Facing 2007: Oral Sex and HIV Transmission

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Abstract

Oral sex, while common, is often practiced without protection. This is partially due to the belief that oral sex does not present a significant risk factor for the transmission of HIV, a belief that is compounded by the uncertainty present in the research on this topic and the absence of clear recommendations to the public about practicing safer oral sex. However, recent research suggests that oral sex does pose a significant risk for HIV transmission, especially when co-factors such as other STIs are taken into consideration. Approximately 7% of new HIV infections can be attributed to oral sex and the per-contact risk is estimated to be 0.04%. These figures are significant and underline the importance of safer oral sex practices such as the consistent use of condoms and dental dams.

Introduction

Many advances have been made in understanding how HIV infection occurs. As well, increasing numbers of options are becoming available to people that are HIV positive or living with AIDS that can decrease the severity of the symptoms and mortality of AIDS. However, AIDS continues to be a devastating disease and new HIV infections continue. HIV infection rates in Canada, for example, after hitting a low in 2000, have been increasing or constant since that time.[1] Heterosexual infection rates are now close to those of men who have sex with men while intravenous drug users are making up a smaller percentage, thus dispelling the myth that HIV/AIDS issues are only of concern for gay men and injected drug users.[2] With the large majority of new HIV infections occurring through sex, it is important to ask questions about what types of sexual behaviours people are engaging in and the risks associated with those behaviours, in terms of HIV transmission.

Education and awareness campaigns during the last few decades have been effective at convincing people of the risks associated with unprotected anal and vaginal sex. If a person chooses to engage in these activities, they are usually aware that they are putting themselves at risk of contracting a sexually transmitted infection (STI), including HIV. Unprotected oral sex, however, is common. It has been well established, both medically and in the public arena, that many STIs, including gonorrhoea, syphilis,

1 Public Health Agency of Canada, "HIV and AIDS in Canada – Surveillance Report to December 31, 2005," pp. 2 (H121-1/2005-2).

2 Public Health Agency of Canada, "HIV and AIDS in Canada...", 3.

herpes, and hepatitis, can be transmitted through unprotected oral sex.[3,4,5,6,7,8,9,10,11,12] However, there remains a large degree of uncertainty in regards to the risks of HIV transmission through the oral route.

The purpose of this paper is to examine recent medical research surrounding the transmission of HIV through oral sex in an attempt to clarify the risk of infection, and to make recommendations for people who engage in oral sex and who wish to minimize their risk of contracting or transmitting HIV.[13] First, I will examine perceptions about HIV transmission through oral sex and the sources of these perceptions. These perceptions will then be correlated to the medical literature on the topic, both literature suggesting a risk of transmission higher than previously thought as well as literature indicating a relatively low level of risk. I will explore the origins of the uncertainty within and the discrepancy between these sources which will precipitate a need to address the issue of co-factors to HIV infection. The most important of these co-factors, the presence of other STIs, will then be discussed. In the appendices, additional considerations will be raised for sex workers and their clients, lesbians, and transgendered individuals. The evidence hereby presented suggests a very definite risk of HIV transmission through oral sex. Responsible for approximately 7% of new HIV infections and with a per-contact infection rate of 0.04%, oral sex should not be considered a zero-risk activity in terms of HIV and safer oral sex practices should be adopted.

The sources I have used are not meant to be an exhaustive survey of all the literature surrounding

3 S. Syrjänen, "Oral viral infections that could be transmitted oro-genitally," *Oral Diseases* 12, suppl. 1 (Sept. 2006): 2.
4 S Edwards and C Carne, "Oral sex and the transmission of viral STIs," *Sexually Transmitted Infections* 74 (1998): 7-9.
5 M. L. Wong and Roy K. W. Chan, "A prospective study of pharyngeal gonorrhoea and inconsistent condom use for oral sex among female brothel-based sex workers in Singapore," *International Journal of STD & AIDS* 10 (1999): 595.
6 *Morbidity & Mortality Weekly Report*, "Transmission of Primary and Secondary Syphilis by Oral Sex – Chicago, Illinois, 1998-2002," Vol. 53, no. 41 (Oct. 2004): 968.
7 A. K. Ditzen et al., "The syphilis-HIV interdependency," *International Journal of STD & AIDS* 16 (2005): 642.
8 M. Janier et al., "Virological, serological, and epidemiological study of 255 consecutive cases of genital herpes in a sexually transmitted disease clinic of Paris (France): a prospective study," *International Journal of STD & AIDS* 17 (2006): 48.
9 M. B. B. et al., "Ocular syphilis acquired through oral sex in two HIV-infected patients," *The Netherlands Journal of Medicine* 62, no. 6 (June 2004): 206.
10 E. Couturier et al., "Syphilis Surveillance in France, 2002-2003," *Eurosurveillance* 9 (2004): 10.
11 Wong Mee Lian, Roy Chan, & Sharon Wee, "Sex Workers' Perspectives on Condom Use for Oral Sex With Clients: A Qualitative Study," *Health Education & Behaviour* 27, no. 4 (August 2000): 502.
12 M. Ashton, "An outbreak no longer: factors contributing to the return of syphilis in Greater Manchester," *Sexually Transmitted Infections* 79 (2003): 291.
13 Recent here is used to mean research published in the last 10 years – written during or after 1996.

this issue but hopefully do represent a large sample of various medical viewpoints and methods of approach. As well, articles I found to be often cited by other sources were sought out in an attempt to include all of the major discourses on this topic. Furthermore, I intend for this paper to be accessible to members of the public who are not medical or research specialists; an attempt has been made to avoid or define specific medical/academic terms and all of the sources used can be found by utilizing the academic databases at most university libraries.[14] If a word or concept is unfamiliar, the reader is invited to examine the footnotes in case I may have clarified it there.

Perceptions and Sources of Information

Many people believe that oral sex carries very little or no risk of HIV transmission. Unfortunately, many people realize they were mistaken on this point and discover a real risk does exist after they receive a positive HIV test.[15] I hope this paper will be one of many emerging sources of information that will assist people who engage in oral sex to make grounded decisions regarding sexual health.

The majority of people receive their information about the risks associated with unprotected oral sex from television, newspapers, and friends or lovers.[16,17] The reason that this information is not more commonly received from a doctor or a health care worker may be due to the fact that, although many people rely on health care professionals to translate new research findings into concrete recommendations,[18] current medical literature is not definite on the topic of HIV transmission through oral sex. As well, there is a fear shared by many doctors and researchers that practices such as

14 Interested persons who are not familiar with this method of research are advised to ask at the reference desk of a local university library for assistance.
15 For example, see Göran A. Bratt, "Two cases of oral-to-genital HIV-1 transmission," *International Journal of STD & AIDS* 8 (1997): 522.
16 Kaijaleena L. Serlo and H. Aavarinne, "Attitudes of university students towards HIV/AIDS," *Journal of Advanced Nursing* 29, no. 2 (1999): 466.
17 Susan J. Henderson et al., "Older Women and HIV: How Much Do They Know and Where Are They Getting Their Information?" *Journal of the American Geriatrics Society* 52 (2004): 1549.
18 Barbara Gerbert et al., "Perceptions of health care professionals and patients about the risk of HIV transmission through oral sex: a qualitative study," *Patient Education and Counselling* 38 (1999): 50.

recommending condoms for oral sex may cause some people to be less likely to use condoms for anal and vaginal sex. Because anal and vaginal intercourse carry a higher risk of HIV transmission, the fear is that by effectively "disallowing" unprotected oral sex, seen by some as an alternative to unprotected anal or vaginal sex, people may become frustrated with the inability to engage in any form of unprotected sexual contact and 'give-up' on safer sex practices altogether.[19,20,21] Gerbert et al. interviewed 28 health care professionals about their strategies for counselling patients about HIV infection through oral sex and found that only 21% told their patients that it was unsafe. Fifty percent remained ambivalent about recommending barriers, 32% avoided specific recommendations, and 18% avoided all counselling about health risks associated with oral sex.[22] Contrary to this, however, some doctors and researchers are addressing this issue assertively, insisting that people need to be informed that there is a low but very real risk of HIV infection associated with unprotected oral sex and are recommending safer sex practices to people who participate in those activities.[23,24]

Research Suggesting Higher Risk

A significant quantity of new research has been published in the last ten years that aims both to find more specific explanations for the mechanisms of HIV transmission through oral sex and to more clearly define the level of risk that is associated with oral-genital contact. While there is still a lack of needed research data in order to answer these questions definitely, almost all of the new findings agree on a few basic points. First, HIV *can* be transmitted to oral tissue and there are documented cases of HIV transmission through oral sex (accounting for approximately 7% of new infections). Second, although the risk of transmission per-contact seems low (estimated to be 0.04%), it is not zero and

19 Barbara Gerbert, Karen Hezig, and Paul Volberding, "Counselling Patients About HIV Risk from Oral Sex," *Journal of General Internal Medicine* 12 (1997): 699.
20 Gerbert et al., "Perceptions of health...", 57.
21 Jill Waalen, "Oral Sex in Spotlight for HIV Transmission," *Annals of Internal Medicine* 125, no. 4 (Aug. 1996): 56.
22 Gerbert et al., "Perceptions of health...", 54.
23 Waalen, 56.
24 Gerbert, Hezig, and Volberding, "Counselling Patients...," 701-702.

individuals engaging in unprotected oral sex are running a real risk of infection, especially when other co-factors are taken in to consideration.

The research done by a number of groups has indicated that the tissue found in the mouth can indeed be infected with HIV.[25,26,27,28,29] In attempting to explain why the risk of HIV transmission is less in the oral cavity than by genital exposure, many researchers looked at the role of saliva. The hypo-tonic nature of saliva leads to the inactivation of infectious HIV in minutes, which is perhaps why only 1-5% of the saliva from HIV-positive individuals contains infectious HIV, something which makes saliva a low risk factor for HIV transmission.[30,31] However, the effect of saliva on HIV seems to be too slow to be effective in preventing infection when an HIV negative person is exposed orally to fluids with a high concentration of infectious HIV cells like blood, breast milk, or seminal fluid.[32,33,34]

In addition to the laboratory research that indicates that samples of oral tissue can be infected with HIV, a growing number of studies indicate that people are acquiring HIV through oral sex. The two

25 The skin covering our bodies and the insides of our body cavities is made up of many layers of "epithelial" tissue. The type of tissue just below the upper layer of epithelial tissue in our nose, mouth, and genital cavities are called "mucous membranes" or "mucosa". It is important to note that not all mucosa secrete mucus, for example the lips, the head of the penis, and the foreskin are all mucous membranes. Much of the research done on oral tissue looks at the oral mucosa as the most likely infection pathway. The high probability of this pathway is attributed to the fact that more than 80% of HIV infections occur across mucous membranes. (See Zheng et al., 1445).

26 For example, Herzberg, Weinberg, and Wahl recognized the possibility of HIV transmission through the oral cavity, whose epithelial layer is notable for its resistance to infections, when they discovered that although the "epithelial cells lining the mucosa may represent an initial barrier, [they] may also be a conduit for HIV-1 entry". M.C. Herzberg, A. Weinberg, & S.M. Wahl, "The Oral Epithelial Cell and First Encounters with HIV-1," *Advances in Dental Research* 19 (April 2006): 158.

27 Y Han et al., "Productive human immunodeficiency virus-1 infection of epithelial cell lines of salivary gland origin," *Oral Microbiology and Immunology* 15 (2000): 82.

28 Xuan Liu et al., "Human Immunodeficiency Virus Type 1 Infection and Replication in Normal Human Oral Keratinocytes," *Journal of Virology* 77, no. 6 (March 2003): 3473.

29 *AIDS Patient Care and STDs*, "Oral Sex and HIV Investigated," Vol. 17, no. 6 (June 2003): 316.

30 Hypo-tonic here means that there are less solutes in saliva than in other cells found within saliva. Reverse osmosis causes water from the saliva to flow into the cells, possibly deactivating or bursting them.

31 Samuel Baron et al., "Why is HIV Rarely Transmitted by Oral Secretions?" *Archives of Internal Medicine* 159 (Feb. 1999): 303.

32 Here "seminal fluid" refers to "cum" or "ejaculate" as well as to "pre-cum" or "pre-ejaculate". "Pre-cum" is presented by many researchers as carrying a significant risk for HIV transmission (See Berrey and Shea, 475; and Gerbert, Hezig, and Volberding, 698).

33 Baron et al., 308.

34 All of those looking at the role of saliva in either assisting or deterring HIV infection determined that it had important anti-HIV properties that may prove useful in future HIV treatments and preventions. These properties seemed to play a major role in lowering the risk of HIV infection in the oral cavity compared with other mucosa in the body, however those researchers also indicated that oral tissue and saliva still provided mechanisms for HIV transmission and that the risk of infection should not be considered zero, especially when other co-factors are considered. D.C. Shugars et al., "Saliva and inhibition of HIV-1 infection: molecular mechanisms," *Oral Diseases* 8, suppl. 2 (2002): 173; Baron et al., 308; and Y. Han et al., 82.

most common types of statistics seen in these studies are (1) the percentage of new HIV infections that can be attributed to oral sex[35] and (2) the per-contact risk of HIV transmission.[36] The most frequent vector of HIV transmission through oral sex is from the penis of an HIV-positive partner to the mouth of an HIV-negative partner (receptive oral sex). However, there have been documented cases of infection from the mouth to the penis (insertive oral sex), the anus to the mouth (insertive anilingus), and the vagina to the mouth (insertive cunnilingus).[37,38,39,40] There is no indication that other vectors such as mouth-to-vagina or mouth-to-anus should be considered impossible.

As illustrated in Table 1, new research indicates that approximately 7% of new HIV infections can be attributed to oral sex.[41]

2.6%[42]	4%[43]	6%[44]	6.6%/8%[45]	7%[46]	6%/7.8%/ 9.3%[47]	8%[48]	8.7%/10%[49]

Table 1: Percentage of HIV infections attributable to oral sex in eight studies

The reason for this high number is often attributed to the fact that although unprotected oral sex is considered to be "low risk", the high frequency with which unprotected oral sex is practiced increases

35 Percentage of new HIV infections attributable to oral sex: eg. if 100 couples, each with one partner being HIV positive and the other HIV negative, underwent a study in which the only unprotected sexual activity they participated in was oral sex and 7 of the HIV negative partners contracted HIV, the study would claim an oral infection rate of 7%. If, in another study, 100 people had just acquired HIV and 8 of those people had not had any other unprotected sexual contact besides oral sex and the rest had unprotected anal or vaginal sex at least once, the study would claim that 8% of the infections were attributable to oral sex.

36 Per-contact risk refers to the likelihood of contracting HIV through a single act of unprotected oral sex.

37 Edwards and Carne, 6.

38 Hawkins, 308.

39 Robinson and Evans, 737.

40 Gerbert, Hezig, and Volberding, "Counselling Patients...," 699.

41 An attempt has been made to eliminate statistics from different reports that draw on the same research source. More than one value is presented in some reports, this is usually because they are referencing multiple sources or else analyzing their own data in different ways. Statistics for the 12 values presented here: mean = 7, median = 7.4, standard deviation = 2.14.

42 V.L. Gilbart, B. G. Evans, & S Dougan, "HIV transmission among men who have sex with men through oral sex," *Sexually Transmitted Infections* 80 (2004): 324.

43 Juliet Richters et al., "HIV transmission among gay men through oral sex and other uncommon routes: case series of HIV seroconverters, Sydney," *AIDS* 17, no. 15 (2003): 2269.

44 *AIDS Patient Care and STDs*, "Oral Sex More Risky," Vol. 14, no. 4 (2000): 227.

45 *Reproductive Health Matters*, "Risk from oral HIV transmission higher than many realize," Vol. 8, no. 15 (May 2000): 177.

46 Scott Gottlieb, "Oral sex may be important risk factor for HIV infection," *British Medical Journal* 320 (Feb. 2000): 400.

47 David A. Hawkins, "Oral sex and HIV transmission," *Sexually Transmitted Infections* 77 (2001):307.

48 Scott Gottlieb, "Unprotected oral sex can transmit HIV," *British Medical Journal* 326 (April 2003): 730.

49 Edwards and Carne, 6-7.

the likelihood of HIV transmission through that practice.[50]

Gauging the number of new HIV infections that can be attributed to oral sex is difficult. Researchers have presented a variation in this percentage due to a number of factors which include the difficulty of finding sero-discordant couples who engage only in oral sex and the large number of co-factors that may lead researchers to discount sero-conversions as not being due specifically to oral sex.[51] As well, discrepancies arise between studies in regards to things like the frequency of oral sex, how the oral sex takes place (how long the contact was, how aggressive the contact was, if there was an ejaculation into the mouth, etc.), number of participants, and other individualistic factors that may be important (amount of pre-cum, structure of the individual's penis/oral cavity, geographic location, individual factors affecting infectiousness of the HIV-positive individual such as T-cell count, anti-retro-viral drugs, etc.).

Several medical teams have examined the question of how low the risk associated with unprotected oral sex, considered to be a "low-risk activity", really is. The three reports referenced here all give an estimated per-contact risk of 0.04% for unprotected oral sex with a partner of whom the HIV-status is unknown.[52,53,54,55] Additionally, one report determined there was a 0.06% risk of infection for unprotected oral sex with a partner who is known to be HIV-positive.[56] These numbers are given as a starting point for addressing HIV transmission through oral sex and will change and become more precise as this issue is targeted by more and more research. In order to illustrate what these numbers mean, especially for people who frequently engage in unprotected oral sex, Table 2 presents a simplified

50 Wong Mee Lian, Roy Chan, & Sharon Wee, "Sex Workers' Perspectives on Condom Use for Oral Sex With Clients: A Qualitative Study," *Health Education & Behaviour* 27, no. 4 (August 2000): 503.

51 A sero-discordant couple refers to a couple wherein one partner is HIV-positive and the other is HIV-negative. Sero-conversion refers to when someone who is HIV-negative becomes HIV-positive.

52 The per-contact risk statistic for a partner of unknown sero-status already takes into consideration the fact that some partners will not be HIV-positive and would therefore present a 0% risk of infection. The statistic is useful for establishing an general idea of the degree of risk that can be associated with oral sex as in most cases it is not possible to determine if a partner is HIV-positive or not.

53 D.C. Shugars et al., 173.

54 K. Page-Shafer et al., "Saliva, Breast Milk, and Mucosal Fluids in HIV Transmission," *Advances in Dental Research* 19 (April 2006): 155.

55 S Syrjänen, "Oral viral infections that could be transmitted oro-genitally," *Oral Diseases* 12, suppl. 1 (Sept. 2006): 2

56 D.C. Shugars et al., 173.

extrapolation of the numbers found in the three reports, based on the assumption that the numbers given above are completely accurate.

Number of Acts	0.04% per-contact risk	0.06% per-contact risk
10	0.40%	0.60%
100	3.92%	5.83%
200	7.69%	11.31%
500	18.13%	25.92%
1000	32.97%	45.13%
1500	45.13%	59.35%

Table 2: Cumulative Risk Factor for Acquiring HIV Through Multiple Acts of Oral Sex[57]

Although it is necessary to await more research before placing confidence in the numbers given above, they provide a compelling reason to consider safer sex alternatives such as condoms or dental dams. The is of special import for the many people who often engage in oral sex such as sex workers, many of whom may reasonably have 500 oral sex encounters in the course of one year.

Research Indicating Lower Risk

There are some studies that present a much lower associated risk of HIV transmission through oral sex. The two most often quoted are del Romero et al. (2002) and Campo et al (2006).[58,59] The first presents data from 135 HIV-negative individuals whose only reported HIV risk factor was unprotected oral sex. These people, when taken as a whole, reported some 19,000 acts of unprotected oral sex over the course of the study with not a single occurrence of HIV infection. The second article, whose authors included members of the first research team, takes another look at the original data from the del Romero article in light of other research that had emerged since its writing in 2002.

The del Romero research suggests strongly that the risk of HIV transmission through the oral route

57 The calculation in this table was performed using the formula: 100% - Chance of not being infected = 100 * (1 – 0.9996^N) where N = the number of unprotected acts of oral sex. The formula above is for the 0.04% risk statistic, substitute 0.9994 for 0.9996 to obtain the cumulative risk for the 0.06% risk statistic.

58 del Romero, Jorge et al. “Evaluating the risk of HIV transmission through unprotected orogenital sex.” *AIDS* 16, no. 9 (June 2002): 1296-1297.

59 Campo, Julian et al. “Oral transmission of HIV, reality or fiction? An update,” *Oral Diseases* 12 (2006): 219-228.

has been overestimated and is possibly much lower than the figures cited above. In addition, it raises other questions about how the research surrounding these issues is done. For example, it is possible that factors other than oral sex might be to blame for the sero-conversions seen in some of the other research.[60] As mentioned earlier, it is the dominant assumption of both the public and many medical professionals that oral sex poses little or no risk of HIV transmission. However, it is important not to privilege conclusions that coincide with popular assumption over conclusions that do not. The 2006 Campo article, although emphasizing that oral sex appears to be a lower-risk behaviour, agrees with this cautionary advice as can be seen in their qualifying note: "oral sex has always been considered less risky compared with other sexual behaviours, although it does not appear to be definitely risk free".[61]

Co-factors to Infection

As the studies mentioned above illustrate, there is a marked uncertainty as to the degree of risk oral sex poses for HIV transmission that is echoed in almost all of the research concerning this topic. A large part of this uncertainty stems from not knowing which sero-conversions can really be associated with oral sex and which ones should be discounted. One factor is that most sexually active people engage in multiple forms of sexual activity so that, although HIV transmission may have occurred through oral sex, it can not be ascertained which sexual practice in particular was the cause and therefore the transmission is usually assumed to have occurred through other means, such as anal or vaginal intercourse.[62] Other cases of oral HIV-transmission are often not included in the statistics presented by research teams because of factors seen as potential causes for increased risk as compared to "normal" cases. For example, Richters et al. discounted a sero-conversion in their results because the patient had had gingivitis and dental treatment prior to infection.[63] Although this makes sense when trying to

60 For example, in the del Romero article, 4 sero-conversions were attributed to anal or vaginal sex and not included in the results (see del Romero, 1297).
61 Campo, 220.
62 Page-Shafer, 155.
63 Richters et al., 2270.

establish basic risk statistics for oral HIV transmission, the number of possible co-factors to transmission is so large that it is difficult to establish what a "normal" case would be.

Of the large number of possible co-factors to HIV transmission through the mouth, some are present in rare cases, like genital/oral piercings or recent surgeries in the mouth or throat such as a tonsillectomy,[64,65] while others exist in many individuals and should be taken into consideration as an indication of how easily oral resistance to HIV can be affected. Wallace reports that smoking crack cocaine increases the likelihood of being infected by HIV through the mouth, possibly due to the lip and mouth injuries produced by this practice.[66] A less obvious co-factor is alcohol. Emphasizing their statement that "unlike other mucosal sites, the integrity of the mucosal membrane of the oral cavity can be directly affected by food and beverages", Zheng et al. demonstrate that the presence of an ethanol concentration as low as 3-4% (the same found in most beers) was enough to significantly increase the infection of oral cells by HIV.[67] O'Connel also reminds us that even oral contraceptives may increase the susceptibility to HIV infection by inhibiting the cell-mediated immune system.[68]

Another major co-factor that should be considered is the presence of another STI. It is well established that unprotected oral sex is a clear route of transmission for many STIs including gonorrhoea, syphilis, herpes, hepatitis, and chlamydia. For example, a study looking at female workers in a Singapore brothel found that gonorrhoea was over 17 times more likely to be transmitted when a condom was not used.[69] Often times, these STIs can be infectious even when there are no visible symptoms. Accordingly, it is widely accepted that, with regards to the STIs mentioned above, unprotected oral sex is not "safe". However, what is not as well-known is the effect the presence of these STIs has on increasing the likelihood of HIV transmission during unprotected oral sex. Herpes,[70]

64 Richters et al., 2270.
65 M. Michelle Berrey and Theresa Shea, "Oral Sex and HIV Transmission," *Journal of Acquired Immune Deficiency Syndromes & Human Retrovirol* 14, no. 5 (April: 1997): 475.
66 Wallace, 470.
67 Zheng, 1445.
68 O'connel, 477
69 Wong and Chan, 595.
70 F. X. Mbopi-Keou et al., "Interactions between human immunodeficiency virus and herpes viruses within the oral mucosa," *Clinical Microbiology and Infectious Diseases* 11 (2005): 84.

gonorrhoea,[71] and syphilis[72,73] have all been identified as definitely increasing the likelihood of HIV transmission through the mouth. This is especially significant in light of the recent outbreak of syphilis in the western world and in China that began around the turn of the millennium.

If a person engages in oral sex assuming that their risk of acquiring HIV is low, they are also assuming that their partner does not have any other STIs and that no other co-factors are at play. Due to the large number of other co-factors and the prevalence of visually undetectable STIs, their low-risk assumption may prove to be quite wrong. This is especially true because people who practice unprotected oral sex are at a much higher risk for contracting other STIs and therefore are more likely to transmit or become infected by HIV.

Conclusion

It is clear that HIV transmission is possible through oral sex. In addition to the risk associated with "normal" oral tissue, there are a huge number of co-factors that can increase the possibility of infection. Due to the difficulty in gauging which of these co-factors may be at play and the extent of the effect they may have, as well as the difficulty in trying to isolate oral sex as the sole factor for transmission, the statistics given for both the percentage of new HIV infections attributable to oral sex and the per-contact risk have a degree of uncertainty associated with them. However, all of the emerging research suggests caution and indicates that although unprotected oral sex may be considered "low-risk", it should not be considered "no risk".

71 Wong and Chan, 595.
72 *Morbidity & Mortality Weekly Report*, 968.
73 A. K. Ditzen et al., "The syphilis-HIV interdependency," *International Journal of STD & AIDS* 16 (2005): 643.

Appendix A - Special Considerations

Special considerations for sex workers and clients of sex workers

A number of factors should be taken into special consideration by sex workers, clients of sex workers, and other people who engage in frequent acts of oral sex or who are involved sexually with people who engage in frequent acts of oral sex. The most obvious of these is that although the risk of HIV transmission through unprotected oral sex may be low (currently estimated at 0.04% per contact), a high frequency of unprotected oral sex compounds this risk and increases the likelihood of infection. As suggested in *Table 2,* extending the 0.04% risk factor over 500 unprotected acts of oral sex may present a risk as high as 18% for contracting HIV. Sex workers who frequently perform unprotected oral sex and clients who frequently receive unprotected oral sex are much more likely to contract other STIs, which often do not have visible symptoms. These further increase the likelihood of HIV transmission and infection.

Transmission can occur from penis-to-mouth, mouth-to-penis, anus-to-mouth, and vagina-to-mouth contact.[74] This means that clients of sex workers are at risk of contracting HIV when *receiving* unprotected oral sex.[75]

Condoms that are designed for oral sex are often freely available and can be used to the comfort and pleasure of both the sex worker and the client. For example, one can often find the brightly coloured Lifestyles condoms in banana, vanilla, and strawberry flavours for free at STI clinics and offices offering sexual health services.[76] Sex workers may find speaking with other sex workers or with sex worker advocacy groups helpful in developing ways to introduce condoms for oral sex to their clients in a way that is positive, provocative, and allows for both parties to feel safer about the risk of HIV/STI transmission. Clients of sex workers should insist on condoms when engaging in oral sex for

74 Mouth-to-vagina and mouth-to-anus transmissions were not documented in the research considered in this paper but should not be considered impossible.

75 Known as a bare-backed blowjob (BBBJ).

76 The author in no way endorses Lifestyles condoms over other condoms. This type is simply often available for free or is inexpensive to buy.

their own safety and as part of an informed sexual experience.

Although this paper does not have the breadth to discuss the following issue adequately, it should also be noted that immigrant sex workers are often associated with a less consistent condom use for oral sex, as seen in the Lian study in Australia.[77] Often this is because these workers experience more desperate situations due to the intersection of poverty, class, race, gender, language, and resident status. Other sex workers, organizations, and clients need to recognize that these people are being further marginalized as they are often pressured to engage in unprotected oral sex in ways that people identified as being "local" are not, and that they need support.

Special considerations for lesbians and bi-sexual women

As is often the case in medical research, women who have sex with women (WSW) are largely ignored in the literature I examined. There is very little data that focuses on oral-vaginal contact and HIV transmission and even less that focuses on WSW in particular. There are documented cases of HIV being transmitted from the vagina of one partner to the mouth of another but even these cases are often qualified and under-examined.[78,79,80] It is necessary that doctors and health institutions continue to be pressured to consider WSW-specific concerns in regard to HIV and oral sex. Until more research has been done, WSW must make their decisions about HIV and oral sex based on the fact that it is simply not clear what the associated risks are. I hope that many will choose to error on the side of caution and practice protected oral sex.[81]

77 Lian, Chan, and Wee, 503.
78 See Edwards and Carne who claim "that not all cases of apparent female to female oral transmission are genuine as there appears to be an underreporting of bisexual activity." Edwards and Carne, 6.
79 Hawkins, 308.
80 Robinson and Evans, 737.
81 Medical clinics and queer-support centres should continue to be pressured to provide free dental dams in the same way that they provide free condoms.

Special considerations for transgendered individuals

Unfortunately there is very little research specific to transgendered individuals in the area of HIV transmission through oral sex. However, the O'Connel article which discusses the effects of estrogen and progesterone-based contraception on the cell-based immune system should be seen as a warning flag that there may be other associated risk factors for individuals following hormonal medication routines.[82] This may mean that practicing protected oral sex is of increased importance to these individuals. This association will hopefully be explored in future research for both estrogen-based and testosterone-based hormone therapies.

82 O'Connel, 477.

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