

HIV Transmission:

Guidelines for Assessing Risk



**A RESOURCE FOR EDUCATORS, COUNSELLORS
AND HEALTH CARE PROVIDERS**

Fifth Edition

*Canadian AIDS
Society*



*Société canadienne
du sida*

HIV Transmission:

Guidelines for Assessing Risk

**A RESOURCE FOR EDUCATORS, COUNSELLORS
AND HEALTH CARE PROVIDERS**

Fifth Edition

*Canadian AIDS
Society*



*Société canadienne
du sida*

Copyright © 2004 Canadian AIDS Society / Société canadienne du sida

All rights reserved. No part of this publication may be reproduced or transmitted for commercial purposes in any form or by any means, electronic, mechanical, including photocopy, recording or any information storage or retrieval system now known or to be invented without permission in writing from the publisher. Permission is granted for non-commercial reproduction.

ISBN

Funding for this publication was provided by Health Canada.

The opinions expressed in this publication are those of the authors/researchers and do not necessarily reflect the official views of Health Canada.

Ce document est aussi disponible en français.

Contents

Foreward and Acknowledgements	3	Fingering (Anal and Vaginal)	25
Quick Reference HIV	5	Fisting (Anal and Vaginal)	26
Quick Reference Hepatitis C	6	Masturbation by Partner	26
1. Guidelines Context		Using Insertive Sex Toys	27
Who is this document for?	7	Sadomasochistic Activities	28
How the Document Was Produced	7	Contact with Feces	28
Affirming Sexuality and the Risk Reduction		Urination	28
Approach	7	Vulva-to-vulva rubbing	29
The Challenge of Providing Accurate		Docking	29
Information	8	Breast milk	29
What Does Risk Mean?	9	Cultural Practices	29
Assessing Risk of HCV Transmission	10	Part 2. Drug Use	
Risk Reduction	10	Injection Drug Use	30
The Sexual and Drug Taking Continuum	10	Non-Injection Drug Use	31
2. Aspects of HIV Transmission		Part 3. Other Activities Involving Needles Tattooing,	
Poverty and Health	11	Piercing, Electrolysis and Acupuncture	31
Power and Negotiation	11	Part 4. Mother-to-Child Transmission	
Stigma, Grief and Loss	12	Breast Feeding	32
Alcohol and Other Substances	13	Vertical Transmission	32
Relationships	13	Part 5. Artificial Insemination, Blood Transfusion	
Maintaining Risk Reduction Strategies	14	and Organ Transplants	32
Risk Reduction is for Everyone	14	Part 6. Other	
HIV and Prisons	15	Branding and Scarification	33
Enhancing the Health of People Living with		Esthetics	33
HIV/AIDS	15	Fighting	33
3. HIV Transmission		Intentional Blood Exchange	36
Evolution of the Model	17	Occupational Exposure	36
Conditions for HIV Transmission	17	Sharing toothbrushes, razors etc.	36
Factors Used to Determine the Level of Risk	18	5. Hepatitis C Transmission	
Categories for Assessing Risk	18	Differences between HIV and HCV	37
4. Assessing Risk of HIV Transmission		Conditions for Transmission of HCV	37
Part 1. Sexual Activities		Factors Used to Determine the Level of Risk	38
Kissing	21	Categories for Assessing Risk	38
Oral Sex: Fellatio	21	Challenges of Assessing Risk for HCV	39
Oral Sex: Cunnilingus	22		
Oral Sex: Anilingus	23		
Intercourse: Penile–Vaginal	23		
Intercourse: Penile–Anal	24		

HIV TRANSMISSION: Guidelines for Assessing Risk

6. Assessing Risk of Hepatitis C Transmission

Part 1. Sexual Activities

Kissing	41
Oral Sex: Fellatio	41
Oral Sex: Cunnilingus.	42
Oral Sex: Anilingus.	42
Intercourse: Penile–Vaginal.	43
Intercourse: Penile–Anal	43
Fingering (Anal and Vaginal)	44
Fisting (Anal and Vaginal).	44
Masturbation by Partner.	45
Using Insertive Sex Toys	45
Sadomasochistic Activities.	45
Contact with Feces	46
Urination	46
Vulva-to-vulva rubbing.	46
Docking	47
Breast milk	47
Cultural Practices	47

Part 2. Drug Use

Injection Drug Use	47
Non-Injection Drug Use.	48

Part 3. Other Activities Involving Needles

Tattooing, Piercing, Electrolysis and Acupuncture	48
--	----

Part 4. Maternal Transmission

Breast Feeding	49
Vertical Transmission	49

Part 5. Artificial Insemination, Blood Transfusion and Organ Transplants.

Organ Transplants.	49
----------------------------	----

Part 6. Other

Branding and Scarification	49
Esthetics	50
Fighting	50
Intentional Exposure to Blood	50
Occupational Exposure.	50
Sharing toothbrushes, razors etc.	51

7. Increasing and Reducing Risk: Barrier Methods for Sexual Transmission of HIV

Condoms.	53
Quality Control	53
Latex Condoms	53
Lambskin Condoms	53
Synthetic Condoms	53

Polyurethane Condoms.	54
Male Condom Use	54
Buying and Storing.	54
Female Condom Use	55
The Female Condom for Anal Intercourse?	56
Dental Dams	56
Plastic Wrap.	56
Latex Gloves and Finger Cots	56
Cervical Barriers	57

8. Increasing and Reducing Risk of HIV:

Biological Factors

A. Mucosal Immunity and HIV	59
Sexually Transmitted Infections.	59
Common Vaginal Infections	59
Open Cuts, Sores, Lesions, Ulcers, Burns and Rashes	59
Vaginal Drying	60
Circumcision	60
Saliva	60
Eyes	60
Crack Cocaine	60
Douching and Enemas	60
Spermicides and Microbicides.	60
Hormonal Contraceptives	61
B. HIV Viral Load and Treatments	61
Post-Exposure Prophylaxis	62
Co-Infection with HIV and HCV	62

Appendix 1: Suggestions for Further Reading . . 63

Foreward and Acknowledgements

The 5th edition of *HIV Transmission: Guidelines for Assessing Risk* marks a significant step forward in the evolution of the Canadian AIDS Society's guidelines. For the first time, the revised guidelines incorporate hepatitis C (HCV) information and a section on assessing the risk of HCV infection. It also contains information included in the last edition, such as that on injection drug use and maternal transmission. As well, this edition retains the range of biological factors, including mucosal immunity, and HIV viral load, highlighting the complex factors that may increase or reduce an individual's risk of infection.

HIV and HCV transmission do not occur in a biological vacuum. Research over the past few years has demonstrated a complex interplay among biological, sociological, psychological and economic factors that influences the vulnerability of individuals and specific groups of individuals to viral transmission. It has become clearer and clearer that issues of class, power and socioeconomic status are major determinants of susceptibility to HIV infection. The model of attributing risk of HIV transmission to various activities has been retained, but an introductory section has been included to place the scientific information presented in later sections in context. Educators and health care providers must realize that to prevent HIV transmission successfully they must incorporate prevention information within the reality of an individual's life. Using a condom may not be possible for everyone, for a variety of complex reasons. Similarly, abstaining from taking drugs or using a new and/or unshared needle and syringe every time a drug is injected may not be possible for everyone. All educators and health care providers should work towards developing strategies that can help reduce an individual's risk of HIV infection, even if that risk is not eliminated. This may mean, for example, that assisting an individual to find stable housing may be more effective at preventing transmission than providing the individual with a box of condoms.

We hope that these guidelines offer a framework from which to work with individuals from diverse communities and life experiences. These guidelines are by no means the final word. As information and circumstances change, so too

will the guidelines. The HIV and HCV epidemics are far from over. In fact, they are constantly growing and shifting. Treatment advances are enabling many people with HIV to live longer and healthier than in the past. However, we are a long way from a cure, for either HIV or HCV and there are no vaccines in sight to prevent further infections. HIV and HCV prevention and education remains our strongest weapon in the fight against these diseases.

In contrast to previous editions, these guidelines incorporate transmission information and assessment of risk for HCV, a major concern for those people doing HIV work in the community. HCV infection in Canada is rapidly on the rise, especially among injection drug users, and many in public health and the medical community consider it to be an epidemic on a grand scale. As a result, information has been included here about HCV and assessing its risk, acknowledging the many AIDS Service Organizations and front-line workers who have taken on the role of delivering HCV transmission information in the absence of an official strategy from Health Canada on coping with this second epidemic.

The Canadian AIDS Society continues to acknowledge the assistance of the organizations and individuals who contributed to the first, second and third editions of this document in 1988, 1994 and 1999, respectively.

We wish to express our gratitude to those who assisted us in developing the framework for this fourth edition. In particular, we are grateful for the time, energy and enthusiasm of the Review Committee, comprised of Daryn Bond, Claire Checkland, Darren Greer, Marc-André LeBlanc, Michael Mancinelli, Roger Procyk, Maxxine Rattner, Shaleena Theophilus, Kim Thomas, Sarah Tsiang, Lynne Belle-Isle, Stéphanie Laporte, Christian Joubert, Michel Morin, Dominic Lévesque, Linda Truglia, Jean Dussault and Jeremy Ries. The Canadian AIDS Society would also like to thank all those who worked on previous editions of the guidelines, including Health Hounds, and the consultants and writers. This edition contains much that has gone before and could not have been completed without their contributions.

HIV TRANSMISSION: Guidelines for Assessing Risk

The consultation process for this edition involved educators, health care providers, researchers, people living with HIV/AIDS, people living with HCV and others from many organizations across Canada. Many of these individuals included their colleagues in the consultation, and we thank all those who devoted time and energy to the project.

Canadian AIDS Society, June 2005

Quick Reference

Categories for Assessing HIV Risk

1. No risk

To our knowledge, none of the practices in this category have ever been demonstrated to lead to HIV infection. There is no potential for transmission since all of the basic conditions for viral transmission are not present.

Potential for transmission None

Evidence of transmission None

Examples: Kissing (no blood); non-insertive masturbation; receiving unshared sex toys; contact with feces or urine (unbroken skin); injecting with unshared needles; using drugs with new pipe or straw; sadomasochistic activities (with universal precautions); tattooing, piercing, electrolysis and acupuncture with sterilized and new equipment; manicures or pedicures.

2. Negligible risk

All of the practices assigned to this risk level present a potential for HIV transmission because they involve an exchange of body fluids, such as semen (including precum), vaginal fluid, blood or breast milk. However, the amounts, conditions and media of exchange are such that the efficiency of HIV transmission appears to be greatly diminished. There are no confirmed reports of infection from these activities.

Potential for transmission Yes

Evidence of transmission: None

Examples: Receiving fellatio or cunnilingus; performing fellatio or cunnilingus with barrier; anilingus; fingering; fisting; using shared sex toys with a condom; using disinfected sex toys; sadomasochistic activities; contact with feces or urine (on broken skin); vulva-to-vulva rubbing; docking; taking breast milk into the mouth; using drugs with shared pipe or straw; tattooing, piercing, electrolysis and acupuncture with shared equipment; fighting; sharing toothbrushes and razors.

3. Low risk

All of the practices assigned this risk level present a potential for HIV transmission because they involve an exchange of body fluids such as semen (including precum), vaginal fluid, blood or breast milk. There are also a few reports of infection attributed to these activities (usually through individual case studies or anecdotal reports, and usually under certain identifiable conditions).

Potential for transmission Yes

Evidence of transmission: . . . Yes (under certain conditions)

Examples: Kissing (with exchange of blood); performing fellatio or cunnilingus without barrier; intercourse (penile-anal or penile-vaginal) with barrier; injecting with cleaned needles; tattooing with non-professional equipment; taking blood in the mouth; occupational exposure.

4. High risk

All of the practices assigned this risk level present a potential for HIV transmission because they involve an exchange of body fluids, such as semen (including precum), vaginal fluid, blood or breast milk. In addition, a significant number of scientific studies have repeatedly associated the activities with HIV infection. Even when the exact mechanism of transmission is not completely clear, the results of such studies conclude that activities in this category are high risk.

Potential for transmission Yes

Evidence of transmission Yes

Examples: Penile-anal or penile-vaginal intercourse without condom; receiving shared sex toys; injecting with shared needles.

Quick Reference

Categories for Assessing Hepatitis C Risk

1. No risk

To our knowledge, none of the practices in this category have ever been demonstrated to lead to HCV infection. There is no potential for transmission since all of the basic conditions for viral transmission are not present.

Potential for transmission None
Evidence of transmission None

Examples: Kissing without the exchange of blood; sado-masochistic activities (with universal precautions); contact with feces or urine (unbroken skin); injecting, smoking and snorting drugs using new equipment; tattooing, piercing, branding, scarification, manicures, pedicures, electrolysis and acupuncture with sterilized and new equipment.

2. Negligible risk

All of the practices assigned this risk level present a potential for HCV transmission because they involve an exchange of blood. However, the amounts, conditions and media of exchange are such that the efficiency of HCV transmission appears to be greatly diminished. There are no confirmed reports of infection from these activities.

Potential for transmission Yes
Evidence of transmission None

Examples: Fellatio; cunnilingus; anilingus; fingering; non-insertive masturbation; sado-masochistic activities with exchange of blood; contact with feces or urine (on broken skin); vulva-to-vulva rubbing, docking, giving or receiving breast milk into the mouth; fighting.

3. Low risk

All of the practices assigned this risk level present a potential for HCV transmission because they involve an exchange of blood. There are also a few reports of infection attributed to these activities (usually through individual case studies or anecdotal reports, and usually under certain identifiable conditions).

Potential for transmission Yes
Evidence of transmission . . . Yes (under certain conditions)

Examples: penile-vaginal and penile-anal intercourse; fisting; snorting and smoking drugs using shared equipment; manicures and pedicures with uncleaned equipment; sharing toothbrushes and razors.

4. High risk

All of the practices assigned this risk level present a potential for HCV transmission because they involve an exchange of blood. In addition, a significant number of scientific studies have repeatedly associated the activities with HCV infection. Even when the exact mechanism of transmission is not completely clear, the results of such studies conclude that activities in this category are high risk.

Potential for transmission Yes
Evidence of transmission Yes

Examples: Injecting drugs using shared and cleaned needles or mixing equipment; tattooing, piercing, electrolysis and acupuncture with shared equipment; occupational exposure.

1. Guidelines Context

Who is this document for?

This document:

- offers a framework for judging the levels of risk of transmission of HIV and hepatitis C virus (HCV) through various activities;
- summarizes the implications of the current medical and scientific evidence on HIV and HCV transmission; and
- discusses risk reduction strategies and psychosocial factors which may affect a person's ability to adopt them.

These guidelines are intended as a resource for educators, counsellors, health care providers and others who provide information and support about safer sex, substance use and HIV and HCV transmission in various community settings. It is assumed that the reader will have a degree of familiarity with scientific and technical language about HIV transmission and risk reduction. The companion brochures, *HIV Transmission – Things You Should Know* and *Hepatitis C Transmission – Things You Should Know* which contain a plain language summary of the information contained here, are intended for distribution to service users.

Although these guidelines are not a complete “how to” guide for service providers, they offer a place from which to start. Other sources need to be consulted to learn more about the means of equipping people with the understanding, motivation, skills, resources and social support necessary to make informed decisions about their sexual, substance-using and other life choices.

Above all, this document is intended as a resource tool to assist in the delivery of consistent and coherent information and support across a variety of settings. It is meant to provide information that will assist individuals to make decisions about the levels of risk they are willing to accept, and the types of activities that they are willing to do.

Because many AIDS Service Organizations have assumed some responsibility of providing HCV prevention information and may be dealing with co-infection issues, this edition also includes some information on assessing risk for HCV. HCV risk assessment information is provided in separate chapters.

How the Document Was Produced

The first edition of the guidelines originated in 1988 from a request by member organizations of the Canadian AIDS Society (CAS). They were concerned by the confusion resulting from the distribution of inconsistent safer sex, drug use/safe injection, and vertical transmission information across the country.

In response, CAS brought together a group of scientific experts and educators to produce the approach that appeared in the highly successful first edition of these guidelines. This fifth edition is the result of a three-part process: (1) an exhaustive review of the literature; (2) a national consultation of medical, scientific and community-based experts to assess the continuing accuracy of the document, how it has been used and how it could be improved; and (3) review of a draft of the final document by a committee of educators, counsellors, health care providers and health care policy analysts. The ultimate objective of regularly reviewing these guidelines is to ensure that they reflect current information and understanding about HIV transmission, and retain a reputation as one of the most authoritative publications of its kind.

Affirming Sexuality and the Risk Reduction Approach

Since the beginning of the HIV and HCV epidemics, it has become a truism that prevention education represents our best hope of controlling the effects of these viruses. Despite the importance of prevention messages, the public has not always been given basic, complete and easily understood information that distinguishes between sexual and substance use practices that place individuals at risk of HIV and/or HCV infection and practices they can enjoy without worry of infection.

Social disapproval and discomfort about sexuality and drug use have often led to either unhelpful coyness and innuendo or self-censorship and official silence. Too often the HIV and HCV epidemics have been used, either consciously or unconsciously, to reinforce notions of “good” and “bad” behaviour.

HIV TRANSMISSION: Guidelines for Assessing Risk

The CAS perspective concerning risk reduction has four dimensions.

1. Effective prevention and sexual pleasure are compatible. Research has shown that individuals will voluntarily practise risk-reducing behaviour if they feel good about themselves, about the preventive measures they are taking and about their capacity to incorporate such measures into their lives.
2. HIV prevention messages should focus upon substance use as a health issue, rather than moral or criminal issues. Effective prevention measures need to acknowledge that stopping alcohol and other substance use is not possible for everyone. Risk reduction strategies offer a variety of practical options aimed at decreasing the likelihood of HIV and HCV transmission associated with substance use.
3. All women have the right to make their own decisions about pregnancy and childbirth. They should be provided with accurate information about their options, including alternatives for delivery, termination of the pregnancy and therapeutic options (for HIV) to reduce the risk of transmission to the fetus if they are HIV positive or living with HCV.
4. Information, education and counselling about HIV transmission must take into account the wide variety of psychological and social factors that can influence a person's capacity to adopt or maintain risk-reducing behaviour.

To achieve and to reinforce positive behaviour change, it is important to affirm both sexuality and risk reduction, and acknowledge the key role they play in personal health. Healthy sexuality and choices about substance use will mean different things to different people, depending on their experiences, values and customs. Rather than attempting to get diverse groups of people to conform to a specific moral code or lifestyle norm, we are more likely to bring about changes by presenting risk reduction options most appropriate to the practices and desires of different individuals. That is why the emphasis of these guidelines is on information that can be applied to everyone and that respects individual choice. This edition aims at providing information and support to enable people to make informed choices rather than giving advice. It also focusses on scenarios where informed choice does not play the same role as it does in consensual

sex or harm reduction, such as mother-to-child transmission and sexual assault issues.

Subject to the limitations imposed by anatomy, it is also assumed that no particular activity is confined to any one group or class of people. Any or all of the activities described here may be practised by gay men, lesbians, heterosexual and bisexual men and women, two-spirited people¹, transexual and transgendered people in all racial, linguistic and ethnocultural communities.

It is hoped that the guidelines will encourage practices that individuals feel comfortable with, that bring them pleasure, and that promote their health and the health of others.

The Challenge of Providing Accurate Information

The safer sex strategy with which we are now familiar was developed before HIV was identified as the underlying cause of AIDS. The earliest AIDS-specific safer sex guidelines date from 1983 and were modelled on precautions to reduce the transmission of hepatitis B, which then was prevalent in communities becoming affected by AIDS. In the 20 years since those first prevention messages, a considerable amount of research has been conducted confirming much of the initial information and clarifying different levels of risk for different sexual practices.

However, providing information about safer sex cannot remove all degrees of ambiguity from our messages. The word “safer” implies that a level of safety can be achieved, but that absolute guarantees do not exist. This lack of certainty can lead to anxieties that inhibit some people's ability to adopt or maintain risk-reducing practices. These guidelines therefore now mainly refer to “risk reduction” or “HIV and HCV prevention” rather than “safer sex.” The guidelines also acknowledge that although total “risk elimination” may be the objective of the hyper-vigilant, it is not necessarily achievable (or even desirable) in the context of many individuals' real lives.

Lack of evidence has also led to a wide variation in risk reduction information offered by different sources. Those wishing to educate themselves about HIV transmission have often been confused by conflicting information, differences in emphasis and inconsistent terminology. For example, the

1. Aboriginal lesbian, gay and bisexual people.

HIV TRANSMISSION: Guidelines for Assessing Risk

same act could be described in one pamphlet as “probably safe” and in another as “possibly dangerous.”

Providing basic information to injection drug users about how to avoid HIV and/or HCV transmission is no less complex. The uneven availability of needle exchange and disposal facilities, the frequency with which some users inject, uncertainty about the efficacy of some equipment cleaning techniques and the lack of access to information about other health risks associated with needle use, all present significant challenges to counsellors, educators and health care providers.

The goal of this document is to offer a logical approach to the theory and evidence of HIV transmission, and to provide a consistent framework for realistically assessing the risk represented by various activities.

This edition also includes the risk of HCV infection through the various activities discussed. Information about the risk of transmission of this virus is becoming more widely agreed upon and many ASOs are beginning to incorporate HCV risk information into their prevention strategies.

What Does Risk Mean?

Because of the uncertainties about HIV transmission, educators and counsellors have chosen to use a qualitative “levels of risk” model. The model used in these guidelines places sexual and drug using activities into categories according to their level of risk of HIV and/or HCV transmission.

We negotiate risk in our lives every day and make decisions, both consciously and unconsciously, about the levels of risk taking with which we can cope. Every time we ride a bicycle, walk on city sidewalks, drive a car or take an airplane, we are taking a risk. We hear a great deal about the health risks of drinking coffee, smoking cigarettes or drinking alcohol — risks that may eventually shorten our lives — and our actions show how we deal with that knowledge. The more we are aware of the risk, the better we are able to choose our actions. Sexual, drug-taking and reproductive choices should be placed in the context of other risks we face in our lives.

Risk reduction information should acknowledge the options that can be exercised by people who feel comfortable with some risk, as well as validate the more cautious approaches of those who want greater assurances. There are “no-risk”

options for engaging in sex and substance use and some will choose them. However, for many people, some level of risk is probably either acceptable or unavoidable, making it necessary to include a broad range of risk reduction choices in HIV prevention education.

Throughout the guidelines there is discussion of risk being ‘slightly reduced’ by certain behaviours (e.g., giving fellatio without a condom and not swallowing semen being less of a risk than swallowing.). However, mention of this reduction of risk does not necessarily mean a change from one category to another (e.g., from high to low risk) but rather indicates different levels of risk within one category. For a categorized assessment of risk for all sexual, drug-taking and other activities, refer to sections 4 and 6.

Criticisms of the Risk Model

There have been some criticisms of the use of the risk model in HIV prevention information. A recurring one is that risk categories do not reflect people’s “real world” thinking about sexuality, nor do they reflect the “continuum” along which sexual activity occurs (the flow and ebb of sex, with one act stimulating or leading into another). Another criticism is that some groups of people who are deemed to be at increased risk for HIV may take additional risks as part of daily life in order to survive (e.g. sex trade workers, street-involved people, injection drug users).

For the purposes of these guidelines, it must be made clear that risk as it is defined here is based on the clinical evidence of the likelihood of infection with HIV occurring during the performance of activities and behaviours described in Section 4. This clinical definition of risk does not take into account other dangers or risks, such as other diseases, social violence or bodily damage due to drug use, that may be inherent in some situations where and when these activities are taking place. Whether a risk is good or bad, acceptable or unacceptable, is ultimately something individuals must decide for themselves. The role of these guidelines is not to eliminate or downplay risk, nor even to make individual choice easier. It is to give a biologically accurate estimation of the likelihood of infection during certain behaviours and activities so that a person may make up his or her own mind about what constitutes an acceptable or non-acceptable risk.

In addition, these guidelines provide a flexible framework upon which counsellors and front-line HIV workers may base prevention education messages. As in the past, this edition classifies activities according to degrees of risk by taking into consideration the potential for transmission and

HIV TRANSMISSION: Guidelines for Assessing Risk

actual scientific evidence that transmission has occurred. This model applies equally to HCV and HIV.

Assessing Risk of HCV Transmission

Including risk assessment information for HCV in these guidelines has been a real and ongoing challenge, partially because of a lack of concrete evidence on how HCV is transmitted sexually in human beings. While the risk factors for transmission for HCV are similar to those for HIV in activities involving the exchange of blood, they differ in activities that involve the exchange of other body fluids. HCV transmission is addressed in sections 5 and 6.

Risk Reduction

From the broader perspective of public health strategy, this document is guided by a commitment to risk reduction as the most achievable goal in behaviour change. From the point of view of the individual, the document assumes that it is better to provide information about options for both reducing and eliminating risk. This way individuals can determine which is appropriate for themselves.

For example, individuals who are not comfortable with the possibility of condom failure during vaginal or anal intercourse can take further steps to protect themselves. In addition to using a condom, they can stop intercourse before ejaculation. If individuals want to reduce risk even further, they can avoid vaginal or anal intercourse altogether.

During oral sex, there is also a series of options that individuals can choose: they can avoid cunnilingus during menstruation, they can stop fellatio before ejaculation occurs, they can use a condom or other latex barrier, or they can avoid the practice altogether.

When injecting drugs, the risk of HIV and HCV transmission can be eliminated by using a new needle and syringe every time. Where sharing is unavoidable, risk of HIV transmission is reduced by proper cleaning of the needle, cooker, syringe and other paraphernalia using bleach and water. The HCV virus is not eliminated by using these methods (see Section 5). To reduce the risk of HIV and other health problems associated with injection drug use, some drugs may be swallowed or smoked but, because of the nature of transmission of HCV and the longer life of the virus outside the human body, sharing of straws when snorting cocaine and other drugs is considered a higher-risk activity than for HIV (see Section 5).

To reduce the risk of maternal transmission of HIV to the fetus in the uterus or during delivery, an HIV-positive woman also has options. She may choose to terminate the pregnancy or she may choose to take prenatal anti-HIV therapy. She may choose neither of those options and let the pregnancy run its course. After birth, she may refrain from breast-feeding the child.

Ultimately, it is up to individuals and their partners to choose the options that are right for them. If they are given complete information and a chance to develop social skills related to sex and substance use, individuals will usually act in their own best interests and those of their partners. In some cases, information alone may not be enough. Both the wish to reduce or to eliminate risk and the capacity to do so are central to effective adoption of prevention measures. The challenge for educators and counsellors is to find ways to help people feel good about risk reduction strategies and to address issues that prevent them from being used.

The Sexual and Drug Taking Continuum

Sexual and drug taking activities do not occur in discreet packages of performance. Individual behaviours are often difficult to isolate when documenting cases of HIV infection and their behavioural causes. Although the risk model for these guidelines isolates each activity and assesses risk based on that activity or behaviour alone, it should be stressed that one activity often leads to another higher-risk activity, making it difficult to pinpoint which activities are specifically responsible for infection. This should be kept in mind when reviewing activities listed in these guidelines where “no evidence” of transmission is stated.

2. Aspects of HIV Transmission

If educators and counsellors focus on individual behaviour exclusively, without reference to social context, it will blind them to a complete picture of how people do, or do not, adopt risk reduction practices. We now know that the risk of transmission of HIV is affected by a multiplicity of psychological and societal issues at both individual and systemic levels. It seems essential to highlight some of these issues in this edition of the guidelines. This section offers a psychosocial framework intended to provide context to the risk assessment model contained in Sections 3 and 4.

Poverty and Health

There is strong evidence that lower income and socio-economic status is associated with poorer health in general, including lower standards of reproductive and sexual health². Earlier initiation into sexual activity and riskier sexual practices are more common among youth with lower socioeconomic status. Economic inequities often contribute to the continuing marginalization of certain social groups, including women, gay men, Aboriginal and ethnocultural communities, sex trade workers, people with disabilities, substance users and youth. This marginalization is often manifested in reduced access to education, housing and health care, low self-esteem, a diminished degree of control over one's life and environment, unequal power in relationships and a lower capacity to make positive choices about health, including strategies aimed at reducing the risk of HIV transmission.

In addition to socioeconomic status, a range of other inter-related class, cultural and psychological factors can influence peoples' capacity to reduce their risk of HIV transmission. This section illustrates how some of these factors may be manifested within certain marginalised groups. However, it must be emphasized that such factors are not always particular to any one group nor will members of any one group be similarly affected. (See Appendix 1 for suggestions for further reading.)

Power and Negotiation

Some people lack the power or self-esteem necessary to negotiate the use of risk reduction techniques in their sexual and drug-using relationships. For example, particularly in relationships that involve sexual, emotional or physical abuse, many people are at risk of HIV infection by partners who regard them as their "property," who refuse to use condoms or who consider unprotected intercourse to be "a right." It is possible that some people with these attitudes are unaware of, or may deny, their HIV-positive status. In such relationships, a person's lack of power or self-esteem is likely to affect his or her ability to decline sexual activity or to insist upon protection that will reduce risk. Peer pressure, desire to be wanted, touched or loved can all overpower a person's ability to negotiate for lower-risk behaviours. The intoxicating effects of drugs and the adrenaline rush of sex can cloud judgements when the negotiation of risk behaviours is taking place. In addition, countless other unforeseeable events and situations may arise that will ultimately determine how safe any one person is at any given time.

Some men consider it unacceptable for a woman to refuse sexual relations. By insisting upon condom use a woman may be mistakenly viewed as promiscuous, disloyal, unfaithful or a "bad" wife. The most extreme deprivation of a woman's ability to practice risk-reducing behaviour occurs in the case of rape or other sexual assault. Health Canada has published guidelines for counsellors on HIV and sexual violence against women³. In addition, women from Aboriginal and ethnocultural communities, or women who experience isolation by virtue of geography or their designated role, may have limited access to appropriate forms of information and support.

Young people are prone to taking risks and experimenting with drugs, alcohol and sexuality, highlighting the importance of education and information about risk reduction for this group. Many young people also experience marginalization due to factors such as lack of access to housing and education, unemployment, family breakdown, poverty and low self-esteem. Young people, particularly

2. Health Canada. *Framework on Sexual and Reproductive Health*, Health Canada. 1998.

3. Neron, C. *HIV and Sexual Violence Against Women*, Health Canada. 1998.

HIV TRANSMISSION: Guidelines for Assessing Risk

the homeless, are vulnerable to sexual exploitation. One study found high levels of sexually transmitted infections (STIs), substance use and inconsistent condom use among Canadian street youth⁴. Young people may be inclined to consider themselves invulnerable or immortal, to think that “HIV and STIs only happen to other and/or older people” or to judge a person’s HIV status based on appearance (“She looks healthy.”). Without accurate information, they may be susceptible to misleading assurances that “there is no risk” or “don’t worry, I’m healthy.” Many young people who are sexually active and/or inject drugs do not have ready access to condoms, clean needles, peer support or risk reduction information that is appropriate.

Evidence suggests that experience of childhood abuse increases an individual’s risk of HIV infection⁵. Any or all of these factors combined can render young people especially vulnerable to the risk of HIV infection.

Potential vulnerability to abuses of sexual and emotional power and lack of access to risk reduction information also exist for people with intellectual, psychological or physical disabilities, or mental illness. Studies have shown a statistically significant association between substance use, inconsistent condom use and other risk behaviours among people with severe mental illness and psychiatric disabilities⁶.

The risk of HIV transmission for people in prison is particularly high. Injection drug use, tattooing and sexual activity, including sexual assault and the trading of sex for favours, are known to be commonplace in prisons. The availability of condoms is limited and clean needles and syringes are not available. Access to health care for prisoners may be less frequent or of a lower standard than for those outside the prison system.

Stigma, Grief and Loss

For many years in Canada and other developed countries, HIV infection rates have been highest among gay men. The

resulting misconception that HIV infection is a “gay disease” has led to a false sense of security among people who are not gay, but who may practice activities that place them at risk of HIV infection. Such attitudes have contributed to the fact that in the developed world, gay men have borne the brunt of prejudice and discrimination associated with HIV disease, a factor that has compounded the substantial grief, loss and depression among this group.

This trend continues in other groups and in current times as well. Reports and statistics about the seriousness of the epidemic among Canada’s injection drug users, prison inmates, Aboriginal people and other groups lead many to conveniently classify the disease as a risk only for these segments of society. Racism, objections on moral grounds to concepts of harm reduction, religious intolerances, social marginalization, poverty and other social ills cause many of these groups to face high levels of discrimination. This, in turn, contributes to growing rates of HIV and other illnesses among these groups. In addition, this form of compartmentalization increases the risk of infection among those who don’t see themselves as belonging to one of these groups. Society, in general, gradually falls prey to the “It won’t happen to me” cycle of denial that was partially responsible for the rapid spread of the disease at the beginning of the epidemic.

Safer sex was coined in the mid-1980s as a short-term response to an immediate health crisis. Harm reduction and safe injection techniques were similarly introduced in the 1990s when the rates of infection began to increase among injection drug users. The failure to find a cure for or a vaccine against HIV disease means that many people have been required to permanently incorporate risk reduction and the possibility of infection into their daily lives. Many have been able to do this successfully for many years. Others find that sustaining risk-reducing behaviour in the face of continued death, illness and anxiety has not been easy. This is especially true for those who have lost significant numbers of friends and acquaintances to HIV/AIDS. Some have developed

4. MacDonald NE, Fisher WA, Wells GA, Doherty JA, Bowie WR. *Canadian street youth: correlates of sexual risk-taking activity*, *Pediatric Infectious Disease Journal*, 13(8): 690-7. Aug. 1994.

5. Sterk, C.E. et al. *Reducing Harm: The effects of childhood abuse on negotiating HIV risk reduction*. 12th World AIDS Conference Abstract 238/33382. 1998.

6. Thompson, S.C. et al. *HIV risk behaviour and HIV testing of psychiatric patients in Melbourne*, *Australian & New Zealand Journal of Psychiatry*. Aug 1997. Menon A.S. et al. *Substance use during sex and unsafe sexual behaviours among acute psychiatric patients*. *Psychiatric Services*, Aug 1997.

HIV TRANSMISSION: Guidelines for Assessing Risk

a sense of inevitability or invulnerability about their own likelihood of being infected, resulting in such phenomena as “survivor guilt” and “condom fatigue.” In addition, there is some evidence that the development of new treatments for HIV disease has led to a false sense of security among some individuals either about the likelihood or the consequences of HIV infection⁷. Potential of decreased practice of risk reduction strategies and should be taken seriously by any educator, counsellor or health care provider working with people who have lived with HIV, or the potential of HIV infection, over many years.

For gay men coming to terms with their sexual orientation, or who are in the process of coming out, HIV entails grappling with an additional set of fears, prejudices and challenges. Gay men who are not attached to, or who do not identify with, the gay community may have limited access to information about HIV or may mistakenly consider themselves to be at reduced risk of HIV infection. However, being “out” in itself does not necessarily increase risk reduction practices⁸.

Drug users face similar issues of identity and social adaptation. Low self-esteem and poor self-image, coupled with daily discrimination they face in dealing with social and commercial systems that see them as a “threat” and a “plague” may make even the best prevention efforts among these populations difficult.

Alcohol and Other Substances

Research indicates that alcohol and other substance use can act as one in a series of potential “triggers” leading to the abandonment of risk reduction strategies. The seeds of sexual activity are often sown in environments where alcohol consumption and the use of other drugs are encouraged. Accordingly, many people engage in sexual activity, especially with casual partners, when they are drunk or high.

Frequent alcohol and/or other substance use and casual sex may be associated with low self-esteem. Use of alcohol and

other substances to facilitate intimacy, the substitution of sex for intimacy, and the tendency of alcohol and other substances to impair a person’s usual sense of responsibility for themselves and for others, are all issues which counsellors, educators and health care providers may need to explore. Injecting drugs also poses challenges for HIV prevention efforts, partly due to the high frequency of daily injections and needle sharing with sex partners⁹.

Relationships

People choose different types of relationships for many different reasons. Some may be for convenience or gratification, such as casual relationships among drug users or people meeting only for sex. Some relationships that start out casually may become more committed or intense over time, and definitions of what is acceptable may shift as a relationship deepens or changes. Issues and definitions of monogamy, fear of disclosure, casual risk and perceptions of responsibility are all factors that must be considered when gauging risks in the context of relationships. As well, power and the ability to negotiate safer sex is not always present for one or both partners within a relationship, and choosing to assess risk and modify behaviour may not always be an immediate option regardless of knowledge of levels of risk.

Differing definitions of monogamy are often responsible for increased risk among sexual partners in long-term relationships. One partner may consider themselves monogamous even though they have sex with other people at specific times (e.g. when a partner is out of town). For others, monogamy means sexual exclusivity. It is important that partners have the same understandings about the terms they are using and what kind of sex, if any, is permitted outside the relationship. Different understandings about these issues may indicate a lack of communication or lead to a breakdown of trust, creating the potential for HIV infection to occur in one or both partners. Lack of understanding about window periods after potential exposure and what constitutes risk both within and outside of the relationship also may increase the potential for infection.

7. Diclemente, R. et al. *Russian roulette: Are persons being treated with protease inhibitors gambling with high risk sex?* 12th World AIDS Conference Abstract 14143, 1998.

8. Appleby, R. et al. *Gay identification: Does it reduce or increase sexual risk-taking?* 12th World AIDS Conference Abstract 23275, 1998.

9. Freeman, R. and Williams, M.L. *Are high-frequency amphetamine injectors at elevated risk for HIV? Results from a US multisite sample.* 12th World AIDS Conference Abstract 60254, 1998.

HIV TRANSMISSION: Guidelines for Assessing Risk

Testing for HIV and counselling about risk reduction are available to monogamous couples who are considering abandoning condoms within a relationship, and who also may be discussing other related issues, such as window periods and the importance of negotiating acceptable definitions of monogamy. The same resources are available to non-monogamous couples, who may also make agreements about dispensing with condoms within the relationship on condition that high-risk sexual and injecting activities are not practised outside the relationship (such an arrangement is sometimes referred to as “negotiated safety”).

One study has shown that many non-monogamous, HIV-negative gay couples practise a form of negotiated safety as an HIV-prevention strategy¹⁰. It must be noted that while this strategy may be successful in preventing HIV transmission, it does not necessarily prevent transmission of other STIs. Infection with other STIs can increase the risk of HIV transmission. Some educators are reluctant to promote negotiated safety as a prevention tool, but do acknowledge the importance of partners discussing these issues within their relationship.

The effectiveness of decisions about monogamy and negotiated safety as HIV-prevention strategies will depend to a great degree on the levels of equality, honesty, trust and communication that exist within the relationship. Whether they are monogamous or non-monogamous, partners also need to agree about what will happen if there is a breach of their particular arrangement. This may involve the end of the relationship, a return to condom use or further HIV testing.

Maintaining Risk Reduction Strategies

Many factors can affect a person’s ability to maintain risk-reducing behaviours. Counsellors, educators and health care providers need to incorporate an awareness of these factors into their counselling about risk reduction and HIV transmission.

It is important not to regard people who are not always able to maintain risk reduction strategies as “bad” or as having “failed.” Despite the varying risks, no single occurrence of a particular activity is guaranteed to result in HIV transmission. An individual’s commitment or capacity to reduce risk is seldom set in stone; it can be influenced at any given time by a wide range of factors. It is counterproductive to

attribute blame or guilt if people participate in higher risk activities than they had intended. Counsellors, educators and health-care providers should create a non-judgmental environment in which the broader issues relating to sexuality, power, self-esteem and HIV and HCV transmission may be discussed. The risk model contained in these guidelines is intended to assist individuals to assess their own acceptable level of risk. When providing information and support, the objective should always be to encourage and enable individuals to maintain a level of risk that is acceptable for themselves in the future.

Risk Reduction is for Everyone

All people who are sexually active or who use drugs should be encouraged to take precautions against HIV infection. At the same time, we should not forget the complex emotional issues that are raised for people once they have been tested and told they are HIV positive. That is why testing must be accompanied by empathic and informed counselling. People living with HIV/AIDS should be supported to make positive decisions about their sexual and substance-using behaviour that balance their emotional needs with their health and safety and that of others. Sexuality counselling should be part of ongoing follow-up support for people living with HIV/AIDS and their partners.

Two common societal reactions to HIV pose problems for people living with HIV/AIDS and make widespread adoption of risk-reduction practices more difficult to achieve.

Some people think that people living with HIV are no longer entitled to enjoy sex and intimacy or to engage in drug use. In addition, some people experience more fear when engaging in sex or injection drug use with someone they know to be HIV positive than when they do not know their partner’s serostatus — even though, in theory, the risk in both cases is the same. This has led to a legal trend in Canada and other parts of the world to focus on risk reduction by placing blame on people who are HIV positive, rather than placing onus on all individuals to practice risk reduction regardless of serostatus.

Whether or not HIV-positive individuals have a responsibility to inform their sex and injecting partners about their status, when they take appropriate precautions, has not been decided by the courts. According to the 1998 Cuerrier decision there is a duty to disclose HIV-positive status

10. Kippax, S, Noble J, Prestage G, Crawford JM, Campbell D, Baxter D, Cooper D. *Sexual negotiation in the AIDS era: negotiated safety revisited*. AIDS. 1997.

HIV TRANSMISSION: Guidelines for Assessing Risk

because failing to disclose would expose the sexual partner to a “significant risk of serious bodily harm” without their consent. The decision therefore makes it clear that HIV-positive status must be disclosed before unprotected vaginal (and presumably anal) intercourse. But the decision did not offer a clear answer to the question of whether disclosure is also required when appropriate precautions are taken.

For the purposes of these guidelines, practices have been assessed for risk based on actual evidence of HIV transmission. That means the guidelines are consistent and valid for everyone, including people who are living with HIV/AIDS. To put a different burden of responsibility on those who are HIV positive would create a double standard in our messages: practise one set of guidelines with those who are infected and practise another with those who are not. In fact, one-third of people who are HIV positive in Canada do not even know they are infected.

Most people will find it desirable to share information about their serostatus with their partners. The circumstances and timing under which people living with HIV/AIDS will want, and feel able, to tell others they are HIV positive will vary greatly. Some may want to tell all their sex partners immediately; others may find that revealing such information creates greater difficulties for them. For example, some people may perceive themselves to be in physical danger if they tell their sex partners. Issues of disclosure for people who are HIV positive have proven to be complex, and there is no easy solution. Questions of when and where and for what reasons to disclose will vary from person to person and from relationship to relationship.

Consistency and coherency are the essential features of the risk model presented here. An expectation that people living with HIV/AIDS should have to exercise additional precautions appears to remove the burden of responsibility from the other partner. It would send contradictory messages about the validity of the precautions recommended. Making decisions about behaviour based on any assessment of the prevalence of HIV in particular communities or groups of people leads to false assumptions and is inappropriate for the purpose of HIV prevention information.

HIV and Prisons

The HIV/AIDS epidemic has struck prisons, and other places of detention with particular severity. Penal institutions around the world and in Canada have grossly dispro-

portionate rates of HIV and HCV infection, and confirmed AIDS cases¹¹. People entering prison tend to have a relatively high incidence of HIV, and prisons provide a propitious environment for transmission of the virus. High-risk behaviours, such as injection drug use and unprotected sex, along with coerced sex, are common in prisons. Prevention tools such as condoms and new needles for drug use and tattooing practices are seldom available in Canadian prisons. Prisoners are often forced to “make do” with less effective means of reducing risk. Assessing risk and providing means for changing risk behaviours in prisons requires a distinct and separate approach than for individuals who are not incarcerated. Knowledge of prison environments, high-risk practices in the institutions and prison culture is required.

Enhancing the Health of People Living with HIV/AIDS

Although these guidelines apply equally to people who are living with HIV/AIDS and those who are not infected, there are further considerations for the health of those who are HIV positive. Making sex and substance use healthier can be part of a broad-based health promotion approach for people living with HIV/AIDS. Just as they need to consider a wide range of treatment and other options for improving and maintaining mental and physical health, people living with HIV/AIDS should be aware of possible exposure to other infections.

Other STIs are of primary concern. People living with HIV/AIDS should be aware that other STIs could affect the immune system and potentially trigger the progression of HIV from an asymptomatic seropositive state to illness. There is also some indication that STIs can have more pronounced effects, and be harder to treat, in men and women living with HIV/AIDS. HCV and other blood-borne infections contracted by sharing needles also pose a greater risk to people living with HIV/AIDS. They can act as catalysts on each other, making each disease progress more quickly, and making treatment more difficult as well as reducing the options for treatment once a dual diagnosis is made.

People living with HIV/AIDS also need to be aware of the potential risks in having unprotected intercourse or sharing needles with someone who is also HIV positive. It is generally considered that “exchanging” virus, especially one that is drug-resistant, could possibly speed the progression of the disease. Different strains of HIV may produce illness

11. Canadian HIV/AIDS Legal Network. *HIV/AIDS and Hepatitis C in Prisons: The Facts*, Canadian HIV/AIDS Legal Network, 2004.

HIV TRANSMISSION: Guidelines for Assessing Risk

at varying rates or may affect different systems in the body. Infection with a new strain may cause new problems or may result in the development of premature resistance to some anti-HIV treatments. Becoming infected with STIs, HCV or other diseases, are serious considerations for the health of someone who is HIV positive. Variants of hepatitis such as A and B can hasten the progression of illness in someone who is living with HIV by placing additional strain on the liver. Given these possibilities, risk-reduction strategies should continue to be promoted between people living with HIV/AIDS.

3. HIV Transmission

A Model for Assessing Risk

Evolution of the Model

The model of risk presented here has evolved from the earliest examples of safer sex advice. As discussed earlier, the notion of risk is qualitative; therefore, we do not have a completely objective and quantifiable way to express degrees of likelihood of HIV transmission. However, bearing these limitations in mind, the levels of risk of various activities are organized into four categories, based on the potential for transmission of HIV and the documented evidence that transmission has actually occurred. These categories of HIV transmission are no risk, negligible risk, low risk and high risk.

If these categories or levels were represented graphically on a continuous line, negligible and low risk would be much closer to the “no risk” end of the continuum. There is no “middle” level of risk. The graphic representation of the risk model appearing in this edition of the guidelines uses a curve to reflect the continuum along which risk levels occur.

It is anticipated that future editions of the guidelines will continue to evolve as we learn more about HIV transmission and its social consequences. This model is not intended as a guide to risk levels for STIs other than HIV.

Conditions for HIV Transmission

It is well established within the field of HIV epidemiology that certain conditions must exist for HIV transmission to occur.

1. There must be a source of infection.

Relying on the identification of a person as a source of infection is not useful in developing prevention messages, since it is nearly impossible to tell if a person is infected by looking at them. It is more appropriate to consider the source of infection as the presence of HIV in certain body fluids, such as blood, semen, vaginal fluid or breast milk.

2. There must be a means of transmission.

The following routes of HIV transmission are well-established:

- specific types of sexual activity (sexual transmission)
- sharing used, uncleaned needles or syringes, and other situations that involve piercing of the skin (subcutaneous and per cutaneous transmission)
- mother-to-child transmission, in the uterus, during childbirth (vertical transmission) or through breast feeding.
- receiving transfusions of infected blood or blood products, transplanted organs, or donated sperm (In Canada all donated blood, organs and semen are now screened for HIV antibodies).

3. There must be a host susceptible to infection.

The virus is harmless until it finds a host or, more accurately, susceptible cells within the host’s body. Every human being is considered to be a host susceptible to infection.

4. There must be an appropriate route of entry to the target cells of the body.

Infected blood, semen, vaginal fluid or breast milk must reach the HIV-susceptible cells in the blood, usually through a break in the skin, absorption through mucosal membranes (mucosa) or through some disruption to the mucosa. Mucosa are the moist surfaces of the body which line most of the body cavities and hollow internal organs such as the vagina, rectum, mouth, urethra, nose and eyelids.

5. There must be a sufficient level of virus delivered to establish infection.

Because of a higher concentration or quantity of virus, some body fluids are efficient media for transmitting HIV, while others are not. Semen, vaginal fluid, blood and breast milk are of most concern in HIV transmission. Although HIV

HIV TRANSMISSION: Guidelines for Assessing Risk

		EVIDENCE		
		NO	YES (under certain circumstances)	YES
POTENTIAL	NO	No Risk	 	
	YES	Negligible Risk	Low Risk	High Risk

has also been isolated in urine, saliva and tears, it is highly unlikely that it will be present in sufficient concentrations for transmission to occur (even if all other four conditions were fulfilled). Research has shown that an enzyme in saliva inhibits HIV. HIV does also not thrive in exposed environments outside the body or inside the body where there are high concentrations of acid, such as in the stomach (hydrochloric acid) or the bladder (uric acid).

HIV has been isolated in pre-ejaculatory fluid (pre-cum). Though the concentration of HIV in pre-cum is likely to be low, it cannot be discounted as a potential source of transmission. Viral load (the amount of HIV present in different body fluids and tissues) can also be a factor in transmission of HIV. The higher the viral load, the higher the risk of transmission through the exchange of these fluids.

Factors Used to Determine the Level of Risk

A. Potential for Transmission

In assessing potential for transmission, we consider whether or not the 5 conditions for transmission explained above are met. Because it is impossible to prove that an infection will never happen, it is important to consider the potential for transmission and weigh it against evidence of what is known to have actually occurred. For the purposes of our model we consider an activity to carry no risk only when there is no potential for transmission to occur.

B. Evidence of Transmission

In creating these guidelines, a review of research was carried out to examine the documented evidence of HIV transmission through specific practices. Case reports, abstracts and research reports were considered, with the greatest weight on reports from cohort studies using multivariate analysis techniques (studying a specific group of individuals over

time and analysing the interaction of a number of variables). For the purpose of this model, greater emphasis is placed on what is known or proven to happen, than on what may happen in theory.

To assess the risk of HIV transmission, the potential for transmission and the evidence that transmission has occurred are both considered. Activities are then placed into one of four categories.

Categories for Assessing Risk

1. No risk

To our knowledge, none of the practices in this category have ever been demonstrated to lead to HIV infection. There is no potential for transmission since all of the basic conditions for viral transmission are not present.

Potential for transmission None
 Evidence of transmission None

2. Negligible risk

All of the practices assigned to this risk level present a potential for HIV transmission because they involve an exchange of body fluids, such as semen (including precum), vaginal fluid, blood or breast milk. However, the amounts, conditions and media of exchange are such that the efficiency of HIV transmission appears to be greatly diminished. There are no confirmed reports of infection from these activities.

Potential for transmission Yes
 Evidence of transmission None

3. Low risk

All of the practices assigned this risk level present a potential for HIV transmission because they involve an exchange of

HIV TRANSMISSION: Guidelines for Assessing Risk

body fluids such as semen (including pre-cum), vaginal fluid, blood or breast milk. There are also a few reports of infection attributed to these activities (usually through individual case studies or anecdotal reports, and usually under certain identifiable conditions).

Potential for transmission Yes

Evidence of transmission Yes
(under certain conditions)

4. High risk

All of the practices assigned this risk level present a potential for HIV transmission because they involve an exchange of body fluids, such as semen (including pre-cum), vaginal fluid, blood or breast milk. In addition, a significant number of scientific studies have repeatedly associated the activities with HIV infection. Even when the exact mechanism of transmission is not completely clear, the results of such studies conclude that activities in this category are high risk.

Potential for transmission Yes

Evidence of transmission Yes

HIV TRANSMISSION: Guidelines for Assessing Risk

4. Assessing Risk of HIV Transmission

This model is not intended as a guide to risk levels for STIs other than HIV.

Part 1. Sexual Activities

For the purposes OF this model, we consider the risk of a single episode of each particular sexual practice. In real life, sexual activity is more complex. It is rarely confined to one episode or to one practice, nor is it always confined to one partner at one time. The order in which people engage in sexual practices also affects risk. If a combination or sequence of sexual activities is deemed to increase risk, these factors are addressed in the text.

Kissing

“Sucking face, necking, smooching”

Potential for Transmission

There is no potential for transmission in pressing dry lips together.

In the absence of blood in the mouth, wet kissing can be classified as no risk. Saliva that does not contain blood presents no potential for transmission. Research has shown that an enzyme in saliva inhibits HIV¹². In general, the mouth and throat are well-defended against HIV; oral mucosal lining contains few cells that are susceptible to HIV. However, saliva should not be thought of as an effective microbicide against HIV; it is not effective in preventing transmission if it is used as a lubricant without barrier protection.

There is a very small potential for transmission in wet kissing where blood may be exchanged. The risk involved in wet kissing is increased when blood is present in the mouth of one or both partners. This could be caused by recent brushing or flossing of the teeth, a sore in the mouth, gum disease, a recent tooth extraction or biting or scratching one another (e.g. with the teeth or orthodontic alliances, such as braces) during particularly vigorous kissing. Although it

is likely that only a small amount of blood would ever be present in the mouth, the presence of a quantity sufficient for transmission of HIV to occur cannot be discounted. The risk of transmission is increased where blood is exchanged between mouths and where the mouth of the person receiving the blood contains ulcers or sores, or where there is evidence of dental recession. Accordingly, kissing in the presence of blood in the mouth cannot be classified as no risk.

Note: It is recommended that a period of approximately 30 minutes to two hours be allowed to elapse after brushing or flossing teeth before sexual activity, due to the possibility of blood in saliva.

Evidence of Transmission

There has never been a documented case of HIV transmission through dry kissing. There are a few anecdotal reports of HIV transmission through wet kissing where blood has been exchanged.

Assessment of Risk of HIV Transmission

Wet or dry kissing

No exchange of blood. No Risk

Wet kissing

With exchange of blood Low Risk

Oral Sex: Fellatio

“Giving or getting head, headjob, blowjob, sucking off, blowing, face-fucking, going down, cock-sucking”

Potential for Transmission

In fellatio, there is potential for transmission to the partner giving fellatio (the person sucking or licking the penis) because pre-ejaculatory fluid (pre-cum) or semen can get into the mouth. A healthy mouth is generally a hostile

12. Reucroft, S, Swain, J. *Saliva thwarts HIV*. New Scientist, 17 January 1988.

HIV TRANSMISSION: Guidelines for Assessing Risk

environment for HIV, because an enzyme in saliva has been shown to inhibit HIV.

The risk of transmission of HIV to the partner giving fellatio is increased if there is a disruption in the oral mucosa such as bleeding gums, cuts, sores, lesions, ulcers or burns in the mouth or by a recent tooth extraction. Risk can be reduced by using a protective barrier, such as a condom.

Speculation that the risk of transmission is increased if ejaculate is swallowed now appears unfounded, since enzymes in the mouth, throat and the stomach are known to inhibit HIV. The risk of transmission relates to taking ejaculate or pre-ejaculatory fluid in an unhealthy or wounded mouth, not into the digestive system, which is a hostile environment for HIV.

The risk in fellatio can be reduced by avoiding ejaculation of semen in the mouth and can be reduced further by using a condom. It is also recommended that the partner giving fellatio wait 30 minutes to two hours after brushing or flossing teeth before engaging in fellatio, since brushing and flossing teeth may cause temporary bleeding of the gums.

In getting fellatio, risk is negligible. A small quantity of blood from bleeding gums or sores in the mouth could come into contact with an abrasion on the head of the penis, and/or with the mucosal lining of the penile opening. However, the small amount of blood that would be passed under such conditions makes infection very unlikely.

In the absence of some disruption to the oral cavity, the risk involved in either giving or getting head can be regarded as quite remote.

Evidence of Transmission

Transmission of HIV is reported to have occurred through giving fellatio. It is only reported to have occurred very rarely, usually in circumstances where there is a route of entry resulting from a disruption to the oral mucosa caused by bleeding gums, cuts, sores, lesions, ulcers or burns in the mouth.

Much of the evidence of transmission during fellatio is based on isolated case reports. Several of the earliest epidemiological studies of men who have sex with men failed to show that giving fellatio carried a significant risk. This might have been because one recognized act of a high risk activity was considered the most likely route of transmission despite multiple acts of lower-risk activities. Some later studies have

shown a risk but it is much smaller than for other activities, such as penile–anal intercourse without a barrier.

Overall, the evidence indicates that transmission through giving fellatio is a relatively rare occurrence and therefore it is classified as low risk. There have been no documented cases of transmission through getting fellatio.

Assessment of Risk of HIV Transmission

Fellatio (performing)

With condom. Negligible Risk*

Without condom and taking semen and/or pre-ejaculate in the mouth. Low Risk

Fellatio (receiving)

With condom. Negligible Risk*

Without condom Negligible Risk

(The risk is increased if there is a disruption in the oral mucosa of the receiving partner, caused by bleeding gums, cuts, sores, lesions, ulcers or burns in the mouth or by a recent tooth extraction or other dental work.)

** There is enough evidence of breakage or improper use of barrier methods to classify this activity as negligible rather than no risk.*

Oral Sex: Cunnilingus

“Licking out, eating out, going down, licking pussy, box lunch, eating at the Y”

Potential for Transmission

There is a potential for transmission of HIV by performing cunnilingus (licking the clitoris and/or in or around the vulva) because vaginal fluid and blood can get in the mouth. However, the mouth generally is a hostile environment for HIV, because an enzyme in saliva has been shown to inhibit HIV.

The potential for transmission to the performing partner is increased if there is a disruption in the oral mucosa caused by bleeding gums, cuts, sores, lesions, ulcers or burns in the mouth or by a recent tooth extraction, or other dental work that causes trauma in the mouth. The risk in performing cunnilingus is also higher during menstruation because of the presence of blood. The risk can be reduced by avoiding cunnilingus during menses using a latex barrier over the vaginal opening, such as a dental dam or, as an alternative, a new and unlubricated condom carefully cut open and used

HIV TRANSMISSION: Guidelines for Assessing Risk

as a barrier between the mouth and vulva or clitoris. It is also recommended that the performing partner not engage in oral sex directly after brushing or flossing teeth before engaging in cunnilingus, since brushing and flossing may cause temporary bleeding of the gums. The amount of time to wait varies from 30 minutes to two hours since these activities can produce cuts and tears along the gum, and the amount and severity depends on how vigorously one brushes or flosses their teeth.

Receiving cunnilingus involves a small potential for transmission because of the possibility of abrasions in the vagina; these could permit entry of small quantities of blood from bleeding gums or a sore in the mouth. However, the small amount of blood likely to be involved in such contact make this a remote possibility.

Evidence of Transmission

There are no well-designed studies offering evidence of transmission through cunnilingus. However, the extremely small number of case reports in which transmission has been attributed to performing cunnilingus supports the classification of this activity as low risk.

There have been no documented cases of transmission through receiving cunnilingus.

Assessment of Risk of HIV Transmission

Cunnilingus (performing)

With barrier Negligible Risk*

Without barrier and not during menses Low Risk

Without barrier and during menses Low Risk

Cunnilingus (receiving)

With barrier Negligible Risk*

Without barrier Negligible Risk

** There is enough evidence of breakage or improper use of barrier methods to classify this activity as negligible rather than no risk.*

Oral Sex: Anilingus

“Rimming, licking out, eating out, licking or eating ass”

Potential for Transmission

Anilingus is not an efficient means of HIV transmission. There is a potential for transmission in performing anilingus if blood is present in or around the anus. There is a potential

for HIV transmission in receiving anilingus because of the possibility of contact between blood in the mouth and the rectal lining. The small amount of blood likely to be involved in such circumstances makes transmission highly unlikely.

It should be noted, however, that anilingus is an efficient route of transmission for other STIs, such as syphilis, gonorrhea, hepatitis A and B, and intestinal parasites (including *Cryptosporidium*).

Any risk from anilingus can be reduced by use of a latex barrier, such as a dental dam or a new condom carefully cut open and used as a barrier between the mouth and anus.

Evidence of Transmission

There have been no documented cases of HIV transmission through receiving or performing anilingus.

Assessment of Risk of HIV transmission

Anilingus (performing)

With barrier Negligible Risk*

Without barrier Negligible Risk

Anilingus (receiving)

With barrier Negligible Risk*

Without barrier Negligible Risk

** There is enough evidence of breakage or improper use of barrier methods to classify this activity as negligible rather than no risk.*

Intercourse: Penile–Vaginal

“Fucking, screwing, making love, getting or being laid”

Potential for Transmission

The earliest safer sex advice rightly categorized penile–vaginal intercourse without a barrier as high risk. All of the conditions for efficient viral transmission are in place during this activity.

Penile–vaginal intercourse without a barrier is a high-risk activity. The majority of documented cases of HIV transmission throughout the world are the result of unprotected penile–vaginal intercourse. The risk of transmission can be reduced through the proper use of male or female condoms with lubricant.

HIV TRANSMISSION: Guidelines for Assessing Risk

Receptive penile–vaginal intercourse without a barrier is one of the most efficient means of HIV transmission. While the male partner in penile–vaginal intercourse without a barrier is also at high risk for HIV infection, women should be aware that as the receptive partners, they are at an even greater risk because of the higher levels of virus present in male seminal fluids, the greater exposed surface area in the female genital tract than in the male genital tract, the greater opportunity for trauma in the female and the high rates of absorption in the mucosal lining of the vagina.

It is thought that transmission to the male partner during unprotected penile–vaginal intercourse can occur in one of two ways. Minor or microscopic cuts or tears on the penis may allow entry of the virus and sores on the penis (e.g. genital ulcers) can pose even more risk by providing a point of entry for the virus. There is also evidence that transmission can occur directly through the mucosal lining of the urethra (through the opening at the tip of the penis) or of the foreskin. There has been enough evidence to show that it happens frequently enough for the insertive partner in unprotected penile–vaginal intercourse to be classified as a high-risk activity.

Studies in sub-Saharan Africa show that uncircumcised men may be at higher risk of HIV transmission than circumcised men in unprotected penile–vaginal or penile–anal intercourse¹³. Foreskin contains large concentrations of the types of cells that HIV targets – a finding that helps explain why uncircumcised men may be more prone to HIV infection than circumcised men¹⁴. In addition, the foreskin may provide an environment for survival of bacteria and viruses, and may be susceptible to tears, scratches and abrasions, suggesting that its presence may increase the likelihood of contracting HIV.

A widespread misconception is that the risk for the receptive partner will be reduced if unprotected penile–vaginal intercourse is stopped before ejaculation occurs (coitus interruptus). This action carries a significant potential for transmission, given the efficiency of transmission through penile–vaginal intercourse and the impossibility of determining how much pre-ejaculatory fluid may be deposited in the vagina before ejaculation. Interrupted penile–vaginal intercourse without a condom, therefore, is still high risk.

Evidence of Transmission

There is ample documented evidence of HIV transmission through unprotected insertive and receptive penile–vaginal intercourse.

The proper use of the male or female condom has been shown to greatly reduce incidence of HIV transmission during penile–vaginal intercourse (see diagram pg. 55). However, there is evidence of occasional condom failure so penile–vaginal intercourse with a condom is considered to be low risk for the both partners. To reduce potential trauma to the vagina, it is important to always use plenty of lubricant, especially if a condom cannot be used for some reason.

Some evidence shows that there is a higher risk of transmission for the male partner during unprotected penile–vaginal intercourse when the female partner is menstruating. However, there is sufficient evidence of infection outside menses to prevent any useful distinction in risk based upon absence of menstrual blood.

Assessment of Risk of HIV Transmission

Insertive penile–vaginal intercourse

With condom Low Risk*
Without condom High Risk

Receptive penile–vaginal intercourse

With condom Low Risk*
Without condom High Risk

**Condoms are not 100% reliable. There is enough evidence of transmission due to condom breakage or improper use to classify this activity as low rather than negligible risk.*

Intercourse: Penile–Anal

“Butt-, bum- or ass-fucking, screwing, making love, getting or being laid, anal sex”

Potential for Transmission

The earliest safer sex advice rightly classified penile–anal intercourse without using a condom as high risk. All of the conditions for efficient viral transmission are in place during this activity. The risk can be reduced through the proper use of condoms with lubricant. Any notion that the insertive

13. Johannes van Dam, M.D. MPH and Marie-Christine Anastasi, M.A. *Male Circumcision and HIV Prevention: Directions for Future Research*, 2002

14. Crabb, Charlene. *Circumcision and HIV Susceptibility*, AIDS: 17(2) p. N3. January 2003.

HIV TRANSMISSION: Guidelines for Assessing Risk

partner in penile–anal intercourse has a low risk of infection is untrue. Although more cases of transmission have been attributed to receptive penile–anal intercourse, the number of infections among insertive partners is significant enough to make this a high-risk activity.

From the perspective of public health education strategies, and particularly from the perspective of individuals engaging in sex, being the insertive partner offers no reliable protection. The mistaken belief that the performing partner is at low risk can foster a false sense of security, making it more difficult for receptive partners (whether male or female) to insist that precautions be used.

It is thought that transmission to the male partner during unprotected penile–anal intercourse can occur in one of two ways. Minor or microscopic cuts or tears on the penis may allow entry of the virus and sores on the penis (e.g. genital ulcers) can pose even more risk by providing a point of entry for the virus. There is also evidence that transmission can occur directly through the mucosal lining of the urethra (through the opening at the tip of the penis) or of the foreskin. There has been enough evidence to show that it happens frequently enough for the insertive partner in unprotected penile–anal intercourse to be classified as a high-risk activity.

Recent evidence suggests that uncircumcised men may be at higher risk of HIV transmission than circumcised men as the insertive partner in penile–vaginal or penile–anal intercourse (see Intercourse: Penile–Vaginal)¹⁵.

Another widespread misconception is that the risk for the unprotected receptive partner is considerably reduced if anal intercourse is stopped before ejaculation occurs. However, given the efficiency of transmission through penile–anal intercourse and the impossibility of determining how much pre-ejaculatory fluid has been deposited in the rectum, this is a high-risk activity. To reduce potential trauma to the anus and rectum, it is important to always use plenty of lubricant, especially if a condom cannot be used for some reason.

Evidence of Transmission

There is ample documented evidence of HIV transmission through unprotected insertive and receptive penile–anal intercourse.

The proper use of condoms with lubricant has been shown to greatly reduce incidence of transmission during anal intercourse. There is evidence of transmission due to condom failure, however, so receptive penile–anal intercourse with a condom is considered to be low risk.

Female condoms have not been studied specifically for use in anal intercourse, nor have they been designed or approved for that purpose. However, anecdotal evidence suggests that they may provide another alternative for reducing risk of HIV transmission from penile–anal intercourse (see Section 7).

Assessment of Risk of HIV Transmission

Insertive penile–anal intercourse

With condom. Low Risk*
Without condom High Risk

Receptive penile–anal intercourse

With condom. Low risk*
Without condom High risk

**Condoms are not 100% reliable. There is enough evidence of transmission due to condom breakage or improper use to classify this activity as low rather than negligible risk.*

Fingering (Anal and Vaginal)

“Finger job, finger-fucking”

Potential for Transmission

Fingering the clitoris, labia, vagina or anus carries negligible risk unless the inserted finger has an open cut, sore, lesion, burn or rash. However, it is possible that the vaginal or rectal lining can suffer trauma; fingernails can easily tear these membranes. This would increase the potential for transmission through other higher-risk activities that may follow (e.g. unprotected penile intercourse). Masturbating oneself and then fingering one’s partner may insert semen or vaginal fluid and increase the potential for transmission.

The primary risk for the performing partner (person doing the fingering) comes from contact with small amounts of blood or vaginal fluid that could find a route of entry through a cut finger or hangnail. The risk for transmission via this method is increased during periods of menstruation.

15. Crabb, Charlene. *Circumcision and HIV Susceptibility*, AIDS: 17(2) p. N3. January 2003.

HIV TRANSMISSION: Guidelines for Assessing Risk

The risk can be reduced by using a latex glove, which performs a similar function to a condom during penile intercourse. However, a gloved finger might still cause some stress to the mucosal linings of the receiving partner, which could increase the risk to the receiving partner if other risky activities follow.

Evidence of Transmission

There are no documented cases of HIV transmission through performing or receiving digital–vaginal or digital–anal intercourse.

Assessment of Risk of HIV Transmission

Vaginal or Anal Fingering (performing)

With latex glove Negligible Risk*

Without latex glove Negligible risk

Vaginal or Anal Fingering (receiving)

With latex glove Negligible Risk*

Without latex glove Negligible Risk

**The latex glove could be defective or improperly used, making it impossible to classify these activities as no risk. However, using a glove will reduce risk, particularly if open cuts, sores, lesions, burns or rashes are present.*

Fisting (Anal and Vaginal)

Potential for Transmission

The practice of inserting the hand into the rectum or vagina is not by itself an efficient means of HIV transmission. However, studies indicate that receiving fisting is linked closely with HIV infection. This is due to the extensive trauma that fisting may cause to the anal or vaginal canal producing a very favourable environment for HIV transmission—if followed by unprotected penile intercourse or the insertion of shared sex toys. Even after a single episode, the trauma to the mucosal lining may last for several weeks after the event and the person is vulnerable during this time as well. Masturbating oneself and then fisting one's partner may insert semen or vaginal fluid and increase the risk of transmission. For this reason, the risk is greater for the receiving partner. The performing partner may have cuts or abrasions (including hangnails) which may be exposed to blood or vaginal fluid during fisting. This risk can be reduced by using a latex glove and by using plenty of lubricant.

Evidence of Transmission

Several studies have identified fisting as a co-factor in HIV transmission, suggesting that other higher-risk activities often precede or follow this activity. However, there is no evidence that fisting alone has resulted in HIV transmission.

Assessment of Risk of HIV Transmission

Fisting (performing)

With glove Negligible Risk*

Without glove Negligible Risk

Fisting (receiving)

With glove Negligible Risk*

Without glove Negligible Risk

*The latex glove could be defective or improperly used, making it impossible to classify these activities as no risk. However, using a glove will reduce risk, particularly if open cuts, sores, lesions, burns or rashes are present.

Masturbation by Partner

“Jerking or jacking off, J/O, giving or getting a hand-job, getting someone off, making someone cum”

Potential for Transmission

The practice of masturbating a man through manual stimulation of the erect penis, or of masturbating a woman by manual stimulation of the clitoris, carries no risk for the person holding the penis or fingering the clitoris unless there are cuts, burns, abrasions or rashes on the fingers or hands that come into contact with pre-cum, semen, vaginal fluid or blood. This risk can be greatly reduced by using a latex glove.

If a man uses his own semen (including pre-cum) or a woman uses her own vaginal fluid as a lubricant on the penis of a male partner, there is a risk of HIV infection through an abrasion on the penis or the mucosal lining of the penile opening or foreskin of the man being masturbated. If a woman uses her vaginal fluid or a man uses his semen or pre-cum as a lubricant to masturbate a woman, there is a similar possibility of infection through contact with cuts or inflammation of the clitoris, labia or vaginal lining. This risk can be eliminated by avoiding the exchange of semen, pre-cum and vaginal fluids between partners and by using a water-based lubricant.

Care should also be taken during and after ejaculation to ensure that no semen or vaginal fluid comes into contact

HIV TRANSMISSION: Guidelines for Assessing Risk

with the other partner's rectum, vagina, mucosal lining of the penis or with any open cuts, sores, lesions, ulcers, burns or rashes (in the mouth or on the body).

Evidence of Transmission

There are no documented cases of transmission through masturbation of a male or female partner.

Assessment of Risk of HIV Transmission

Non-insertive Masturbation* (performing)

With glove No Risk

Without glove No Risk**

Non-insertive Masturbation* (receiving)

With glove No Risk

Without glove No Risk**

* For insertive masturbation (fingering) please see Fingering, page 25.

**Providing there are no open cuts, sores, lesions, burns or rashes on the hand or fingers which come into contact with the partner's pre-ejaculate, semen or vaginal fluid.

Using Insertive Sex Toys

Potential for Transmission

Using sex toys (e.g. dildos, vibrators, Chinese balls, butt plugs, anal beads) and other objects can cause trauma to the mucosal lining of the rectum or vagina. The extent of trauma varies depending on the size of the device and the way it is used. Even if properly cleaned and therefore not directly transmitting HIV, trauma and resulting inflammation can promote the possibility of later transmission by opening a route of entry for HIV to the blood and to HIV-susceptible cells through the cuts or tears in the rectal or vaginal mucosa, and thereby increase the risk for other activities that might follow.

Transferring a sex toy directly from one partner to another allows for sharing of infected fluids that can result in direct HIV transmission.

The risk of HIV transmission can be reduced by cleaning sex toys after use. They should be washed with soap and water, and rinsed. When using instruments and toys for sex play, universal precautions, such as is found in hospitals for mate-

rials such as metal, wood, rubber, etc., should be followed. For more information on universal precautions consult Infection Control Guidelines: Preventing the transmission of bloodborne pathogens in health care and public services settings (Health Canada). The cleaning method will depend on the toy—for example, a rubber dildo can be soaked but a vibrator with electrical parts cannot.

Placing a condom on the toy will make cleaning much easier. In the immediacy of a sexual situation, some people may use a condom as a substitute for cleaning. After using a condom with one person, replace it with a new one before the toy is transferred to another person. There is some risk involved with this method because of the possibility that the condom can break, slip off or not completely cover the surface of the toy.

Other non-insertive sex toys are discussed under Sadomasochistic Activities.

Evidence of Transmission

There is evidence of HIV transmission to the receiving partner from the sharing of insertive sex toys¹⁶.

Assessment of Risk of HIV Transmission

Using Sex Toys*

Receiving, shared, no condom High risk

Receiving, shared, with condom Negligible risk**

Receiving, unshared No risk

Receiving, disinfected Negligible risk***

Giving, shared, no condom Negligible risk

Giving, shared, with condom Negligible risk**

Giving, unshared Negligible risk

Giving, disinfected Negligible risk

*This activity may cause trauma to the vaginal or rectal lining, making it easier for HIV transmission to occur later with unprotected penile intercourse.

**The condom could be defective or improperly used, making it impossible to classify these activities as no risk.

***There is a possibility that the toy may not be cleaned properly.

16. Kwakwa, H A et al. Female-to-female transmission of human immunodeficiency virus, *Clinical Infectious Diseases*, 36 (1): February 2003.

HIV TRANSMISSION: Guidelines for Assessing Risk

Sadomasochistic Activities

“S/M, S & M”

Potential for Transmission

Many sadomasochistic activities pose no risk of HIV transmission. These include the use of whips, chains, clamps, masks, weights, gags, ties and other restraints and non-insertive devices.

As with other sexual activities, the general principles of HIV transmission apply: infection can occur when infected semen, vaginal fluid, blood or breast milk comes into contact with a receiving site, such as the mucosal linings of the rectum, penis or vagina, or a route of entry to the blood system via an open cut, sore, lesion, ulcer, burn or rash.

Some activities may lead to the incidental or intentional drawing of blood (e.g. whips, nipple-clamps, restraints, severe spanking, tattooing, skin piercing). When any sadomasochistic activity involves the potential drawing of blood, universal precautions similar to those set in hospitals should be taken¹⁷. Anything used to draw blood should not be used on more than one person without disinfecting it (see Using Sex Toys).

Evidence of Transmission

No studies have ever examined HIV transmission by means of various sadomasochistic activities.

Assessment of Risk of HIV Transmission

Sadomasochistic activities
(using universal precautions) No Risk
Sadomasochistic activities Negligible Risk

Contact with Feces

“Scat, shit play, brown”

Potential for Transmission

There have been no reports of isolation of HIV from feces, but blood can occasionally be present. This means that there is a small potential for HIV transmission through receiving defecation where the feces come into contact with mucosa or with open cuts, sores, lesions, ulcers, burns or rashes. Defecation on unbroken skin does not pose a risk.

Evidence of Transmission

There is no evidence that transmission of HIV has occurred from contact with feces.

Assessment of Risk of HIV Transmission

Contact with feces

On unbroken skin No Risk
With mucosa or with open cuts, sores, lesions, ulcers, burns or rashes Negligible Risk*

*Due to the potential of blood, if present in the feces, entering an open cut, sore, lesion, burn, ulcer, rashes or mucosa

Urination

“Watersports, golden showers, pissing, yellow”

Potential for Transmission

Urine is not an efficient medium for viral growth and contains few of the lymphocytes that host HIV. External urination on unbroken skin poses no possibility of transmission. Ingesting or otherwise allowing urine inside the body involves a small potential for HIV transmission. Ingesting urine poses the possibility of infection by other organisms, particularly hepatitis A and B, herpes and other diseases of particular concern for people living with HIV.

There is some evidence that small amounts of blood is present in urine, and HIV could be passed on to a receptive partner. Bloody urine coming into contact with an open cut, sore, lesion, burn or bleeding gums in the mouth of the recipient partner would be classified as negligible rather than no risk.

Evidence of Transmission

There is no evidence that transmission of HIV has occurred through contact with urine.

Assessment of Risk of HIV Transmission

Receiving urine

On the body No Risk
Into the body Negligible Risk*

17. Health Canada. *Infection Control Guidelines: Preventing the transmission of bloodborne pathogens in health care and public services settings*, Health Canada. May 1997

HIV TRANSMISSION: Guidelines for Assessing Risk

** As blood may be present in the urine, there is a potential of transmission through an open cut, sore, lesion, burn or bleeding gums in the mouth of the receiving partner.*

Vulva-to-vulva rubbing

“pussy, beaver, cat fight”

Potential for Transmission

Vulva-to-vulva rubbing poses the potential for transmission because there is a possibility that vaginal fluid may be exchanged between partners. During menstruation, the risk is increased by the potential exchange of blood.

Evidence of Transmission

There is no evidence of transmission of HIV by vulva-to-vulva rubbing. The very few reported cases of female-to-female sexual transmission of HIV have most likely been the result either of mouth–vagina contact or sharing of sex toys.

Assessment of Risk of HIV Transmission

Vulva-to-vulva rubbing. Negligible Risk
Vulva-to-vulva rubbing during menses . . . Negligible Risk

Docking

Potential for Transmission

Docking is placing the foreskin of one partner over the penis of another partner followed by masturbation of both penises simultaneously. There is a small potential for transmission by the entry of semen into the urethra, especially if the foreskin is sealed tight enough to prevent the escape of semen. There is also a possibility that pre-cum or semen will be retained under the foreskin of an uncircumcised partner, resulting in a risk of transmission into or through its mucosa. The risk of HIV transmission for uncircumcised men is higher than for circumcised men¹⁸. (See Chapter 7.)

Evidence of Transmission

Although the theoretical risk for transmission is high, no documented cases of HIV infection have been attributed to docking. However, it should be stressed that although it may be difficult to isolate cases of infection, this does not rule out the possibility of cases occurring, considering the continuum of sexual activities in which partners may participate, including where one low-risk activity

leads to another higher-risk activity. The lack of literature mentioning this specific mode of transmission may not be conclusive.

Assessment of Risk of HIV Transmission

Docking. Negligible Risk
Docking with exchange of semen and/or
pre-cum N/A*

**According to our model, the lack of documented cases in relation to the high potential of risk would lead this activity to be categorized as Negligible Risk. In this case though, the potential for risk associated with the activity and the lack of mention in research literature precludes making a risk assignment.*

Breast milk

Potential for Transmission

Taking breast milk into to mouth can occur during sexual activity. There is a potential for transmission because HIV has been isolated in breast milk in sufficient quantities to enable transmission to occur. The potential is increased if bleeding gums, cuts, sores, ulcers, lesions or burns are present in the mouth of the recipient. Also, lactating mothers who are actively feeding infants may experience cracked nipples which may bleed and transfer the HIV virus to those taking breast milk into the mouth from the source.

Evidence of Transmission

There are no documented cases of HIV transmission from taking breast milk in the mouth during sexual activity.

Assessment of Risk of HIV Transmission

Taking breast milk into the mouth Negligible Risk

Cultural Practices

Potential for Transmission

Cultural practices, such as clitorectomy, vaginal sewing and applying herbal drying agents to the mucosal lining of the vagina to tighten the vaginal cavity, may cause initial and recurring trauma that induces bleeding and increases the risk of HIV.

The potential for bleeding, developing open sores and open wounds exists with all of these activities. There is an

18. Crabb, Charlene. *Circumcision and HIV Susceptibility*, AIDS: 17(2) p. N3. January 2003.

HIV TRANSMISSION: Guidelines for Assessing Risk

increased potential for HIV transmission because of the increased likelihood of an exchange of blood, semen or vaginal fluid between partners.

Evidence of Transmission

Although there are no documented cases of HIV that can be directly attributed to these cultural practices, there have been studies which have shown that the rates of HIV are higher in those regions which practice these activities¹⁹.

Assessment of Risk of HIV Transmission

According to our model, the lack of documented cases in relation to the high potential of risk would lead this activity to be categorized as Negligible Risk. In this case though, the potential for risk associated with the activity and the lack of mention in research literature precludes making a risk assignment.

Part 2. Drug Use

Drugs can be consumed many different ways. For the purposes of HIV transmission the methods of consumption that we will examine include snorting, smoking and injection.

Injection Drug Use

“Shooting up, hitting up, jacking up, mainlining, cranking”

Injection drug use may involve either street drugs (e.g. cocaine, heroin), prescription drugs (e.g. insulin, anabolic steroids), hormones or vitamin supplements (e.g. intramuscular vitamin B12).

Potential for Transmission

Sharing needles or syringes has a very high potential for transmission of HIV due to the presence of blood in the shaft of the used needle and in the tube of the used syringe. Whether it is visible or not, blood will almost certainly be present in a used needle or syringe in sufficient quantities for transmission to occur. Infective HIV may remain present in the blood in a used needle or syringe for up to 24 to 72 hours²⁰. Sharing needles and syringes can also transmit other blood-borne viruses, such as hepatitis B and hepatitis C. These are of particular concern to people living with HIV (and vice-versa), as they can hasten the progression of the

disease and complicate or reduce treatment options.

To reduce the risk, a new needle and syringe should be used every time. If sharing a needle or syringe is absolutely unavoidable, it is essential that they are cleaned using bleach and water to reduce the risk of contracting HIV. Any brand of household bleach will do, although the most concentrated bleach (5% or more) is best.

If undiluted bleach is not available, then diluted bleach is a less but still somewhat effective cleaning agent. Liquid dishwashing detergent can also help eliminate HIV. If nothing else is available, hydrogen peroxide, rubbing alcohol or strong drinking alcohol might be tried, although these agents are considered less effective and are no guarantee of killing any virus present. Tunnel wash—a mix of soap, diluted bleach, vinegar and water—is widely used in prisons where undiluted bleach is not readily available. Sterile water (available from some needle exchanges) is preferable for rinsing, but water which has been recently boiled can be used if sterile water is not available.










Even when injection drug use does not involve shared needles or syringes, a number of infections other than HIV may be acquired by injecting drugs. Avoiding these illnesses is particularly important for people living with HIV/AIDS. These illnesses include skin abscesses and infections at the site of injection, blood clots, heart infections and bacterial pneumonia.

Evidence of Transmission

It is well established that sharing needles and syringes poses a high risk of transmission of HIV.

Needle cleaning

It is well established that sharing needles and syringes poses a high risk of transmission of HIV, HCV and other blood-borne viruses. To avoid the risk, a new and/or unshared needle and syringe should be used every time. Try not to share needles (“fits”). If you do share, always clean the needle and syringe with bleach and water. Here’s how.

Water rinse x1	Bleach x2	Water rinse x2
Fill the syringe completely with sterile water. (Soapy water if you can.) Shake. Squirt out. Do not reuse this water.	Fill the syringe completely with full strength bleach. Leave for at least 30 seconds. Shake. Squirt out. Do it again.	Fill the syringe completely with sterilized water. Shake. Squirt out. (not back into the container). Do it again.
		
FILL	FILL	FILL
		
SHAKE	SHAKE	SHAKE
		
EMPTY DISCARD WATER BOTTLE	EMPTY	EMPTY

Clean cooker including spoons with bleach and water. Use a new filter every time. You can get bleach and water from any needle exchange site.

19. Baleta, A. Concern voiced over “dry sex” practices in South Africa, *The Lancet*: 352:1292. 1998.

20. Masters, B. et al. Recovery of HIV from syringes. 12th World AIDS Conference Abstract 23222, 1998.

HIV TRANSMISSION: Guidelines for Assessing Risk

Assessment of Risk of HIV Transmission

Injection using shared and/or uncleaned needle, syringe and/or mixing equipment. High Risk
Injection using shared and cleaned needle, syringe and/or mixing equipment Low risk*
Injection using new and/or unshared needle, syringe and mixing equipment No Risk

*There is evidence of transmission due to improperly cleaned needles and/or syringes.

Non-Injection Drug Use

Sharing straws, crack pipes

Potential for Transmission

There is a potential of transmission of HIV through the sharing of straws or pipes for snorting or smoking drugs. This is because of the likelihood of blood being present on the straw or pipe due to a disruption of nasal membranes or cuts and sores on the lips.

The likelihood of transmission of HIV is lessened by the amount of time that the pipe or straw is exposed to the air before being used by a second person. HIV does not survive well outside of the body.

Evidence of Transmission

There is no published evidence of HIV transmission specifically through the sharing of crack pipes. There are several studies indicating HIV transmission through crack users performing oral sex. In these cases transmission the cuts, sores and burns on the lips of the crack user are thought to have served as the route of entry for the disease²¹.

There are no published cases of transmission of HIV through the sharing of straws or other devices for snorting.

Assessment of Risk of HIV Transmission

Snorting or smoking drugs using new and/or unshared straws or pipes No Risk

Snorting or smoking drugs using shared straws or pipes. Negligible Risk*

*Risk is associated with the potential presence of blood on these materials due to the rupture of nasal membranes and/or the presence of sores or cuts on the lips.

Part 3. Other Activities Involving Needles

Tattooing, Piercing, Electrolysis and Acupuncture

Other than for injection drug use, needles can be used for tattooing, piercing, electrolysis and acupuncture.

Potential for Transmission

All tattooing, piercing, electrolysis and acupuncture practitioners should follow universal precautions similar to those used in hospitals²². It is required by law that all needles used in such procedures be used only once and disposed of after use. However, situations occur where these precautions may not be adhered to or strictly enforced. In such cases, individuals will have to negotiate their own level of acceptable risk. Appropriate queries should be made about the precautions observed in any particular clinic or studio prior to such procedures being performed. (See Section 2, HIV and Prisons).

There is also an opportunity for genital piercing potentially to puncture a condom. An extra-large condom or condom with a larger reservoir may provide added protection for piercings on the head of the penis.

Evidence of transmission

There is a potential for blood to be present on tools used for piercing, tattooing and electrolysis, however there have been no reported cases of transmission through this method. Ensuring that the tattoo, piercing or electrolysis is carried out using sterilized equipment (using universal precautions) and new needles will eliminate the risk of exposure.

Evidence of transmission using non-professional, hand made equipment (for example, the equipment used by peo-

21. Faruque S, Edlin BR, McCoy CB, Word CO, Larsen SA, Schmid DS, Von Bargen JC, Serrano Y. Crack cocaine smoking and oral sores in three inner-city neighborhoods. J Acquir Immune Defic Syndr Hum Retrovirol., 13(1): 87-92. 1996 Sept. Masters, B. et al. Recovery of HIV from syringes. 12th World AIDS Conference Abstract 23222, 1998.

22. Health Canada. Infection Control Guidelines: Preventing the transmission of bloodborne pathogens in health care and public services settings, Health Canada. May 1997.

HIV TRANSMISSION: Guidelines for Assessing Risk

ple in prisons for unsanctioned tattooing) has been difficult to obtain. One study²³, along with anecdotal evidence, does indicate that tattooing while in prison was an independent factor in HIV transmission.

Assessment Of Risk

Tattooing, piercing, electrolysis and acupuncture using universal precautions No Risk

Tattooing, piercing, electrolysis and acupuncture using shared, uncleaned equipment Negligible Risk

Tattooing using non-professional equipment Low Risk

Part 4. Mother-to-Child Transmission

Because of the complexity of issues relating to maternal transmission, no category to assess the risk of transmission is assigned here. The statistical probabilities are taken from recent scientific studies.

Breast Feeding

Potential for transmission

HIV is present in the breast milk of lactating HIV-positive women. Infants may be at risk of HIV infection through breast-feeding, as the mucosal immunity in their mouths is not fully developed. In North America, it is recommended that HIV-positive mothers do not breast-feed infants. This is not always the recommendation in developing countries. In such countries, breast milk may be the only available source of nutrients necessary for the child's development and provide the only means of protecting the infant with antibodies against other potentially life-threatening infections. However, studies are being done on longer-term use of Zidovudine (AZT) to prevent the transmission of HIV through breast-feeding²⁴.

Vertical Transmission

Potential for transmission

A woman's choice to have a child when she is HIV positive is a complex and emotional one. Studies have shown that if no anti-HIV treatments are taken during pregnancy, there is between 20%-30% chance of HIV transmission from the mother to the fetus. This is often referred to as vertical transmission. Recent studies also suggest that a number of other factors are associated with vertical transmission, including maternal viral load, clinical stage of disease, nutritional status, low infant birth weight, cigarette smoking during pregnancy and intrapartum (during birth) factors, such as prolonged rupture of membranes that may expose the fetus to maternal fluids.

In recent years, it has been shown that the risk of vertical transmission is reduced to 2% - 3% by treatment with the anti-HIV drugs Zidovudine or Nevirapine, administered orally during the second and third trimesters of pregnancy, intravenously during labour, and to the baby just after birth²⁵. Combination antiretroviral therapy may reduce this risk even further, although studies examining this have not yet been completed. Delivery via caesarian section may also decrease the risk of maternal HIV transmission²⁶.

A woman's right to reproduce is not diminished, nor should it be discouraged, because she is HIV positive. Women living with HIV/AIDS who are pregnant, or who are considering pregnancy, should be encouraged to discuss their situation with an obstetrician or reproductive health specialist who is experienced in the issues surrounding maternal transmission of HIV.

Part 5. Artificial Insemination, Blood Transfusion and Organ Transplants

In Canada, all donated blood, organs and semen are now screened for HIV antibodies. There is a very small potential for transmission due to the possibility that blood or semen

23. Estebanez Estebanez, P., Colomo Gomez, C., Zunzunegui Pastor, M.V., Rua Figueroa, M., Perez, M., Ortiz, C., Heras, P., Babin, F. *Jails and AIDS. Risk factors for HIV infection in the prisons of Madrid.* Gaceta sanitaria, 4(18):100-5. 1990 May-June.

24. Manigart O, et al. *Effect of Perinatal Zidovudine Prophylaxis on the Evolution of Cell-Free HIV-1 RNA in Breast Milk and Postnatal Transmission.* Journal of Infectious Diseases, 190:1422-1428. 2004.

25. Connor EM, Sperling RS, Gelber R, Kiselev P, Scott G, O'Sullivan MJ, et al. *Reduction of maternal infant transmission of HIV-1 with zidovudine treatment.* New England Journal of Medicine. 331:1173-80. 1994.

26. Read, J. *Mode of delivery and vertical transmission of HIV-1: A meta-analysis from fifteen prospective cohort studies (The International Perinatal HIV Group).* 12th World AIDS Conference Abstract 23275, 1998.

HIV TRANSMISSION: Guidelines for Assessing Risk

may have been donated in the four-to-six-week window period prior to the donor developing HIV antibodies. However, it cannot realistically be assigned a risk category under this model. To further reduce this small risk, new and more sensitive screening tests are being developed.

Part 6. Other

Branding and Scarification

Branding and scarification are practices that can occur in different contexts, including in S/M activities or as part of cultural practices, such as healing scarification.

Potential for Transmission

Heat-branding does not meet the conditions for HIV transmission because of the high temperatures involved (heat kills HIV). Knife-branding should only be done with a sterile scalpel with a disposable blade (scalpels can be bought at medical supply stores). It should only be used once, then placed in a strong narrow-necked plastic container with a lid, and thrown in the garbage. If using a new scalpel is not possible, the knife should be soaked in bleach for twenty minutes and then rinsed with water.

Likewise, scarification should be performed using new needles, knives or razors. If using a new equipment is not possible, the equipment should be soaked in bleach for twenty minutes and then rinsed with water.

Evidence of Transmission

There is a risk of HIV transmission from sharing unsterilized branding or scarification equipment under certain circumstances, although there is little documented research exploring the role of branding or scarification in HIV transmission²⁷, and none that demonstrate documented cases of HIV transmission occurring through these practices. The lack of literature mentioning this specific mode of transmission may not be conclusive.

Assessment of Risk of HIV Transmission

According to our model, the lack of documented cases in relation to the high potential of risk would lead this activity to be categorized as Negligible Risk. In this case though, the potential for risk associated with the activity and the

lack of mention in research literature precludes making a risk assignment.

Esthetics

Potential for Transmission

Even without sterilization, it is unlikely that HIV would be transmitted via manicures or pedicures as HIV does not survive long when exposed to the environment.

Evidence of Transmission

There is no evidence to support transmission occurring through receiving a manicure, pedicure, haircut, massage, etc.

Assessment of Risk of HIV Transmission

Manicures or pedicures with uncleaned equipment..... No Risk
Manicures or pedicures with sterilized equipment..... No Risk

Fighting

Potential for Transmission

Most of the conditions for transmission of HIV are present in the case of a fight where both people have open cuts or wounds. However, due to the short life of HIV when exposed to the open air, there is a question as to whether or not there would be a sufficient level of the virus to transmit HIV.

Evidence of Transmission

There are no documented cases of transmission of HIV in this manner.

Assessment of Risk of HIV Transmission

Fighting Negligible Risk

27. Orubuloye, I. O. and Caldwell, Pat and Caldwell, John. A note on suspect practices during the AIDS epidemic: vaginal drying and scarification in southwest Nigeria. Health Transition Review, 5(suppl.):161-165. c. 1995.

		EVIDENCE		
		NO	YES (under certain circumstances)	YES
POTENTIAL	NO	No Risk		
	YES	Negligible Risk	Low Risk	High Risk

Hepatitis C No Risk: Kissing without the exchange of blood; sadomasochistic activities (with universal precautions); contact with feces or urine (unbroken skin); injecting, smoking and snorting drugs using new equipment; tattooing, piercing, branding, scarification, manicures, pedicures, electrolysis and acupuncture with sterilized and new equipment.

Hepatitis C Negligible Risk: Fellatio; cunnilingus; anilingus; fingering; non-insertive masturbation; sadomasochistic activities with exchange of blood; contact with feces or urine (on broken skin); vulva-to-vulva rubbing, docking, giving or receiving breast milk into the mouth; fighting.

HIV No Risk: Kissing (no blood); non-insertive masturbation; receiving unshared sex toys; contact with feces or urine (unbroken skin); injecting with unshared needles; using drugs with new pipe or straw; sadomasochistic activities (with universal precautions); tattooing, piercing, electrolysis and acupuncture with sterilized and new equipment; manicures or pedicures.

HIV TRANSMISSION: Guidelines for Assessing Risk

Model

Hepatitis C High Risk: Injecting drugs using shared and cleaned needles or mixing equipment; tattooing, piercing, electrolysis and acupuncture with shared equipment; occupational exposure.

HIV High Risk: Penile-anal or penile-vaginal intercourse without condom; receiving shared sex toys; injecting with shared needles.

Hepatitis C Low Risk: penile-vaginal and penile-anal intercourse; fisting; snorting and smoking drugs using shared equipment; manicures and pedicures with uncleaned equipment; sharing toothbrushes and razors.

HIV Low Risk: Kissing (with exchange of blood); performing fellatio or cunnilingus without barrier; intercourse (penile-anal or penile-vaginal) with barrier; injecting with cleaned needles; tattooing with non-professional equipment; taking blood in the mouth; occupational exposure.

HIV Negligible Risk: Receiving fellatio or cunnilingus; performing fellatio or cunnilingus with barrier; anilingus; fingering; fisting; using shared sex toys with a condom; using disinfected sex toys; sadomasochistic activities; contact with feces or urine (on broken skin); vulva-to-vulva rubbing; docking; taking breast milk into the mouth; using drugs with shared pipe or straw; tattooing, piercing, electrolysis and acupuncture with shared equipment; fighting; sharing toothbrushes and razors.

HIV TRANSMISSION: Guidelines for Assessing Risk

Intentional Blood Exchange

“Vampirism”, “Blood Brother/Sisterhood”

Potential for Transmission

Drinking, sucking or licking the blood of a person who is infected with HIV poses a potential for transmission. This risk of transmission is increased depending on the amount of blood that is taken into the mouth, and the frequency of the activity and the presence of cuts or sores in the mouth.

Likewise, customs like “blood brothers” or “blood sisters” (where blood can be exchanged between people by rubbing open cuts together to show trust and friendship with one another) can also put a person at risk for contracting HIV. Customs like this can allow one persons’ blood to get into the bloodstream of another person, allowing transmission of HIV to occur.

Evidence of Transmission

There are a few anecdotal reports of HIV transmission through taking blood into the mouth.

There are no documented cases of HIV transmission through blood Brother/Sisterhood pacts. It should be stressed however, that blood Brother/Sisterhood pacts carry a very high assessment of theoretical risk as the likelihood of someone else’s blood directly entering your bloodstream is high.

Assessment of Risk of HIV Transmission

Taking blood into the mouth Low Risk
Blood Brother/Sisterhood pacts: According to our model, the lack of documented cases in relation to the high potential of risk would lead this activity to be categorized as Negligible Risk. In this case though, the potential for risk associated with the activity and the lack of mention in research literature precludes making a risk assignment.

Occupational Exposure

Potential for transmission

Exposure to semen, vaginal fluids, blood and breast milk in an occupational setting (for example in emergency response and medical staff) does carry a potential for transmission

if universal precautions are not followed. For example exposure through needle-stick injuries happen and in such cases there have been three factors associated with transmission of HIV: the volume of blood injected, the illness of the source patient and the administering of post-exposure prophylaxis²⁸. Safe handling of needles, wearing gloves when administering punctures to draw blood and access to post-exposure prophylaxis (in the case of exposure) can all help reduce the potential for transmission.

Evidence of Transmission

In Canada there have been few (three cases as of 2002) recorded cases of HIV transmission due to occupational exposure.

Assessment of Risk of HIV Transmission

Occupational Exposure Low Risk

Sharing toothbrushes, razors etc.

Potential for Transmission

Sharing personal use items such as razors and toothbrushes generally do not present an effective means or route for HIV transmission. In addition, the short life of HIV outside the body reduces the likelihood of transmission. However, it is preferable to avoid sharing such items, as contact with the first user’s blood is possible as a result of nicks, cuts and bleeding gums in both users.

Evidence of Transmission

There are no documented cases of HIV transmission attributed to sharing personal use items such as razors or toothbrushes.

Assessment of Risk of HIV Transmission

Sharing toothbrushes, razors etc. Negligible Risk

28. CDC. Case-control study of HIV seroconversion in health-care workers after percutaneous exposure to HIV-infected blood --- France, United Kingdom, and United States, January 1988-August 1994. MMWR 44:929-33. 1995.

5. Hepatitis C Transmission: A Model for Assessing Risk

Hepatitis C (HCV) is a blood-borne virus that can destroy the liver. The major causes of HCV infection worldwide are unscreened blood transfusions, and re-use of needles, syringes, tattooing and piercing equipment. In Canada, all donated blood and organs are now screened for HCV.

There is currently no vaccine to prevent HCV. Pegylated Interferon combined with Ribavirin is used in the treatment of persons with chronic HCV infection.

Differences between HIV and HCV

HCV has been shown to live much longer outside the body and in a dormant state, even on dried surfaces, than HIV. Activities that would be negligible risks for HIV, such as sharing toothbrushes or straws to snort cocaine, are much higher for HCV. This is because they often involve exchanging small amounts of blood and the external exposure (to air, temperature and light) that kills HIV may not kill HCV. In addition, cleaning techniques for needles that considerably reduce the risk of HIV do not necessarily have the same risk reduction effects for HCV. This also suggests that HCV is much hardier than HIV.

The risk of contracting HCV through sexual contact is not as well-established. Recent studies show that there is little to no HCV present in vaginal fluids and semen. However, it must be stressed that this area is still being researched and no final conclusions have been made on the assessment of risk for transmission through sexual activities that do not involve the presence of blood

Conditions for Transmission of HCV

The same five conditions as for HIV must be present for HCV transmission to occur. There are however some differences between HIV and HCV within each category because of the fact that blood is the main concern for transmission of HCV.

1. There must be a source of infection.

Relying on the identification of a person as a source of infection is not useful in developing prevention messages, since it is nearly impossible to tell if a person is infected by looking at them. It is more appropriate to consider the source of infection as the presence of HCV in the blood.

2. There must be a means of transmission.

The following routes of HCV transmission are well-established:

- sharing used needles or syringes or other drug using equipment, and other situations that involve piercing of the skin (such as tattooing or piercing)
- specific types of sexual activity (when blood may be exchanged)
- receiving transfusions of infected blood or blood products or transplanted organs (in Canada all donated blood and organs are screened for HCV).
- mother-to-child transmission, in the uterus, during childbirth (vertical transmission) or through breast feeding (when nipples are bleeding).

3. There must be a host susceptible to infection.

The virus is harmless until it finds a host or, more accurately, susceptible cells within the host's body. Every human being is considered to be a host susceptible to infection.

4. There must be an appropriate route of entry to the target cells of the body.

Infected blood reach the HCV-susceptible cells in the blood, usually through a break in the skin. Unlike HIV, transmission of the virus purely through the mucosal membranes (mucosa) exposed during sexual contact has not been found. Mucosa are the moist surfaces of the body which line most of the body cavities and hollow internal organs such as the vagina, rectum, mouth, urethra, nose and eyelids.

HIV TRANSMISSION: Guidelines for Assessing Risk

		EVIDENCE		
		NO	YES (under certain circumstances)	YES
POTENTIAL	NO	No Risk	 	
	YES	Negligible Risk	Low Risk	High Risk

5. There must be a sufficient level of virus delivered to establish infection.

Because of a higher concentration or quantity of virus, some body fluids are efficient media for transmitting HCV, while others are not. Blood is of most concern in HCV transmission.

Factors Used to Determine the Level of Risk

A. Potential for Transmission

In assessing potential for transmission, we consider the 5 conditions for transmission. Because it is impossible to prove that an infection will never happen, it is important to consider the potential for transmission and weigh it against evidence of what is known to have actually occurred.

B. Evidence of Transmission

In creating these guidelines, a review of research was carried out to examine the documented evidence of HCV transmission through specific practices. Case reports, abstracts and research reports were considered, with the greatest weight on reports from cohort studies using multivariate analysis techniques (studying a specific group of individuals over time and analysing the interaction of a number of variables). For the purpose of this model, greater emphasis is placed on what is known or proven to happen, than on what may happen in theory.

To assess the risk of HCV transmission, the potential for transmission and the evidence that transmission has occurred are both considered. Activities are then placed into one of four categories.

Categories for Assessing Risk

1. No risk

To our knowledge, none of the practices in this category have ever been demonstrated to lead to HCV infection. There is no potential for transmission since all of the basic conditions for viral transmission are not present.

Potential for transmission None
 Evidence of transmission None

2. Negligible risk

All of the practices assigned this risk level present a potential for HCV transmission because they involve an exchange of blood. However, the amounts, conditions and media of exchange are such that the efficiency of HCV transmission appears to be greatly diminished. There are no confirmed reports of infection from these activities.

Potential for transmission Yes
 Evidence of transmission None

3. Low risk

All of the practices assigned this risk level present a potential for HCV transmission because they involve an exchange of blood. There are also a few reports of infection attributed to these activities (usually through individual case studies or anecdotal reports, and usually under certain identifiable conditions).

Potential for transmission Yes
 Evidence of transmission . . . Yes (under certain conditions)

4. High risk

All of the practices assigned this risk level present a potential for HCV transmission because they involve an exchange of

HIV TRANSMISSION: Guidelines for Assessing Risk

blood. In addition, a significant number of scientific studies have repeatedly associated the activities with HCV infection. Even when the exact mechanism of transmission is not completely clear, the results of such studies conclude that activities in this category are high risk.

Potential for transmission Yes
Evidence of transmission Yes

Challenges of Assessing Risk for HCV

A. Lack of Consistent Information and Research on Sexual Transmission

Research on sexual transmission of HCV shows some discrepancy between male to male transmission and female to male/male to female transmission. There is frequent mention of certain activities (for example: penile-anal intercourse, anilingus, using insertive sex toys and sadomasochistic activities) in the male to male research indicating that these activities are consistent with sexual transmission. In female to male/male to female these activities are not mentioned and there is little evidence of sexual transmission of HCV between men and women. For the purposes of assessing risk, where there is potential and evidence for at least one group, the assessment assumes that the conditions for transmission have been met for all groups unless there are physiological differences that warrant a different risk assessment.

B. Difficulty Assessing the Risk of a Single Activity in the Presence of Multiple Activities

For the purposes this model, we consider the risk of a single episode of each particular practice. In real life, activity is rarely confined to one episode or to one practice. If a combination or sequence of activities is deemed to increase risk, these factors are addressed in the text.

HIV TRANSMISSION: Guidelines for Assessing Risk

6. Assessing Risk of Hepatitis C Transmission

Part 1. Sexual Activities

The risk of contracting hepatitis C through sexual contact is not well-established. Recent studies show that there is little to no hepatitis C virus present in vaginal fluids or semen. However, transmission can occur if blood is present, either visibly or through microscopic cuts or tears in the skin and/or mucosa.

It must be stressed that this area is still being researched and no final conclusions have been made on the assessment of risk for transmission through sexual activities that do not involve the presence of blood.

Kissing

“Sucking face, necking, smooching”

Potential for Transmission

There is no potential for HCV transmission in pressing dry lips together.

In the absence of blood in the mouth, wet kissing can be classified as no risk. Saliva that does not contain blood presents no potential for transmission.

There is a small potential for transmission in wet kissing where blood may be exchanged. The presence of blood in the mouth could be caused by recent brushing or flossing of the teeth, a sore in the mouth, gum disease, a recent tooth extraction or biting or scratching one another (e.g. with the teeth or orthodontic appliances, such as braces) during kissing. Although it is likely that only a small amount of blood would ever be present, the presence of a quantity sufficient for transmission of HCV to occur cannot be discounted. The risk of transmission is increased where blood is exchanged between mouths and where the mouth of the person receiving the blood contains ulcers or sores, or where there is evidence of dental recession.

Note: It is recommended that a period of 30 minutes to two hours be allowed to elapse after brushing or flossing

teeth before sexual activity, due to the possibility of blood in saliva.

Evidence of Transmission

There is no evidence of transmission of HCV through kissing alone.

Assessment of Risk of HCV Transmission

Wet or dry kissing

No exchange of blood. No Risk

Wet kissing

With exchange of blood N/A*

** According to our model, the lack of documented cases in relation to the high potential of risk would lead this activity to be categorized as Negligible Risk. In this case though, the potential for risk associated with the activity and the lack of mention in research literature precludes making a risk assignment.*

Oral Sex: Fellatio

“Giving or getting head, headjob, blowjob, sucking off, blowing, face-fucking, going down, cock-sucking”

Potential for Transmission

There is a potential risk of transmission of HCV to the partner giving fellatio if there is a disruption in the oral mucosa such as bleeding gums, cuts, sores, lesions, ulcers or burns in the mouth or by a recent tooth extraction and the presence of blood from an abrasion or cut on the penis.

It is recommended that the partner giving fellatio wait 30 minutes to two hours after brushing or flossing teeth before engaging in fellatio, since brushing and flossing teeth may cause temporary bleeding of the gums.

There is a similarly small risk of contracting HCV in getting fellatio if blood from bleeding gums or sores in the mouth could come into contact with an abrasion on the penis. Although it is likely that only a small amount of blood

HIV TRANSMISSION: Guidelines for Assessing Risk

would ever be present, the presence of a quantity sufficient for transmission of HCV to occur cannot be discounted.

Evidence of Transmission

Some studies show small amounts of HCV in saliva where poor dental health is apparent, indicating that trauma in the mouth (bleeding gums) is likely responsible for the presence of HCV in these cases. It is not known if the enzyme in saliva that inhibits HIV also inhibits HCV. To date, there is no evidence of HCV being transmitted through fellatio.

Assessment of Risk of HCV Transmission

Fellatio (giving)

With condom Negligible Risk*

Without condom Negligible Risk

Fellatio (getting)

With condom Negligible Risk*

Without condom Negligible Risk

** There is enough evidence of breakage or improper use of barrier methods to classify this activity as negligible rather than no risk.*

Oral Sex: Cunnilingus

“Licking out, eating out, going down, licking pussy, box lunch, eating at the Y”

Potential for Transmission

There is a potential for transmission of HCV by performing cunnilingus (licking the clitoris and/or in or around the vulva) because of the possible exchange of blood

There is a potential for transmission to the partner performing cunnilingus if there is a disruption in the oral mucosa caused by bleeding gums, cuts, sores, lesions, ulcers or burns in the mouth or by a recent tooth extraction, or other dental work that causes trauma in the mouth and the presence of blood from an abrasion or cut on the clitoris or vulva. The risk in performing cunnilingus is also higher during menstruation because of the presence of blood.

It is recommended that the performing partner wait 30 minutes to two hours after brushing or flossing teeth before engaging in cunnilingus, since brushing and flossing may cause temporary bleeding of the gums.

Receiving cunnilingus involves a small potential for transmission because of the possibility of abrasions on the vagina,

clitoris or vulva; these could permit entry of small quantities of blood from bleeding gums or a sore in the mouth. Although it is likely that only a small amount of blood would ever be present, the presence of a quantity sufficient for transmission of HCV to occur cannot be discounted.

The risk can be reduced by using a latex barrier over the vulva, such as a dental dam or, as an alternative, a new and unlubricated condom carefully cut open and used as a barrier between the mouth and vulva or clitoris.

Evidence of Transmission

Some studies show a small amount of HCV in saliva where poor dental health is apparent, indicating that trauma in the mouth (bleeding gums) is likely responsible for the presence of HCV in these cases. To date, there is no evidence of HCV transmission as a result of cunnilingus.

Some reports suggest that in people living with HIV/AIDS there is an increased possibility of transmitting HCV.

Assessment of Risk of HCV Transmission

Cunnilingus (performing)

With barrier and during menses Negligible Risk*

With barrier and not during menses Negligible Risk

Without barrier and not during menses Negligible Risk

Without barrier and during menses Negligible Risk

Cunnilingus (receiving)

With barrier Negligible Risk*

Without barrier Negligible Risk

** There is enough evidence of breakage or improper use of barrier methods to classify this activity as negligible rather than no risk.*

Oral Sex: Anilingus

“Rimming, licking out, eating out, licking or eating ass”

Potential for Transmission

Anilingus is not an efficient means of HCV transmission. There is a potential for transmission in performing anilingus if blood is present in or around the anus and there is a disruption to the oral mucosa caused by bleeding gums, cuts, sores, lesions, ulcers or burns or by a recent tooth extraction, or other dental work. Although it is likely that only a small amount of blood would ever be present, the presence of a quantity sufficient for transmission of HCV to occur cannot

HIV TRANSMISSION: Guidelines for Assessing Risk

be discounted. Any risk from anilingus can be reduced by use of a latex barrier, such as a dental dam or a new condom carefully cut open and used as a barrier between the mouth and anus.

Receiving anilingus involves a small potential for transmission because of the possibility of abrasions in or around the anus; these could permit entry of small quantities of blood from bleeding gums or a sore in the mouth. Although it is likely that only a small amount of blood would ever be present, the presence of a quantity sufficient for transmission of HCV to occur cannot be discounted.

It is recommended that the performing partner wait 30 minutes to two hours after brushing or flossing teeth before engaging in anilingus, since brushing and flossing may cause temporary bleeding of the gums.

Evidence of Transmission

There is no evidence of transmission for HCV in this activity.

Assessment of Risk of HCV Transmission

Anilingus (performing)

With barrier Negligible Risk*

Without barrier Negligible Risk

Anilingus (receiving)

With barrier Negligible Risk*

Without barrier Negligible Risk

* *There is enough evidence of breakage or improper use of barrier methods to classify this activity as negligible rather than no risk.*

Intercourse: Penile–Vaginal

“Fucking, screwing, making love, getting or being laid”

Potential for Transmission

There is potential for transmission in the presence of blood from cuts, abrasions or sores on the penis and vaginal area. The presence of menstrual blood also increases the risk for transmission. Minor or microscopic cuts or tears and sores on the penis (e.g. genital ulcers) can provide a point of entry for the virus. The foreskin may be particularly susceptible to tears, scratches and abrasions, suggesting that its presence may increase the likelihood of contracting HCV.

Evidence of Transmission

Some studies have indicated that transmission of HCV has occurred during penile-vaginal sex, when blood is present. As mentioned above, studies show that there is little to no virus present in vaginal fluids and semen, so the evidence presented to date is under certain circumstances only, resulting in a low risk category for HCV transmission with or without a condom.

Some studies indicate that people living with HIV are at greater risk of sexual transmission of HCV.

Assessment of Risk of HCV Transmission

Insertive penile-vaginal intercourse

With condom. Low Risk*

Without condom Low Risk

Receptive penile-vaginal intercourse

With condom. Low Risk*

Without condom Low Risk

* *There is enough evidence of breakage or improper use of barrier methods to classify this activity as low rather than negligible risk.*

Intercourse: Penile–Anal

“Butt-, bum- or ass-fucking, screwing, making love, getting or being laid, anal sex”

Potential for transmission

There is potential for transmission in the presence of blood from cuts, abrasions or sores on both the penis and the anus or rectum. Minor or microscopic cuts, tears or sores on the penis (e.g. genital ulcers) can provide a point of entry for the virus. The foreskin may be particularly susceptible to tears, scratches and abrasions, suggesting that its presence may increase the likelihood of contracting HCV.

The potential for transmission of HCV through penile-anal sex is the same for men or women who have anal sex.

Evidence of Transmission

Studies examining the risk of sexual transmission of HCV identify several activities as risky. These include fisting and anal sex.

The specific condition of one or both partners having HIV may increase the likelihood of transmission of HCV.

HIV TRANSMISSION: Guidelines for Assessing Risk

Assessment of Risk of HCV Transmission

Insertive penile–anal intercourse

With condom Low Risk*

Without condom Low Risk

Receptive penile–anal intercourse

With condom Low Risk*

Without condom Low Risk

**There is enough evidence of breakage or improper use of barrier methods to classify this activity as low rather than negligible risk.*

Fingering (Anal and Vaginal)

“Finger job, finger-fucking”

Potential for Transmission

There is a risk of transmission of HCV through fingering the clitoris, labia, vagina or anus if the finger has an open cut, sore, lesion, burn, rash or hangnail and there is blood present in or on the clitoris, labia, vagina or anus. The likelihood of the vaginal or rectal lining suffering trauma is increased as fingernails can easily tear these membranes.

The risk for transmission via this method is increased with the presence of menstrual blood.

The risk can be reduced by using a latex glove, which performs a similar function to a condom during penile intercourse. However, a finger (gloved or not) might still cause some stress to the mucosal lining of the receiving partner, which could increase the risk to the receiving partner if other activities (such as penile-vaginal or penile-anal intercourse without a condom) follow.

Evidence of Transmission

There are no documented cases of HCV transmission through performing or receiving digital-vaginal or digital-anal intercourse.

Assessment of Risk of HCV Transmission

Vaginal or Anal Fingering (performing)

With latex glove Negligible Risk*

Without latex glove Negligible Risk

Vaginal or Anal Fingering (receiving)

With latex glove Negligible Risk*

Without latex glove Negligible Risk

**The latex glove could break or be defective or improperly used, making it impossible to classify these activities as no risk. However, using a glove will reduce risk, particularly if open cuts, sores, lesions, burns or rashes are present.*

Fisting (Anal and Vaginal)

Potential for Transmission

The practice of inserting the hand into the rectum or vagina is not by itself an efficient means of HCV transmission.

Tearing may occur due to forceful insertion or scratches from finger-nails. The performing partner may have cuts or abrasions (including hangnails) which may be exposed to blood during fisting. There might also be a presence of menstrual blood.

Risk can be reduced by using a latex glove. However, a hand and or fingers (gloved or not) might still cause some stress to the mucosal lining of the receiving partner, which could increase the risk to the receiving partner if other activities (such as penile-vaginal or penile-anal intercourse without a condom) follow.

Evidence of Transmission

Studies examining the risk of sexual transmission of HCV identify several activities as risky. These include fisting and anal sex. As mentioned above, the specific condition of one or both partners having HIV may increase the likelihood of transmission of HCV.

Assessment of Risk of HCV Transmission

Fisting (performing)

With glove Low Risk*

Without glove Low Risk

Fisting (receiving)

With glove Low Risk*

Without glove Low Risk

**The latex glove could break or be defective or improperly used, making it impossible to classify these activities as negligible risk. However, using a glove will reduce risk, particularly if open cuts, sores, lesions, burns or rashes are present.*

HIV TRANSMISSION: Guidelines for Assessing Risk

Masturbation by Partner

“Jerking or jacking off, J/O, giving or getting a hand-job, getting someone off, making someone cum”

Potential for Transmission

The practice of masturbating a man through manual stimulation of the erect penis, or of masturbating a woman by manual stimulation of the clitoris, carries no risk for the person holding the penis or fingering the clitoris unless there are cuts, burns, abrasions or rashes on the fingers or hands that come into contact with the partners’ blood. This risk can be reduced by using a latex glove.

Evidence of Transmission

There are no documented cases of transmission through masturbation of a male or female partner.

Assessment of Risk of HCV Transmission

Non-insertive Masturbation* (performing)

With glove Negligible Risk**

Without glove Negligible Risk

Non-insertive Masturbation* (receiving)

With glove Negligible Risk**

Without glove Negligible Risk

* For insertive masturbation, see *Fingering*.

** *The latex glove could break or be defective or improperly used, making it impossible to classify these activities as no risk. However, using a glove will reduce risk, particularly if open cuts, sores, lesions, burns or rashes are present.*

Using Insertive Sex Toys

Potential for transmission

Using sex toys (e.g. dildos, vibrators, Chinese balls, butt plugs, anal beads etc.) can cause trauma resulting in bleeding to the rectum or vagina. The extent of potential transmission varies depending on the size of the device and the way it is used.

Trauma and resulting bleeding can promote the possibility of later transmission by providing a route of entry for HCV to the blood and to HCV-susceptible cells through the cuts or tears in the rectum or vagina, and thereby increase the risk for HCV transmission through other activities that

might follow (such as penile-vaginal or penile-anal intercourse).

Transferring a sex toy directly from one partner to another allows for sharing of infected blood that can result in direct HCV transmission. When using instruments and toys for sex play, universal precautions, such as is found in hospitals for materials such as metal, wood, rubber, etc., should be followed. For more information on universal precautions consult *Infection Control Guidelines: Preventing the transmission of bloodborne pathogens in health care and public services settings* (Health Canada).

Placing a condom on the toy can make cleaning much easier. In the immediacy of a sexual situation, some people may use a condom as a substitute for cleaning. After using a condom with one person, replace it with a new one before the toy is transferred to another person. There is some risk involved with this method because of the possibility that the condom can break, slip off or not completely cover the surface of the toy.

Evidence of Transmission

There are no documented cases of transmission through using insertive sex toys, however the risk of exposure to blood, and the lack of literature mentioning this specific mode of transmission may not be conclusive.

Assessment of Risk of HCV Transmission

According to our model, the lack of documented cases in relation to the high potential of risk would lead this activity to be categorized as Negligible Risk. In this case though, the potential for risk associated with the activity and the lack of mention in research literature precludes making a risk assignment.

Sadomasochistic Activities

“S/M, S & M”

Potential for Transmission

Infection can occur when infected blood comes into contact with a route of entry to the blood system via an open cut, sore, lesion, ulcer, burn or rash.

Some activities may lead to the incidental or intentional drawing of blood (e.g. whips, nipple-clamps, restraints, severe spanking). When any sadomasochistic activity involves the potential drawing of blood, sterile precautions

HIV TRANSMISSION: Guidelines for Assessing Risk

similar to those set in hospitals should be taken²⁹. Anything used to draw blood should not be used on more than one person.

Any open cuts, sores, lesions, ulcers, burns or rashes should also be protected from exposure to blood. Any body part, device or item that has blood on it should not come into contact with another person's vagina, rectum, penis or eyes, or with an open cut, sore, lesion, ulcer, burn or rash in the mouth or on the body.

Even when sadomasochistic activities are very rough – if they do not draw blood that comes into contact with someone else and are not followed by any other sexual activities that involve contact with blood – they are not a risk for HCV transmission.

Evidence of Transmission

There are no documented cases of transmission through sadomasochistic activities, however the risk of exposure to blood, and the lack of literature mentioning this specific mode of transmission may not be conclusive.

Assessment of Risk of HCV Transmission

Sadomasochistic activities (with universal precautions) No Risk
Sadomasochistic activities. Negligible Risk

Contact with Feces

“Scat, shit play, brown”

Potential for Transmission

Blood can occasionally be present in feces which means that there is a small potential for HCV transmission through receiving defecation onto open cuts, sores, lesions, ulcers, burns or rashes. Defecation on unbroken skin does not pose a risk.

Evidence of Transmission

There is no evidence of HCV transmission through contact with feces.

Assessment of risk of HCV transmission

Contact with feces

On unbroken skin No Risk

On broken skin Negligible Risk*

**Due to the potential of blood, if present in the feces, entering an open cut, sore, lesion, burn on the body.*

Urination

“Watersports, golden showers, pissing, yellow”

Potential for Transmission

Blood can occasionally be present in urine which means that there is a small potential for HCV transmission through receiving another person's urine onto open cuts, sores, lesions, ulcers, burns or rashes.

Evidence of Transmission

There is no evidence that transmission of HCV has occurred through contact with urine. There is some evidence that small amounts of HCV virus are present in blood in the urine, and could be passed on to a receptive partner if that urine is ingested. In this case, ingesting the urine would be classified as negligible rather than no risk.

Assessment of risk of HCV transmission

Receiving urine

On the body. No Risk
Into the body Negligible Risk*
Onto broken skin Negligible Risk*

** As blood may be present in the urine, there is a possibility of transmission through an open cut, sore, lesion, burn or bleeding gums in the mouth of the receiving partner.*

Vulva-to-vulva rubbing

“pussy, beaver, cat fight”

Potential for Transmission

During menstruation, the risk is increased by the potential exchange of blood into open cuts, sores, lesions, ulcers, burns or rashes on the vulva or clitoris.

Evidence of Transmission

There have been no studies to demonstrate transmission of HCV in this manner.

29. Health Canada. *Infection Control Guidelines: Preventing the transmission of bloodborne pathogens in health care and public services settings*, Health Canada. May 1997.

HIV TRANSMISSION: Guidelines for Assessing Risk

Assessment of Risk of HCV Transmission

Vulva-to-vulva rubbing. Negligible Risk

Docking

Potential for Transmission

The potential for transmission requires the presence of blood and an open sore or cut on the penis of both partners. If both partners have no bleeding or open sores, there is no potential for transmission.

Evidence of Transmission

There is no evidence of transmission.

Assessment of Risk of HCV Transmission

Docking. Negligible Risk

Breast milk

Potential for Transmission

The presence of HCV virus in breast milk is negligible. The potential is present if bleeding gums, cuts, sores, ulcers, lesions or burns are present in the mouth of the recipient and the lactating woman is experiencing cracked nipples which may bleed and transfer the virus to those taking breast milk into the mouth.

Evidence of Transmission

There is no evidence of transmission.

Assessment of Risk of HCV Transmission

Giving or receiving breast milk into the mouth. Negligible Risk

Cultural Practices

Cultural practices, such as clitorrectomy, vaginal sewing, and applying herbal drying agents to the mucosal lining of the vagina to tighten the vaginal cavity, may cause initial and recurring trauma that induces bleeding and increases the risk of transmission of HCV.

Potential for Transmission

The potential for bleeding, developing open sores and open wounds exists with all of these activities. The opportunity for transmission of HCV in the presence of bleeding sores or wounds has been observed.

Evidence of Transmission

While there are no documented cases of HCV transmission directly attributed to these practices, the theoretical risk remains high.

Assessment of Risk of HCV Transmission

According to our model, the lack of documented cases in relation to the high potential of risk would lead this activity to be categorized as Negligible Risk. In this case though, the potential for risk associated with the activity and the lack of mention in research literature precludes making a risk assignment.

Part 2. Drug Use

Injection Drug Use

“Shooting up, hitting up, jacking up, mainlining, cranking”

Injection drug use may involve either street drugs (e.g. cocaine, heroin), prescription drugs (e.g. insulin, anabolic steroids), hormones or vitamin supplements (e.g. intramuscular vitamin B12).

Potential for Transmission

The sharing of needles or syringes involves a very high potential for transmission of HCV due to the presence of blood in the shaft of the used needle and in the tube of the used syringe. Whether it is visible or not, blood will almost certainly be present in a used needle or syringe in sufficient quantities for transmission to occur. Infective HCV may remain present in the blood in a used needle or syringe for several days, or even weeks.

There is also a risk of HCV transmission through the sharing of other injecting equipment can such as spoons, filters, water, tourniquets and swabs.

Evidence of Transmission

It is well established that sharing needles and syringes poses a high risk of transmission of HCV. To eliminate the risk, a new needle, syringe and mixing equipment should be used every time.

It is very important to note that there are serious doubts as to whether cleaning methods are adequate for the purpose of killing HCV. To completely avoid the risk of infection with HCV, needles should never be shared. All needles should be capped and disposed of as soon as possible after

HIV TRANSMISSION: Guidelines for Assessing Risk

use. A needle should never be recapped by anyone other than the person who used it. It is also important not to share vials or spoons of liquid, because blood from one person's needle can get into the liquid and be drawn into another person's needle. Needles can be marked by burning or breaking pieces of the plastic to identify which needle belongs to whom.

Assessment of Risk of HCV Transmission

- Injection using new needle and syringe and unshared mixing equipment No Risk
- Injection using shared, uncleaned needle and/or syringe and/or mixing equipment. High Risk
- Injection using shared, cleaned needle and/or syringe and/or mixing equipment High Risk

Non-Injection Drug Use

Sharing straws, crack pipes

Potential for Transmission

Sharing straws and crack pipes when snorting or smoking cocaine or other drugs contains a real potential for the transmission of HCV. Snorting can rupture mucosal linings in the nose causing bleeding, and small amounts of blood can remain on the straw when it is used by another person. The potential for HCV to be transmitted in blood on the straw and then find a route of entry through mucosal ruptures in another user's nose is classified as low risk. Sharing crack pipes also poses a risk of HCV infection because hot pipes can potentially burn or blister the lips of a user and cause them to bleed. As with straws, blood on the pipe could also transmit HCV.

Evidence of Transmission

It is well established that sharing pipes to smoke drugs or straws to snort drugs can lead to HCV infection.

Assessment of risk of HCV transmission

- Snorting or smoking cocaine or other drugs using new or unshared straws and/or pipes No Risk
- Snorting or smoking cocaine or other drugs using shared straws and/or shared pipes Low Risk

Part 3. Other Activities Involving Needles

Tattooing, Piercing, Electrolysis and Acupuncture

Potential for Transmission

All tattooing, piercing, electrolysis and acupuncture practitioners should follow universal precautions similar to those used in hospitals³⁰. It is required by law that all needles used in such procedures be used only once and disposed of after use. However, situations occur where these precautions may not be adhered to or strictly enforced. In such cases, individuals will have to negotiate their own level of acceptable risk. Appropriate queries should be made about the precautions observed in any particular clinic or studio prior to such procedures being performed. (See Section 2, HIV and Prisons).

Evidence of Transmission

HCV is much harder than HIV when exposed to air. This means that some percutaneous activities, such as piercing and tattooing with shared equipment (including ink) have a much higher risk for HCV transmission than for HIV.

There is a potential for blood to be present on tools used for piercing, tattooing, electrolysis and acupuncture and there have been several studies linking tattooing and piercing with HCV transmission. Ensuring that the tattoo, piercing, electrolysis or acupuncture is carried out using sterilized equipment (using universal precautions) and new needles will eliminate the risk of exposure. It is important to note that cleaning with soap or bleach is not an adequate method of destroying the HCV virus.

Blood may also be present in ink pots, deposited during the uptake of ink and present on other paraphernalia used in tattooing, piercing, electrolysis or acupuncture. Check with your service provider to ensure that all equipment is either sterilized or unused.

Evidence of transmission using non-professional equipment (for example, the equipment used by people in prisons for unsanctioned tattooing) has been cited in a number of studies.

30. Health Canada. *Infection Control Guidelines: Preventing the transmission of bloodborne pathogens in health care and public services settings*, Health Canada. May 1997.

HIV TRANSMISSION: Guidelines for Assessing Risk

Assessment of Risk of HCV Transmission

Piercing, tattooing, acupuncture or electrolysis with shared equipment with or without cleaning . . . High Risk
Tattooing with shared ink. High Risk
Piercing, tattooing acupuncture or electrolysis with sterilized equipment No Risk
Piercing, tattooing acupuncture or electrolysis with unshared equipment (including ink) No Risk

Part 4. Maternal Transmission

Because of the complexity of issues relating to maternal transmission, no category to assess the risk of transmission is assigned here. The statistical probabilities are taken from recent scientific studies.

Breast Feeding

Potential for transmission

The presence of HCV virus in breast milk is negligible. Studies have shown that for infants born to women with HCV, the average rate of infection was the same for infants who were breastfed as those who were bottle-fed³¹. The potential is present if the mother is experiencing cracked nipples which may bleed and transfer the virus to her child.

Vertical Transmission

Potential for transmission

A woman's right to reproduce is not diminished, nor should it be discouraged, because she is living with HCV. Women living with HCV who are pregnant, or who are considering pregnancy, should be encouraged to discuss their situation with an obstetrician or reproductive health specialist who is experienced in the issues surrounding maternal transmission of HCV.

The rates of vertical transmission (from mother to fetus) ranges from 0% to 20%, with an average of 5%. The a high viral load the time of birth is a key factor associated with the transmission of the virus. It should be noted that a woman who is co-infected with HIV and HCV is 3.8 times more likely to transmit HCV³².

Part 5. Artificial Insemination, Blood Transfusion and Organ Transplants

In Canada, all donated blood, organs and semen are now screened for HCV. Due to the possibility that blood may have been donated in the window prior to the donor developing HCV antibodies, there is a very small potential for transmission. However, it cannot realistically be assigned a risk category under this model. To further reduce this small risk, new and more sensitive screening tests are being developed.

Part 6. Other

Branding and Scarification

Branding and scarification are practices that can occur in different contexts, including in S/M activities or as part of cultural practices, such as healing scarification.

Potential for Transmission

Knife-branding should only be done with a sterile scalpel with a disposable blade (scalpels can be bought at medical supply stores). It should only be used once, then placed in a strong narrow-necked plastic container with a lid, and thrown in the garbage. Likewise, scarification should be performed using new needles, knives or razors. Bleach is not known to kill the HCV virus effectively. Therefore, cleaning branding and scarification equipment can only partially reduce, and not eliminate, the risk of transmission. However, if using a new equipment is not possible, the equipment should still be soaked in bleach for twenty minutes and then rinsed with water to reduce the risk of transmission.

Evidence of Transmission

There is a risk of HCV transmission from sharing unsterilized branding or scarification equipment, although there is little documented research exploring the role of branding or scarification in HCV transmission.

Assessment of Risk of HCV Transmission

Branding and scarification, new or unshared equipment. No Risk

31. CDC Viral Hepatitis; Perinatal Transmission Modes viewed on the Internet at <http://www.cdc.gov/ncidod/diseases/hepatitis/c_training/edu/1/epidem-trans-8.htm>.

32. Yen T, Keeffe EB, Ahmed A. *The Epidemiology of Hepatitis C Virus Infection*. Journal of Clinical Gastroenterology. 36(1):47-53, 2003.

HIV TRANSMISSION: Guidelines for Assessing Risk

Branding and scarification, shared equipment..... N/A*

* According to our model, the lack of documented cases in relation to the high potential of risk would lead this activity to be categorized as Negligible Risk. In this case though, the potential for risk associated with the activity and the lack of mention in research literature precludes making a risk assignment.

Esthetics

Potential for Transmission

Some of the services that estheticians provide for their clients, for example manicures and pedicures, could pose a risk of HCV transmission. Estheticians' tools pose the same risk for the transmission of HCV as personal hygiene items like razors and toothbrushes.

Evidence of Transmission

Some studies show that HCV transmission may occur through esthetical procedures, although the exact means of transmission in these cases remains unclear.

Assessment of Risk of HCV Transmission

Manicures or pedicures with uncleaned equipment..... Low Risk
Manicures or pedicures with sterilized, new or unshared equipment..... No Risk

Fighting

Potential for Transmission

The conditions for transmission of HCV are present in the case of a fight where both people have open cuts or wounds.

Evidence of Transmission

There are no documented cases of transmission of HCV in this manner.

Assessment of Risk of HCV Transmission

Fighting Negligible Risk

Intentional Exposure to Blood

“Vampirism”, “Blood Brother/Sisterhood”

Potential for Transmission

Drinking, sucking or licking the blood of a person who is infected with HCV poses a potential for transmission. This risk of transmission is increased depending on the amount of blood that is taken into the mouth and the presence of cuts in the mouth. The presence of blood in the mouth could be caused by recent brushing or flossing of the teeth, a sore in the mouth, gum disease, a recent tooth extraction or biting or scratching one another (e.g. with the teeth or orthodontic alliances, such as braces) during kissing.

Likewise, customs like “blood brothers” or “blood sisters” (where blood can be exchanged between people by rubbing open cuts together to show trust and friendship with one another) can also put a person at risk for contracting HCV. Customs like this provide a direct route of one persons' blood into the bloodstream of another person and meets all five conditions for transmission of HCV.

Evidence of Transmission

There are no reported cases of vampirism as being a method of HCV transmission.

There are no documented cases of HCV transmission through blood Brother/Sisterhood pacts. It should be stressed however, that blood Brother/Sisterhood pacts carry a very high assessment of theoretical risk as the likelihood of someone else's blood directly entering your bloodstream is high.

Assessment of Risk of HCV Transmission

According to our model, the lack of documented cases in relation to the high potential of risk would lead this activity to be categorized as Negligible Risk. In this case though, the potential for risk associated with the activity and the lack of mention in research literature precludes making a risk assignment.

Occupational Exposure

Potential for transmission

Exposure to blood in an occupational setting (for example in emergency response and medical staff) does carry a potential for transmission if universal precautions are not followed.

HIV TRANSMISSION: Guidelines for Assessing Risk

Safe handling of needles and wearing gloves when administering punctures to draw blood or for other activities where exposure to blood is possible can help reduce the potential for transmission.

Evidence of Transmission

Accidental needle-stick injuries has been documented as a form of transmission for HCV and the seroconversion rate from one exposure is estimated to be between 3% and 10%³³.

Assessment of Risk of HCV Transmission

Occupational Exposure High Risk

Sharing toothbrushes, razors etc.

Potential for Transmission

Sharing personal use items such as razors, toothbrushes and nail care equipment meet the conditions for HCV transmission, given that these items may come in contact with blood, and that the HCV virus can live for extended periods of time outside the human body.

Evidence of Transmission

Some studies show that HCV transmission may occur through “household exposure” in households where some individuals are living with HCV, although the exact means of transmission in these cases remains unclear. The studies did exclude sexual exposure and injection drug use as risk factors.

Assessment of Risk of HCV Transmission

“Household exposure” Low Risk*

** Studies do not specify whether transmission occurred through sharing of toothbrushes, razors, etc, or through other means. The studies did exclude sexual exposure and injection drug use as risk factors.*

33. Op. Cit.

HIV TRANSMISSION: Guidelines for Assessing Risk

7. Increasing and Reducing Risk: Barrier Methods for Sexual Transmission of HIV

Condoms

Male and female condoms made of latex or polyurethane are an effective barrier and one of the most important tools in preventing HIV transmission.

Quality Control

In Canada, condoms as contraceptive devices are classified as medical devices, and are subject to regulatory control under the Food and Drugs Act and Medical Devices Regulations. The Regulations are administered by the Health Protection Branch of Health Canada, and they outline standards and conditions of sale with which condom manufacturers and importers must comply. The Regulations apply to all types of condoms available for distribution and sale in Canada, including those sold through vending machines and by mail order.

Some requirements apply to all condoms, regardless of their material of manufacture. For example, all condoms must be properly packaged and labelled, and all manufacturers must notify the Branch of the sale of condoms. Other regulatory controls are specific to the different kinds of condoms, depending on what they are made of.

Latex Condoms

Latex condoms must meet design, length and width requirements as well as specific tests for water leakage, bursting volume and bursting pressure as described in the Regulations. The Health Protection Branch maintains a national program of sampling and analysis to monitor latex condoms sold in Canada to ensure that they comply with these requirements. Periodically, one lot from each brand of latex condoms available on the Canadian market is sampled and tested. Unsatisfactory lots are removed from retail sale and follow-up testing is performed to ensure product efficacy.

Imported condoms must be accompanied by documentation demonstrating they meet Canada's standards.

Health Canada does not have the resources to inspect all condoms distributed in the country. There is no visible way for the public to know that Health Canada has spot-tested any particular product. However, complaints or concerns about a particular product can be reported to the Medical Devices Hotline at 1 (800) 267-9675. The Medical Devices Bureau is also able to provide further information about Canada's condom standards and test results from its periodic compliance surveys.

Lambskin Condoms

Natural membrane condoms are not required to meet the above requirements for latex condoms because of their different material characteristics. Lambskin condoms used alone are not considered effective in the prevention of HIV, because the virus is easily able to pass through the membrane. However, lambskin membrane condoms are made available for people who have an allergy to latex and “double-bag”—that is a latex or polyurethane condom is placed over a lambskin membrane condom if the allergic person is the insertive partner, or placed under it if the allergic person is the receptive partner.

Synthetic Condoms

Manufacturers of condoms made from synthetic materials, such as the polyurethane female condom, must submit data concerning their safety and effectiveness to the Health Protection Branch. The manufacturer must demonstrate that the condoms provide an effective barrier to micro-organisms and sperm, and must have acceptable test methods so that the quality of the condom sold on the market can be monitored.

HIV TRANSMISSION: Guidelines for Assessing Risk

Polyurethane Condoms

Polyurethane has been shown to be an effective barrier against HIV. Polyurethane condoms have different characteristics than latex condoms, which users should consider. Female condoms are currently made of polyurethane, and male condoms are also available in polyurethane, although they may be more difficult to find.

Polyurethane is stronger than latex, but the female condom and the male polyurethane condom are considerably more expensive than the latex male condom. In addition, polyurethane does not stretch like latex, which may make it more difficult to ensure a proper fit on the penis, in the case of a male condom made of polyurethane.

However, unlike latex condoms, polyurethane does not break down when exposed to heat and light, so they may be stored for up to five years. Also, polyurethane conducts heat better than latex, providing users with a more “natural” feel. Male condoms made of polyurethane are easier to put on, since they can be pulled on, rather than rolled on the penis. Finally, people who are allergic to latex can use polyurethane.

Male Condom Use

Condoms require getting used to. Men who are first-time condom users should practise using them by themselves before they use one with a partner. To ensure that their male partners are using condoms properly and to be more comfortable about their role in making condoms a regular part of intercourse, women can also practise condom-use by putting the condom on a penis substitute.

There is some evidence that condoms break or slip more frequently when used in anal sex, although this may be due to higher levels of improper use. Thicker latex condoms have been designed specifically for anal sex; however, there is little available evidence to date to suggest that they are more effective than regular condoms.

If condoms are used properly, they have been shown to substantially reduce risk of HIV transmission. However, sometimes condoms may fail, usually because they are not used properly and consistently. Because of evidence of HIV transmission due to broken or improperly used condoms, vaginal and anal intercourse with a condom are deemed to be low rather than negligible, risk.


The key to reducing risk is proper condom use. Therefore, it is important to follow the guidelines included here.

Buying and Storing

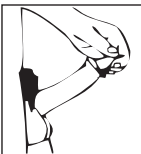
There are many different brands of condoms and preferences are personal. Try several brands to find the most comfortable. When using condoms, follow these guidelines:

- Always use before the expiry date on the package. If in doubt, get a fresh supply.
- Store condoms in a cool, dry place. Exposure to heat can break down latex. Polyurethane condoms are not affected by heat or light and may be stored for up to five years.
- Carefully open the condom package; teeth or fingernails can tear the condom.
- Use a new condom for each act of sexual intercourse.
- Hold the condom over an erect penis.
- If a penis is uncircumcised, pull back the foreskin before putting on the condom.
- Put the condom on by pinching the reservoir tip and unrolling it all the way down the shaft of the penis from head to base.
- If the condom does not have a reservoir tip, pinch it to leave a half-inch space at the head of the penis for semen to collect after ejaculation.


How to use a latex condom




Open the package carefully. Rough handling and long finger nails can damage condoms. The condom will only unroll one way. Figure out which way it unrolls. Do not open the package until you are ready to use the condom. Store packages in a cool, dry place.



Gently press the air out of the condom tip as air may cause breakage. A generous dab of water-based lubricant in the tip of the condom increases sensation. On the outside, it helps prevent condom breaks. Use only water-based lubricants. Do not use oil-based lubricants as they may damage the condom.



Place the condom on the head of the erect penis and gently unroll it so the condom covers the entire penis. If uncircumcised, pull back the foreskin before rolling on the condom. Remove any air remaining at the tip by gently pressing the air out toward the base of the penis.



After ejaculation, withdraw the penis while it is still erect. Hold on to the rim of the condom as you slowly withdraw so that the condom does not slip off. Discard used condom and wash.

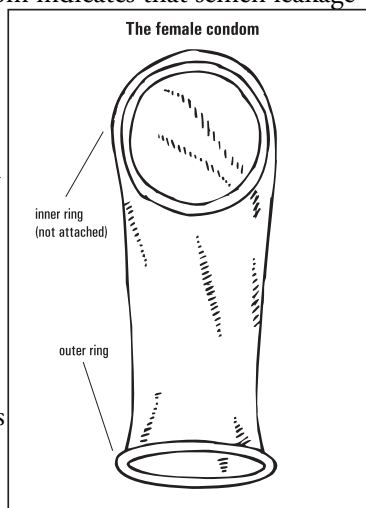
HIV TRANSMISSION: Guidelines for Assessing Risk

- In the event that the condom breaks, withdraw the penis and put on a new condom before resuming intercourse.
- Use only water-based lubrication (oil-based lubricants, such as cooking or vegetable oil, baby oil, hand lotion or petroleum jelly will cause the condom to deteriorate and break).
- Withdraw the penis after ejaculation while still erect, grasp the rim of the condom between the fingers and slowly withdraw the penis (with the condom still on) so that no semen is spilled.
- Remove the condom, making certain that no semen is spilled.
- Carefully dispose of the condom. Do not reuse it.

Female Condom Use

The female condom is now approved and available for sale in Canada (availability may vary). Laboratory studies have shown that polyurethane, the material used in the manufacture of the female condom, does not permit the transmission of HIV. The female condom is the first generation of HIV-specific vaginal barrier methods. It is a sheath that lines the vagina, with two flexible plastic rings at either end. The closed end is inserted in the vagina and the open end hangs outside the body against the outer lips of the vagina. The condom comes with a water-based lubricant to make insertion easier and to allow comfortable movement during sex. It may be inserted into the vagina up to eight hours before intercourse.

Testing of the female condom indicates that semen leakage after sex is less frequent than with a male condom, and that the risk of semen getting into the vagina due to dislodgment is one-third lower. Other tests have investigated the female condom's risk of causing irritation or encouraging bacteria and other health problems in the vagina. In some tests, female condoms were used in sex and then left in the vagina overnight



(a much longer period than normal). The results showed no complications, indicating that even women with very sensitive skin can use the female condom. Studies have also been conducted to ascertain how women and their partners feel about the female condom. While many women and their partners find it acceptable, some people are concerned that the part of the condom which stays outside the vagina is aesthetically unappealing, while other women have reported discomfort with the rings. These problems have tended to be reduced as people become more familiar with the device.³⁴

Because it is made of polyurethane rather than latex, the female condom³⁵ is both sturdier than the male condom and more expensive to manufacture. Several studies have been conducted to determine the safety and acceptability of reusing the female condom in an effort to make it more affordable and accessible. WHO convened two expert consultations to review the various studies and form recommendations to the field. The resulting statement was released at the XIV International AIDS Conference in Barcelona, July 2002.

Based on these consultations, WHO does not recommend or promote reuse of female condoms. However, recognizing the urgent need for risk-reduction strategies for women who cannot or do not access new condoms, the consultation developed a draft protocol for safe handling and preparation of female condoms intended for reuse. This protocol is based on the best available evidence, including studies confirming the structural integrity of female condoms after repeated cleaning and re-use. The protocol has not been extensively studied for safety and has not been evaluated for efficacy in human use. The WHO protocol, as well as other resources relating to the reuse of the female condom, can be found at www.reusefemalecondom.org.

The female condom offers the welcome potential of giving women the chance of more control over their own protection. Like the male condom, proper use is crucial to its effectiveness. The following guidelines are recommended:

- Do not use damaged, discoloured, brittle, or sticky condoms.
- Check the expiration date.
- Carefully open the condom package; teeth or fingernails can tear the condom.
- First, inspect the condom and make certain it is completely lubricated on the outside and the inside.

34. Family Planning Perspectives Digest, 33(4). July/August 2001.

35. Note that the studies have been conducted only on the Reality™ female condom, and the WHO guidelines apply exclusively to that product.

HIV TRANSMISSION: Guidelines for Assessing Risk

The female condom is inserted into the vagina with fingers, much like a tampon that has no applicator. To do so:

- Hold the condom at the closed end and squeeze the flexible inner ring with thumb and middle finger so it becomes long and narrow. With the other hand, separate the outer lips of the vulva.
- Gently insert the inner ring end as far into the vagina as possible, using the index finger to push up the inner ring until the finger reaches the cervix (similar to how a diaphragm would be inserted).
- Before intercourse, make certain the condom is in place. When in place, it will cover the opening of the cervix and line the vaginal walls. A general indicator of correct insertion is that the individual will no longer feel the ring. The open end of the condom must always remain outside the vaginal opening. Before intercourse, make certain that the condom is straight and not twisted.
- Add water-based lubricant onto the penis and/or the inside of the female condom to increase comfort and decrease noise. It is important to use enough lubricant so that the condom stays in place during sex. If the condom is pulled out or pushed in, that is an indicator that there is not enough lubricant.
- Be sure that the penis is not entering the vaginal canal outside of the condom before intercourse.
- To remove the condom, twist the outer ring and gently pull the condom out to avoid any spillage. Carefully dispose of the condom.
- Do not use a male condom along with a female condom. If the two condoms rub together, the friction between them can cause the male condom to be pulled off or the female condom to be pushed in.

The Female Condom for Anal Intercourse?

The female condom has not been designed or approved for use during anal intercourse. However, it is being used by many people for this purpose. One study that examined the use of the female condom by MSM found that 57% of the men reported problems that included rectal bleeding by the receptive partner³⁶. The use of lubricant inside, removing the inner ring and placing the condom on an erect penis can help eliminate some trauma and discomfort.

Dental Dams

Dental dams are relatively thick sheets of latex squares developed by dentists to isolate a tooth for infection control purposes. Although cunnilingus and anilingus carry a negligible to low risk of HIV transmission, dental dams have been recommended for people who wish to reduce risk further.

The following steps are recommended when using a dental dam:

- Rinse off with water to get rid of powder coating.
- Put some water-based lubricant on the partner's vagina or anus and place a new latex square so that it completely covers the vaginal or anal opening.
- Hold the dam firmly in place with both hands, and apply mouth and tongue to the unlubricated side of the dam only.
- When done, safely dispose of the dental dam.

Many people find that dental dams are small, difficult to use and greatly reduce sensation. Dams are often available only from medical supply stores. An alternative that some people find more accessible and easier to use is to cut open an unused, unlubricated condom or latex glove and place it over the vagina or anus following the method described above.

Plastic Wrap

Plastic wrap has also been advocated by some AIDS educators as a risk-reduction tool for cunnilingus and anilingus. Only one brand, Glad®, has been tested in the laboratory. It was found to be effective for preventing transmission of the herpes simplex virus. It has not been tested as a barrier for HIV. Plastic wrap is not subject to the quality control testing for filtering viruses and micro-organisms that condoms require. It is not as elastic as latex, but it is cheap, accessible and easy to use. However, plastic wrap marketed as "microwavable" is more porous than the conventional plastic wrap; it is not recommended for use during sexual activity.

Latex Gloves and Finger Cots

Latex gloves and finger cots (latex covers that go over individual fingers, rather than a full glove) reduce the risk of HIV transmission via open cuts, sores, lesions, burns or

36. Gross M, Buchbinder SP, Holte S, Celum CL, Koblin BA, Douglas JM. Use of reality "female condoms" for anal sex by US men who have sex with men. *HIVNET Vaccine Preparedness Study Protocol Team*. *Am J Public Health*, 89(11):1739-41. 1999 Nov.

HIV TRANSMISSION: Guidelines for Assessing Risk

rashes on the hands or fingers. In certain circumstances, they are recommended for use during fingering and fisting. However, some people are allergic to latex or to the powder inside latex gloves. Care should also be taken to prevent holes being made in the glove by fingernails during vigorous activity (e.g. fisting) and rings should be removed before putting on the glove.

Cervical Barriers

Cervical barriers (diaphragms and cervical caps) are soft latex or silicone cups that fit at the upper end of the vagina, covering the cervix. They are currently used to prevent pregnancy, but research is underway to see if their use may also reduce the transmission of HIV and other STIs.

Women are physically more vulnerable to sexual transmission of HIV than men, probably due in part to the nature of the cervix. Unlike the vaginal epithelium (surface), which consists of approximately 30-50 layers of flat, sturdy cells, parts of the surface of the cervix are made up of a single layer of fragile cells, which are more easily damaged.

In younger women, these fragile cervical cells are even more exposed than in adult women, probably a major factor in adolescent girls' higher risk. In addition, several target cells for HIV, including CD-4 cells, are found more frequently on the cervix than throughout the rest of the vagina. The passage of infectious fluids into the upper genital tract (also highly susceptible) via the cervix may be another factor in women's HIV acquisition.

Though the cervix is not the only site of vaginal transmission of HIV or STIs, it is possible that a woman could reduce her risk of infection by protecting her cervix with a barrier³⁷. Developers are working on new cervical barrier methods that would be easier to use for contraception, and in addition, some researchers are exploring their potential utility for disease prevention.

No rigorous research has yet been completed that shows whether cervical barrier methods can reduce the risk of HIV transmission but observational studies have already demonstrated an association between cervical barrier use and reduced risk of other STIs. More research is needed to determine whether cervical barrier methods, used either

alone or with a microbicide, could protect women from these devastating diseases³⁸.

Cervical barrier contraceptives are labelled for use with nonoxynol-9 (N-9) spermicide. Frequent use (more than once a day) of N-9 products can cause vaginal irritation, which may increase the risk of getting HIV or other STIs from infected partners. Research on cervical barriers for HIV prevention involves non-spermicidal lubricants, and the use of N-9 products is not recommended for those at high risk of HIV infection.

37. Moench T, Chipato T, Padian N. *Preventing disease by protecting the cervix: the unexplored promise of internal vaginal barrier devices*. AIDS, 15(13):1595-1602. 2001.

38. *Cervical barriers* viewed on the Internet at <<http://www.global-campaign.org/barriers.htm>>.

HIV TRANSMISSION: Guidelines for Assessing Risk

8. Increasing and Reducing Risk of HIV: Biological Factors

A. Mucosal Immunity and HIV

Body cavities and canals that are open to the air, including the mouth, nose, eyes, urethra, vagina and rectum, are lined with thin layers of tissue that secrete a protective liquid. These tissues are mucous membranes (mucosa) and they prevent germs from infecting the body from outside. The protective effect of mucous membranes is called mucosal immunity.

In recent years, much has been learned about the way in which the body's immune system functions. Many factors influence mucosal immunity, making it either harder or easier for germs (e.g. HIV) to enter the body. This section examines different biological factors known to influence mucosal immunity and therefore affect the risk of HIV transmission.

Sexually Transmitted Infections

Active STIs, such as syphilis, gonorrhea, herpes simplex, Human Papilloma Virus (genital warts) and Chlamydia, are known to increase the risk of HIV transmission. There are three reasons for this. Firstly, any STI-related sores or lesions provide an open route of entry for HIV to enter the bloodstream and infect cells. Secondly, STIs weaken mucosal immunity, enabling HIV to enter the body directly through mucous membranes. Evidence suggests that repeated infection with STIs, even if each infection has been treated, can weaken mucosal immunity so that the body's mucous membranes no longer protect it as well from HIV infection³⁹. Third, cells in the immune system that target HIV are prone to be present in greater numbers at the site of an infection.

This information is important for a number of reasons. It means that people with recurrent STI infections may be at

increased risk of HIV infection, and they should consider extra precautions for low-risk activities (e.g. oral sex). It also means that taking precautions against STIs may prevent increased risk of HIV infection. And, it means that people who are at risk for STIs should visit their doctor or STI clinic regularly (at least every six months) for STI testing. Any infections that are found should be treated promptly.

There is also evidence that the additional impact of recurrent STIs on the immune system can hasten the progression of HIV disease⁴⁰. For this reason, it is important that people living with HIV/AIDS also take precautions to avoid infection with STIs and have them treated promptly if they occur. In addition, vaccinations against infections, such as hepatitis A and hepatitis B, are also recommended to those living with HIV/AIDS.

Untreated STIs can increase a person's susceptibility to HIV infection. STIs are also of particular concern to people living with HIV/AIDS because they may affect the immune system and contribute to the progression of HIV.

Common Vaginal Infections

Common vaginal infections (e.g. yeast) can weaken mucosal immunity, increasing the risk of HIV transmission. Women should treat common vaginal infections promptly and if possible avoid any unprotected sexual activity in the area affected while the infection persists.

Open Cuts, Sores, Lesions, Ulcers, Burns and Rashes

The conditions of transmission make it clear that it is possible for HIV to gain access to the body through open cuts, sores, lesions, ulcers, burns or rashes. Scrapes, incisions, skin rashes, cold sores or genital sores (e.g. herpes) should

39. Wasserheit JN. *Heterogeneity of heterosexual transmission: the role of other STIs*. [Abstract We.C.453] 11th International conference on AIDS. July 1996.

40. Dyer JR, Eron JJ, Hoffman IF, Kazembe P, Vernazza PL, Nkata E, Daly CC, Fiscus SA, Cohen MS. *Association of CD4 cell depletion and elevated blood and seminal plasma human immunodeficiency type 1 RNA concentrations with genital ulcer disease in HIV-1 infected men in Malawi*. *Journal of Infectious Disease* 177:224-7. 1998.

HIV TRANSMISSION: Guidelines for Assessing Risk

be protected from contact with blood, semen, vaginal fluid and with another person's mucous membranes. Any sexual activity that could bring blood, semen, vaginal fluid or breast milk into contact with skin or mucous membranes that are inflamed or damaged creates a greater risk of HIV transmission.

Vaginal Drying

In some cultures women use various herbal mixtures to dry the lining of the vagina before intercourse. This practice tightens the vagina, which may increase pleasure for the male partner. Any substance that dries out the vaginal mucosa reduces its immunity and increases the risk of HIV transmission. A well-lubricated vagina reduces the risk of HIV transmission.

Women may experience vaginal drying as natural phenomena of aging. Along with condom use, increasing artificial lubrication with water-soluble products can reduce the risk of HIV, as well as ease discomfort associated with vaginal drying during and after sex.

Circumcision

Studies in sub-Saharan Africa show that uncircumcised men may be at higher risk of HIV transmission than circumcised men in unprotected penile-vaginal or penile-anal intercourse⁴¹. Foreskin contains large concentrations of the types of cells that HIV targets – a finding that helps explain why uncircumcised men may be more prone to HIV infection than circumcised men⁴². In addition, the foreskin may provide an environment for survival of bacteria and viruses, and may be susceptible to tears, scratches and abrasions, suggesting that its presence may increase the likelihood of contracting HIV.

Saliva

HIV can be found in saliva, but in much lower concentrations than in semen, blood, vaginal fluid and breast milk. Furthermore, an enzyme in saliva has been found to inhibit the capacity of HIV to enter white blood cells and therefore

to infect the body. For this reason, the exchange of saliva does not pose a risk of HIV transmission. However, there may be a risk of transmission if HIV-infected blood is present in saliva.

Eyes

Contact with eyes is often overlooked as a potential route for transmission. Care should be taken to ensure no blood, semen, vaginal fluid or breast-milk comes in contact with a partner's eyes. Although there is no documented evidence of HIV transmission through the lenses of the eye, the mucosal linings around the eye could provide a theoretical (negligible) risk of infection. As well, other viruses such as adenovirus and the herpes virus have been transmitted through this means⁴³.

Crack Cocaine

The regular use of crack cocaine may lead to a weakening of mucosal immunity. Smoking crack cocaine can lead to burns and inflammation in the mouth, which significantly increases the risk of viral transmission via oral sex or sharing pipes (especially in the case of HCV)⁴⁴. Crack cocaine users can reduce this risk through the use of condoms during oral sex and, in the case of HCV, by not sharing pipes.

Douching and Enemas

Studies show that douches and enemas make the mucosal lining in the rectum and vagina more vulnerable to inflammation by removing the protective top layer of tissue and changing its micro bacterial surroundings. This reduces mucosal immunity and can increase the risk of HIV transmission during sex.

Spermicides and Microbicides

Spermicides are chemical substances that kill sperm. Microbicides are chemical substances that kill viruses and other microbes. Scientists are currently testing many spermicides and microbicides to see if they can help prevent transmis-

41. Johannes van Dam, M.D., MPH and Marie-Christine Anastasi, M.A. *Male Circumcision and HIV Prevention: Directions for Future Research*. 2002.

42. Crabb, Charlene. *Circumcision and HIV Susceptibility*, AIDS: 17(2) p. N3. January 2003.

43. *Minimizing Transmission of Bloodborne Pathogens and Surface Infectious Agents in Ophthalmic Offices and Operating Rooms*. American Academy of Ophthalmology, 2003.

44. Faruque S, Edlin BR, McCoy CB, Word CO, Larsen SA, Schmid DS, Von Bargen JC, Serrano Y. *Crack cocaine smoking and oral sores in three inner-city neighbourhoods*. Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology. 13:87-92, 1996.

HIV TRANSMISSION: Guidelines for Assessing Risk

sion of STIs, including HIV. As of yet, no safe and effective microbicide is currently available to the public.

One of the most common spermicides is nonoxynol-9, a chemical which functions mainly as a back-up in helping to prevent pregnancy. Until recently, scientists believed that vaginal use of nonoxynol-9 offered limited protection against bacterial STIs (e.g. gonorrhea, Chlamydia). However, recent evidence has refuted this. Three randomized controlled trials failed to detect any statistically significant effect of N-9 against common bacterial STIs⁴⁵. As a result, the World Health Organization has concluded that products containing N-9 should not be promoted for STI protection⁴⁶.

Early evidence (mainly in test tubes) that N-9 would be effective against HIV in humans have also turned out to be misleading. After a long and complicated history of testing, scientists have concluded that products containing N-9 do not offer protection against HIV. It appears that when used frequently, products (e.g. lubricants, vaginal foams, jellies, etc.) containing N-9 may increase risk of HIV transmission by causing small disruptions in the vaginal epithelium. Scientists are concerned that these disruptions may increase a woman's risk of acquiring HIV⁴⁷. In addition, N-9 should never be used rectally, as even single use at low doses causes disruption in rectal mucosa.

However, the failure of N-9 clinical trials as an effective microbicide against HIV and other STIs have not curbed hopes that some agents may yet be helpful, when combined with other methods of protection (e.g. condoms) in reducing risk of HIV infection.

Microbicides are still being tested for effectiveness against HIV transmission.

Hormonal Contraceptives

Hormonal contraceptives, in pill, patch or injection form, have been linked to reduced mucosal immunity of the vagina⁴⁸. It has been observed that oral contraceptives containing the hormone progesterone can reduce the thickness of the vaginal epithelium, which in turn reduces the mucosal immunity of the vagina, and that they can increase the presence of target cells for HIV infection in cervical epithelium⁴⁹.

However, other studies have since shown that while there is biological reasoning that would suggest a connection between hormonal contraceptives and increased risk of HIV/STI acquisition, the only method for which this association held up was between Depo-provera use and chlamydial and gonococcal infections⁵⁰. Further, a 2003 population-based study in Uganda shows that hormones were not associated with HIV after accounting for behavioral factors⁵¹.

B. HIV Viral Load and Treatments

Viral load is the amount of HIV present in different body fluids and tissues at a given time. A test to measure viral load in blood plasma has been widely available in Canada since 1997.

People with a high viral load are more infectious than those with a low viral load. In the normal course of untreated HIV disease, viral load will be very high shortly after infection during the "seroconversion" period, before the body has begun to make antibodies to HIV. After seroconversion, the viral load decreases. Gradually, as the disease progresses, viral load will increase (at different rates depending on the individual). In the later stages of HIV disease, viral load is very high. Other factors (e.g. nutrition, STIs, local infec-

45. Roddy et al. 1998; Van Damme 2000; Roddy et al. 2002.

46. WHO/CONRAD *Technical Consultation on Nonoxynol-9*. Geneva: World Health Organization. 2002.

47. Ibid.

48. *Progesterone and SIV transmission in monkeys*. Joint WHO/UNAIDS statement. May 9 1996.

49. Prakash, M. et al. *Oral Contraceptive Use Induces Upregulation of the CCR5 Chemokine Receptors on CD4+ T cells in the Cervical Epithelium of Healthy Women*. *Journal of Reproductive Immunology*. 54: 117-131. 2002.

50. Morrison, C. et al. *Hormonal Contraceptive Use, Cervical Ectopy, and the Acquisition of Cervical Infection*. *Sexually Transmitted Diseases*. 31(9): 561-567. September 2004.

51. Kiddugavu, M. et al. *Hormonal Contraceptive Use and HIV-1 Infection in a Population-Based Cohort in Rakai, Uganda*. *AIDS*, 17:233-240. 2003.

HIV TRANSMISSION: Guidelines for Assessing Risk

tions, other illnesses) may also affect a person's viral load at any given time.

The use of combination antiretroviral drugs (combination therapy) can reduce HIV viral load, sometimes below the limit of detection of the available viral load tests. This does not mean that no HIV is present, merely that it is reduced substantially.

Studies have shown that when viral load is reduced in blood it may also be reduced in semen⁵² vaginal fluid⁵³ and the anorectal mucosa⁵⁴. This may reduce the risk of HIV transmission. However, it does not eliminate the risk. High-risk activities remain high-risk activities. No one should assume that a low HIV viral load makes unprotected intercourse a low-risk activity. A person's viral load level may fluctuate considerably between tests, and it is possible that higher concentrations of virus may be present at the site of a local infection, such as a sore caused by an STI. Unprotected anal and vaginal intercourse remain high-risk activities. Furthermore, when HIV is transmitted from a person taking combination therapy, it is possible that the newly infected person may acquire a drug-resistant strain of the virus, making treatment of HIV disease in the newly-infected person potentially more difficult.

Post-Exposure Prophylaxis

Taking combination therapy after exposure to HIV (called post-exposure prophylaxis, or PEP) may be an option for some people to prevent seroconversion in some instances where it is likely that exposure to HIV has occurred and access to the drugs is immediate, such as in a hospital after sexual assault, or an occupational exposure to HIV (e.g. a needle stick injury in a health care setting⁵⁵). The existence of (and access to) PEP should never be used as a substitute for HIV prevention practices.

Co-Infection with HIV and HCV

Practising risk reduction is especially important in patients infected with both HIV and HCV. Safer sex, healthy

lifestyle and safer drug use practices (e.g. vein care, use of new needles) are necessary to avoid other infections that could complicate treatment and worsen progression of the primary diseases.

It is known that treatment for co-infected patients is more complex than for those singly infected with either virus. Studies indicate that people can be successfully treated for HCV when they are co-infected with HIV. However, they also have more side-effects, discontinue treatment more and also have lower rates of virus suppression than people who are not co-infected with HIV.

One of the key challenges in the treatment of co-infected patients is the well-established higher risk of toxicity associated with interferon therapy for HCV among those already undergoing highly active antiretroviral therapy for HIV. Both therapies include medications that can cause anaemia (low red blood cell count). HCV treatment can lower CD4 cells and be harmful to the immune system. HCV treatment may also change the amount of anti-HIV drugs in the blood, potentially causing resistance to these drugs. The risk of developing side effects from HIV drugs, especially Videx (ddI, didanosine), is greater in people taking HCV medications. Due to these concerns, liver and HIV doctors often prefer to treat HCV first, when someone has well above 500 CD4 cells.

52. Vernazza, PL, et al. *Effect of antiviral treatment on the shedding of HIV-1 in semen*. AIDS 11 (10): 1249-1254, Aug 1997.

53. Dalmore M, Ellerbrock T, Lennox JL, Hart C, Schnell C, Bush T, Evans-Strickfaden T, Conley L, Clancy K. *Does Antiretroviral Therapy Reduce the Amount of HIV in Vaginal Secretions of HIV-Infected Women?* [Abstract 111.3] 3rd National Conference on Women and HIV May 1997.

54. Lampinen, T. , et al. *Antiretroviral therapy and HIV-1 shedding from anorectal mucosa*. 12th World AIDS Conference Abstract 23393, 1998.

55. Carbo, DM, et al. *A case-control study of HIV seroconversion in health care workers after percutaneous exposure*. New England Journal of Medicine, 337:1485-90. 1997.

Appendix 1

Suggestions for Further Reading

Anderson, D. *Mechanisms of HIV transmission via semen*, Journal of NIH Research, 1992, 4(7):104-107.

Bureau of HIV/AIDS, STD and TB, Centre for Infectious Disease Prevention and Control, Health Canada. *HIV/AIDS Epi Updates: Ethnicity Reporting for AIDS and HIV in Canada*, Health Canada, 2001c:27.

Brackbill, R.M., R.J. MacGowan and D. Rugg. *HIV infection risks, behaviors and methadone treatment: client-reported HIV infection in a follow-up study of injection drug users in New England*, American Journal of Drug and Alcohol Abuse, 1997, 23(3): 397-411.

Canadian Aboriginal AIDS Network. *Understanding HIV/AIDS epidemiology: HIV/AIDS surveillance among Canada's Aboriginal peoples*. Ottawa: Canadian Aboriginal AIDS Network, 2001.

Canadian HIV/AIDS Legal Network. *HIV/AIDS and Hepatitis C in Prisons: The Facts*, Canadian HIV/AIDS Legal Network, 2004.

Canadian Journal of Infectious Diseases Society. *Hepatitis C and HIV Management Guidelines; 2001*, Available on line at <www.pulsus.com/Infdis/12_a/contents.htm>.

Carey, R., W. Herman, S. Retta, J. Rinaldi, B. Herman and T. Athe. *Effectiveness of Latex condoms as a barrier to human immunodeficiency virus-sized particles under conditions of simulated use*, Sexually Transmitted Diseases, 1992, 19(4): 230-234.

Centers for Disease Control. *Update: barrier protection against HIV infection and other sexually transmitted diseases*, Morbidity and Mortality Weekly Report, 1993, 42(30): 589-591.

Center for Community-Based Health Strategies. *Priority setting guide: glossary. 2001*. Available on line at: <www.hivaidsta.org/pdf/Priority_Setting_Guide/Appendices_Glossary_Biblio.pdf>.

Clemetson, D., G. Moss, D. Willerford et al. *Detection of HIV DNA in cervical and vaginal secretions*, Journal of the American Medical Association, 1993, 269(22): 2860-2864

Connor, EM., R.S. Sperling, R. Gelber, P. Kiselev, G. Scott, M.J. O'Sullivan et al. *Reduction of maternal infant transmission of HIV-1 with zidovudine treatment*, New England Journal of Medicine, 1994, 331: 1173-1180.

Crabb, Charlene. *Circumcision and HIV Susceptibility*, AIDS: 17(2) p. N3. January 2003.

Craib, K.J., D.R. Meddings, S.A. Strathdee, R.S. Hogg, J.S. Montaner, M.V. O'Shaughnessy and M.T. Schechter. *Rectal gonorrhoea as an independent risk factor for HIV infection in a cohort of homosexual men*, Genitourinary Medicine, 1995, 71(3): 150-154.

De Vincenzi, I. et al. (European Study Group on Heterosexual Transmission of HIV). *Comparison of female to male and male to female transmission of HIV in 563 stable couples*, British Medical Journal, 1992, 304(6830): 809-813.

Duerr A., Y. Munde, L. Flowers, J. Xia, N. Kamtorn et al. *Risk of HIV transmission during the seroconversion versus the post-seroconversion period*, XIth International Conference on AIDS, 1996, (Abstract Mo.C.571).

European Study Group on Heterosexual Transmission of HIV. *Risk factors for male to female transmission of HIV*, British Medical Journal, 1989, 298: 411-415.

Fiore, J.R., Y.J. Zhang, A. Bjoundal, M. Di Stefano, G. Angarano, G. Pastore and E.M. Fenyo. *Biological correlates of HIV-1 heterosexual transmission*, AIDS, 1997, 11(9):1089-1094.

Fox, Philip C., A. Wolff, Chih-Ko Yeh, Jane C. Atkinson and Bruce J. Baum. *Salivary inhibition of Hiv-1 infectivity: functional properties and distribution in men, women and children*, Journal of the American Dental Association, 1989, 118 (june): 709-711.

HIV TRANSMISSION: Guidelines for Assessing Risk

- Garfein RS, Doherty MC, Monterroso ER et al. *Prevalence and incidence of hepatitis C virus infection among young adult injection drug users*. Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology 1998;18 Suppl 1: S11-19.
- Gu, Z., Q. Gao, E.A. Faust and M.A. Wainberg. *Possible involvement of cell fusion and viral recombination in generation of human immunodeficiency virus variants that display dual resistance to AZT and 3TC*, 1995, Journal of Gen Virology, 76: 2601-2605.
- Hankins, C. and J. Roy. *The Sexual Transmission of the Human Immunodeficiency Virus: An Annotated Bibliography and Overview of the Literature*, Montréal, Centre d'études sur le sida/Centre for AIDS Studies, 1990.
- Health Canada, *Framework on Sexual & Reproductive Health: Directions from a National Discussion Process*, Health Canada, 1998.
- Health Canada. *Infection Control Guidelines: Preventing the transmission of bloodborne pathogens in health care and public services settings*, Health Canada. May 1997.
- HIV Prevention and Women*, Journal of the American Medical Association, 1995, 273: 979.
- Keet, I., N. Albrecht van Lent, T. Sandfort, R. Coutinho and G. Van Griensven. *Orogenital sex and the transmission of HIV among homosexual men*, AIDS, 1992, 6(2): 223-226.
- Laga, M., A. Manoka, M. Kivuvu et al. *Non-ulcerative sexually transmitted diseases as risk factors for HIV-1 transmission in women: results from a cohort study*, AIDS, 1993, 7(1): 95-102.
- Liskin, Laurie L. and Chuanchom Sakondhavit. *The female condom: a new option for women*.
- dans Mann, Jonathan, Daniel J.M. Tarantola et Thomas W. Netter (dir.), *AIDS in the World: A Global Report*, Cambridge, MA: Harvard University Press, 1992, p. 700-707.
- MacDonald, N.E., W.A. Fisher, G.A. Wells, J.A. Doherty and W.R. Bowie. *Canadian Street Youth: correlates of sexual risk-taking activity*, Pediatric Infectious Disease Journal, 1994, 13(8): 690-7.
- Moench T, Chipato T, Padian N. *Preventing disease by protecting the cervix: the unexplored promise of internal vaginal barrier devices*. AIDS, 15(13):1595-1602. 2001.
- Myers, T., S.L. Bullock, L.M. Calzavara, P. Cockerill and V.W. Marshall. *Differences in sexual risk-taking behaviour with state of inebriation in an aboriginal population on Ontario, Canada*, Journal of Studies on Alcohol, 1997, 58(3): 312-22.
- Neron, Carole. *HIV and Sexual Violence Against Women - A guide for counsellors working with women who are survivors of sexual violence*, Health Canada, Ottawa, 1998.
- O'Donnell, Darryl. *Orogenital Sex Between Men*, Australian Federation of AIDS Organizations, 1994.
- Osmond, D.H. and N. Padian. *Sexual transmission of HIV*, The AIDS Knowledge Base, 1994.
- Piazza, M., A. Chirianni, L. Picciotto et al. *Blood in Saliva of Patients with Acquired Immunodeficiency Syndrome: Possible Implication in Sexual Transmission of the Disease*, Journal of Medical Virology, 1994, 42(1): 38-41.
- Post-Exposure Prophylaxis*, AIDS Weekly Plus, 29 July 1996: 13.
- Public Health Agency of Canada. Division of HIV/AIDS Epidemiology and Surveillance, Bureau of HIV/AIDS, STD and TB, Centre for Infectious Disease Prevention and Control. *HIV and AIDS in Canada: surveillance report to December 31, 2004*. Public Health Agency of Canada 2004.
- Remien, R.H., A. Carballo-Diequez, G. Wagner. *Intimacy and sexual risk behaviour in serodiscordant male couples*, AIDS Care, 1995, 7(4):429-38.
- Reucroft, S. and J. Swain. *Saliva protein reduces infectivity of HIV*, New Scientist, 17 February 1998.
- Roper, W., H. Peterson and J. Curran. *Commentary: condoms and HIV/STI prevention - clarifying the message*, American Journal of Public Health, 1992, 83(4): 501-503.
- Rosenberg, M., K. Holmes and World Health Organization. *Virucides in prevention of HIV infection: research priorities*, Sexually Transmitted Diseases, 1993, 20(1): 41-44.
- Royce, Rachel. "Does male circumcision prevent HIV infection?" in Mann, Jonathan, Daniel J.M. Tarantola and Thomas W. Netter (ed.), *AIDS in the World: A Global Report*, Cambridge, MA: Harvard University Press, 1992.
- Royce, R.A., A. Sena, W. Cates, M.S Cohen. *Sexual transmission of HIV*, New England Journal of Medicine, 1997, 336(15): 1072-8.

HIV TRANSMISSION: Guidelines for Assessing Risk

- Runganga, A.O. and J. Kasule. *The vaginal use of herbs/substances: an HIV transmission facilitatory factor?* AIDS Care, 1995,7(5):639-45.
- Samuel, M., N. Hessel, S. Shiboski et al. *Factors associated with human immunodeficiency virus seroconversion in Homosexual men in three San Francisco cohort studies, 1984-1989*, Journal of Acquired Immune Deficiency Syndromes, 1993, 6(3): 303-312.
- Saracco, A. et al. *Man-to-woman sexual transmission of HIV: longitudinal study of 343 steady partners of infected men*, Journal of Acquired Immune Deficiency Syndromes, 1993, 6(5): 497-502.
- Stein, Zena. *HIV prevention: an update on the status of methods women can use*, American Journal of Public Health, 1993, (83), 10:1379-1382.
- Stone, K. and H. Peterson. *Spermicides, HIV and the vaginal sponge*. Journal of the American Medical Association, 1992, 268(4): 521-523.
- Turner, B.J., W.W. Hauck, T.R. Fanning, L.E. Markson. *Cigarette smoking and maternal-child HIV transmission*, Journal of Acquired Immune Deficiency Syndromes & Human Retrovirology, 1997, 14(4): 327-37.
- United Nations Joint Program on AIDS. *UNAIDS Best Practice Collection: The Female Condom*, Geneva, UNAIDS, 1997.
- Vernazza, P.L., B.L. Gilliam, M. Flepp, J.R. Dyer, A.C. Frank, S.A. Fiscus, M.S. Cohen, J.J. Eron and A.C. Frank. *Effect of antiviral treatment on the shedding of HIV-1 in semen*, AIDS, 1997, 11:987-993.
- Voeller, B. et al. *Mineral oil lubricants cause rapid deterioration of latex condoms*, Contraception, 1989, 39(1): 95-102.
- Warren, D., R.S. Klein, W. Brown, J. Sobel, P. Schuman, J. Anderson, S. Cu-Cuvin, K. Mayer, S. Holmberg and A. Duerr. *High prevalence of abnormal vaginal flora and bacterial vaginosis in women with or at risk for HIV infection*, Xth International Conference on AIDS, 1996, (abrégeé Th.B.114).
- Wasserheit, J. *Epidemiological synergy: interrelationships between HIV infection and other sexually transmitted diseases*, Sexually Transmitted Diseases, 1992, 19(2): 61-77.
- Women's Addiction Foundation. *Substance use, HIV and hepatitis C*. 2001. Available on-line at: <www.womenfdn.org/info/hiv.pdf>.
- Yeh, Chih-ko, Beverly Handelman, Philip C. Fox and Bruce J. Baum. *Further studies of salivary inhibition of HIV-1 infectivity*, Journal of Acquired Immune Deficiency Syndromes, 1992, 5(9): 898-903.
- Young, Hugh. *Safe Sex Guidelines: Defining Risk for Gay Men and Other Men Who Have Sex with Men*, The New Zealand AIDS Foundation, 1995.
- Zhu, T., N. Wang, A. Carr, S. Wolinsky and D.D. Ho. *Evidence of coinfection by multiple strains of human immunodeficiency virus type 1 subtype B in an acute seroconverter*, Journal of Virology, 1995, 69: 1324-7.

HIV TRANSMISSION: Guidelines for Assessing Risk

