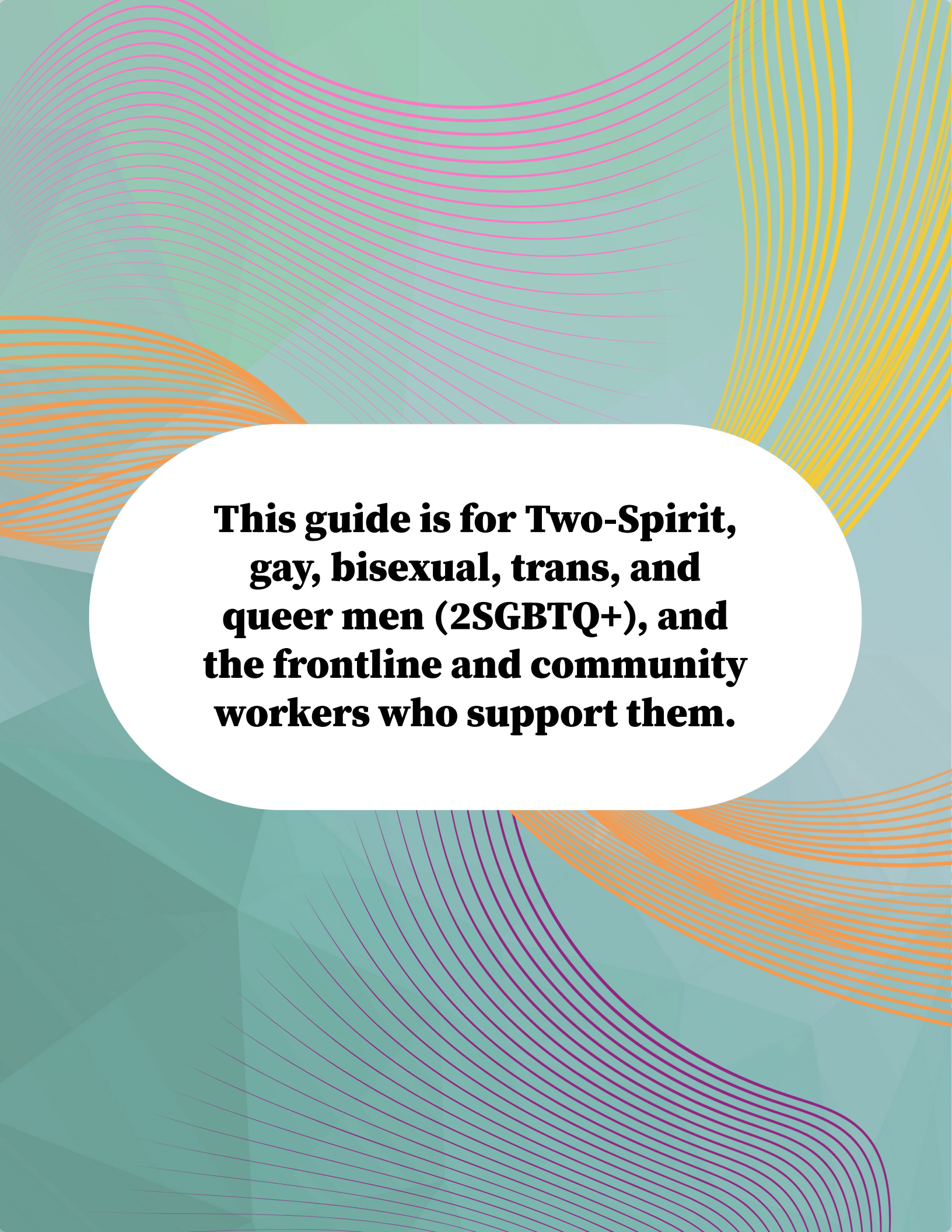


A Guide for gbMSM to Understand Anti-Microbial Resistance in Treating STIs and Improve Sexual Health

Written by Devan Nambiar, MSc.

Reviewed by JORDAN GOODRIDGE, BHSC, MD, CCFP

August 28, 2026



**This guide is for Two-Spirit,
gay, bisexual, trans, and
queer men (2SGBTQ+), and
the frontline and community
workers who support them.**

Overview

In the last few years, there have been various discussions on antimicrobial resistance (AMR) in treating gonorrhea and use of doxycycline prophylaxis (doxyPEP) to treat sexually transmitted infections (STIs). This has caused concern for gay, bisexual, and men who have sex with men (gbMSM).

This guide will unpack what AMR is, how the prevention and treatment of sexually transmitted infection(s) work, and how to make informed decisions to take care of your sexual health.

Antimicrobials are a broad group of medicines used to prevent and treat infections caused by various microorganisms.¹ Antibiotics—a subset of antimicrobials—are a broad group of medicines used to prevent and treat infections caused by bacteria, including certain sexually transmitted infections (STIs) such as gonorrhea, syphilis, and chlamydia.^{1,2} These medications work by killing bacteria or slowing or stopping them from multiplying, allowing the body's immune system to clear the infection.⁴

Antibiotic resistance occurs when bacteria develop the ability to survive treatment with antibiotics that were previously effective.⁵

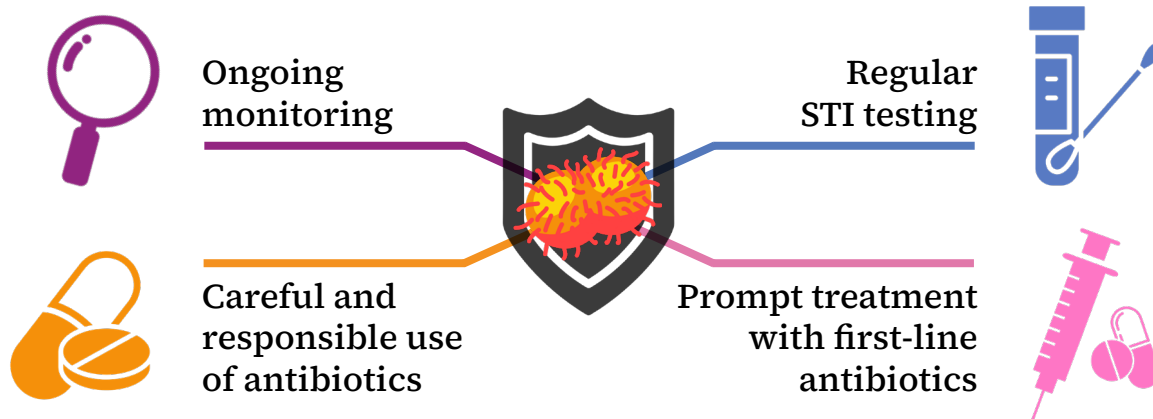
These resistant bacteria are not created by sexual activity itself; rather, they emerge through natural evolution and are accelerated by the misuse and overuse of antibiotics. Once antibiotic-resistant bacteria develop, they can be transmitted from one person to another during sexual contact, just like antibiotic-susceptible bacteria.³

Additionally, gbMSM are also disproportionately impacted by antibiotic resistance, particularly in relation to antibiotic treatment of bacterial STIs such as gonorrhea.^{2,3} While gonorrhea remains treatable in Canada, there are fewer treatment options available as antimicrobial resistance increases.

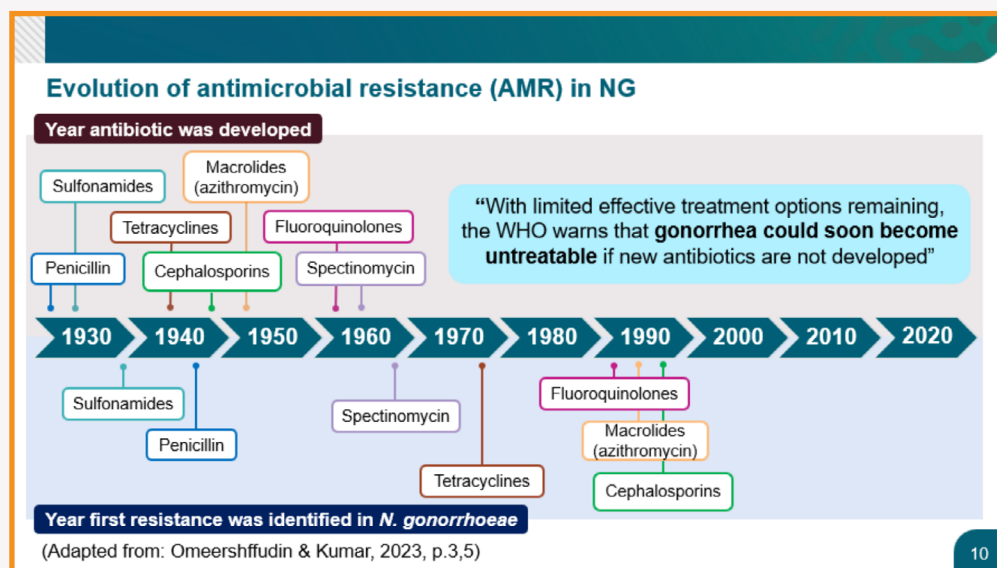
Antimicrobial-resistant gonorrhea in Canada

In Canada, antimicrobial-resistant gonorrhea is an increasing public health concern. Over time, *N. gonorrhoeae*—the bacteria that causes gonorrhea infection—has developed resistance to several antibiotics that were once effective treatments, reducing the number of available treatment options.

Surveillance data³ show a steady increase in resistance to multiple antimicrobials, highlighting the importance of:



The slide below, adapted from Dr. Chittle's 2026 Public Health Ontario Rounds presentation, *Let's Talk About Gonorrhea: A Case-Based Clinical Overview*,⁶ illustrates the evolution of antimicrobial resistance in gonorrhea in Canada to multiple antimicrobial agents over time.



Should I be concerned about gonorrhea's resistance to Doxycycline?

One important prevention strategy is doxycycline post-exposure prophylaxis (doxyPEP).⁷ DoxyPEP involves taking a 200 mg dose of doxycycline within 72 hours after condomless sex to reduce the risk of acquiring certain bacterial STIs. Clinical studies have shown that doxyPEP is highly effective at preventing syphilis and chlamydia and provides more modest protection against gonorrhea.

DoxyPEP is less effective against gonorrhea because many strains have already developed resistance to tetracyclines, the class of antibiotics that includes doxycycline.^{7,8,9} As a result, doxycycline is **not recommended for the treatment of gonorrhea**, which relies primarily on an injectable antibiotic called ceftriaxone. As resistance to available antibiotics continues to increase, there are growing concerns that gonorrhea may become increasingly difficult to treat in the future.

It's important to remember that doxyPEP remains a highly effective prevention tool for some individuals, while researchers continue to monitor resistance over time, which should help to better weigh the benefits vs. risks of treatment.



DoxyPEP involves taking a 200 mg dose of doxycycline within 72 hours after condomless sex to reduce the risk of acquiring certain bacterial STIs. Clinical studies have shown that doxyPEP is highly effective at preventing syphilis and chlamydia and provides more modest protection against gonorrhea.

Doxycycline resistance and gonorrhea

Are we running out of antibiotics? While gonorrhea remains treatable in Canada, antibiotic resistance means we have fewer treatment options than we used to, which is why careful antibiotic use is so important.

The DOXYVAC (ANRS 174 DOXYVAC)^{8,9} study demonstrated that doxyPEP reduced the incidence of syphilis and chlamydia by approximately 80% and reduced gonorrhea by about one-third. The lower effectiveness against gonorrhea is largely explained by the high prevalence of tetracycline-resistant *N. gonorrhoeae* circulating in many populations before doxyPEP was introduced.

At the International AIDS Society (IAS) Conference⁸ in 2025, experts reviewed doxyPEP recommendations from several countries and discussed concerns regarding antimicrobial resistance. A meta-analysis⁸ reported that the proportion of tetracycline-resistant *N. gonorrhoeae* varied by region, with prevalence estimates of approximately 27% in North America, 50% in Europe, and up to 80% in parts of sub-Saharan and East Africa.

DoxyPEP reduced the incidence of syphilis and chlamydia by approximately 80%.

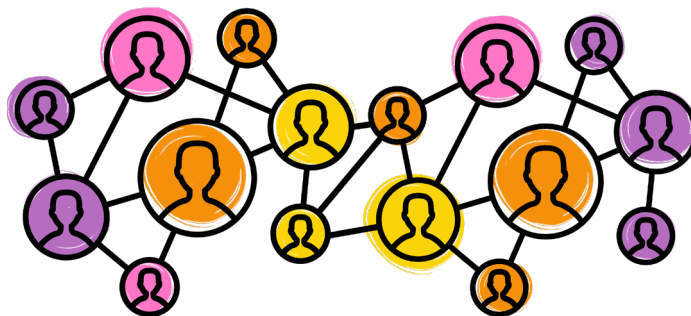


DoxyPEP reduced gonorrhea by about one-third.



How is antimicrobial-resistant gonorrhea spread during sex?

A person infected with an antibiotic-resistant strain of *N. gonorrhoeae* can transmit that resistant strain to their sexual partners through oral, vaginal, or anal sex. The newly infected person now has an infection that may be more difficult to treat, depending on which antibiotic(s) it is resistant to. As resistant strains continue to spread within sexual networks and develop resistance to additional antibiotics, treatment options become increasingly limited, making it more challenging to control the infection.



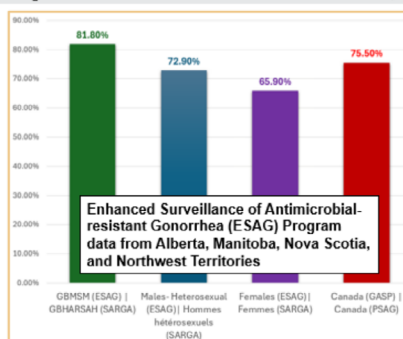
When transmission of antimicrobial-resistant gonorrhea occurs, the newly infected person may require different antibiotics or more complex treatment if the bacteria are resistant to standard (or 'first-line') medications.

According to Dr. Chittle's 2026 Public Health Ontario Rounds⁶ presentation, approximately 81.8% of reported antimicrobial-resistant gonorrhea cases occurred among gbMSM. This proportion was substantially higher than that observed in the overall Canadian population. To help reduce the spread of antibiotic-resistant gonorrhea, regular STI screening, timely treatment, and partner(s) notification is important.

To help reduce the spread of antibiotic-resistant gonorrhea, regular STI screening, timely treatment, and partner(s) notification is important.

Trends in AMR NG in Canada

Percentage of NG cultures resistant to at least 1 antimicrobial, 2022



Rates of AMR in NG are disproportionately high among gay, bisexual and other men who have sex with men (GBMSM)

(PHAC, 2025b; Swatzky et al., 2025)

Slide content adapted with permission from Lourenço, CDIC Webinar, June 2025

Why is antimicrobial-resistant gonorrhea more common among gbMSM?

Researchers believe several factors contribute to the higher prevalence of antimicrobial-resistant gonorrhea among gbMSM. Kenyon and Schwartz (2018)¹⁰ proposed that the combination of highly connected sexual network-level dynamics and frequent exposure to antibiotics creates favourable conditions for resistant bacteria to emerge and spread.

Frequent STI screening and prompt treatment are important public health measures that reduce transmission. However, greater exposure to antibiotics across a population may also increase selective pressure that promotes the emergence of resistant organisms. Most bacteria die, but sometimes resistant bacteria survive and continue spreading.

This does not mean antibiotics should be avoided when medically indicated. Rather, it highlights the importance of using antibiotics appropriately and only when recommended.

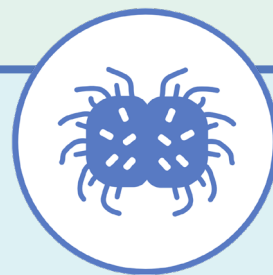
Pharyngeal (throat) gonorrhea:

Gonorrhea infections in the throat can be more difficult to eradicate because antibiotic concentrations in the throat may be lower than at other infection sites.¹⁰ The throat also contains many naturally occurring bacteria that can exchange genetic material with *N. gonorrhoeae*, potentially contributing to antibiotic resistance.



Transmission of resistant strains:

As discussed earlier, people infected with antibiotic-resistant gonorrhea can transmit these resistant strains to their sexual partners through oral, anal, or vaginal sex.¹⁰



Selective pressure from antibiotic use:

Antibiotic treatment removes susceptible bacteria while resistant strains survive and continue circulating within sexual networks.



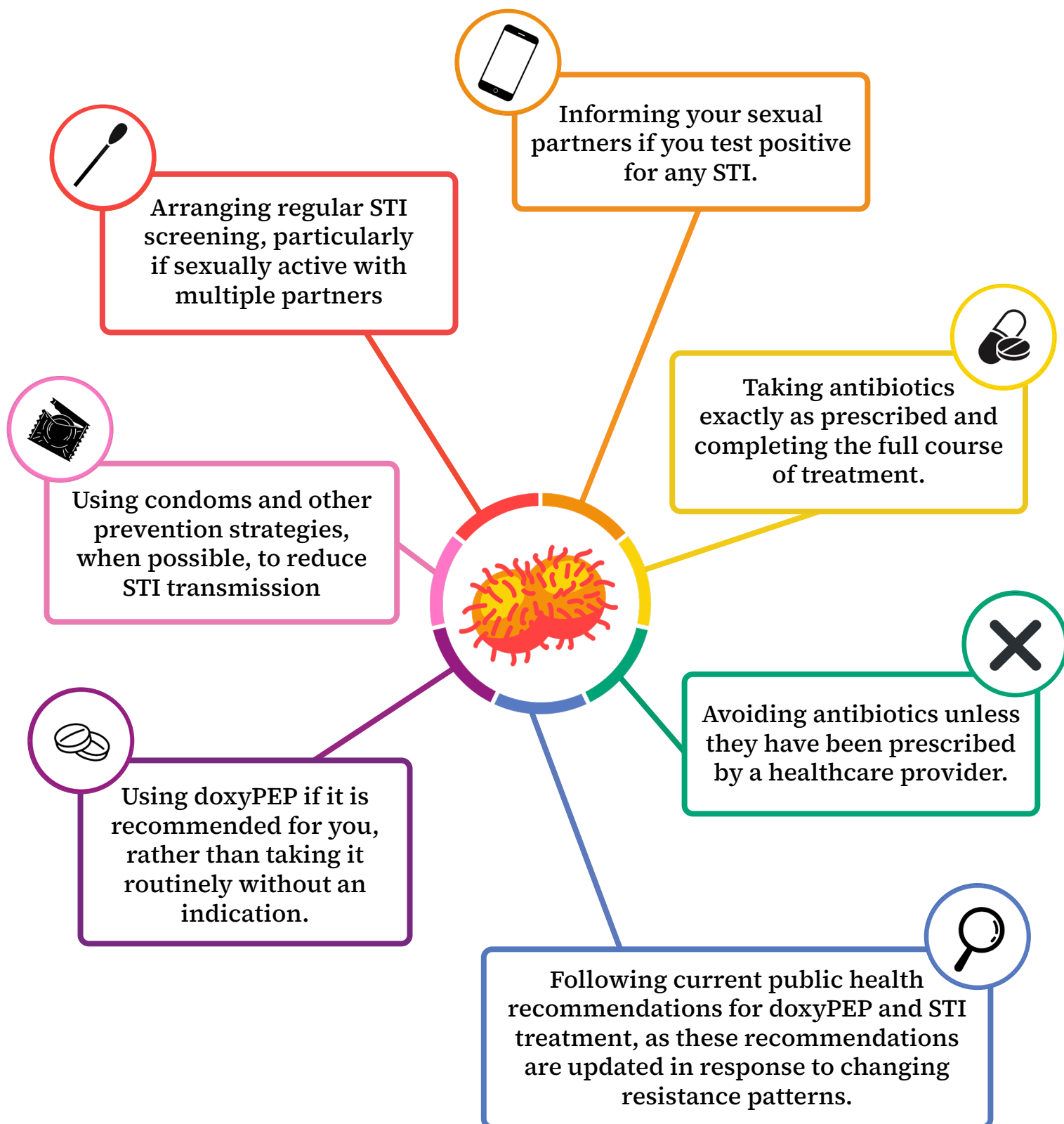
Dense sexual networks:

In populations with higher rates of partner change and interconnected sexual networks, resistant strains can spread more rapidly once they are introduced.¹⁰



What can I do to help prevent antimicrobial resistance?

Individuals can help reduce the spread of antimicrobial resistance by:



References

1. World Health Organization. Antimicrobial Resistance. [Internet] 2022. [cited 2026 June 29]. Available from <https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance>
2. Government of Canada. Canadian Antimicrobial Resistance Surveillance System: 2025 key findings. [Internet 2025]. [cited 2026 June 29]. Available from <https://www.canada.ca/en/public-health/services/publications/drugs-health-products/canadian-antimicrobial-resistance-surveillance-system-2025-key-findings.html>
3. Government of Canada. Canadian Antimicrobial Resistance Surveillance (CARSS). Antimicrobial resistance. [Internet] 2024 [cited 2026 June 29]. Available from <https://health-infobase.canada.ca/carss/amr/results.html?ind=12>
4. Revive by Global Antibiotic Research & Development Partnership. Antibiotic, antibacterial and antimicrobial. [Internet] 2026 [Cited 2026 June 29]. Available from <https://revive.gardp.org/re-source/antibiotic-antibacterial-and-antimicrobial/?cf=encyclopaedia>
5. World Health Organization. What is the difference between antibiotics and antimicrobial resistance? [Internet] 2026 [Cited 2026 June 29]. Available from <https://www.emro.who.int/health-topics/drug-resistance/what-is-the-difference-between-antibiotic-and-antimicrobial-resistance.html>
6. Dr. Chittle A. 2026. Public Health Agency of Canada. Public Health Ontario Rounds: Let's Talk About Gonorrhea: A Case-Based Clinical Overview. [Internet 2026]. [Cited 2026 June 28] Available from <https://www.youtube.com/watch?v=4E1v9ky8i7k>
7. Government of Canada. Recommendations on the use of prophylactic doxycycline for the prevention of bacterial STI (chlamydia, gonorrhea, syphilis). [Internet] 2025 [Cited 2026 June 29]. Available from <https://www.canada.ca/en/public-health/services/infectious-diseases/sexual-health-sexually-transmitted-infections/canadian-guidelines/national-advisory-committee-stbbi/recommendations-prophylactic-doxycycline-prevention-bacterial-sti-chlamydia-gonorrhea-syphilis.html>
8. Resistance is a growing concern amid rising use of doxyPEP. Aidsmap.[Internet] 2025 July 16 [Cited 2026 June 29]. Available from <https://www.aidsmap.com/news/jul-2025/resistance-growing-concern-amid-rising-use-doxypep>
9. Hosein, S.R. CATIE. Scientists in France assess antibiotic resistance in people who use doxycycline post-exposure prophylaxis (doxyPEP). [Internet] 2026 January 13 [Cited 2026 June 29]. Available from <https://www.catie.ca/catie-news/scientists-in-france-assess-antibiotic-resistance-in-people-who-use-doxycycline-post>
10. Kenyon, CR, Schwartz IS. Effects of Sexual Network Connectivity and Antimicrobial Drug Use on Antimicrobial Resistance in *Neisseria gonorrhoeae*. Emerg Infect Dis. 2018;24(7):1195-1203. <https://doi.org/10.3201/eid2407.172104>