may be less protective against these STIs compared to those that are transmitted through contact with infected fluids.

Studies suggest *female* condoms are equally effective as male condoms in reducing the vaginal transmission of STIs. Female condoms may provide more protection than male condoms against STIs transmitted through skin–skin contact. This is because they cover more parts of the body that can become infected, or are infected, by STIs.

What are the advantages of condoms compared to other HIV prevention strategies?

Condoms have several advantages compared to other HIV prevention strategies. For example:

- If a condom is used correctly and it doesn't break, slip or leak, then it is virtually 100% protective against HIV because an exposure cannot occur. However, there is still a possibility that condoms will break, slip or leak even when used correctly, allowing for an exposure to occur. Therefore, condoms do not completely eliminate the risk of HIV transmission.
- Condom effectiveness does not rely on accurate knowledge of a person's HIV status—something that is often difficult to know for certain. Some other prevention strategies only work if the HIV status of one or both partners is known.
- Condoms can prevent an exposure to HIV from occurring in the first place. The goal of some prevention strategies is to reduce the risk of an exposure leading to an infection, such as the use of antiretroviral medications to prevent transmission: post-exposure prophylaxis (PEP) or pre-exposure prophylaxis (PrEP) by HIV-negative people and treatment by HIV-positive people to reduce the viral load to undetectable levels.
- Other prevention options may be less effective if either partner has an STI, the HIV-positive partner has a high viral load, or other biological factors that increase HIV risk are present. However, these do not affect condom effectiveness (as long as an exposure doesn't occur).

- When condoms effectively prevent an exposure from occurring, they can reduce the risk of HIV transmission for both anal and vaginal sex to the same level. However, the risk of HIV transmission while using PrEP or when the viral load is undetectable *may* be higher for anal sex than for vaginal sex. (This is because anal sex has a higher baseline risk of HIV transmission than vaginal sex.)
- Condoms also reduce the risk of other STIs, such as gonorrhea, chlamydia, herpes, and syphilis. Although other strategies may reduce the risk of HIV transmission, they do not reduce the risk of STI transmission. This is important because STIs can increase a person’s risk of HIV transmission.
- Condoms can reduce the risk of unintended pregnancy.
- Condoms are less expensive, more readily available, and less toxic than strategies that involve antiretroviral medications, such as PEP and PrEP.

What are the disadvantages of condoms?

Condoms have several disadvantages and this can make it difficult for people to use them consistently and correctly. For example:

- There are many ways in which condoms can be used incorrectly.
- Condom use can be difficult to negotiate with a partner.
- Condoms need to be available at the time of sex and may be difficult to use if sex is unplanned or recreational drugs are involved.
- Condoms can make it difficult for some people to maintain an erection, also known as condom-associated erection problems.

- Condoms can be uncomfortable and decrease sexual pleasure and intimacy. Poor “fit and feel” of condoms may be a major cause of breakage, slippage, leakage, issues associated with pleasure loss during sex, and condom-associated erection problems.
- People who have allergies to latex cannot use latex condoms. However, non-latex options are available.
- Condoms do not allow conception.

What are the advantages and disadvantages of the female condom compared to the male condom?

The female condom has several advantages compared to the male condom. The female condom provides an alternative to individuals/ couples who do not like using the male condom. A female condom can be inserted a few hours before sex (this may be more convenient and less likely to interrupt sexual spontaneity); it may provide additional protection against STIs because the outer ring covers the external genitalia; and use is controlled by the receptive sexual partner (this is an advantage for individuals who are unable to negotiate the use of a male condom with an insertive partner).

The female condom also has several disadvantages. It is more expensive than the male condom and some people using the female condom find it uncomfortable, difficult to insert or do not like the appearance. Many new types of female condoms are in development to hopefully improve the acceptability of this option.

Can the female condom be used for anal sex and is it effective?

Unlike male condoms, the female condom was not designed to be used for anal sex. However, the female condom is used by some people to prevent the anal transmission of HIV and STIs.

There is limited safety data, and no effectiveness data, on the use of the female condom for anal sex. However, the use of the female condom for anal sex is supported, and promoted, by many non-profit and government organizations, such as the British Columbia Centre for Disease Control.

Instructions for using the female condom for anal sex are inconsistent. Some organizations recommend that the inner ring be removed from the female condom for anal use while others do not. More research is needed on the safety and effectiveness of the female condom for anal sex and consistent guidelines on using the female condom are needed.

What does this all mean for people who want to use condoms?

In summary, the research suggests:

- The male condom can reduce, but not eliminate, the risk of HIV and STI transmission for oral, vaginal and anal sex.
- The female condom is equally effective as the male condom at reducing the risk of STI transmission through vaginal sex. The effectiveness of female condoms has not been studied for anal sex or HIV transmission, but there is no reason to think they are not protective to some extent.

There are several key messages for people who want to use condoms to reduce their risk of HIV and STI transmission:

- Consistent use of condoms is important. If you have difficulty using condoms regularly, discuss this with your doctor or a sexual health counsellor.
- Correct use of condoms is important. Many people do not use condoms correctly. Make sure you know how to use male and/or female condoms correctly.
- Finding condoms with the right “fit and feel” is important because it may help improve consistent and correct use.

Many sexual health centres and AIDS service organizations have programs to educate and support people to use condoms consistently and correctly.

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