

AAAS AMA: Hi, we're Christine Johnston and Ina Park, two researchers who study Sexually transmitted infections (STIs). Ask us anything!

AAAS-AMA¹ and r/Science AMAs¹

¹Affiliation not available

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Abstract

Sexually transmitted infections (STIs) are really common – there are about 20 million new cases every year in the United States and about 110 million total infections according to the Centers for Disease Control (<https://www.cdc.gov/std/stats/sti-estimates-fact-sheet-feb-2013.pdf>). Yet people are often afraid to ask questions about these infectious diseases because of stigma around sex and STIs. We study STIs for a living and we're not squeamish. We will be back at 1 pm ET to answer your questions, Ask us anything! Christine Johnston, Assistant Professor of Medicine, University of Washington. I'm a physician-scientist at the University of Washington. I'm board-certificated in internal medicine and infectious diseases and provides primary care to patients with HIV infection. My clinical research focuses on the natural history and pathobiology of genital herpes simplex virus (HSV) infection and I'm interested in novel therapies to prevent and manage HSV infection, such as antiviral agents and vaccines. In addition, I am the Medical Director of the University of Washington Sexually Transmitted Diseases Prevention Training Center, which educates health care providers about prevention and management of sexually transmitted infections (STI). I earned her MD from the University of Minnesota Medical School in 2001. Ina Park, Medical Consultant, Division of STD Prevention, Centers for Disease Control and Prevention; Associate Professor, Department of Family and Community Medicine, University of California San Francisco School of Medicine; Medical Director, California Prevention Training Center. I'm a medical epidemiologist with a passion for empowering and informing others about sexually transmitted disease (STD) prevention. My research interests include evaluation of serologic assays for diagnosis of syphilis and assessing the population-level impact of human papillomavirus vaccination. In 2012 I was recognized with the Young Investigator of the Year Award by the American STD Association, and recently served as a contributing author for the 2015 CDC STD Treatment Guidelines. I am currently writing a narrative non-fiction book for the lay public on STD and HIV prevention entitled "CLAP: The Science of Sex and its Least Intended Consequences". I earned my MD in 2001 from the University of California, Los Angeles School of Medicine and completed my residency in Family Medicine at the Kaiser Permanente Medical Center in Los Angeles.

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AAAS-AMA [R/SCIENCE](#)

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Christine Johnston, Assistant Professor of Medicine, University of Washington. I'm a physician-scientist at the University of Washington. I'm board-certificated in internal medicine and infectious diseases and provides primary care to patients with HIV infection. My clinical research focuses on the natural history and pathobiology of genital herpes simplex virus (HSV) infection and I'm interested in novel therapies to prevent and manage HSV infection, such as antiviral agents and vaccines. In addition, I am the Medical Director of the University of Washington Sexually Transmitted Diseases Prevention Training Center, which educates health care providers about prevention and management of sexually transmitted infections (STI). I earned her MD from the University of Minnesota Medical School in 2001.

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CORRESPONDENCE:

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AMA: Hi, we're Christine

Is it true that the chances of an un-infected male picking up an STI from penile-vaginal sex with an infected female are very low, and much lower than (1) through anal sex or (2) the other way around (female from male)?

[arcadefiery](#)

IP: STIs are not equal opportunity infections. For the ones where I'm sure that we have transmission information (gonorrhea, chlamydia, herpes, HIV), women are definitely more likely to get it from having sex with an infected man than the other way around. I know its not fair, but thats the way it is.

And anal sex (if the penis is going in your bottom) is certainly higher risk than a man's risk from penile-vaginal sex.

Johnston and Ina Park, two researchers who study Sexually transmitted infections (STIs). Ask us anything!, *The Winnower* 4:e149744.44657, 2017, DOI: [10.15200/winn.149744.44657](https://doi.org/10.15200/winn.149744.44657)

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Regarding your research on HPV, do you feel that HPV virus is associated with head & neck cancers? Most parents I know are not vaccinating their sons against HPV but are choosing to vaccinate their daughters because of the cervical cancer link. Given the research I have read (out of Australia), it seems foolish to me to vaccinate my daughter but not my son.

[northshore21](#)

IP: HPV is absolutely linked to certain types of head and neck cancers.(aka oropharyngeal cancer) In fact about 70% of over 16,000 cases of these cancers are linked to HPV, or 11,600 cases per year check it out [here](#) Men are much more likely to get these cancers than women, so I think you should definitely vaccinate both your daughter and your son.

I'm curious what you have to say about HPV and its impact? I know there's a vaccine for it now. I also know that many people in my age group (20s) treat it very casually because it doesn't seem as scary as say HIV. What about the impact of other STIs? What do you think the likelihood is of another STI coming out of nowhere and having a really devastating impact like HIV in the 80s?

[Bluesmanfromthepast](#)

IP: HPV has a huge impact. Even though most people (90%) end up clearing it, it still leads to almost 40,000 cases of cancer (cervical, head/neck, anal, vaginal), plus more than 300,000 cases of genital warts. There's a very effective vaccine, which doesn't mean you should treat it casually, but its wonderful that we have something really effective for prevention in addition to condoms.

Other STIs have a huge impact in terms of causing fertility problems in women premature labor, and STIs like syphilis can cause neurologic issues/blindness. This is not to say we should stop having sex, but we should all definitely get tested to keep ourselves healthy.

I can't predict whether we will have the emergence of another STI like HIV, but truth is, I am worried that between apps like Tinder/Grindr and more of a hook-up culture that it could happen and that we'll get blindsided. That's why i think its important to keep protecting yourself.

What's your favourite std, and a follow up question, why is it your favourite?

[ZenPyx](#)

Christine Johnston (CJ) From a research standpoint, personal favorite STD is genital herpes (both HSV-1 and HSV-2). The virus causes many recurrences in some people but is very mild in most, and trying to figure out why the differences exist is really fascinating - is it the virus, the host, or both? From a social standpoint it is also interesting to think about why this infection has so much stigma associated with it, as many have already noted, particularly since it is such a common infection!

What's your favourite std, and a follow up question, why is it your favourite?

[ZenPyx](#)

Hi its Ina Park (IP) ZenPyx great question. HPV is my favorite because basically every sexually active person will get exposed at some point, and so I feel like its relevant to all of us. My colleague calls it the "common cold of the genitals" and that is how I'd like all of us to think about it. my number two and three are syphilis and gonorrhea

As an 80's child, contracting chicken pox was a regular occurrence. Today, we are far less likely to see chicken pox due to fairly successful vaccination rates (~90% in children under 3). How likely are we to see similar vaccines for things like HSV I/II? Is this possible with other STDs?

What resource is your field missing most?

[sparklebrothers](#)

We are hopeful that we will have a successful vaccine for HSV-1/HSV-2 and other STIs. There are a couple of HSV vaccines that are being tested now in the USA and Australia. There is global interest in creating STI vaccines to decrease the morbidity associated with these very common infections.

[globalroadmap!](#)

This might be a little outside your realm of research, but I once heard that herpes was sort of just a thing in life that happened in the past until maybe 30ish years or so ago when pharama finally made a breakthrough with drugs that could suppress outbreaks and marketing created a stigma about having it. Is this true? It's kind of a waste of a question but I really want to know lol.

[supergnaw](#)

CJ: I wish I understood why herpes has become so stigmatized over the last several decades. It is likely that with increasing sexual activity and awareness of the infection, it has also become increasingly stigmatized. Unfortunately, most STIs, especially the chronic viral STIs such as HSV and HIV, suffer from intense stigma, so I would not attribute it to any types of marketing campaigns. However, I would love suggestions on campaigns to reduce the stigma! Please share your ideas.

[deleted]

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IP: Yes it is incredibly common, in fact, 79 million people are currently infected with HPV and 14 million more will be infected this year. There are about 40 types that infect the anus/genital area, and the types that cause warts are different than the types that cause cancer. They are both incredibly common.

the types that cause warts on the hand don't infect the genitals at all, so I'm not sure about the body's ability to clear those types, but for genital/anal HPV, about 90% of people who have HPV will clear it on its own. once you have genital warts, its true that if you are willing to wait several months, your body can clear genital warts on its own. For those who don't want to wait, I wouldn't recommend over the counter stuff because there are SO many good at-home treatments that are available by prescription (imiquimod, podofilox, sinecatechins), see these [wart treatments](#) from CDC.

Hi, as someone with a close loved one who is hiv positive, I appreciate your contribution to helping people in this way. I try to be wary of sexual encounters and try to be as safe as possible. But it's always been a cultural norm to have oral sex without any type of protection, and I've actually done this before, not being sure of just how risky it is. Is there a high risk factor for oral sex without protection?

[MightyMaus1](#)

IP: Agree with ihavetolaugh, its very low risk from the HIV standpoint. For people who give oral sex to a guy, gonorrhea, syphilis, herpes, and HPV can be transmitted easily. For people who give oral sex to a woman, herpes, and syphilis could be transmitted that way (not so much for gonorrhea/chlamydia, HPV)

I think it is definitely a cultural norm to have oral sex without protection, and most of my patients do not use protection for oral sex, in case you are wondering :)

It seems like very little effort or funding has been put into STI education for lesbians and the WLW community. While I get that lesbians are less likely to contract HIV, there are some infections, like BV, which are *more* common. Unfortunately, this lack of education seems to reinforce the social stigma that lesbian sex isn't *real* sex, and may lead young lesbians to behave as though they can't (or won't) be exposed to STIs.

What do you think can or should be done about this? Is the outcome of STIs on different sexual communities part of your research, and if so, what else are you seeing?

[tinybear](#)

IP: tinybear I can't agree with you more. There has been some funding into this, mostly around BV and HPV, which are just as common if not more common in WSW. Some WLW only have sex with women and some WLW also have sex with men, so those that do are as likely to contract HIV, syphilis, gonorrhea or chlamydia.

Honestly, I'm not sure about improving funding for STIs and WLW, but i think that more out/proud lesbian scientists would help advocate. My colleague [Jeanne Marrazzo](#) outed herself in a major medical journal and pioneered this work but we need more scientists like her.

Are there rare types of STI's that are unknown to the general public and if so what are there symptoms/cure rate?

Asking for a friend.

[cg1bs](#)

Hi, there are at least 3 dozen bugs that can be transmitted sexually and CJ and I are only talking about the biggies. Here are some more at the [STD Project](#) Each of them would have different cure rates, but in thinking about the ones caused by bacteria/parasites, the most common of these would be mycoplasma genitalium, trichomonas, and hepatitis C. all are curable. You can read a little more in my blog post for [Bedsider](#)

Why does the CDC not recommend HSV testing, but at the same time recommends partner notification upon diagnosis of HSV. You'd think if they thought it was important enough for partners to be notified, then everyone should be getting tested regularly. I understand the angle that a positive diagnosis does more harm psychologically than the physical effects of the virus itself, but if everyone were tested and everyone learned how truly common it is, it would break down the ridiculous stigma and do wonders for the psychological burden the few diagnosed bear. So if the CDC had the foresight to align their policies in the 2 places, that issue of psychological burden would become a moot point, and the more people know about their infections, the better we can curb the rate of infection because it is proven those who have knowledge of their infection are less likely to transmit than those that don't. So would be amazing if the CDC started recommending testing for all.

[backtonature007](#)

CJ: HSV is not a reportable disease in most states (except Washington) and partner notification through public health as other STIs (such as gonorrhea and syphilis). The CDC does recommend that people disclose to partners if they have genital herpes.

The problem with our testing is that the serologic testing (blood tests that look for antibodies) is not good enough - for the commonly available tests there can be false positive tests for HSV-2 and false negative tests for HSV-1, and the tests perform worse in low risk populations. If we had better serologic tests, I would agree with you 100%!

Why is HSV so stigmatized on the genitals but not stigmatized on the mouth? Correct me if I am wrong but HSV 1/2 can both be found in either area? More of a social question but always found that double standard curious... 2nd question is: what are your thoughts on drug resistant STIs? Management is always changing!

[murderkroger_rip](#)

CJ: HSV is a very common infection both on the genitals (could be HSV-1 or HSV-2) and on the mouth (HSV-1). It is true that for most people, symptoms are minor - 80% of people who have HSV-2 infection are not aware that they are infected! I would be interested in hearing thoughts from you all about why it is so stigmatized and how we can break the stigma.

As for HSV-1, global estimates were recently released: [HSV1 global estimates!](#) - 2/3 of the world's population is infected. It varies depending on age, geography, but this is an extremely common infection, now matter where you live.

This is less of a scientific question, but one that I haven't gotten an answer for.

Why did the nomenclature change from STD to STI a while back?

[ensign53](#)

CJ: Great question. The field has been moving toward STI (sexually transmitted infection) over STD (sexually transmitted diseases) for several years. STI is preferred by some because many times people are not symptomatic with these infections and except for the chronic viral infections (HSV, HIV) they can be cured with treatment (so do not necessarily cause long term disease). STI is also thought to be less stigmatizing than STD.

What are your thoughts on using Truvada and similar drugs as a PrEP? Do you think U.S. doctors are right to hesitate in prescribing PrEP to patients, and/or do you think the FDA et al. will provide guidelines encouraging PrEP prescriptions when requested by patients?

[13104598210](#)

PrEP has been an amazing prevention strategy for HIV. I'm pro-PrEP and having prescribed it myself, it is not difficult to prescribe and monitor. There are guidelines for use of PrEP, but they just say who might benefit, they don't dictate "you should do this" to doctors.

If you know someone who needs PrEP, there are lots of [PrEP friendly providers](#)

Does the current sex education in K-8 US schools suffice to educate kids on the risks of STIs? What are the most common misconceptions or misunderstandings about STIs that persist in the general population?

[SentienceFragment](#)

People think that STIs happen to other people, that people who get STIs are somehow "bad", and that people will know if they have an STI (that they will have symptoms). STIs are extremely common throughout the population and happen to people who have sex (regardless of whether they are "good" or "bad"!). They are often asymptomatic, which is why screening for gonorrhea and chlamydia is recommended for sexually active women 25 and under and women over 25 women with new partners, why HIV screening is recommended for everyone, and why at least annual screening is recommended for syphilis and at all exposed sites for gonorrhea men who have sex with men (throat, rectum, urethra) (and more often if there are multiple partners).

I think our sex education in schools is clearly insufficient -sex education should avoid stigmatizing STIs by not scaring people about having sex and by teaching people how to keep themselves healthy by learning about STI prevention. Does anyone have an example of a great sex education platform for kids?

Since gonorrhea and chlamydia are very treatable and have such an adverse effect on women's health, what is the reason we don't mandate a national chlamydia day or something where every person in the US takes a gram azithromycin on August 10th or something. It would wipe out almost all the chlamydia in the country, and decrease occult transmission. I remember suggesting this to an infectious disease doctor once and they laughed it off as being silly and increasing resistance.

[PussyStapler](#)

CJ: People in the field have certainly thought about this. The concern as noted below is cost and resistance. Making people aware that screening is indicated and knowing where to go to be screened is the key. Mass screening is being done in some places - for instance in Minnesota, statewide STI testing day was April 27, 2017! [Minnesota STI testing day!](#) With screening, only people who are infected will be treated.

Hi Ina, I dug into Human Papillomavirus the other day and i was surprised to find that i could find absolutely zero history on the virus and its origins despite its staggering figures on more than half of all people eventually getting the virus throughout their lives in the US. Care to enlighten us on its origins?

Thanks guys :)

[BellevueR](#)

IP: Hi BellevueR, such a good question and I wish I knew! I only know that it was first linked with cervical cancer in 1976, which is crazy to think that we found out about its link to cervical cancer that recently. Sorry it remains a mystery

I am curious about the level of access to resources for this kind of research, specially under our current government. Considering the stigma, do you still get people coming in hoping to become live subjects? Have you witness any kind of mutations that may be of concern(like how a strain of gonorrhea is becoming a super bug)? Are there countries in which your area of study has become a major focus(I know probably some countries in Africa may be of interest)? Have you witness any

condition or disease that has had an unexpected effect when the person gets infected with an STD(maybe something like the Delta32 mutation I herd about)?

You are not obligated to answer all my questions, even just one would be more than great.

[Quisqueyano354](#)

CJ: Dedicated people in the USA and around the world are still participating in STI research, despite the stigma. We cannot advance STI prevention and treatments without the support of research funding from federal agencies and without support from clinical research participants! This is a team effort!

What are your opinions on why the CDC recommends against HSV testing for those who show no symptoms. Do you think that including an HSV test in the standard STI panel could help to reduce the stigma surrounding herpes or more importantly reduce the spread of herpes?

From the CDC (<https://www.cdc.gov/std/herpes/screening.htm>)

CDC does not recommend herpes testing for people without symptoms. This is because diagnosing genital herpes in someone without symptoms has not shown any change in their sexual behavior (e.g., wearing a condom or not having sex) nor has it stopped the virus from spreading. Also, false positive test results (test results that say you have herpes when you do not actually have the virus) are possible. Even if you do not have symptoms, you should talk openly and honestly about your sexual history with your doctor to find out if you should be tested for any STDs, including herpes.

[CasualHSV](#)

CJ: I agree with the recommendation to test people with symptoms or partners with HSV-2, but only because we don't have the right tools. The problem with HSV serologic tests (which look for antibody responses) is that the tests are not perfect and can have false positive (for HSV-2) and false negative (for HSV-1 results. I would love it if we had more reliable tests to diagnose HSV infections - this would allow us to do more widespread testing and get a prevention program in place. Hopefully this will be available someday in the future.

Hi, Doctors Park and Johnston.

I truly hope you can answer mine. I've scoured the internet to no avail:

What testing method or methods (such as doing two different tests) can people use to get checked for HSV-2 with a high likelihood of accuracy?

The CDC says "failure to detect HSV by culture or PCR does not indicate an absence of HSV infection."

So what can a person do? PCR plus ELISA? PCR plus igG?

Thanks

[YoubigdumbSOB](#)

CJ: If you have a lesion, the best way to test would be HSV PCR (or culture). That way you can know the type of HSV (type 1 or 2). If you don't have a lesion and are at risk of having HSV-2 (have genital symptoms or a partner with HSV-2), you should have a serologic (blood) test looking for antibody. There are specific recommendations in the CDC STD Treatment Guidelines about when additional testing should be performed to rule out a false positive HSV-2 serology result.

From the Guidelines [CDCSTDGuidelines!](#) "The most commonly used test, HerpeSelect HSV-2 Elisa might be falsely positive at low index values (1.1–3.5) (334-336). Such low values should be confirmed with another test, such as Biokit or the Western blot (337). The HerpeSelect HSV-2 Immunoblot should not be used for confirmation, because it uses the same antigen as the HSV-2 Elisa. Repeat testing is indicated if recent acquisition of genital herpes is suspected."

What's your recommendation on what precautions should be taken when having sex for the first time with someone?

What about if a new couple decided they wanted a natural sensation and wanted to stop using condoms. From an STI perspective, what steps should be taken? Let's assume both people were tested clean two years ago with a handful of protected sex experiences since then and no visual signs of an STI.

[A Good Soul](#)

IP: hi since you are asking about condoms I'll assume this is either a man/woman, or a man/man couple. I tell all my patients that they should start with condoms, and then make a mutual decision to stop if they desire a natural sensation. Its good to get STI tested before you stop using condoms, (it could happen before you have sex, or just before you stop using condoms). just know that it is possible to transmit STIs even with no visual symptoms/signs. For the type of couple you describe, I think if they test before they stop using condoms, they are unlikely to get syphilis, gonorrhea or chlamydia, but herpes and HPV could still be transmitted because they aren't routinely tested for in the usual STI panel

Physicians and health insurance carriers recommend women be screened for STD's/STI's once a year and pap smear screenings every 3 years. Do you believe this is truly an adequate amount of time? Should the frequency be shortened or lengthened? I know this can vary depending on your lifestyle (if you're sexually active or not), but do you think individuals are getting screened frequently enough?

[sdm4242](#)

IP: well for STIs, it really depends. once a year is not enough if someone has several partners or if they're in an open relationship, then it should be done as frequently as every 3 months. so many people are not getting screened at all I would be happy if young women would have it at least once a year. For men who have sex with men, also at least once a year (every 3 months if they have multiple partners).

for Pap screening, yes every 3 years is frequent enough. we've realized this over decades of actually doing too many Paps (every year) and realizing that women were being subjected to invasive an unnecessary procedures when many of them would get better on their own.

Its actually good to space out the Paps to allow the woman's body time to clear the HPV on its own. so every 3 years is definitely the way to go