

## A Critical Look On Condoms

Kigbu JH. MBBS, FWACS, Cert.IVF(Germany), DD Nyango MBBS, FWACS

Department of Obstetrics and Gynaecology, Jos University Teaching Hospital Jos, Nigeria.

### Abstract

**Background:** To protect the public health, the practice of safer sex, promoted in a sex-positive way, is necessary. It includes saying no to unwanted sex, being faithful, having fewer partners, having sex that does not include intercourse, and using condoms. This is not just to prevent HIV and Sexually transmitted infections (STIs), but also to prevent unwanted pregnancy, STI-related infertility and negative pregnancy outcomes, and cervical cancer- and most importantly to protect children and for partners to protect each other. Couples in stable relationships are now changing their sexual behavior due to increasing awareness on HIV and other STIs. While some are abstaining from premarital sex, others are being faithful to their partners. However, large numbers of people are yet to adopt safer sexual behavior through correct condom use. Since the beginning of the AIDS epidemics, condom distribution has greatly increased.

**Methodology:** Literature review on the topic was done using Pubmed. Relevant journals and topics were also reviewed. Textbooks on relevant topics were also searched.

### Results

The consistent use of male latex condoms significantly reduces the risk of HIV infection in men and women.

Consistent use of male latex condoms reduces the risk of gonorrhoea in men.

Laboratory studies have proved that latex condom is impermeable to the infectious agents in genital secretions, including the smallest viruses.

Male condoms may be less effective in protecting against STIs that are transmitted by skin-to-skin contact, if that area is not covered by the condom

### Conclusion:

Condoms are currently the only available means of preventing the sexual transmission of HIV and some other STIs. Condoms exist for both men and women.

**Key words:** HIV/AIDS, Condoms, STIs.

Date accepted for publication: 26<sup>th</sup> January 2009

Nig J Med 2009; 354-359

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### Introduction

The discussion on Condoms is mostly greeted with dislike in our African society even though condoms have been there since time immemorial<sup>1</sup>. This is mostly because of ignorance; however, with the emergence of HIV/AIDS, acceptance of condoms has assumed an important strategy in HIV/AIDS prevention the world over. There is no doubt that many people are mutually faithful to one another partner over their lifetimes. HIV, however, is being transmitted in sex acts occurring outside this norm<sup>2</sup>.

To protect the public health, the practice of safer sex, promoted in a sex-positive way, is necessary. It includes saying no to unwanted sex, being faithful, having fewer partners, having sex that does not include intercourse, and using condoms. This is not just to prevent HIV and Sexually transmitted infections (STIs), but also to prevent unwanted pregnancy, STI-related infertility and negative pregnancy outcomes, and cervical cancer- and most importantly to protect children and for partners to protect each other. Couples in stable relationships are now changing their sexual behavior due to increasing awareness on HIV and other STIs. While some are abstaining from premarital sex, others are being faithful to their partners. However, large numbers of people are yet to adopt safer sexual behavior through correct condom use. Since the beginning of the AIDS epidemics, condom distribution has greatly increased. It is estimated that between six and nine billion condoms are distributed around the world every year. In Nigeria, the National Action Committee on AIDS (NACA) reported that 200 million condoms were used in four years<sup>2,3</sup>. In urban areas, and in many rural communities in the developing world, men and women can now obtain- quality condom free or at subsidized prices. Furthermore, condom use has been increasing steadily over the years and is becoming a normal part of sex life for a growing number of people<sup>2,3,4</sup>. An estimated 83% of commercial sex workers now use or insist on the use of condoms<sup>4</sup>. Condom names such as *Prudence* and *Maximum*, both African brands, reflect the fact that condoms can be promoted to provide a sense of trust. That includes trust not only in a partner but also trust in the condom to protect.

Correspondence to Dr Joseph Haruna Kigbu, Email: [jhkigbu@yahoo.com](mailto:jhkigbu@yahoo.com)

## History of Condoms

Records show that decorative penile covers were mentioned in Egyptian writings as far back as 1350BC<sup>1</sup>. In 1564, the Italian anatomist, Fallopius, described the concept of the penile barrier for the prevention of venereal disease<sup>1</sup>. The famous romancer, Casanova, is said to have protected himself with sheets of sheep intestines<sup>1,5</sup>. Other materials that have also been mentioned include oiled paper, fish bladder, leather, and even tortoise shell supposedly favored by the Japanese<sup>1-7</sup>. See Figure 1. In the 18<sup>th</sup> century, these sheets were first given the name "Condom" Presumable after inventor Colonel Condom<sup>1</sup> with the advent of vulcanized rubber in 1843 came the mass production of synthetic condoms. In the 1990s, manufacturers began to use plastics (e. g polyurethane) for both male and female condoms after the latex male condoms. Currently, condoms are available in different sizes, shapes, textures, colors and even flavors (male condom), and can be made as sexy and pleasurable even as the people can imagine.

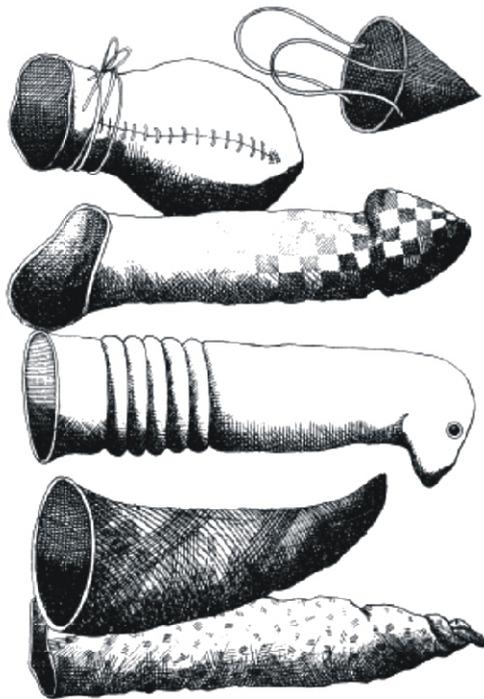


Figure 1<sup>7,8</sup>

## Condom Options

Until recently, most commercially available condoms were manufactured from latex ("rubber" condoms), while about 5%<sup>3</sup> were made from the intestinal caecum of lambs ("natural skin", "natural membrane", or "lambskin" condoms)<sup>5,6</sup>. Natural membrane condom may not offer the same level of protection against STIs as latex condoms, however. Unlike latex condoms, natural membrane condoms contain small pores that may permit

passage of viruses, including hepatitis B virus, herpes simplex virus, and HIV<sup>5,7</sup> and are recommended for contraceptive use only as sperm which are 0.003mm in diameter cannot penetrate latex which are 0.3-8mm thick. Condoms can be straight or tapered, smooth or ribbed colored or clear, lubricated or non-lubricated. These are all marketing ventures aimed at attracting individual notions of pleasure and enjoyment. New condoms manufactured from polyurethane are thinner and stronger than those manufactured from latex, provide a less constricting fit, are more resistant to deterioration, and may enhance sensitivity. Unlike latex condoms, condoms made of polyurethane are compatible with oil-based lubricants<sup>6-7</sup>. Plastic condoms have not been well studied for protection against STIs but are believed to provide protection similar to that of latex condoms. Two polyurethane condoms have been approved by the United States Food and Drug Administration (FDA) for latex sensitive persons and are commercially available in the United States: the Avanti Condom (Durex consumer products and the Reality female condoms (the female Health Company). Plastic condoms manufactured from materials other than polyurethane have also been marketed. The Tactylon condom (Sensicon Corporation) manufactured from a plastic material used in non-allergenic examination gloves<sup>7</sup> received clearance from the FDA and have been available since 1998. In this regard, a full range of quality condoms are now available to respond appropriately to these consumers concerns. A class of condoms with ribs and dots on both sides "Play Tingle" was designed to create tingling sensations- a benzocaine condom called "Performa" and a polyurethane one called "Avanti". Also, while the "Affair" condoms were developed specifically for men who have sex with men (Gay), the "Fiesta" condoms were designed with youths in mind. The later who are in various colors to connote the concept of fun, also come in a range of flavors and shapes. The "baggy" condom with an extra-large head is a modification of the 'affairs' ("Affairs Sensation") and the Ultra-Safe condom with nonoxynol-9 spermicidal are to improve sensation and infection prevention respectively<sup>8-9,10</sup>. Similarly, the perception that condoms reduce sexual pleasure, are awkward, uncomfortable and not sexy has led to the introduction of erotic ways of sexing up male and female condoms for penetrative sex<sup>11-13</sup>. In order words, making condoms more comfortable and pleasurable transforms them from being strictly disease-prevention and public health tools into erotic accessories. See Table 1 for comparison of condom types.

Table 1: Characteristics of latex, natural membrane, and plastic condoms<sup>7</sup>

TYPE	LATEX	NATURAL MEMBRANE	PLASTIC
Brand names	Numerous	Fourax, natural	Avanti Reality
Material	Natural rubber	Lamb	Polyurethane*
Lubrication use	Water based only	Lamb caecum	Any
Cost	Low	Moderate	Moderate/high
Prevention of Pregnancy	Yes	Yes	Yes
Prevention of STIs and HIV	Yes	Yes/No	Likely
Male types	Yes	Yes	No
Female types	-	-	Yes
Odour	Yes	-	No
Allergy	No	No	Yes

\* Non-polyurethane plastic condoms are also available in the markets.

Some condoms are lubricated with small amounts of Nonoxynol -9, ranging in concentration from 1-12%<sup>4, 8</sup>. Although spermicidal lubricated condoms have been available in the United States since 1983, there is no evidence that these condoms are more effective than condoms without spermicidal<sup>9</sup>.

The condom is among the most inexpensive and cost-effective contraceptives especially considering the added protection against STIs and HIV.

**SAFETY STANDARDS.** Manufacturers test each lot of condoms according to voluntary performance standards established by the FDA,<sup>5-6, 11</sup> testing involves, electronic testing for holes and weak spots, water leakage test (by filling a condom with 300ml of water and checking for holes or moisture outside the condom), the air burst test adopted by ASTM in 1994, (where the volume at burst point is documented) and the tensile test dropped in 1996 because of its poor ability to predict deterioration or breakage during actual use.

**FEMALE CONDOMS.** The female condom, a polyurethane sheath is not left behind in this advancement. The failure to eliminate sex-work has prompted public health researchers to look for alternative options to promote condom use in the sex business. The reality female condom<sup>7, 13</sup> is a soft, loose 3-fitting polyurethane sheath, 7.8cm in diameter and 17cm long. It contains two flexible polyurethane rings. One ring lies inside, at the closed end of the sheath, and serves as an insertion mechanism and internal anchor. The other ring forms the external, open edge of the device and remains outside the vagina after insertion. See figure II. The second generation of female condom (FC<sub>2</sub>), produced

from nitrile has the same physical characteristics as the first, but its cheaper<sup>12, 13</sup>. The panty condoms and the anti-rape condoms are also available.



Female condom. Figure II<sup>13, 14</sup>

The panty condom. The panty condom consists of a sensual, sexy cotton or nylon panty with an aperture in the front lower section where an interior membrane (much like a feminine day pad) contains a self adhesive condom that develops during coitus. It is manufactured from a polyethylene resin, a material that is thinner and stronger than latex. Unlike latex, it is anti- allergic. It is lubricated, discreet, safe, easy to use and can be worn all day. It is protected inside a membrane until used. The panty condom is reusable and the condom is replaceable. The panty condom is imported and distributed exclusively by ACME Condom Company. The product is manufactured by Natural Sensation Compania Ltda. NS based in Bogota, Columbia<sup>12, 13</sup>. It can effectively prevent unintended pregnancy, STIs and HIV/AIDS. See Figures III and IV.



Figure III.Backview



Figure IV. Front view.

Unsafe condoms. Condoms remain the sole effective method of prevention of HIV and should be promoted as such. Variety in condom size, color, flavor, lubricant and texture is all wonderful, but condoms are not problem free. There is not only negative perceptions of condoms and stigmatization of condoms, but also something that is often overlooked, which is that some condoms have been deliberately modified to make them unsafe<sup>13</sup>. See Figure V. In some places including Cambodia and China, condoms have been modified to add so-called pearls, hard rubber studs or even bristles that are painful and dangerous to the receptive partner, causing injury to the vagina and anus. In addition to unsafe condoms, accessories such as the "tiger's moustache" penis ring have bristles and are as dangerous in the same way as unsafe condoms, See Figure VI. These are condoms that promote rather than prevent HIV, and therefore have been outlawed in Thailand<sup>13</sup>.



Figure V<sup>14</sup>.Unsafe condoms

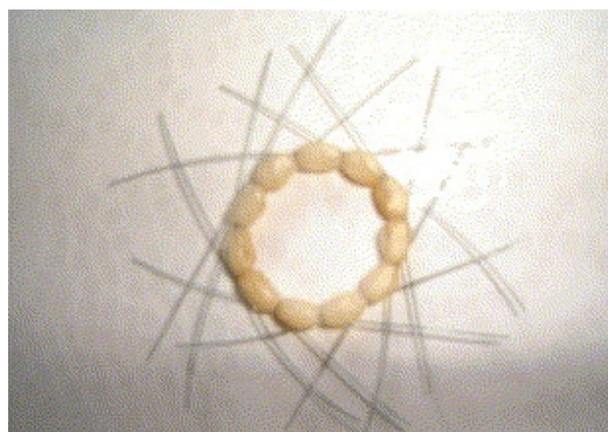


Figure VI<sup>14</sup>. "Tiger's moustache" penis ring

Are condoms effective? Theoretically, condoms are very effective; why haven't we seen disease prevalence decline as condom use increases? The relationship between condom use and infection is not so simple or so clear. Although laboratory studies have shown that no STI causing organism including HIV can pass through latex condom<sup>13-15</sup>, correct and consistent use are necessary conditions for effectiveness. Other factors important in infection protecting properties of condoms are the manufacturer and condition of storage. Also slippage and breakage during the act of coitus contribute to less than 100% protective role of condom. However, meta-analysis has shown that using condom always is seven times safer against HIV than never using them. The experiences from Thailand and Cambodia demonstrated clearly the importance of promoting multiple infection prevention strategies at one time<sup>16-19</sup>. Though each has marginal effect; together, condom promotion, behavior change communication and education/awareness campaigns work synergistically to reduce STIs.

Lack of evidence. Experts have come to the conclusion that there are more problems with the studies or lack of studies than with the theoretical effectiveness of condoms. In its summary of a workshop on the scientific evidence on condoms effectiveness for prevention of STIs, the US National Institutes of Health concluded that correct and consistent use of latex condom effectively reduces transmission of HIV/AIDs in woman and men and prevent pregnancy<sup>19,20</sup>. For six other STIs, the epidemiological data were insufficient to draw meaningful conclusions. The report stresses that "the absence of definitive conclusions reflected inadequacies of the evidence available and should not be interpreted as proof of the adequacy or inadequacy of the condom to reduce the risk of STIs. The WHO and

UNAIDS pointed out that some have misunderstood the difference between “lack of evidence of effectiveness” and a “lack of effectiveness”<sup>4,19,20</sup>. The lack of evidence is due, in part, to the difficulty of concluding scientifically valid and ethical studies to establish reliably the effectiveness of condoms against specific STIs. Fortunately, researchers are rising to the challenge to produce better evidence. The clearest results come from studies on HIV transmission comparing always (100%) with never- (0%) condom users. A Cochrane library review of condom effectiveness in reducing heterosexual transmission of HIV found an overall 80% reduction in HIV Sero-conversion with condom use<sup>21, 22</sup>. The results from several studies comparing non-users with ever users have been mixed. There are many confounding factors that influence the outcome of infection, including individual risk behaviors. A recent study of men and women attending an urban STI clinic in the United States addressed these factors by comparing consistent condom users with inconsistent users<sup>23, 24</sup>. Rates of infection were lower for men and women among consistent condom users than among inconsistent users for gonorrhea (adjusted odds ratio (AOR) 0.87 and 0.71), and for genital herpes in men (AOR 0.73). However, in the same study, when all condom users (consistent and inconsistent) were compared with non users, there was limited evidence of effectiveness. It was very significant that condom users reported greater sexual risk taking (50% more reporting new partners and 70% more reporting multiple partners) in the previous four months than non-users. For condom use to have an effect on levels of infection, use must be high among those at highest risk. Computer models have shown that life time risk of HIV infection can be reduced more if a smaller number of people use condoms fairly consistently, than if a larger number use them fairly inconsistently<sup>22,23,25</sup>. This is especially true for those at highest risk of STIs. The ability of condoms to prevent infection also depends on how well they are used. Perfect use and typical use can be very different. It is very difficult to ascertain if condoms have been used correctly and perfectly for each act of sexual intercourse. The prevalence of various STIs (whether they are discharges or ulcers) within the population also affects the probability of infection. The decline in HIV prevalence seen in Thailand is largely due to the government's 100% condom program, which mandates that condoms be used for every paid sex act. Condom use during paid sex acts increased to 90% and the percentage of men paying for sex dropped by half<sup>25, 26</sup>. In Cambodia mandatory condom use in commercial sex has had similar impacts on prevalence of HIV and other STIs.

In Uganda, on the other hand changes in behavior especially significant decline in numbers of casual sex partners, along with increased condom use has resulted in a 70% decline in HIV prevalence since the 1990s<sup>24, 26</sup>. These examples highlight the importance of promoting many infection reducing strategies at one time. Each has some effect, but together, condom promotion, behavior change, and education work synergistically to reduce STIs. The female condom also offers protection against STIs, and studies show there is potential for its use, especially among commercial sex workers in Africa<sup>26, 27, 28-31</sup>.

In summary, there is evidence to conclude that:

The consistent use of male latex condoms significantly reduces the risk of HIV infection in men and women.

Consistent use of male latex condoms reduces the risk of gonorrhea in men.

Laboratory studies have proved that latex condom is impermeable to the infectious agents in genital secretions, including the smallest viruses.

Male condoms may be less effective in protecting against STIs that are transmitted by skin-to-skin contact, if that area is not covered by the condom

Condoms use should be low cost, and easily promoted and distributed. Condoms use along will not be sufficient to achieve the significant reductions in STIs, including HIV, needed to promote improved health and survival. As seen in Uganda and Thailand, condoms are an important part of risk reduction, but need to clear evidence to support the promotion of male and female condoms to reduce the risk of STIs and HIV. In addition, there is continuing need for rigorous research with specific subgroups, as well as research in correctness of use in the meantime, renewed effects to increase distribution and use of condoms, can have significant impact on STI reduction throughout the world.

1. The most effective ways of preventing the sexual transmission of HIV are:
  - Abstaining entirely from sexual intercourse,
  - Practicing non-penetrative sex,
  - Remaining faithful when neither person is HIV infected, and,
  - Always using condoms during sexual intercourse.
2. Used correctly and consistently, condoms can prevent HIV infection and save lives.
3. Condoms are currently the only available means of preventing the sexual transmission of HIV and some other STIs.

4. Condoms exist for both men and women.
5. Just because a condom's price is low, or the condom is given away free, does not necessarily mean that it is lower quality than a condom sold in a pharmacy shop or market. Low cost or socially marketed or freely distributed condoms may also be of a high quality.
6. Condoms should never be re-used or used after the expiration date on the package.

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#### CONCLUSION

The condom is the only widely used device that offers dual protection against pregnancy and disease when used correctly and consistently. Although vigorous campaigns and researches are on-going to improve acceptance and usage, how soon will the at risk client rely 100% on the condom for protection?