

No. 354-Canadian HIV Pregnancy Planning Guidelines

This Clinical Practice Guideline has been written and reviewed by the Canadian HIV Pregnancy Planning Guideline Development Team Core Working Group and The Society of Obstetricians and Gynaecologists of Canada Infectious Disease Committee*, reviewed by the Guideline Management and Oversight Committee, and approved by the Board of the SOGC.

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Abstract

Objective: The objective of the Canadian HIV Pregnancy Planning Guidelines is to provide clinical information and recommendations for health care providers to assist Canadians affected by HIV with their fertility, preconception, and pregnancy planning decisions. These guidelines are evidence- and community-based and flexible and take into account diverse and intersecting local/population needs based on the social determinants of health.

Intended Outcomes:

- Reduction of risk of perinatal HIV transmission (from mother to child) and horizontal HIV transmission (between partners/parents) by increasing the extent of pregnancy planning by individuals with HIV through informed discussions of safer options for conception.
- Improvement of pregnancy and infant outcomes in the context of HIV through the provision of recommendations for healthy pregnancies.
- Reduction of the stigma associated with pregnancy and HIV through education.

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Women have the right and responsibility to make informed decisions about their care in partnership with their health care providers. To facilitate informed choice, women should be provided with information and support that is evidence based, culturally appropriate, and tailored to their needs. The values, beliefs, and individual needs of each woman and her family should be sought and the final decision about the care, and treatment options chosen by the woman should be respected.

- Increased access to pregnancy planning and fertility services for individuals affected by HIV through education.

Evidence: Literature searches were conducted by a librarian using the Medline, Cochrane Central Register of Controlled Trials (CENTRAL), and Embase databases for published articles in English and French related to HIV and pregnancy and HIV and pregnancy planning for each section of the guidelines. The full search strategy is available upon request.

Values: The evidence obtained was reviewed and evaluated by the Infectious Diseases Committee of the SOGC under the leadership of the principal authors, and recommendations were made according to the guidelines developed by the Canadian Task Force on Preventive Health Care and through use of the Appraisal of Guidelines Research and Evaluation instrument for the development of clinical guidelines.

Benefits, Harms, and Costs: Guideline implementation should assist the practitioner in developing an evidence-based approach for the prevention of unplanned pregnancy, preconception, fertility, and pregnancy planning counselling in the context of HIV infection.

Validation: These guidelines have been reviewed and approved by the Infectious Disease Committee and the Executive and Council of the SOGC.

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Recommendations:

1. Reproductive health counselling, including contraception and pregnancy planning, should be offered to all people with HIV of reproductive age soon after HIV diagnosis and on an ongoing basis (II-3A).
2. Counselling should be provided to all people with HIV of reproductive age on strategies to reduce horizontal and perinatal HIV transmission risk (I-A).
3. Individuals should be counselled on all relevant aspects of pregnancy planning—such as maintaining a healthy diet and lifestyle; the cessation or reduction of smoking, drinking alcohol, and drug use; the risk of genetic disease occurrence, and prenatal screening—as outlined in current Canadian practice guidelines irrespective of their known HIV status (III-A).
4. Folic acid (found in the form of vitamin supplements) should be initiated 3 months prior to becoming pregnant and for at least the first 3 months of pregnancy (II-3A).
5. Prospective parents should be tested for sexually transmitted and other infections/comorbidities, even if they have conceived in the past and have no symptoms of infection (III-A).
6. Counselling should include a discussion of the potential risk for both horizontal and perinatal HIV transmission, including perinatal transmission via breastfeeding and how transmission (or risk of transmission) might affect the mental health of 1 or both parents and other family members (III-A).
7. Counselling should be performed by a knowledgeable provider in a supportive, nonjudgemental manner that takes into account factors specific to sexual diversity and ethnocultural and/or religious beliefs and practices (III-A).
8. People with HIV who intend to conceive should be aware of the potential stigma and discrimination they may face from people who are less informed about the risks of perinatal and horizontal HIV transmission. They may therefore require further counselling to cope with psychosocial issues during the pregnancy or postpartum period (II-3A).
9. The preconception period can be an important opportunity to achieve mental health stability. Assembling a care team that is appropriate to the individual's or couple's needs in the perinatal period has important implications for maternal and infant health outcomes (III-A).
10. The intersection of HIV and substance use necessitates a supportive, non-stigmatizing discussion of substance use in the preconception period with referral to appropriate services, including harm reduction strategies, for both mother and infant (III-A).
11. All people with HIV should be counselled on the possible ethical and legal aspects of pregnancy planning (III-A).
12. People and couples affected by HIV who are considering pregnancy should be counselled on the possibility of legal sanctions if they do not permit antiretroviral therapy to be given to their baby after birth (III-B).
13. People with HIV should be made aware of the possibility of criminal sanctions related to HIV non-disclosure and horizontal and/or perinatal transmission (III-C).
14. Ethical considerations, including those related to the health status of a person with HIV or couples, should be discussed during preconception counselling, if relevant (III-B).
15. Clinicians should review all medications that an individual with HIV may be using, including antidepressants, hepatitis treatment, pain medications, over-the-counter medications, and herbal and alternative medications, to ensure that they are safe during conception and pregnancy. Any changes to medications should be made prior to pregnancy (II-3A).
16. All people with HIV who are planning to conceive should already be taking or imminently started on combination antiretroviral therapy, both for their own health and to prevent horizontal HIV transmission during the preconception period. They should be counselled on maintaining a high level of antiretroviral drug adherence to maintain a suppressed viral load (I-A).
17. For women not on antiretroviral therapy, initiating combination antiretroviral therapy is recommended in the preconception period to achieve a suppressed viral load and management of drug-related side effects prior to conception (II-A).
18. Women should avoid any drugs that are potentially teratogenic or considered toxic in the preconception period and in pregnancy. The safest, most efficacious antiretroviral regimen tailored to pregnancy should be selected (II-3A).
19. Condomless sex or sperm washing should be avoided as the conception method until the partner with HIV has been on combination antiretroviral therapy for at least 3 months with at least 2 viral load measurements below the level of detection at least 1 month apart. Preferably the partner with HIV should have been on combination antiretroviral therapy with a suppressed viral load for 6 months. When rapid viral suppression is achieved through the use of new antiretroviral agents, 2 undetectable viral load measurements at least 1 month apart should still be achieved before initiating condomless sex or sperm washing (II-A).
20. The data on pre-exposure prophylaxis should be discussed with all patients during preconception. HIV pre-exposure prophylaxis is not routinely recommended in the context of HIV and preconception. In the situation in which adherence and viral suppression in the infected partner cannot be confirmed, but conception attempts are still intended by the serodiscordant couple, pre-exposure prophylaxis should be recommended to the HIV-negative partner (II-A).
21. In patients with hepatitis C co-infection, new highly effective direct-acting agents are commonly being used to cure hepatitis C. There is inadequate evidence regarding the potential effects of these agents in pregnant women, and they should be avoided in the immediate preconception period and during pregnancy. It is ideal to treat and cure a woman's hepatitis C prior to attempting conception. There is no evidence that newer agents affect the sperm and therefore can be used in the preconception period for men. However, ribavirin, an older drug that is still used, should not be used in individuals (i.e., women and men) for at least 6 months prior to conception (II-A).
22. All recommendations with respect to combination antiretroviral therapy during the preconception period and during pregnancy should

consider both the health of the person with HIV and prevention of both horizontal and perinatal transmission of HIV. Decisions regarding combination antiretroviral therapy should be made in consultation with an HIV specialist (III-A).

23. Couples and individuals should be counselled thoroughly about all horizontal HIV transmission risk reduction methods before attempting conception and supported to make an informed choice about which of the many options for conception method is most appropriate and acceptable to them (III-C).
24. Prospective parents should be informed about the rate of success, availability, and cost of each conception option (III-C).
25. Couples and individuals who have attempted conception using a home-based method (e.g., condomless sex or home insemination) for 6 to 12 months without success should be referred to a gynaecologist or fertility specialist for a complete fertility workup and appropriate treatment (III-A).
26. Pre-pregnancy counselling should include a discussion about all parenting options, including adoption, for all individuals and couples (III-C).
27. If an individual or couple has attempted a recommended conception method for 6 to 12 months without success, assisted reproductive technologies, including intrauterine insemination or in vitro fertilization with or without intra-cytoplasmic sperm injection, with washed partner/parent sperm or a sperm donor should be recommended (II-3A).
28. The Canadian HIV Pregnancy Planning Guidelines Development Team recommends that single women with HIV or women with HIV in a same-sex relationship be referred to a fertility specialist and counselled on the option of intrauterine insemination with donor sperm (III-C).
29. For serodiscordant couples in which the man is living with HIV and is on combination antiretroviral therapy with virologic suppression, the Canadian HIV Pregnancy Planning Guidelines Development Team recommends attempting timed condomless sex for 6 to 12 months (I-A) or referral to a fertility specialist for consideration of sperm washing or use of donor sperm with intra-uterine insemination (II-2A) as the preferred initial methods of conception.
30. Single men with HIV or a man with HIV in a same-sex relationship who has an HIV-negative or HIV-positive surrogate should be referred to a fertility specialist (III-A).
31. The Canadian HIV Pregnancy Planning Guidelines Development Team recommends timed condomless sex for seroconcordant couples taking combination antiretroviral therapy with virologic suppression (II-3A).
32. Seroconcordant couples should be counselled on the risks and benefits of timed condomless sex (including HIV super-infection and transmission of drug-resistant strains of HIV) (II-3A).
33. People with HIV should be counselled about fertility issues that also occur in the general population, including genetic disorders and advanced maternal age, and offered infertility investigations and treatment if required (III-A).
34. Fertility laboratories should follow Canadian Standards Association guidelines for infection control when handling HIV-positive materials and use additional procedures available for the processing of HIV-positive sperm to ensure the preparation of a virus-free sample (III-A).
35. Potentially infectious samples should be processed in a separate laboratory or dedicated area with separate equipment within the main laboratory to reduce the risk of HIV contamination (III-A).
36. Potentially infectious gametes and embryos should be stored in biocontainment straws and dedicated cryopreservation containers to minimize the risk of cross-contamination of samples (III-A).

INTRODUCTION

Demand for HIV Pregnancy Planning and Fertility Services in Canada

The natural history of HIV infection has significantly changed with the introduction of highly successful cART.¹ As a result, people with HIV are now experiencing an improved quality of life and a prolonged life expectancy.¹⁻³ In countries with greater financial and medical resources, the mortality caused by HIV has significantly decreased and approaches general population norms.²

Another significant trend in HIV epidemiology in the past 2 decades is that the rate of HIV infection in women has been steadily on the rise. By the end of 2014, it was estimated that approximately 75 500 Canadians were living with HIV. Among this group, it is estimated that 16 880 were women, accounting for about 22.4% of the national total.⁴ Furthermore, over 70% of Canadian men and women with HIV are of reproductive age.⁴

In addition, the use of cART, CS when indicated, and avoidance of breastfeeding have led to the reduction of perinatal HIV transmission to <1%. Consequently, many people with HIV and couples affected by HIV are considering having children. The increasing numbers of pregnancies in people with HIV over the past decade confirms this.⁴ In Canada, the number of pregnancies in people with HIV are captured through a registry created by the Canadian Perinatal HIV Surveillance Program of the Public Health Agency of Canada of selected hospitals. According to the last annual reporting, 248 children were born in 2016 to women living with HIV in Canada. Furthermore, pregnancy planning has been identified as a key area of importance to the Canadian community of people with HIV.⁵ As a result, there is an increasing need to address

ABBREVIATIONS

cART	combination antiretroviral therapy
CHPPG	Canadian HIV Pregnancy Planning Guidelines
CS	Caesarean section
HIV	human immunodeficiency virus
HPV	human papillomavirus
ICSI	intra-cytoplasmic sperm injection
IUI	intrauterine insemination
IVF	in vitro fertilization
PHAC	Public Health Agency of Canada
PrEP	pre-exposure prophylaxis
RNA	ribonucleic acid
SOGC	Society of Obstetricians and Gynaecologists of Canada

the reproductive health concerns and services available and provided to people with HIV.

Despite this, a large clinical and research gap continues to exist between the desires, intentions, and need for support of people with HIV to have children and the necessary resources, relevant research, and support networks to do so successfully in a medically safe and personally acceptable manner. The issues at hand when considering pregnancy planning in the context of HIV are not just the prevention of perinatal transmission but also the prevention of horizontal transmission (from 1 partner/parent to the other) and the management of potential fertility issues. Two primary studies have been conducted in the Canadian context that focused on pregnancy planning for people living with HIV. In 2006, Ogilvie et al.⁶ conducted a research study to examine the fertility intentions of women with HIV in British Columbia. Of the 182 women in the study, 25.8% expressed intentions to have children regardless of their clinical HIV status, which is close to levels in the general population.⁶ In 2009, Loutfy et al.⁷ completed a cross-sectional study designed to assess fertility desires, intentions, and actions of women with HIV in Ontario. This study surveyed 490 women of reproductive age with HIV (ages 18–52). Of the study participants, 61% were born outside of Canada, 52% lived in Toronto, 47% were of African ethnicity, 74% were currently on cART, and the median age was 38. Of total respondents, 69% desired to give birth and 57% intended to give birth in the future. In 2009, Nattabi et al. conducted a systematic review of 29 studies of factors influencing fertility desires and intentions among people with HIV and reported that fertility desires were influenced by a variety of demographic, health, stigma-associated, cultural, and psychosocial factors.⁸

In the aforementioned studies, it was concluded that the desires and intentions of people with HIV to have children were high and that clinical HIV status did not seem to be a predictor of fertility intentions. There appears to be a strong desire and intent to have children among people with HIV, and therefore, specialized counselling, services, and support may be required.

Access to HIV Pregnancy Planning and Fertility Services in Canada

Despite the fact that many individuals and couples with and affected by HIV wish to have children, a limited number of fertility clinics in North America offer assisted reproductive services for people with HIV. These include advice on the management of HIV during pregnancy planning; timing of peak fertility to allow for fertilization; sperm washing (a procedure that removes the HIV viral particles

from the sperm, reducing the chance of horizontal transmission); management of individuals or couples affected by fertility issues; and fertility treatments including IUI and IVF.

Europeans have been assisting couples affected by HIV with their reproductive goals since the 1980s, and at least 5 European countries have national programs to assist people with HIV in their pregnancy planning.⁹ In Canada, different services and treatment protocols are offered depending on the individual clinic or centre and, as a result, the costs associated with each service vary depending on the type of treatment or service and the location where it is administered. It is important to note that in most jurisdictions in Canada, sperm washing, IUI, and IVF have limited coverage through provincial health insurance.

A study by Lo et al.¹⁰ showed that although over 95% of Canadian fertility clinics surveyed were willing to counsel people with HIV in consultation, substantially less had actually seen any people with HIV within the previous 12 months. Services offered also varied by region, with clinics located in only 4 provinces reporting offering full fertility treatments to people with HIV. In addition to a deficiency in assisted reproductive services, there remains a scarcity of pregnancy planning, prenatal and postnatal care, and counselling programs for people and couples with and affected by HIV in Canada.

Unintended Pregnancy

As is the case in the general population, many pregnancies among people with HIV are unintended. In an Ontario study of women with HIV of reproductive age, 56% of their last pregnancies were unintended.¹¹ One of the goals of these guidelines is to encourage health care providers to discuss pregnancy planning, including contraception, with their patients as early as possible after diagnosis and on an ongoing basis to reduce the incidence of unintended pregnancy.

Framework for the Development of CHPPG

Conceptually, these guidelines were developed taking into account WHO's human rights¹² premise that "all couples and individuals have the right to decide freely and responsibly the number and spacing of their children and to have access to the information, education and means to do so," including people with HIV. By using a human rights-based approach, the CHPPG Development Team recognizes that the human rights of those with and affected by HIV are frequently violated, and this often affects their intentions and desires to have children. In addition, the CHPPG Development Team recognizes the need to cultivate strong leadership among all stakeholders and to integrate these guiding principles into all aspects of HIV pregnancy plan-

ning, fertility care, and treatment and support for people with HIV in Canada. Recommendations and their implementation must be up to date, evidence based, flexible, and ethnoculturally sensitive while also taking into account diverse and intersecting local and/or population needs and the social determinants of health.¹³

OBJECTIVES OF THE GUIDELINES

The following 4 main clinical issues need to be considered for individuals and couples affected by HIV when it comes to pregnancy planning and counselling: (1) healthy preconception, (2) reduction of perinatal transmission to the infant, (3) reduction of horizontal transmission between partners during conception, and (4) management of fertility issues.

The objective of the CHPPG is to provide clinical information and recommendations for health care providers to assist individuals and couples with HIV in Canada with these clinical issues.

WHO BENEFITS FROM THESE GUIDELINES?

These guidelines are intended to support health care professionals, couples, and individuals with pregnancy planning, including access to information about conception and fertility services and techniques to prevent horizontal transmission in the context of HIV.

These guidelines are intended for use by health care providers—including, but not limited to, physicians, fertility clinic staff, nurses, social workers, psychologists, counsellors (including those involved in post-test counselling), midwives, pharmacists, and community-based organizations—and by individuals and couples with and affected by HIV who are considering planning a pregnancy. In addition, these guidelines are addressed to policymakers as a reference when defining policies such as reimbursement and other regulations that affect access to pregnancy planning and fertility treatment, including access to information, care, treatment, and support for people with HIV in Canada.

ISSUES NOT ADDRESSED BY THESE GUIDELINES

Canadian guidelines currently exist for the management of HIV during pregnancy, HIV screening during pregnancy,^{14,15} and fertility issues relevant to the general population; therefore, these issues are not addressed in these guidelines.¹⁶ Moreover, issues related to the postpartum period or infant feeding, including breastfeeding, are not covered because

these issues were deemed by the CHPPG Development Team to be outside the scope of this document.

METHODS

These guidelines were developed based on the principles described in the Appraisal of Guidelines Research and Evaluation instrument, which is a generic tool for assessing the quality of clinical guidelines. One important purpose of the Appraisal of Guidelines Research and Evaluation instrument is to help guideline developers follow a structured and rigorous development methodology and to act as a self-assessment to ensure that their guidelines are sound.

Literature Search Strategy and Selection

The literature search was carried out by a librarian until the end of 2016 for each section separately. First, the PubMed and Medline databases were searched for English and French articles from time of inception to December 20, 2016, by using terms such as “HIV” AND “pregnancy” OR “pregnancy planning” OR “fertility” OR “reproduction” OR “infertility” OR “parenthood” OR “insemination” OR “artificial insemination” OR “sperm washing” OR “IVF” OR “ICSI” OR “IUI.” Other search terms included “HIV” AND “horizontal transmission” OR “sexual transmission” OR “serodiscordant.” The full search of terms for each section is available upon request. Titles and abstracts were then reviewed by CHPPG section leads for inclusion. Then, section leads reviewed additional databases from conference proceedings to identify relevant studies. These conference databases included the

Conference on Retroviruses and Opportunistic Infections, International AIDS Conference, and International AIDS Society Conference. A hand search of key journals and conferences was also performed, and references of retrieved articles were reviewed for additional citations. Finally, experts in the field were consulted for their opinions as to whether any relevant literature was missed.

Grading of Evidence

Grading of the evidence and recommendations was carried out using the Evaluation of Evidence criteria described by the Canadian Task Force on Preventive Health Care (Table).

Guideline Development Team and Procedures

The development of these guidelines was an interdisciplinary partnership. Key stakeholders in varied relevant fields were brought together from across the country to form the CHPPG Development Team. These stakeholders include fertility specialists, embryologists, obstetricians, gynaecologists, infectious diseases specialists, pediatricians, family physicians, HIV specialists, nurses, counsellors, social workers, psychiatric specialists, midwives, health promotion experts, legal and ethics experts, HIV community leaders, and people with HIV. Consistent with a community-based or participatory action approach, guideline review included members of the HIV community. The CHPPG Development Team includes individuals and organizational representatives of each of the aforementioned groups and stakeholders from across diverse demographic groups and from across Canada for national representation.

Table. Key to evidence statements and grading of recommendations, using the ranking of the Canadian Task Force on Preventive Health Care

Quality of evidence assessment ^a	Classification of recommendations ^b
I: Evidence obtained from at least one properly randomized controlled trial	A. There is good evidence to recommend the clinical preventive action
II-1: Evidence from well-designed controlled trials without randomization	B. There is fair evidence to recommend the clinical preventive action
II-2: Evidence from well-designed cohort (prospective or retrospective) or case-control studies, preferably from more than 1 centre or research group	C. The existing evidence is conflicting and does not allow to make a recommendation for or against use of the clinical preventive action; however, other factors may influence decision making
II-3: Evidence obtained from comparisons between times or places with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of treatment with penicillin in the 1940s) could also be included in the category	D. There is fair evidence to recommend against the clinical preventive action E. There is good evidence to recommend against the clinical preventive action
III: Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees	L. There is insufficient evidence (in quantity or quality) to make a recommendation; however, other factors may influence decision making

^aThe quality of evidence reported in these guidelines has been adapted from The Evaluation of Evidence criteria described in the Canadian Task Force on Preventive Health Care.

^bRecommendations included in these guidelines have been adapted from the classification of recommendations criteria described in The Canadian Task Force on Preventive Health Care.

Formulating Recommendations and Language

The principal authors of these guidelines revisions were M. Loutfy, M. Yudin, V. Poliquin, and V.L. Kennedy. Specific sections were critically reviewed and updated by F. Dzineku, N. Dean, A. Symington, and S. Margolese on the basis of their expertise. Then all CHPPG Development Team members reviewed the guidelines as did the Infectious Disease Committee of the SOGC. The process of formulating revised recommendations for the CHPPG involved lengthy deliberation of the available evidence and practical experience from team members, including clinicians and people with HIV. The team considered the health benefits, side effects, and risks to prospective parents and their infants. In addition, cultural and practical considerations were taken into account when formulating recommendations, including the acceptability of assisted (“non-natural”) conception within various cultural groups and access, availability, and cost of assisted fertility services across Canada.

In the redevelopment of these guidelines, the CHPPG Development Team highlighted the need for inclusive language. Although these guidelines were written with language that is inclusive of all people and couples regardless of sexual orientation, gender identity, and coupling scenario, there were instances for which inclusivity presented a challenge. We acknowledge that in instances in which the term *woman* or *women* is used, this information may also apply to transgender men who are planning pregnancy. In addition, the term *partner* is used throughout to include romantic partners and those who are attempting conception together but are not in an intimate relationship.

ENSURING A HEALTHY PREGNANCY, CHILD, AND FAMILY

Although management of HIV in pregnancy planning requires many special considerations, it is important to remember that all the general recommendations for pregnancy planning also apply to individuals and couples with HIV.

Pregnancy planning discussions should ideally be initiated by providers caring for people of reproductive age. As previously discussed, people with HIV have similar or heightened fertility desires and intentions as their HIV-negative peers, and early communication may help to decrease the likelihood of unplanned pregnancies.

Women with HIV in Canada are a diverse and heterogeneous group. Social determinants of health may affect women differently depending on their background, personal histories, and where they live. Providers should be familiar with issues relevant to their local population, resources available, and the need for tailored interventions or access to care.

PHAC is an important source of information with respect to ensuring a healthy pregnancy, child, and family. *Eating Well with Canada's Food Guide* (<https://www.canada.ca/en/health-canada/services/food-nutrition/canada-food-guide/get-your-copy.html>) provides guidance to eat well during pregnancy. Other resources that may be more culturally appropriate for certain groups are available. Providers should be conscious of the potential for higher rates of food insecurity in certain vulnerable populations and should actively screen for this issue in the preconception period.

General health recommendations during pregnancy are available for health professionals. For example, PHAC has described alcohol use in pregnancy as “an important public health and social issue for Canadians.”¹⁷ Guidelines for alcohol use and nutrition during pregnancy can be found at www.phac-aspc.gc.ca. PHAC has also produced *The Sensible Guide to a Healthy Pregnancy*, which includes guidance on general nutrition, folic acid, alcohol, physical activity, smoking, and oral health.¹⁸

There are several guides available to assist in achieving optimal health prior to conception that also apply to individuals and couples affected by HIV.¹⁹ Clinical practice guidelines regarding pregnancy are available on the SOGC website (www.sogc.org). For example, the SOGC’s “Pre-conception Folic Acid and Multivitamin Supplementation for the Primary and Secondary Prevention of Neural Tube Defects and Other Folic Acid-Sensitive Congenital Anomalies” guideline may be of relevance because it reviews the need for increased folic acid dosing if someone is taking anti-folate medicines (e.g., sulfamethoxazole and trimethoprim [Septra]), which affects some women with HIV.²⁰

All people affected by HIV who are planning pregnancy should be tested for other infections prior to becoming pregnant because it is the standard of care when caring for people with HIV. These include, but are not limited to, hepatitis B, hepatitis C, gonorrhea, chlamydia, syphilis, cytomegalovirus, and toxoplasmosis. In addition, the SOGC provides guidelines for the management of sexually transmitted diseases such as herpes simplex virus, HPV, and hepatitis.¹⁹

Women with HIV are known to have an increased number of medical comorbidities relative to their HIV-negative counterparts. Therefore, providers should consider screening for these prior to initiating pregnancy.

Recommendations

1. Reproductive health counselling, including contraception and pregnancy planning, should be offered to all people with HIV of reproductive age soon after HIV diagnosis and on an ongoing basis (II-3A).

2. Counselling should be provided to all people with HIV of reproductive age on strategies to reduce horizontal and perinatal HIV transmission risk (I-A).
3. Individuals should be counselled on all relevant aspects of pregnancy planning—such as maintaining a healthy diet and lifestyle; the cessation or reduction of smoking, drinking alcohol, and drug use; the risk of genetic disease occurrence, and prenatal screening—as outlined in current Canadian practice guidelines irrespective of their known HIV status (III-A).
4. Folic acid (found in the form of vitamin supplements) should be initiated 3 months prior to becoming pregnant and for at least the first 3 months of pregnancy (II-3A).
5. Prospective parents should be tested for sexually transmitted and other infections/comorbidities, even if they have conceived in the past and have no symptoms of infection (III-A).

PSYCHOSOCIAL/MENTAL HEALTH RELATED TO HIV PREGNANCY PLANNING AND FERTILITY

The transition to parenthood is often a time of great joy for parents. It is also a life-altering event that can result in stress and anxiety.^{21–23} Everyone planning pregnancy should consider the implications of psychosocial and mental health issues prior to conception. In the context of HIV, there are specific psychosocial health considerations that have a potential impact on perinatal outcomes and thus should be identified and addressed in the perinatal period when relevant.

The first of these are experiences of stigma and discrimination. An additional burden is placed on people with HIV or couples affected by HIV due to stigma and discrimination surrounding HIV and the associated transmission risks to fetuses and infants. Despite the medical advances associated with HIV, living with HIV continues to impart a significant psychological burden on many of the people it affects through stigma and marginalization.^{24,25} A growing body of literature substantiates the stigma and discrimination experienced by people with HIV by health care professional with respect to parenting.^{26–29} People with HIV considering pregnancy may also be concerned with stigma and discrimination that can be experienced across the parenting continuum from preconception to breastfeeding. The relationship between experiences of stigma and maternal-child outcomes is highly related to support in the preconception period and thus requires specific attention. Although the psychosocial/mental health focus in the preconception period naturally focuses on mental health history and risks in pregnancy, infant feeding practices for people with HIV is an important consideration prior to conception as well.

Another area of perinatal HIV research that has expanded in recent years is the intersection of HIV and perinatal mental health. Canadian research supports the high prevalence of significant mental health comorbidities among women with HIV, including depression.³⁰ A history of depression and/or inadequate social support has been found to increase depression during pregnancy and to contribute to poor medical adherence and treatment outcomes among pregnant women.^{31–33} Given that poor mental health prior to pregnancy can be a strong predictor of perinatal symptoms³⁴ and the high prevalence of perinatal depressive symptoms that have been found among women with HIV,³⁵ providers are encouraged to ensure that a comprehensive mental health assessment is conducted in the preconception period and that necessary referrals are made to support optimal mental health prior to pregnancy. Although literature remains scarce on the perinatal mental health of partners in couples affected by HIV, it is known that a partner's behaviour during the early postnatal weeks can significantly affect the mental health status of new mothers,³⁴ particularly with respect to postpartum depression.³⁵ As such, expert opinion in the development of these guidelines suggests a similar evaluation of mental health history of partners to ensure family-centred care in the perinatal period.

The preconception period can be an important opportunity to achieve mental health stability. Assembling a care team that is appropriate to the individual's or couple's needs is essential. A thoughtful risk/benefit analysis should also be conducted that takes into account the frequency/severity of current or previous mood-altering episodes, potential side effects of medication treatments in pregnancy, and any history of attempts to discontinue mental health treatment.

A final area of important consideration in the preconception period is the intersection between HIV and substance use.³⁶ It is imperative that any discussion pertaining to substance use be conducted with non-stigmatizing language and with a harm reduction approach. The literature substantiates that the rates of substance use among people with HIV, both during pregnancy and in general, have declined but remain higher than in the general population.^{37,38} Given the higher incidence of substance use among people with HIV, a detailed discussion about substance use is recommended in the preconception period with referral to supportive services as necessary.

Recommendations

6. Counselling should include a discussion of the potential risk for both horizontal and perinatal HIV transmission, including perinatal transmission via

- breastfeeding and how transmission (or risk of transmission) might affect the mental health of 1 or both parents and other family members (III-A).
7. Counselling should be performed by a knowledgeable provider in a supportive, nonjudgemental manner that takes into account factors specific to sexual diversity and ethnocultural and/or religious beliefs and practices (III-A).
 8. People with HIV who intend to conceive should be aware of the potential stigma and discrimination they may face from people who are less informed about the risks of perinatal and horizontal HIV transmission. They may therefore require further counselling to cope with psychosocial issues during the pregnancy or postpartum period (II-3A).
 9. The preconception period can be an important opportunity to achieve mental health stability. Assembling a care team that is appropriate to the individual's or couple's needs in the perinatal period has important implications for maternal and infant health outcomes (III-A).
 10. The intersection of HIV and substance use necessitates a supportive, non-stigmatizing discussion of substance use in the preconception period with referral to appropriate services, including harm reduction strategies, for both mother and infant (III-A).

LEGAL AND ETHICAL ISSUES

Scientific developments affect the legal and ethical dimensions of pregnancy planning in the context of HIV. Holistic consideration of the law and ethics is necessary to ensure that prospective parents affected by HIV are given complete, accurate information to make fully informed choices in their pursuit of parenthood. Pregnancy planning information should be provided in a manner that is empowering, positive, considerate of culture, and attentive to the stigma, surveillance, and judgement people with HIV experience, particularly in the context of parenthood.

Sexual and reproductive rights are human rights.³⁹ People with HIV are entitled to fertility and contraceptive information and comprehensive clinical care that (1) is free of discrimination, to ensure reproductive freedom,⁴⁰ and (2) focuses on the obligations of health care providers to ensure that the rights of people with HIV are respected, decisions are informed, and fertility and risk reduction techniques/treatments are available.

To optimize pregnancy outcomes for everyone considering pregnancy, HIV testing should be available to all sexually active individuals. Knowing the HIV status of the person

or couple before the establishment of a pregnancy is desirable in order to help individuals make the most appropriate reproductive choices. Recommending HIV testing to prospective parents is good medical practice. The following “5Cs” of HIV testing always apply, irrespective of reproductive choices: consent, confidentiality, counselling, correct test results, and connection to prevention, care, and treatment.⁴¹ Similarly, an important element of counselling following HIV diagnosis in all people of reproductive age is a focused discussion related to pregnancy planning and parenthood.

People with HIV who are planning pregnancy often access health services in the preconception period to assist them in supporting a healthy conception and pregnancy. This may include, but is not limited to, the use of risk reduction techniques. Fears experienced by people with HIV related to HIV disclosure to health care providers remain in all settings because they continue to experience stigma, surveillance, and judgement.²⁸ To counter social stigma, services should normalize pregnancy and childbirth desires and employ the use of risk reduction strategies for individuals and couples with HIV. Health care providers have ethical and legal obligations to provide complete, accurate, appropriate, and sensitive information to individuals or couples with HIV regarding fertility, preconception, and pregnancy planning. There is no ethical reason to withhold fertility services to individuals or couples with HIV who are properly informed, consenting, and willing to use reasonable risk-reducing interventions, as appropriate.

One of the primary legal and ethical considerations for pregnancy planning in the context of HIV is the risk of HIV transmission to uninfected partners and offspring. Although recent scientific data have confirmed that the risk of transmitting HIV to an offspring⁴² and to a sexual partner⁴³ can be dramatically reduced with the use of cART, the risk of transmission cannot be completely eliminated. Even in the presence of risk, it is not unethical or illegal for an informed parent or parents to choose to attempt pregnancy and conceive a child. The ethical obligation of care providers is to ensure comprehensive counselling of and access to preferred risk reduction techniques for the prospective parent(s). Health care providers who are not equipped to provide comprehensive counselling and/or a full range of risk reduction techniques (e.g., clinical or laboratory resources) should refer the patient to a provider that has the resources available. These risk reduction techniques are explored fully in the Options for Reducing Risk of Horizontal HIV Transmission During Conception section.

In Canada, criminal sanctions can be applied in certain circumstances to individuals with HIV who do not disclose

their status to sexual partners or who risk transmitting HIV to an infant.^{44,45} Intercourse that is not protected by a condom without the disclosure of HIV-positive status to the sexual partner and breastfeeding are 2 activities that could attract criminal prosecution. (It should be noted that under Canadian law, a fetus is not an independent legal entity with independent rights; therefore, there can be no criminal charges related to conception or actions during pregnancy). The possibility of serious criminal charges is a risk and individuals with HIV contemplating conceiving a child should be informed of this legal risk as part of counselling and informed consent. Health care providers should provide resources and contact information for HIV legal organizations (e.g., Canadian HIV/AIDS Legal Network, HIV/AIDS Legal Clinic of Ontario, Coalition of Quebec community-based AIDS Organizations VIH Info droits service) for up-to-date legal information. Health care providers should also consider including notation of disclosure between sexual partners in the patient's file, when appropriate.

The inherent ethical issues associated with all pregnancies, conception, and assisted reproductive interventions are addressed in other SOGC guidelines and should be used when relevant to individuals or couples with HIV.¹⁹ From an ethical perspective, as part of pregnancy planning, health care providers should discuss the significant ethical decisions that parents with HIV will have to make after a successful pregnancy and birth. In particular, current medical recommendations regarding infant feeding should be discussed and plans made regarding alternatives to breastfeeding and safety of the mother regarding possible assumptions about HIV status by others as a result of formula feeding. The medical testing and treatment that are necessary for the infant should also be discussed in advance. Additional considerations that may be relevant to patients with HIV may include the health of the prospective parents (e.g., HIV-related illness), available services for parents and children living with and/or affected by HIV, and the potential involvement of child protection services in the family.

Recommendations

11. All people with HIV should be counselled on the possible ethical and legal aspects of pregnancy planning (III-A).
12. People and couples affected by HIV who are considering pregnancy should be counselled on the possibility of legal sanctions if they do not permit antiretroviral therapy to be given to their baby after birth (III-B).
13. People with HIV should be made aware of the possibility of criminal sanctions related to HIV

non-disclosure and horizontal and/or perinatal transmission (III-C).

14. Ethical considerations, including those related to the health status of a person with HIV or couples, should be discussed during preconception counselling, if relevant (III-B).

cART AND OTHER DRUGS IN PREGNANCY PLANNING

A substantial body of evidence has shown that potent cART not only prolongs the lives of people with HIV but also significantly reduces the risk of both horizontal and perinatal HIV transmission, thus leading to a greater number of people with HIV having or desiring to have children.^{1-4,6,7,42,43} cART reduces the viral load, thereby nearly eliminating the risk of horizontal HIV transmission between sexual partners, and in pregnancy this viral suppression nearly eliminates the risk of perinatal HIV transmission. It is well accepted that cART during pregnancy should take into consideration the health of both the pregnant person and child and that cART is generally safe in pregnancy, with some exceptions. It is important that the selection of cART when planning a pregnancy takes into consideration drug efficacy and tolerability and should be the least toxic to the fetus and newborn. Specifically, cART when planning a pregnancy should not only prevent perinatal HIV transmission but also ensure optimal therapy for the pregnant individual. Current global guidelines for the care of individuals with HIV recommend that all individuals with HIV be started on cART regardless of CD4 count.⁴⁶ Guidelines recommend counselling on maintaining a high level of antiretroviral drug adherence to maintain a suppressed viral load. Physicians and patients should check these guidelines often, at least bi-annually, because they are regularly updated.

Delaying cART until the second trimester is no longer recommended.^{46,47} Rather, cART initiation is recommended in the preconception period, or as early as possible, to allow for full viral suppression and management of cART-related side effects prior to conception. This is further supported by a recently published French cohort study, which showed that initiation of cART before conception led to the lowest perinatal transmission rate.⁴⁷

Because cART guidelines now recommend treatment for all people with HIV regardless of CD4 cell count,⁴⁶ men with HIV should also be started on cART prior to conception. If not already on cART, it should be started as soon as possible in the preconception period. If condomless sex or sperm washing is the intended conception method for serodiscordant individuals, conception should be delayed until

the partner with HIV is on cART with at least 2 viral load measurements at least 1 month apart below the level of detection.⁴³ Preferably, full viral suppression is also recommended for a minimum of 3 months prior to conception attempts, with at least 6 months of viral suppression being even better.⁴³ In circumstances of rapid viral suppression that may become more common with the use of newer antiretroviral agents, conception using condomless sex or sperm washing could be recommended earlier with 2 undetectable viral loads at least 1 month apart, but waiting 3 to 6 months is still preferable. The purpose of starting cART is for both personal health reasons and to prevent horizontal HIV transmission during conception. Several large studies have shown that if the plasma viral load is suppressed, there is negligible risk of sexual HIV transmission.^{43,48,49} Biomedical studies have also shown that reduction in plasma viral load correlates with reduction of viral load in semen and vaginal fluid.^{50–52} These points should be discussed with the patient(s) in all scenarios in order to reduce risk to the HIV-negative partner or reduce the risk of super-infection.

There have been several recently completed and ongoing studies examining the efficacy of HIV PrEP in preventing HIV infection to a non-infected partner of a serodiscordant couple during conception.^{53–56} The U.S. Centers for Disease Control and Prevention published an interim guidance document for the use of PrEP in men who have sex with men.⁵⁷ This document is primarily based on the results of the IPREX study, which has shown PrEP to be efficacious in this population.⁵⁸ The guidance document notes that PrEP could play a role in preventing horizontal transmission related to conception.⁵⁷ PrEP use for HIV prevention for women has not been shown to be as effective as for men who have sex with men, with several trials producing negative results.^{59,60} The FEM-PrEP Project was terminated early because it was found that it would be highly unlikely to be able to demonstrate the effectiveness of Truvada (emtricitabine and tenofovir disoproxil fumarate) in preventing HIV infection in women.⁵⁹ The VOICE (Vaginal and Oral Interventions to Control the Epidemic) study comparing daily use of oral emtricitabine/tenofovir, oral tenofovir, and 1% tenofovir-based vaginal gel for safety and effectiveness in preventing male-to-female HIV transmission also resulted in negative findings.⁶⁰ Conversely, the Partners PrEP study evaluated transmission prevention in HIV-serodiscordant couples and found tenofovir alone was 63% effective in reducing HIV transmission and 73% effective when used with emtricitabine.⁶¹ In a similar study conducted among heterosexually active adults in Botswana, entitled TDF2, emtricitabine/tenofovir showed slightly less efficacy, 62.6% as compared to the placebo arm ($P = 0.03$).⁶² The reasons for these discrepancies remain under study and could

include issues related to adherence or potential biological factors.

Vernazza et al. published a case series of PrEP being combined with natural intercourse during ovulation and found it to be associated with a 75% likelihood of conception and no transmission among serodiscordant couples in which the man was living with HIV.⁶³ Two cost-effectiveness analyses have been conducted assessing the benefit of giving PrEP to an HIV-negative woman whose male partner living with HIV had full viral suppression on cART.^{64,65} Both found that the addition of PrEP for the female partner was not cost effective. The Centers for Disease Control and Prevention and American Society of Reproductive Medicine have released statements in support of the use of PrEP in the preconception period^{66,67}; however, there is no scientific evidence for this recommendation and given the challenges in conducting such a trial, it is unlikely to ever be done. Conversely, many other countries' guidelines and practices do not recommend the use of PrEP for an HIV-negative individual whose partner is living with HIV and has full viral suppression on cART. However, when adherence or viral suppression cannot be confirmed and the couple intends to pursue conception attempts (e.g., condomless sex) immediately, the use of PrEP should be recommended for the HIV-negative partner in a serodiscordant relationship.⁶⁸ The 2016 Consolidated Guidelines on the Use of Antiretroviral Drugs for Treating and Preventing HIV Infection currently suggest consideration of PrEP for all at-risk individuals, such as HIV-negative partners of persons with HIV with viremia.⁶⁹ Whichever the scenario, the CHPPG Development Team recommends the discussion of PrEP with all patients to ensure an informed decision.

There are many non-cART medications that individuals with HIV may be using to treat concurrent conditions. Clinicians should review all prescribed, over-the-counter, herbal and alternative medications, complementary therapies, and street drugs used by individuals with HIV prior to conception.

In patients with hepatitis C co-infection, new highly effective direct-acting agents are commonly being used to cure hepatitis C. There is inadequate evidence of the potential effects of these agents in pregnant women and they are, therefore, currently not recommended for use in pregnancy and should be avoided in the immediate preconception period for women.⁷⁰ It is ideal to treat and cure a woman's hepatitis C prior to attempts at conception. There is no evidence that these agents affect sperm and can, therefore, be used in the preconception period for men. Ribavirin should not be used in individuals for at least 6 months prior to conception.⁷⁰ The contraindication of using ribavirin in the

preconception period also applies to men because this drug has been found to affect male gametes; the exact mechanism of its effect is not known.⁷⁰

Recommendations

15. Clinicians should review all medications that an individual with HIV may be using, including antidepressants, hepatitis treatment, pain medications, over-the-counter medications, and herbal and alternative medications, to ensure that they are safe during conception and pregnancy. Any changes to medications should be made prior to pregnancy (II-3A).
16. All people with HIV who are planning to conceive should already be taking or imminently started on combination antiretroviral therapy, both for their own health and to prevent horizontal HIV transmission during the preconception period. They should be counselled on maintaining a high level of antiretroviral drug adherence to maintain a suppressed viral load (I-A).
17. For women not on antiretroviral therapy, initiating combination antiretroviral therapy is recommended in the preconception period to achieve a suppressed viral load and management of drug-related side effects prior to conception (II-A).
18. Women should avoid any drugs that are potentially teratogenic or considered toxic in the preconception period and in pregnancy. The safest, most efficacious antiretroviral regimen tailored to pregnancy should be selected (II-3A).
19. Condomless sex or sperm washing should be avoided as the conception method until the partner with HIV has been on combination antiretroviral therapy for at least 3 months with at least 2 viral load measurements below the level of detection at least 1 month apart. Preferably the partner with HIV should have been on combination antiretroviral therapy with a suppressed viral load for 6 months. When rapid viral suppression is achieved through the use of new antiretroviral agents, 2 undetectable viral load measurements at least 1 month apart should still be achieved before initiating condomless sex or sperm washing (II-A).
20. The data on pre-exposure prophylaxis should be discussed with all patients during preconception. HIV pre-exposure prophylaxis is not routinely recommended in the context of HIV and preconception. In the situation in which adherence and viral suppression in the infected partner cannot be confirmed, but conception attempts are still intended by the serodiscordant couple, pre-exposure prophylaxis

should be recommended to the HIV-negative partner (II-A).

21. In patients with hepatitis C co-infection, new highly effective direct-acting agents are commonly being used to cure hepatitis C. There is inadequate evidence regarding the potential effects of these agents in pregnant women, and they should be avoided in the immediate preconception period and during pregnancy. It is ideal to treat and cure a woman's hepatitis C prior to attempting conception. There is no evidence that newer agents affect the sperm and therefore can be used in the preconception period for men. However, ribavirin, an older drug that is still used, should not be used in individuals (i.e., women and men) for at least 6 months prior to conception (II-A).
22. All recommendations with respect to combination antiretroviral therapy during the preconception period and during pregnancy should consider both the health of the person with HIV and prevention of both horizontal and perinatal transmission of HIV. Decisions regarding combination antiretroviral therapy should be made in consultation with an HIV specialist (III-A).

OPTIONS FOR REDUCING RISK OF HORIZONTAL HIV TRANSMISSION DURING CONCEPTION

Individuals and couples with HIV who wish to conceive a child need to consider the risk of horizontal HIV transmission during conception. That risk depends on a number of variables, including the HIV serostatus of each partner, the use of cART, the plasma viral load, the level of drug-resistant virus of each prospective parent, and other local factors such as concomitant genital infection.^{71,72} Couples and individuals should be counselled thoroughly about all horizontal HIV transmission risk reduction methods before attempting conception so they can make an informed choice about which conception method is most appropriate to their particular situation. Furthermore, prospective parents should be informed about the rate of success, availability, and cost of each conception option.

In all scenarios, it is recommended that the individual with HIV initiate cART and achieve viral suppression prior to attempting conception and that conception be avoided until this point, as reviewed in the previous section. In serodiscordant scenarios in which the person with HIV has not achieved viral suppression but conception is intended, PrEP is recommended, as previously reviewed, and additional measures such as assisted reproductive technology should be carefully reviewed.

Condomless Sex and Timed Condomless Sex

Condomless sex as a method of conception has only recently been considered a recommended option for individuals with HIV. With an increasing number of people being started on cART earlier after HIV acquisition, there is a growing body of data quantifying the small degree of risk of sexual transmission in the context of cART in which the individual with HIV has an undetectable viral load. A meta-analysis published by Loutfy et al.⁴⁹ identified 3 studies that considered the rate of HIV transmission among serodiscordant couples in which the HIV-positive partner was confirmed to be virologically suppressed. The rate of transmission in these 3 studies was 0 per 1000 person-years (95% CI 0–0.05). More recently, the final data from the only randomized control trial, HPTN 052, for which 1763 participants with HIV from serodiscordant couples were randomly assigned to receive either early or delayed cART, were published.⁴³ In that study, there were no transmissions when the partner with HIV was on cART with a suppressed viral load. The PARTNER study was also recently published and was a prospective, longitudinal, cohort study of serodiscordant couples in which the partner with HIV was on cART with a viral load <200 copies/mL and condoms were only used some of the time. Participants were followed up for over 36 000 condomless sex acts, and no linked partner infections were detected when the partner with HIV had stable virologic suppression.⁴⁸

Timed condomless sex refers to timing acts of condomless sex to the period of peak fertility during the menstrual cycle and thereby reduces the overall number of acts of condomless sex required for conception and risk of sexual transmission of HIV. Identifying the fertility window can be accomplished through a variety of methods, including fertility awareness methods (e.g., calendar method and basal body temperature monitoring); urinary luteinizing hormone testing (ovulation predictor kits); or sonographic monitoring of ovarian follicles.⁷³ Some studies of HIV-serodiscordant couples presenting for preconception counselling found that knowledge about the fertility window was low among participants; therefore, it is important to spend time counselling about methods for effectively timing condomless sex if this method of conception is attempted.^{74,75}

Condomless sex is suitable in most circumstances when the partner with HIV is adherent to cART with suppressed virus; however, the nature of each case must be evaluated. Individuals with HIV who do not have access to or who cannot afford assisted conception services or those who fear stigma associated with the use of assisted conception services may be more likely to attempt condomless sex or timed condomless sex as a means of conception. More research is needed to determine the factors considered when couples

decide to conceive without any medical assistance.⁷⁶ Prospective parents must have a frank discussion about the risks of sexual HIV transmission to make an informed decision about this option. The relative risk of sexual HIV transmission involved in condomless sex as a means of conception is dependent on the plasma viral load of the partner with HIV, the length of time the partner living with HIV has been on cART, the frequency of intercourse, the presence of concurrent sexually transmitted infections, and which partner is infected.^{59,77–79} Given that the reassuringly low rate of sexual transmission is predicated on virologic suppression, we recommend that condomless sex should be avoided until the partner with HIV has been on cART for at least 3 months with at least 2 viral load measurements at least 1 month apart below the limit of detection.⁷⁷ Preferably, viral suppression for 6 months is recommended prior to conception attempts. Condomless sex is not an appropriate means of conception in the context of pre-existing fertility problems (e.g., azoospermia or tubal factor infertility), and patients with such conditions should be referred directly to a gynaecologist and/or fertility specialist. In addition, couples using timed condomless sex as a method of conception should be evaluated and treated promptly for genital infections (e.g., bacterial vaginosis, cervicitis, and genital ulcerative disease) because concomitant genital infections can potentiate the risk of HIV transmission and may also be transmitted during condomless sex.^{71,72} For couples using timed condomless sex as a method of conception, the HIV-negative partner should be counselled about clinical signs of seroconversion and should undergo regular testing for HIV seroconversion to avoid delay in diagnosis. Finally, if conception is not achieved within 6 to 12 months, couples should be referred to a gynaecologist and/or fertility specialist for appropriate investigations. Case-control data from Africa have found HIV infection to be associated as a risk factor for tubal factor infertility.⁸⁰ Although these data are not immediately generalizable to a Canadian setting, it is not unreasonable to consider assessment of tubal patency (e.g., via sonohysterogram) earlier than 6 to 12 months if there is any clinical suspicion of potential for non-patent fallopian tubes because studies have shown reduced fertility among women living with HIV.^{81–83}

The addition of PrEP in the case of condomless sex and timed condomless sex is not routinely recommended at this time given that the incremental benefit of adding PrEP to prevent horizontal transmission of HIV is infinitesimally small in a situation in which the partner with HIV is consistently using cART and is virologically suppressed. However, as previously discussed, if these criteria cannot be ensured with confidence, there may be a role for institution of PrEP in the form of daily dosing of tenofovir and emtricitabine.

The decision of whether to prescribe PrEP must be individualized and take into account each couple's clinical situation, tolerance of risk, personal choice, and ability to afford PrEP.

Home Insemination

Home insemination has been a popular option for conception for women with HIV with HIV-negative partners, for same-sex female couples, and for single HIV-positive women with access to donor sperm. The procedure involves collecting sperm from a partner or donor in a sterile container or a condom. The sperm is drawn into a needleless syringe and then inserted into the vagina as close to the cervix as possible. Optimal results are achieved when insemination is done during peak fertility. This is a preferred method due to cost effectiveness, low resource utilization, and minimization of medicalization of the process of insemination. If home insemination is unsuccessful after 6 to 12 months, women with HIV should be advised to seek the assistance of a fertility specialist. Similar to condomless sex, home insemination is not an appropriate means of conception in the context of pre-existing fertility problems (e.g., azoospermia or tubal factor infertility), and these patients should be referred directly to a gynaecologist and/or fertility specialist.

Sperm Washing

Sperm washing is a well-established, effective, and safe risk reduction fertility option for serodiscordant couples in which the man is with HIV and the woman is HIV-negative and for seroconcordant couples when super-infection is a concern. Semen is centrifuged to separate live sperm (which do not carry HIV) from seminal plasma and non-germinal cells (which may carry HIV) and then inseminated into the female partner at the time of ovulation. This practice is well established in the literature to be an effective method to minimize horizontal transmission.⁸⁴⁻⁹³ In technical terms, sperm washing involves centrifuging ejaculated semen on a 40% to 80% colloidal silica density gradient to separate progressively motile HIV-free sperm from non-sperm components and seminal plasma, which remain in the supernatant. The sperm pellet at the bottom is re-suspended in fresh medium and centrifuged twice before the preparation of a final swim-up. There is no consensus among researchers about the need to test washed sperm for detectable HIV RNA before the sample is used. A nucleic acid-based sequence amplification (NASBA; Biomerieux, Basingstoke, UK) or similar commercial assay can be used; however, these assays are not commercially available in Canada. The risk of the sample having detectable HIV is 1.5% to 7.7% from failure of the centrifugation to remove all of the seminal plasma and leukocytes. The number of washes is limited because repeated centrifuging leads to loss of sperm quality and quantity. A

double-tube technique has been proposed to increase yield and reduce the need for post-wash HIV testing. Although the necessary equipment is available in Canada, this technique has not been adopted by the majority of centres offering sperm washing. According to the most recent meta-analysis on the topic, which synthesized the results of 40 trials of serodiscordant couples who underwent either IUI or IVF with or without ICSI with washed sperm, there were no cases of HIV transmission that occurred in 11 585 assisted reproductive cycles.⁹⁴ This study included a subpopulation of couples in which the male partner with HIV was not virologically suppressed and reported no cases of HIV transmission in 2863 assisted reproductive cycles.

IUI, IVF, and ICSI

IUI, IVF, and ICSI are fertility techniques that can reduce the risk of HIV transmission to the uninfected partner. IUI involves placing prepared sperm directly into the uterus during ovulation. For couples who wish to further reduce the risk of horizontal HIV transmission or for those who have fertility issues, sperm washing can be combined with ovulation induction and IVF or ICSI. IVF refers to the procedure whereby oocytes are exposed to spermatozoa outside the uterus and a fertilized embryo is returned to the uterus for the gestation period. Some studies have shown that because ICSI involves insemination with only 1 spermatozoa, the risk of possible HIV transmission in serodiscordant couples should be lower than that with IUI or conventional IVF. This is because in traditional IUI, millions of spermatozoa are inseminated, and in classic IVF the oocytes are exposed to thousands of spermatozoa.⁹⁵ In many jurisdictions, assisted reproductive technology is not subsidized for patients and both IVF and ICSI are very expensive, costing up to \$15 000 per cycle, making these procedures inaccessible to many people.

A 2014 meta-analysis of studies examining HIV-serodiscordant couples undergoing IUI or IVF reported fecundability rates of 14% to 17% for IUI and 16% to 30% for IVF.⁹⁶ Rates of fecundability were slightly lower when the HIV-positive partner was female, consistent with an earlier meta-analysis.⁸⁵ Although data are conflicting, some observational studies point toward poorer assisted reproductive outcomes in women with HIV compared with control patients. For instance, a 2016 case-control study considered 82 cases of women with HIV and 82 control patients matched for age, parity, and main reason for infertility. The authors found that women with HIV had a lower implantation rate (10% vs. 21%), clinical pregnancy rate (12% vs. 32%), and live-birth rate (7% vs. 19%) compared with HIV-uninfected control patients.⁹⁷ The authors of the study concluded that women with HIV and with virologic

suppression should not delay assisted reproductive technology when preliminary methods of conception have failed.

Sperm Donation, Egg Donation, and Surrogacy

Sperm donation, egg donation, and surrogacy are discussed in depth in a joint policy statement on ethical issues in assisted reproduction prepared by the SOGC and the Canadian Fertility and Andrology Society.¹⁶ However, these policies do not directly address the issues of individuals with HIV.⁹⁸ Sperm donation is available to the uninfected partners of men with HIV and to women with HIV. Surrogacy is not currently an option in Canada for single men with HIV or men with HIV in a same-sex couple. Sperm donation by men with HIV is restricted by Canadian law; however, it may be possible through the Donor Semen Special Access Program when the recipient is known to the donor. Additional information is available from Assisted Human Reproduction Canada and fertility specialists. Individuals and couples with HIV who require sperm donation, egg donation, or a surrogate are likely to require legal advice and contracts.

Adoption

Adoption should be reviewed as an option for parenting with all prospective parents with or affected by HIV. Adoption is a legal and social process. It involves the transferring of rights over a child from birth parents to adoptive parents. In Canada, adoption is regulated provincially, so requirements vary depending upon geographical location. They may also differ depending upon whether the adoption is undertaken privately or through the public system or is international.⁹⁹ A recent study reviewed the adoption process in Ontario where 1 or both prospective parents were living with HIV.¹⁰⁰ The same group presented a case series of individuals with HIV who have successfully adopted in Ontario.¹⁰¹ This group concluded that even though international adoption can pose major barriers for people with HIV, both public and private domestic adoption is available to these people. Prospective parents should know that the total number of children available for public adoption is low and waiting times are long in Canada compared with other countries.

Recommendations

23. Couples and individuals should be counselled thoroughly about all horizontal HIV transmission risk reduction methods before attempting conception and supported to make an informed choice about which of the many options for conception method is most appropriate and acceptable to them (III-C).
24. Prospective parents should be informed about the rate of success, availability, and cost of each conception option (III-C).
25. Couples and individuals who have attempted conception using a home-based method (e.g., condomless

sex or home insemination) for 6 to 12 months without success should be referred to a gynaecologist or fertility specialist for a complete fertility workup and appropriate treatment (III-A).

26. Pre-pregnancy counselling should include a discussion about all parenting options, including adoption, for all individuals and couples (III-C).

SCENARIO-BASED RECOMMENDATIONS FOR THE PREVENTION OF HORIZONTAL HIV TRANSMISSION

The CHPPG Development Team recommends that all options be discussed with individuals or couples to review pros and cons of each option. These options typically include the following:

1. Condomless sex (with a partner living with HIV who is on cART with full viral suppression)
2. Condomless sex timed with peak fertility (with a partner living with HIV who is on cART with full viral suppression)
3. Home insemination at the time of peak fertility using a syringe
4. Sperm washing in a fertility clinic followed by IUI
5. IVF or ICSI
6. Egg and/or sperm donation (with gestational carrier) when applicable
7. Adoption

The following scenario-based recommendations are intended to guide health care providers through the specific preconception options recommended for each scenario. More than 1 option is often acceptable and recommended per scenario, and the chosen strategy is based on patient preference. Some options may not always be the most practical for the patient or couple based on availability of services, cost, cultural beliefs, personal risk evaluation, or clinical circumstance. In these cases, physicians and other health care providers should provide nonjudgemental support of the decision of the patient(s) involved.

Woman Living with HIV and HIV-Negative Man

Recommendations

27. If an individual or couple has attempted a recommended conception method for 6 to 12 months without success, assisted reproductive technologies, including intrauterine insemination or in vitro fertilization with or without intra-cytoplasmic sperm injection, with washed partner/parent sperm or a sperm donor should be recommended (II-3A).

Single Woman Living with HIV or Woman Living with HIV in a Same-Sex Relationship

Single women with HIV or women with HIV in a same-sex relationship should be counselled on the risks and benefits of home insemination with donor sperm (known donor or purchased sperm), IUI with donor sperm, IVF with donor sperm, ICSI with donor sperm, gestational carrier or true surrogate with donor sperm, and adoption. IUI is preferred over home insemination given the high cost of sperm and the increased pregnancy success rate of IUI performed in a fertility clinic. If sperm from a known donor is used for IUI, regulations applicable to the donation of sperm must be followed.

Recommendations

28. The Canadian HIV Pregnancy Planning Guidelines Development Team recommends that single women with HIV or women with HIV in a same-sex relationship be referred to a fertility specialist and counselled on the option of intrauterine insemination with donor sperm (III-C).

Man Living with HIV and HIV-Negative Woman

Recommendations

29. For serodiscordant couples in which the man is living with HIV and is on combination antiretroviral therapy with virologic suppression, the Canadian HIV Pregnancy Planning Guidelines Development Team recommends attempting timed condomless sex for 6 to 12 months (I-A) or referral to a fertility specialist for consideration of sperm washing or use of donor sperm with intra-uterine insemination (II-2A) as the preferred initial methods of conception.

Single Man Living with HIV or Man Living with HIV in a Same-Sex Relationship

Recommendation

30. Single men with HIV or a man with HIV in a same-sex relationship who has an HIV-negative or HIV-positive surrogate should be referred to a fertility specialist (III-A).

Man and Woman Living with HIV

Recommendations

31. The Canadian HIV Pregnancy Planning Guidelines Development Team recommends timed condomless sex for seroconcordant couples taking combination

antiretroviral therapy with virologic suppression (II-3A).

32. Seroconcordant couples should be counselled on the risks and benefits of timed condomless sex (including HIV super-infection and transmission of drug-resistant strains of HIV) (II-3A).

INFERTILITY INVESTIGATIONS AND TREATMENT

Fertility treatments for people living with HIV have been available for over 25 years, with over 8000 IUI attempts and 1200 IVF attempts published since the first pregnancy in 1992.⁹ Although access to care has improved in Canada, complete assisted reproductive care is still only available to people affected by HIV in 50% of Canadian fertility clinics.¹⁰² Fertility clinics offering investigation and treatment to people with HIV should make their patients aware there have been no reported cases of perinatal or horizontal HIV transmission that have originated from a fertility clinic when standard universal precaution protocols are used. The most recent data suggest that the perinatal HIV transmission rate is 4.5 per 10 000 or less⁹⁶ and that no transmission to clinic personnel or cross-contamination to another patient has ever been reported.¹⁰² As such, there is no reason not to offer fertility treatment to people with HIV. If a fertility clinic lacks the clinical and laboratory resources needed to effectively care for people with HIV, they should refer couples to a centre that has these resources.

Condomless sex can and should be offered when appropriate for patients. For individuals experiencing infertility problems or wishing for an alternative method in order to minimize the risk of transmission, standard infertility investigations should be made available in fertility clinics and include the following: ovarian reserve, semen analysis, and tubal patency confirmation.

According to Assisted Reproduction Canada regulations, all fertility clinics should be operating using Canadian Standard Association procedures for universal precautions and infection control, and therefore the Development Team reached expert consensus that there is no scientific grounds for fertility clinics to not offer services to people with HIV.

Recommendations

33. People with HIV should be counselled about fertility issues that also occur in the general population, including genetic disorders and advanced maternal age, and offered infertility investigations and treatment if required (III-A).

HIV INFECTION CONTROL IN FERTILITY CLINICS

Fertility laboratories routinely treat all samples as potentially infectious, according to the Canadian Standard Association guidelines, for the protection of both the health care worker and patient (universal precautions). These same universal precaution protocols are to be applied to the handling of HIV-infected materials. When the male is the affected partner, additional procedures can be used during the processing of the semen sample to ensure the preparation of virus-free sperm. Processing of samples from individuals with known HIV should be performed in a separate laboratory or, at a minimum, a designated area within the main laboratory using dedicated equipment. Furthermore, potentially infectious gametes and embryos should be stored in biocontainment straws (closed straws) or dedicated cryopreservation containers to avoid the risk of cross-contamination.¹⁰³

Recommendations

34. Fertility laboratories should follow Canadian Standards Association guidelines for infection control when handling HIV-positive materials and use additional procedures available for the processing of HIV-positive sperm to ensure the preparation of a virus-free sample (III-A).
35. Potentially infectious samples should be processed in a separate laboratory or dedicated area with separate equipment within the main laboratory to reduce the risk of HIV contamination (III-A).
36. Potentially infectious gametes and embryos should be stored in biocontainment straws and dedicated cryopreservation containers to minimize the risk of cross-contamination of samples (III-A).

APPLICABILITY

There are several potential barriers to applying the recommendations outlined in these guidelines. First, fertility services are still not available to individuals with HIV and couples affected by HIV in all provinces.¹⁰ In addition, many of the fertility services recommended in these guidelines are expensive and not covered by most provincial or private health insurance coverage and are therefore inaccessible to many people with HIV. Within provinces, there are urban and more rural restrictions that may also limit availability.

It is the intention of the CHPPG Development Team to closely monitor the uptake of these guidelines. Questionnaires, focus groups, and workshops will be held across the country to review and assess their uptake and to inform a plan to update the guidelines as necessary. Knowledge translation tools are available on

the CATIE website (www.catie.ca) in the form of these and other guidelines, workshops, and pamphlets.

SUMMARY

The implementation of these guidelines will assist individuals and couples living with HIV with their fertility and pregnancy planning needs through the provision of clinical information and recommendations. It will also reduce the risk of horizontal and perinatal HIV transmission and will increase the rate of pregnancy planning in the community of individuals living with HIV by providing safer options for conception, reducing the stigma associated with pregnancy and HIV, and improving access to pregnancy planning and fertility services.

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