

Sexually transmissible infections affecting the gastrointestinal tract: what gastroenterologists & hepatologists need to know.

Daniel Richardson^{1,2}, Holly D. Mitchell³, Claire Jenkins³, Lewis C.E. Mason⁴, Michael Ewens⁵, Lucy Rabuszko¹, Callum Chessell⁶, Deborah Williams¹, Colin Fitzpatrick^{1,2}, Omar Kadhim Mohammed¹, Jason Zucker⁷, Henry JC de Vries^{8,9,10,11}, Kate S. Baker⁴

¹University Hospitals Sussex NHS foundation Trust, Brighton, UK

²Brighton & Sussex medical School, Brighton, UK.

³UK health security agency, London UK.

⁴Department of Genetics, University of Cambridge, Cambridge, UK.

⁵Leeds teaching hospitals NHS trust, Leeds, UK.

⁶East Sussex healthcare NHS trust, Eastbourne, UK.

⁷Department of Internal Medicine, Division of Infectious Diseases, Columbia University Irving Medical Center, New York, New York, USA.

⁸ Amsterdam UMC location University of Amsterdam, Department of Dermatology, Meibergdreef 9, Amsterdam, the Netherlands

⁹Amsterdam Institute for Infection and Immunity, Infectious Diseases, Amsterdam, The Netherlands

¹⁰Center for Sexual Health, Department of Infectious Diseases, Public Health Service Amsterdam, The Netherlands

¹¹Amsterdam Institute for Global Health and Development, Amsterdam, The Netherlands

Corresponding Author: Prof Daniel Richardson, Department of Sexual Health and HIV, University Hospitals Sussex NHS Foundation Trust, Brighton, UK daniel.richardson7@nhs.net

Abstract: 225

Word Count: 3262

References: 102

Figures: 5

Tables: 1

Contributor statement: DR drafted the initial manuscript. All authors contributed to the final manuscript. DR is acting as the guarantor.

Funding: The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing Interests: None of the authors have any competing interests

Data availability: Data sharing not applicable to this article as no datasets were generated or analysed.

Statement of Research Ethics: This research was conducted in accordance with the World Medical Association declaration of Helsinki.

Acknowledgements: we would like to thank the two patients who provided written consent for photographs to be used in this manuscript

Keywords: sexually transmissible enteric infections, sexually transmitted infections, homosexuality, male, proctitis, enteritis, Hepatitis A virus, *Giardia duodenalis*, *Shigella* spp, *Campylobacter* spp, *Salmonella* spp. *E. coli*, *Entamoeba histolytica*, *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, Lymphogranuloma venereum, Mpox, *Treponema pallidum*.

Figure 1: Oral and anorectal sexually transmissible enteric infections

Figure 2: Sexually transmissible hepatitis, enteritis and proctocolitis

Figure 3: Less frequent causes of sexually transmissible enteric infections

Figure 4: The Characteristics of men who have sex with men with enteric pathogens

Figure 5: Clinical photographs of anal sexually transmitted infections

Table 1: Interventions to consider in men who have sex with sexually transmissible enteric infections

ABSTRACT

Sexually transmissible gastrointestinal (enteric) infections cause oro-pharyngitis, hepatitis, enteritis, proctocolitis and ano-rectal disease, and can mimic neoplastic and inflammatory gastrointestinal disease. Sexually transmissible enteric infections are generally seen in men who have sex with men (MSM) due to sexual behaviours which risk faecal-oral transmission.

Oropharyngeal and anorectal sexually transmitted infections (STI) are transmitted via direct inoculation from oral and anal sexual behaviours. *Shigella* spp. *Campylobacter* spp. *Salmonella* Spp. diarrhoeagenic *E. coli*, *Giardia duodenalis* and *Entamoeba histolytica* are recognised sexually transmissible enteric faeco-oral pathogens in MSM. *N. gonorrhoeae*, *Chlamydia trachomatis*, Herpes simplex virus (HSV), *Treponema pallidum* subspecies *pallidum* (Syphilis), Mpox and HSV cause sexually transmissible oro-pharyngeal and ano-rectal disease. *Cryptosporidium*, intestinal spirochaetosis, *Blastocystis*, *Strongyloides stercoralis*, *Enterobius vermicularis* and enteric viruses have infrequently been reported as sexually transmissible in MSM. Sexually transmissible enteric infections have increased in MSM over the past 35 years. Gastroenterologists and hepatologists do not generally enquire about sexual behaviours, but identifying sexually transmissible enteric infections is important because of high rates of bacterial antimicrobial resistance, and the additional management includes: bacterial antimicrobial susceptibility testing, testing for STIs/HIV, providing recommendations for sexual abstinence and partner notification; and onward referral to specialist sexual health clinics for sexual health prevention interventions. In this review we highlight the sexually transmissible infections which can affect the gastrointestinal tract and provide some key management points for gastroenterologists and hepatologists.

KEY POINTS:

1. **Sexually transmissible enteric infections:** Some gastrointestinal pathogens can be sexually transmissible, particularly in men who have sex with men (MSM), and should be managed as sexually transmitted infections (STI).
2. **Sexual history taking and the clinical assessment:** A sexual history and clinical assessment is important in people presenting with gastrointestinal syndromes (hepatitis, enteritis, proctocolitis and anal-rectal symptoms) for the recognition of sexually transmissible enteric infections.
3. **Investigations:** Comprehensive stool testing for bacteria and parasites using sensitive molecular testing complemented by reflex antimicrobial susceptibility testing for enteric bacteria. Patients (particularly MSM) with ano-rectal or oropharyngeal symptoms where an STI is suspected should be referred to sexual health clinics (genitourinary medicine - GUM) for investigation. Patients with sexually transmissible enteric infections should be screened for other STIs including HIV.
4. **Antimicrobial and proton pump inhibitor (PPI) stewardship:** Most bacterial enteric pathogens do not need antimicrobial treatment (but diagnostic testing and antimicrobial susceptibility testing should be undertaken). The use of PPIs should be rationalised as they can increase the risk of sexually transmissible enteric infections.

5. **Prevention of transmission:** Recommending a period of sexual abstinence and partner notification is important to prevent ongoing sexual transmission. People who work in food handling or health care need to follow local and national guidelines before returning to work.

6. **STI prevention:** Identifying people (and their sexual partners) with sexually transmissible enteric pathogens provides opportunities for the prevention of other sexually transmitted infections (e.g. HIV testing, HIV pre-exposure prophylaxis).

SEXUALLY TRANSMISSIBLE ENTERIC INFECTIONS

Introduction

Faeco-oral transmission of pathogens during sexual behaviour is well recognised amongst who have sex with men (MSM).¹ The first descriptions of sexually transmissible enteric infections were from New York City and San Francisco in the 1960s -1970s highlighting the transmission of *Entamoeba histolytica*, *Giardia duodenalis*, Hepatitis A Virus and *Shigella* spp. between MSM.²⁻⁵ During the early years of the HIV epidemic (1981-1997), there were few reports of sexually transmissible enteric infections in MSM. Since the availability of effective treatment and prevention of HIV including highly active anti-retroviral therapy (HAART), treatment as prevention and HIV pre-exposure prophylaxis (PrEP), Sexually transmissible enteric infections have increased in-line with other sexually transmitted infections (STI).^{6,7} The broadening of sexual repertoires, changing patterns of recreational drug use including chemsex (sexualised use of crystal methamphetamine, gamma hydroxybutyrate and other recreational drugs usually as part of group sex organised via social media smart phone applications) and availability of sexual partnerships facilitated by social media are also likely to have increased rates of sexually transmissible enteric infections in MSM.^{8,9} It is important to acknowledge that the increase in screening for STIs, and the sensitivity of molecular tests used (e.g. polymerase chain reaction (PCR), nucleic acid amplification test (NAAT)) may have conflated the rise in STIs in MSM.^{7,10}

Oropharyngeal and ano-rectal STIs including *Neisseria gonorrhoeae* and *Chlamydia trachomatis* are commonly seen in MSM and are transmitted via oral and anal sexual behaviours and are frequently asymptomatic driving onward transmission.¹¹⁻¹³ (Figure 1) Novel pathogens including the lymphogranuloma venereum subtype of *Chlamydia trachomatis* and Mpox which can cause anorectal symptoms have posed particular challenges in the past 20 years.^{14,15} Enteric pathogens can cause significant morbidity including fulminant hepatitis, severe dehydration, renal disease,

neurological disease and hospitalisation.^{16 17} The relatively high consumption of antimicrobials (particularly macrolides, fluoroquinolones, tetracyclines and cephalosporins) in MSM for other STIs (e.g. *N. gonorrhoeae*, *C. trachomatis*) has contributed to concerning rates of transmission of antimicrobial resistant diarrhoeagenic *Enterobacteriaceae*.¹⁸⁻²⁰

Recently published clinical practice guidelines lack consistency and specific antimicrobial recommendations.²¹ There is a lack of awareness (amongst clinicians and communities) and a lack of effective control interventions for sexually transmissible enteric infections.^{19 22} Patients with symptomatic sexually transmissible enteric infections present across various clinical settings, including sexual health clinics, primary care, and acute hospitals (including gastroenterology and other non STI specialists).

To improve understanding across specialities, this review aims to describe the faeco-oral sexually transmissible enteric pathogens grouped by clinical syndrome which mainly affect MSM. There are likely to be other groups of people such as cis-gendered women, gender non-conforming people and trans people, sex workers and heterosexually identifying MSM who are also at risk of faeco-oral sexually transmissible infections, however the majority of published evidence is from MSM. This review focuses on MSM only because that is where the evidence has been derived.

Gastroenterologists and hepatologists may encounter hospitalised patients and people attending outpatients with sexually transmissible enteric infections. We outline the clinical and public health challenges, and key practical messages for gastroenterologists, hepatologists and other clinicians specifically for UK settings, although most of the advice and recommendations are universal.

Importantly, MSM with sexually transmissible enteric infections should be referred to specialist sexual health services for appropriate screening, partner notification, treatment where appropriate and for other sexual health interventions (e.g. HIV-PrEP).²³

Oropharyngeal infections:

Treponema pallidum, subspecies *pallidum* (syphilis), Mpox and Herpes Simplex Virus (HSV) and rarely lymphogranuloma venereum (*C. trachomatis* L serovar) are sexually transmissible causes of oral ulceration seen mainly in MSM.²⁴⁻²⁶ Rates of *T. pallidum* globally have been increasing over the past 25 years (since the availability of effective HIV treatment), initially in MSM, but also affecting other marginalised populations including sex workers, injecting drug users, vulnerable women and people who experience violence and poverty.²⁷ Mpox is an emerging zoonotic pox virus; person to person sexual transmission was highlighted in the 2022 global outbreak of mpox amongst MSM.²⁵ HSV may present with painful oral ulceration or pharyngitis, and can be confirmed with molecular testing; consideration of antiviral therapy (intermittent or suppressive) may be beneficial.²⁸ Molecular testing for *T. pallidum*, Mpox, HSV are all available (in the UK) including in multiplex assays. Mpox can be life-threatening in immunosuppressed hosts including people living with HIV with a low CD4 count.²⁵

Neisseria gonorrhoeae is a frequent asymptomatic infection of the oropharynx and can be detected by highly sensitive molecular testing (NAATs), supplemented by traditional culture for antimicrobial resistance testing.²⁹⁻³⁰ Oropharyngeal gonorrhoea drives both the transmission and the evolution of antimicrobial resistance in *N. gonorrhoeae* in MSM.³⁰ There is current debate about whether the frequency of screening of MSM for pharyngeal *N. gonorrhoeae* is excessive over concern regarding the impact on antimicrobial consumption and generation of antimicrobial resistance.¹⁰⁻³¹ The WHO identifies antimicrobial-resistant *N. gonorrhoeae* as an "urgent threat to public health" due to the rise of extensively drug-resistant (XDR) strains, which significantly limits treatment options.³⁰

Although oropharyngeal *Chlamydia trachomatis* can be found in MSM, the pathogenesis and impact on ongoing transmission is unclear.¹¹⁻³² Treatment of *T. pallidum*, *N. gonorrhoeae*, HSV and Mpox should be managed in specialist sexual health services where MSM can also be offered vaccination for Mpox.³³

Viral hepatitis

Hepatitis A transmission continues to occur in MSM, despite an effective vaccine, and hepatitis A immunity remains below the threshold required for herd immunity in high income settings.^{34 35}

(Figure 2) In 2016 a large global outbreak of three distinct hepatitis A subtypes was epidemiologically linked to 'gay' pride festivals and events and circuit (sex) parties in Europe, the USA and Asia.³⁶⁻³⁹

Hepatitis A in MSM is associated with living with HIV and acute HIV seroconversion, HIV-PrEP use, sex work, low educational attainment, sexual practices which increase the risk of faecal contamination (oral-anal sex), visiting sex on premises venues, recreational drug use, transmission of other STIs, and hospitalisation.³⁴ (Figure 4) Although some people are asymptomatic, people with acute hepatitis A experience jaundice, fever, nausea, diarrhoea and abdominal discomfort which can last up to 2 months; hepatitis A does not cause a chronic or persistent infection. Fulminant hepatitis A and liver failure is rare.⁴⁰ Treatment for hepatitis A is generally supportive, although many individuals are hospitalised.³⁴ Healthcare networks need to increase the offer and uptake of hepatitis A vaccination for susceptible MSM which will entail reducing stigma and discrimination barriers.⁴¹

Hepatitis E is a zoonotic faeco-oral virus described during outbreaks of unexplained hepatitis in India, Kashmir and Afghanistan in the 1950s-1970s.⁴² Genotypes 1A and 2A cause acute hepatitis in humans following an incubation period of 15-60 days.⁴³ Hepatitis E can (rarely) cause extrahepatic manifestations, including neurological disease (e.g., neuralgic amyotrophy, Guillain-Barré syndrome, encephalitis, myelitis, mononeuritis multiplex, Bell's palsy, vestibular neuritis, myositis, myasthenia gravis, peripheral neuropathy), renal disease (glomerulonephritis, IgA nephropathy), and haematological disease (thrombocytopenia, aplastic anaemia). Other reported complications include pancreatitis, arthritis, myocarditis, and thyroiditis.¹⁷ Acute hepatitis E in the third trimester of pregnancy is associated with 20% maternal morbidity and mortality caused by eclampsia, haemorrhagic complications and liver failure. Ribavirin and corticosteroids have been used in the management of immunosuppressed hosts; novel compounds (NITD008 and GPC-N114) have been used in experimental studies, and effective vaccines are in development and potentially offer high efficacy.⁴⁴ Hepatitis E has been shown to be sexually transmissible in MSM, therefore MSM with

unexplained transaminitis, renal disease and neurological disease should be tested.¹⁷ Hepatitis B virus, and to a far lesser extent, Hepatitis C Virus disproportionately affects men who have sex with men due to sexual transmissibility, although they are bloodborne viruses, not faeco-oral.^{45 46}

Enteritis

Giardia duodenalis (also known as *Giardia lamblia* and *Giardia intestinalis*) is a flagellated non-invasive parasite consisting of 8 subtypes (assemblages) of which A and B cause human disease.⁴⁷ The inert cysts of *G. duodenalis* are generally transmitted via contaminated food or water and excyst in the acidic stomach to pathogenic trophozoites which cause epithelial inflammation and villous flattening leading to fat malabsorption and steatorrhea.⁴⁷ The sexual transmission of *G. duodenalis* between MSM is associated with living with HIV, co-infections with other STIs and enteric pathogens, and sexual behaviours which risk faecal contamination.⁴⁸ *G. duodenalis* can be diagnosed using traditional stool microscopy for visualisation of cysts, or trophozoites; however the sensitivity of molecular tests is far superior.^{23 48} Antimicrobial treatment with nitroimidazoles (e.g. tinidazole or metronidazole), paromomycin or nitazoxanide is recommended, and treatment failure is being reported possibly due to antimicrobial resistance.^{23 48}

T. pallidum (syphilis) is estimated to cause an ulcerative gastritis in 1% of cases.⁴⁹ Most patients will also have a typical truncal maculopapular rash and other symptoms including preceding ano-genital ulcer(s), fatigue and weight loss.⁵⁰ Syphilis can also cause a hepatitis and cholestasis.⁵¹

Proctocolitis

Enterobacteriaceae *Shigella sonnei*, *Shigella flexneri*, *Campylobacter* spp. Diarrhoeagenic *Escherichia coli* (including Shiga-toxin producing *E. coli*) and *Salmonella Enterica* (Typhi and non-typhi) are sexually transmissible in MSM.⁵²⁻⁵⁵ These organisms require a very small inoculum for transmission,

especially *Shigella* spp. (as few as ten organisms can cause an infection) and some may survive on surfaces and sex toys.⁵⁶ There have been significant outbreaks of *Shigella* among MSM in high income settings, including extensively drug resistant (against three antimicrobials used historically to treat *Shigella* namely, azithromycin, ciprofloxacin, and cephalosporins).^{19 57} These organisms cause proctocolitis and extra-intestinal phenomena such as neurological disease (encephalitis, polyneuropathy) and rheumatological disease (sexually acquired reactive arthritis).⁵³ Antimicrobial treatment should be avoided unless patients are hospitalised with prolonged symptoms, immunosuppression or other co-morbidities.^{21 23} Expert antimicrobial advice should be sought as empirical quinolones, macrolides and cephalosporins are unlikely to be effective in MSM: fosfomicin, pivmecillinam or carbopenems can be considered in people who need antimicrobials.^{58 59} In England, there are currently more cases of sexually transmissible shigellosis compared with travel associated shigellosis; and all MSM with *Shigella* should be managed as having an STI.⁶⁰ Furthermore, a meta-analysis estimated asymptomatic carriage rates of ; 1.1% for *Shigella*, 1.9% for *Campylobacter* spp., 3.8% diarrhoeagenic *E. coli*, and 0.3% *Salmonella* spp. in MSM.⁶¹

Entamoeba histolytica is an invasive parasite with an estimated annual global mortality of 55,000 people.⁶² The inert transmissible cysts can survive in the environment for weeks and following ingestion, excystation occurs in the small intestine producing trophozoites which invade intestinal epithelium causing inflammation and can migrate via the portal system leading to liver abscess.⁶² It is estimated that 90% of human hosts are asymptomatic; symptomatic disease presents as watery or bloody diarrhoea, abdominal pain and weight loss.⁶² In MSM, *E. histolytica* is associated with; increasing age, lower educational achievement, seasonality, concurrent and previous sexually transmitted infections, hepatitis B, hepatitis C, concurrent sexually transmitted enteric infections, oral-anal sex, exclusively/majority receptive anal sex and sadomasochism.⁶³ Traditionally, stool microscopy has been used for diagnosis, however, microscopy cannot reliably differentiate

pathogenic *E. histolytica* from other non-pathogenic *Entamoebae*, in particular *Entamoeba dispar*, *Entamoeba Bangladeshi* and *Entamoeba moshkovskii*. Molecular diagnostics can now distinguish between *E. histolytica* and non-pathogenic amoebae.⁶² All cases of *E. histolytica*, asymptomatic and symptomatic including sexual contacts who test positive, require sequential courses of a tissue amoebicide, usually a nitroimidazole (e.g. tinidazole) followed by a luminal amoebicide (e.g. paromomycin) to ensure clearance of both active trophozoites and cysts.^{23 62} The investigation of liver abscess in patients with *E. histolytica* is recommended.⁶²

Ano-rectal disease

Ano-rectal STIs are common in MSM and may increase the risk of HIV transmission.⁶⁴⁻⁶⁶ (Figure 1) Herpes simplex virus, *Neisseria gonorrhoea*, *Chlamydia trachomatis* (including lymphogranuloma venereum (LGV)), *T. pallidum* and Mpox are all causes of sexually transmissible ano-rectal ulceration and proctitis in MSM and are all diagnosed using molecular NAAT from ano-rectal swabs and in the case of syphilis, with complimentary serology.^{15 23 65-67} *N. gonorrhoeae* and *C. trachomatis* (non LGV subtypes) are usually asymptomatic but can cause a symptomatic and muco-purulent haemorrhagic proctitis.^{13 68} *T. pallidum* (syphilis) and Mpox and have diverse clinical ano-rectal features which can be challenging to diagnose and distinguish clinically including ulceration, condylomata lata, and proctitis. (Figure 5) HSV typically presents as ano-rectal ulceration frequently accompanied by urinary (e.g. urinary hesitancy and retention) constitutional (e.g. fever) and neurological (e.g. paraesthesia) symptoms.⁶⁹ LGV is an ulcerative invasive sexually transmitted infection caused by the L genovars of *Chlamydia trachomatis* which has been endemic in Europe and other high-income settings since 2003.¹⁴ Classical (inguinal LGV) presents as genital ulceration and lymphadenopathy (bubos); but the current epidemic is characterised by the ano-rectal syndrome where MSM present with ano-rectal symptoms and sometimes a colitis complicated by fever, strictures, perforation, abscesses and fistulae.⁷⁰ On initial presentation, MSM with ano-rectal symptoms and signs should be thoroughly investigated for sexually transmissible causes as *T. pallidum* (syphilis) and LGV can mimic

inflammatory and neoplastic conditions.⁷¹⁻⁷³ Clinicians are faced with a clinical conundrum when managing MSM presenting with a proctitis before microbiology results are available: empirically treat for *N. gonorrhoeae*, *C. trachomatis* with or without treatment for HSV?^{23 65} Current clinical guidelines lack consistency and clarity in the recommendation for the empirical treatment of ano-rectal HSV.^{21 23}
^{69 74} Human papilloma virus can cause ano-genital and oral warts (condyloma), and dysplasia (anal intraepithelial neoplasia and anal / oropharyngeal squamous cell carcinoma).⁷⁵ MSM with ano-rectal symptoms should be carefully examined using a proctoscope.⁷⁶ In refractory cases of proctitis in MSM where initial microbiology tests are negative, testing for *M. genitalium* is recommended.²³

Other pathogens

Other pathogens which share similar transmission dynamics to the enteric pathogens described so far, but are infrequently sexually transmissible include the parasites *Blastocystis* and *Cryptosporidium*; *Enterobius vermicularis* (threadworms), *Brachyspira pilosicoli* and *B. aalborgi* (intestinal spirochaetosis), *Strongyloides stercoralis*, and some enteric viruses (enterovirus, norovirus, rotavirus, enteric adenovirus, sapovirus, astrovirus, and enteric coronaviruses).^{69 77-83} (Figure 3)
Sexually transmissible enteric infections are under-researched so the absence of evidence should not be treated as evidence of absence.⁶⁸ In people living with HIV, opportunistic infections may reactivate and/or affect the gastrointestinal tract including *Candida albicans* (oesophagitis), cytomegalovirus (CMV), Epstein Barr Virus, *Mycobacterium tuberculosis* and non-tuberculous *Mycobacteria* (e.g. *Mycobacteria avium* complex).⁸⁴

Stigma, shame, prejudice and discrimination affect the access to healthcare for diverse people including MSM, other sexual minorities, racialised minority groups, gender diverse people, sex

workers, people living in poverty, incarcerated people and some groups of cisgendered women; and having a sexually transmissible infection or gastrointestinal infection can further limit peoples access to healthcare.^{85 86} Globally, enteric pathogens remain neglected and more work is needed to improve the awareness, clinical guidelines, diagnostics and therapeutic options including vaccines to control the transmission of these pathogens.^{21 55}

PRACTICAL CONSIDERATIONS FOR GASTROENTEROLOGISTS AND HEPATOLOGISTS

Sexual history taking

Sexually transmitted infections should be considered in people with unexplained gastrointestinal symptoms. This should include at a minimum, sensitive sexual history-taking and specifically identifying the gender of a patient's sexual partners, the recency of sexual behaviour ("how many sexual partners have you had in the past 3 months"), the type of sexual behaviours people have been engaging in (oral, vaginal, anal, rimming, use of toys), and the use of condoms or other barriers. We acknowledge that some clinicians may find talking about sexual behaviours challenging. In general, patients are generally open to discussing sexual behaviours after consent (for example, "I would like to ask you some questions about your sexual life if that's OK?" When approached respectfully and professionally, most people are not embarrassed or consider this an invasion of privacy.⁸⁷ Patients with possible sexually transmissible enteric infectious should ideally be referred on to specialist sexual health clinics. Travel history, particularly to regions where diarrhoeal pathogens are more endemic, and occupational history is also important.²³

Clinical assessment

Examination of the oral cavity, external genitalia, perianal region and anus and proctoscopy can highlight important clinical signs. A general medical assessment including blood pressure, pulse,

temperature, abdominal examination, and an assessment of hydration status in people presenting with diarrhoea; as recommended by NICE can support decisions for hospital admission.⁸⁸ MSM with ano-rectal symptoms should be carefully examined using a proctoscope.⁷⁶

Investigations

Support patients to provide stool specimens for microbiological testing, including molecular panels for bacteria, viruses, and parasites, with reflex culture and antimicrobial susceptibility testing for enteric bacteria. Direct specimens (swabs) from oral and anorectal lesions using molecular testing for *N. gonorrhoeae*, *C. trachomatis* (including LGV), HSV, *T pallidum* and mpox. Blood tests should include HIV and hepatitis serology (including HAV and HEV IgM) when viral hepatitis is suspected. In refractory cases of proctitis in MSM where initial microbiology tests are negative, testing for *M. genitalium* is recommended.²³ It's important to note that some people with early oral or ano-rectal syphilis have positive molecular tests (swabs) paralleled with negative serology.⁸⁹ Unnecessary invasive interventions such as endoscopy, sigmoidoscopy and colonoscopy should be avoided.¹⁶

Sexually transmitted infection testing

In the UK, most jurisdictions are supported by sexual health clinics (genitourinary medicine) for STI/HIV testing and management of STIs. NAAT testing (direct swabs from the oropharynx and rectum; and urine) for *Chlamydia trachomatis*, *Neisseria gonorrhoeae* and serology for *T. pallidum* and HIV are now readily available. In cases of MSM with enteric infections, hepatitis A, B and C serology is also recommended.²³

Antimicrobial- and PPI-stewardship

Empirical antimicrobial therapy is rarely required in enteric bacterial infections. In MSM who require hospital admission for shigellosis, specialist microbiology advice should be sought to guide antimicrobial choice. Routine susceptibility testing provides individualised care and supports public health surveillance.²³ Proton pump inhibitors (PPI) can increase the susceptibility of enteric infections

by altering gastric pH.⁹⁰ Up to 70% of PPI prescriptions may be inappropriate; promoting PPI stewardship may reduce transmission risk in MSM.^{90 91}

Prevention of transmission

Discussing a period of sexual abstinence with patients who have a sexually transmissible enteric infection is recommended.²³ (Table 1) The United States Centres for Disease Control (CDC) have recommended the following interventions to prevent transmission: wash hands, genitals, and anus before and after sexual activity; use a condom or dental dam when engaging in anilingus (oro-anal sex or 'rimming'); use latex gloves when fingering or fisting; avoid having sex with a partner for at least 2 weeks after symptoms resolve if you or your partner has recently had diarrhoea or a diagnosis of shigellosis; wash sex toys before and after each use; and wash hands after touching used sex toys.⁹² However these interventions are not always acceptable for patients and lack real world-use evidence.^{23 93} Supporting MSM who experience dependence on recreational drugs and chemsex may reduce onward transmission of enteric pathogens.^{94 95} Partner notification and testing can reduce onward transmission and identify people within sexual networks who benefit from STI and HIV testing.⁹⁶ Asymptomatic MSM sexual contacts of *E.histolytica* require testing and treatment if positive to reduce the risk of invasive disease and transmission.^{23 62} Ensuring food handlers (and people who work in health care) stay away from work until at least 2 days after cessation of symptoms as part of UKHSA guidelines and compliance with other public health interventions (e.g. microbiological clearance) in partnership with health protection teams.⁹⁷

STI prevention

Identifying people (partner notification and contact tracing) including MSM who are part of sexual networks involving the transmission of sexually transmissible enteric pathogens provides opportunities for STI and HIV prevention. These patients should be referred to sexual health services to access HIV pre-exposure prophylaxis, discussion about doxycycline post-exposure prophylaxis (DoxyPEP), vaccines for Hepatitis A, hepatitis B, Human papilloma virus, mpox, *N gonorrhoeae*

(4CmenB) and comprehensive STI testing where recommended.^{23 98-100} DoxyPEP is not recommended in all jurisdictions due to concerns over antimicrobial resistance.^{101 102}

Public health

The UK health security agency provides clear guidelines on reporting of notifiable enteric pathogens and may contact clinicians to work in partnership to design and deliver local outbreak management strategies. Clinicians should work sensitively with patients and public health to facilitate outbreak management. Co-designed interventions with affected communities may be more effective than top-down approaches.

Table 1: Interventions to consider in men who have sex with sexually transmissible enteric infections	
Sexually transmissible enteric infection management	- Partner notification - A period of abstinence from sexual contact - Public health notification (where mandated)
HIV prevention	- HIV testing - HIV pre-exposure prophylaxis - HIV treatment as prevention
Sexually transmissible enteric infection prevention	- Hepatitis A vaccination - Sexual behaviour modification/recreational drug use support - PPI stewardship
Sexually transmitted infection prevention	- STI testing (particularly <i>Treponema pallidum</i> [syphilis]) 4CmenB vaccine (gonorrhoea vaccine) where recommended - Human papilloma virus vaccine - Hepatitis B vaccine - Mpox vaccine - Doxycycline Post exposure prophylaxis (doxyPEP) [not recommended in all jurisdictions]

REFERENCES:

1. McNeil CJ, Kirkcaldy RD, Workowski K. Enteric Infections in Men Who Have Sex With Men. *Clin Infect Dis* 2022;74(Suppl_2):S169-s78. doi: 10.1093/cid/ciac061
2. Most H. Manhattan: "a tropic isle"? *Am J Trop Med Hyg* 1968;17(3):333-54. doi: 10.4269/ajtmh.1968.17.333 [published Online First: 1968/05/01]
3. Dritz SK, Ainsworth TE, Back A, et al. Patterns of sexually transmitted enteric diseases in a city. *Lancet (London, England)* 1977;2(8027):3-4. doi: [https://dx.doi.org/10.1016/s0140-6736\(77\)90002-2](https://dx.doi.org/10.1016/s0140-6736(77)90002-2)
4. Kazal HL, Sohn N, Carrasco JI, et al. The gay bowel syndrome: clinico-pathologic correlation in 260 cases. *Ann Clin Lab Sci* 1976;6(2):184-92.
5. Weller IV. The gay bowel. *Gut* 1985;26(9):869-75. doi: 10.1136/gut.26.9.869
6. Mitchell H, Hughes G. Recent epidemiology of sexually transmissible enteric infections in men who have sex with men. *Current opinion in infectious diseases* 2018;31(1):50-56. doi: <https://dx.doi.org/10.1097/QCO.0000000000000423>
7. Unemo M, Bradshaw CS, Hocking JS, et al. Sexually transmitted infections: challenges ahead. *Lancet Infect Dis* 2017;17(8):e235-e79. doi: 10.1016/s1473-3099(17)30310-9 [published Online First: 20170709]
8. Richardson D, Nambiar KZ, Nadarzynski T. Understanding the diverse sexual repertoires of men who have sex with men, trans and gender-diverse groups is important for sexually transmitted infection prevention. *BMJ Sex Reprod Health* 2021;47(3):e3. doi: 10.1136/bmjsh-2020-200804 [published Online First: 20200924]
9. Gilbert VL, Simms I, Jenkins C, et al. Sex, drugs and smart phone applications: findings from semistructured interviews with men who have sex with men diagnosed with *Shigella flexneri* 3a in England and Wales. *Sex Transm Infect* 2015;91(8):598-602. doi: 10.1136/sextrans-2015-052014 [published Online First: 2015/04/30]
10. Vanbaelen T, Kenyon C. Primum non-nocere: Is it time to stop screening for *Neisseria gonorrhoeae* and *Chlamydia trachomatis* in men who have sex with men taking HIV pre-exposure prophylaxis? *Sexually Transmitted Infections* 2024;100(6):337-38. doi: 10.1136/sextrans-2024-056165
11. Samarasekera K, Fitzpatrick C, Finnerty F, et al. Pilot study of pharyngeal *Chlamydia trachomatis* in HIV-positive and HIV-negative men who have sex with men. *Sex Health* 2021;18(2):200-01. doi: 10.1071/sh20218
12. Richardson D, Pickering A, Trotman D, et al. Pharyngeal gonorrhoea in men who have sex with men. *Int J STD AIDS* 2021;32(5):449-52. doi: 10.1177/0956462420975627 [published Online First: 20210203]
13. Richardson D, Trotman D, Devlin J, et al. Gonorrhoea proctitis in men who have sex with men: The importance of performing culture specimens for antimicrobial resistance surveillance. *J Eur Acad Dermatol Venereol* 2021;35(12):e873-e75. doi: 10.1111/jdv.17503 [published Online First: 20210724]
14. Richardson D, Goldmeier D. Lymphogranuloma venereum: an emerging cause of proctitis in men who have sex with men. *Int J STD AIDS* 2007;18(1):11-4; quiz 15. doi: 10.1258/095646207779949916
15. Russell A, Siddiq M, Fitzpatrick C, et al. Anorectal Mpox in men who have sex with men associated with sexually transmitted co-infections: a case series. *Sex Transm Infect* 2024;100(1):52-53. doi: 10.1136/sextrans-2023-055906 [published Online First: 20240117]
16. Cresswell FV, Ross S, Booth T, et al. *Shigella flexneri*: A Cause of Significant Morbidity and Associated With Sexually Transmitted Infections in Men Who Have Sex With Men. *Sex Transm Dis* 2015;42(6):344. doi: 10.1097/olq.0000000000000295

17. Fitzpatrick C, Doherty S, George S, et al. Hepatitis E in men who have sex with men: a systematic review. *Frontline Gastroenterology* 2024;15(6):523-29. doi: 10.1136/flgastro-2024-102797
18. Zane GK, Barbee LA, Duerr A, et al. High Incidence and Duration of Antibiotic Use Among a Cohort of Men Who Have Sex With Men in Seattle, Washington. *Open Forum Infect Dis* 2025;12(2):ofaf051. doi: 10.1093/ofid/ofaf051 [published Online First: 20250130]
19. Mason LCE, Richardson D, Charles H, et al. Using demographics of patients to inform treatment of shigellosis in England. *Lancet Microbe* 2024:101026. doi: 10.1016/j.lanmic.2024.101026 [published Online First: 20241112]
20. O'Flanagan H, Siddiq M, Llewellyn C, et al. Antimicrobial resistance in sexually transmitted Shigella in men who have sex with men: A systematic review. *Int J STD AIDS* 2023;34(6):374-84. doi: 10.1177/09564624231154942 [published Online First: 20230214]
21. Chessell C, Erin B, Dempsey M, et al. Evaluation of current clinical guidelines for the management of sexually transmissible enteric infections using the AGREE II toolkit. *Sex Transm Infect* 2025 doi: 10.1136/sextrans-2025-056497 [published Online First: 20250326]
22. Charles H, Prochazka M, Thorley K, et al. Outbreak of sexually transmitted, extensively drug-resistant Shigella sonnei in the UK, 2021-22: a descriptive epidemiological study. *Lancet Infect Dis* 2022;22(10):1503-10. doi: 10.1016/s1473-3099(22)00370-x [published Online First: 20220706]
23. Richardson D, Pakianathan M, Ewens M, et al. British Association of Sexual Health and HIV (BASHH) United Kingdom national guideline for the management of sexually transmitted enteric infections 2023. *Int J STD AIDS* 2023;34(9):588-602. doi: 10.1177/09564624231168217 [published Online First: 20230529]
24. Zhou X, Wu MZ, Jiang TT, et al. Oral Manifestations of Early Syphilis in Adults: A Systematic Review of Case Reports and Series. *Sex Transm Dis* 2021;48(12):e209-e14. doi: 10.1097/olq.0000000000001538
25. Thornhill JP, Barkati S, Walmsley S, et al. Monkeypox Virus Infection in Humans across 16 Countries - April-June 2022. *N Engl J Med* 2022;387(8):679-91. doi: 10.1056/NEJMoa2207323 [published Online First: 20220721]
26. Riera-Monroig J, Fuertes de Vega I. Lymphogranuloma venereum presenting as an ulcer on the tongue. *Sex Transm Infect* 2019;95(3):169-70. doi: 10.1136/sextrans-2018-053787 [published Online First: 20181215]
27. Tsuboi M, Evans J, Davies EP, et al. Prevalence of syphilis among men who have sex with men: a global systematic review and meta-analysis from 2000-20. *Lancet Glob Health* 2021;9(8):e1110-e18. doi: 10.1016/s2214-109x(21)00221-7 [published Online First: 20210708]
28. Patel R, Green J, Moran B, et al. British Association of Sexual Health and HIV UK national guideline for the management of anogenital herpes, 2024. *Int J STD AIDS* 2025;36(2):90-105. doi: 10.1177/09564624241282396 [published Online First: 20241007]
29. Chow EPF, Vodstrcil LA, Williamson DA, et al. Incidence and duration of incident oropharyngeal gonorrhoea and chlamydia infections among men who have sex with men: prospective cohort study. *Sex Transm Infect* 2021;97(6):452-57. doi: 10.1136/sextrans-2020-054764 [published Online First: 20201118]
30. Lewis DA. Will targeting oropharyngeal gonorrhoea delay the further emergence of drug-resistant Neisseria gonorrhoeae strains? *Sex Transm Infect* 2015;91(4):234-7. doi: 10.1136/sextrans-2014-051731 [published Online First: 20150424]
31. Kenyon C, Herrmann B, Hughes G, et al. Management of asymptomatic sexually transmitted infections in Europe: towards a differentiated, evidence-based approach. *Lancet Reg Health Eur* 2023;34:100743. doi: 10.1016/j.lanepe.2023.100743 [published Online First: 20231026]
32. Xu X, Chow EPF, Ong JJ, et al. Chlamydia trachomatis transmission between the oropharynx, urethra and anorectum in men who have sex with men: a mathematical model. *BMC Med* 2020;18(1):326. doi: 10.1186/s12916-020-01796-3 [published Online First: 20201117]

33. Tweed M, Fortescue-Talwar K, Finn R, et al. Delivering a community-based monkeypox vaccination programme in partnership. *Int J STD AIDS* 2023;34(6):427-29. doi: 10.1177/09564624231155995 [published Online First: 20230221]
34. Russell A, Wedge-Bull M, Robinson J, et al. Hepatitis A in men who have sex with men (MSM): a systematic review. *Frontline Gastroenterology* 2025;flgastro-2025-103178. doi: 10.1136/flgastro-2025-103178
35. Fitzpatrick C, Finnerty F, Williams D, et al. Hepatitis A susceptibility in newly attending men who have sex with men to an urban sexual health centre. *International journal of STD & AIDS* 2021;32(3):276-79. doi: <https://dx.doi.org/10.1177/0956462420961960>
36. Foster MA, Hofmeister MG, Albertson JP, et al. Hepatitis A Virus Infections Among Men Who Have Sex with Men - Eight U.S. States, 2017-2018. *MMWR Morb Mortal Wkly Rep* 2021;70(24):875-78. doi: 10.15585/mmwr.mm7024a2 [published Online First: 20210618]
37. Plunkett J, Mandal S, Balogun K, et al. Hepatitis A outbreak among men who have sex with men (MSM) in England, 2016-2018: The contribution of past and current vaccination policy and practice. *Vaccine X* 2019;1:100014. doi: 10.1016/j.jvacx.2019.100014 [published Online First: 20190228]
38. Ndumbi P, Freidl GS, Williams CJ, et al. Hepatitis A outbreak disproportionately affecting men who have sex with men (MSM) in the European Union and European Economic Area, June 2016 to May 2017. *Euro Surveill* 2018;23(33) doi: 10.2807/1560-7917.es.2018.23.33.1700641
39. Cheng CY, Wu HH, Zou H, et al. Epidemiological characteristics and associated factors of acute hepatitis A outbreak among HIV-coinfected men who have sex with men in Taiwan, June 2015-December 2016. *Journal of viral hepatitis* 2018;25(10):1208-15. doi: <https://dx.doi.org/10.1111/jvh.12926>
40. Nainan OV, Xia G, Vaughan G, et al. Diagnosis of hepatitis a virus infection: a molecular approach. *Clin Microbiol Rev* 2006;19(1):63-79. doi: 10.1128/cmr.19.1.63-79.2006
41. Fitzpatrick C, Finnerty F, Williams D, et al. Hepatitis A susceptibility in newly attending men who have sex with men to an urban sexual health centre. *Int J STD AIDS* 2021;32(3):276-79. doi: 10.1177/0956462420961960 [published Online First: 20201218]
42. Balayan MS, Andjaparidze AG, Savinskaya SS, et al. Evidence for a virus in non-A, non-B hepatitis transmitted via the fecal-oral route. *Intervirology* 1983;20(1):23-31. doi: 10.1159/000149370
43. Doceul V, Bagdassarian E, Demange A, et al. Zoonotic Hepatitis E Virus: Classification, Animal Reservoirs and Transmission Routes. *Viruses* 2016;8(10) doi: 10.3390/v8100270 [published Online First: 20161003]
44. Almeida PH, Matielo CEL, Curvelo LA, et al. Update on the management and treatment of viral hepatitis. *World J Gastroenterol* 2021;27(23):3249-61. doi: 10.3748/wjg.v27.i23.3249
45. Hahné SJ, Veldhuijzen IK, Wiessing L, et al. Infection with hepatitis B and C virus in Europe: a systematic review of prevalence and cost-effectiveness of screening. *BMC Infect Dis* 2013;13:181. doi: 10.1186/1471-2334-13-181 [published Online First: 20130418]
46. Gouda M, Fitzpatrick C, Williams D, et al. Prevalence of anti-hepatitis B core in men who have sex with men attending a sexual health clinic in Brighton, UK, from 2012 to 2019. *Sex Health* 2023;20(1):92-95. doi: 10.1071/sh22120
47. Minetti C, Chalmers RM, Beeching NJ, et al. Giardiasis. *Bmj* 2016;355:i5369. doi: 10.1136/bmj.i5369 [published Online First: 20161027]
48. Dubey V, Sivachandran V, Wahab N, et al. Giardia duodenalis in men who have sex with men: a systematic review. *Frontline Gastroenterology* 2024;15(5):417-23. doi: 10.1136/flgastro-2024-102780
49. Lai K, Pinto-Sander N, Richardson D, et al. Syphilis gastritis: a case report. *Int J STD AIDS* 2018;29(7):723-25. doi: 10.1177/0956462417711623 [published Online First: 20170604]
50. Okamoto K, Hatakeyama S, Umezawa M, et al. Gastric syphilis: The great imitator in the stomach. *IDCases* 2018;12:97-98. doi: 10.1016/j.idcr.2018.03.015 [published Online First: 20180321]

51. Supronowicz Ł, Rogalska M. Syphilitic hepatitis. *Clin Exp Hepatol* 2024;10(1):9-13. doi: 10.5114/ceh.2024.136235 [published Online First: 20240312]
52. Siddiq M, O'Flanagan H, Richardson D, et al. Factors associated with sexually transmitted shigella in men who have sex with men: a systematic review. *Sex Transm Infect* 2022 doi: 10.1136/sextrans-2022-055583 [published Online First: 2022/10/26]
53. Wahab N, Dubey V, Sivachandran V, et al. Campylobacter spp. in men who have sex with men: A systematic review. *Int J STD AIDS* 2024;35(14):1094-102. doi: 10.1177/09564624241280739 [published Online First: 20240911]
54. Frem JA, Russell A, Fitzpatrick C, et al. Gastrointestinal Escherichia coli in men who have sex with men: A systematic review. *Int J STD AIDS* 2024;9564624241306847. doi: 10.1177/09564624241306847 [published Online First: 20241209]
55. Sivachandran V, Wahab N, Dubey V, et al. Demographic, Behavioural, and Biological Factors Seen in Men Who Have Sex with Men with Salmonella spp.: A Systematic Review. *Venereology* 2024;3(4):162-71.
56. DuPont HL, Levine MM, Hornick RB, et al. Inoculum size in shigellosis and implications for expected mode of transmission. *J Infect Dis* 1989;159(6):1126-8. doi: 10.1093/infdis/159.6.1126 [published Online First: 1989/06/01]
57. Mason LCE, Greig DR, Cowley LA, et al. The evolution and international spread of extensively drug resistant Shigella sonnei. *Nat Commun* 2023;14(1):1983. doi: 10.1038/s41467-023-37672-w [published Online First: 20230408]
58. Richardson D, Soni S. Are macrolides and quinolones the most appropriate antimicrobials for the presumptive treatment of sexually transmitted enteric infections? *J Eur Acad Dermatol Venereol* 2022;36(7):e553-e54. doi: 10.1111/jdv.18021 [published Online First: 20220225]
59. Richardson D, Rabuszko L, Mason LCE, et al. Antimicrobial treatment options for extensively drug-resistant (XDR) shigellosis in men who have sex with men. *Sexually Transmitted Infections* 2025;sextrans-2025-056612. doi: 10.1136/sextrans-2025-056612
60. Taylor R, Mason LCE, Jenkins C, et al. Comment on: A case of intercurrent shigellosis and rectal gonorrhea in an acutely unwell febrile returned traveler by Fuller et al. *Ther Adv Infect Dis* 2025;12:20499361251347703. doi: 10.1177/20499361251347703 [published Online First: 20250619]
61. Richardson D, Savary-Trathen A, Fitzpatrick C, et al. Estimated prevalence and associations of sexually transmissible bacterial enteric pathogens in asymptomatic men who have sex with men: a systematic review and meta-analysis. *Sex Transm Infect* 2024;100(8):532-37. doi: 10.1136/sextrans-2024-056183 [published Online First: 20241118]
62. Cooney J, Siakavellas SI, Chiodini PL, et al. Recent advances in the diagnosis and management of amoebiasis. *Frontline Gastroenterology* 2025;16(1):37-50. doi: 10.1136/flgastro-2023-102554
63. Hughes R, Richardson D, Fitzpatrick C. Factors associated with Entamoeba histolytica proctocolitis in men who have sex with men: a systematic review. *Frontline Gastroenterology* 2024;15(4):321-27. doi: 10.1136/flgastro-2024-102641
64. Barbee LA, Khosropour CM, Dombrowski JC, et al. New Human Immunodeficiency Virus Diagnosis Independently Associated With Rectal Gonorrhea and Chlamydia in Men Who Have Sex With Men. *Sex Transm Dis* 2017;44(7):385-89. doi: 10.1097/olq.0000000000000614
65. Pinto-Sander N, Parkes L, Fitzpatrick C, et al. Symptomatic sexually transmitted proctitis in men who have sex with men. *Sexually Transmitted Infections* 2019;95(6):471. doi: <https://dx.doi.org/10.1136/sextrans-2018-053936>
66. Klausner JD, Kohn R, Kent C. Etiology of clinical proctitis among men who have sex with men. *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America* 2004;38(2):300-2. doi: <https://dx.doi.org/10.1086/380838>

67. Richardson D, Kumar P, Jaricha T, et al. Primary syphilis in men causes painful anogenital lesions and serology is not always helpful. *Sex Transm Infect* 2020;96(8):620. doi: 10.1136/sextrans-2020-054495 [published Online First: 20200331]
68. Richardson D, Pakianathan M, Ewens M, et al. The new 2023 BASHH sexually transmitted enteric infections guideline. *Sex Transm Infect* 2023;99(5):363-64. doi: 10.1136/sextrans-2023-055849
69. Essa M, Crossman J, Ettinger S, et al. Anorectal herpes simplex virus in men who have sex with men: a systematic review. *Frontline Gastroenterology* 2025;flgastro-2025-103357. doi: 10.1136/flgastro-2025-103357
70. de Vries HJC. Lymphogranuloma venereum in the Western world, 15 years after its re-emergence: new perspectives and research priorities. *Curr Opin Infect Dis* 2019;32(1):43-50. doi: 10.1097/qco.0000000000000519
71. Pimentel R, Correia C, Estorninho J, et al. Lymphogranuloma Venereum-Associated Proctitis Mimicking a Malignant Rectal Neoplasia: Searching for Diagnosis. *GE Port J Gastroenterol* 2022;29(4):267-72. doi: 10.1159/000516011 [published Online First: 20210506]
72. Patil RV, Stephenson I, Richards CJ, et al. Rectal cancer mimic: a rare case of syphilitic proctitis. *BMJ Case Rep* 2020;13(12) doi: 10.1136/bcr-2020-235522 [published Online First: 20201218]
73. Tinmouth J, Rachlis A, Wesson T, et al. Lymphogranuloma venereum in North America: case reports and an update for gastroenterologists. *Clin Gastroenterol Hepatol* 2006;4(4):469-73. doi: 10.1016/j.cgh.2005.12.006
74. de Vries HJC, Nori AV, Kiellberg Larsen H, et al. 2021 European Guideline on the management of proctitis, proctocolitis and enteritis caused by sexually transmissible pathogens. *Journal of the European Academy of Dermatology and Venereology* 2021;35(7):1434-43. doi: <https://dx.doi.org/10.1111/jdv.17269>
75. Stanley MA, Winder DM, Sterling JC, et al. HPV infection, anal intra-epithelial neoplasia (AIN) and anal cancer: current issues. *BMC Cancer* 2012;12:398. doi: 10.1186/1471-2407-12-398 [published Online First: 20120908]
76. Hughes R, Fitzpatrick C, Nichols K, et al. A pilot study exploring sexual health clinician confidence and barriers to anal examination and proctoscopy in men who have sex with men. *Sex Health* 2022;18(6):515-16. doi: 10.1071/sh21196
77. Ettinger S, Castle JC, Robinson J, et al. The characteristics of men who have sex with men with Blastocystis: A systematic review. *Int J STD AIDS* 2025;9564624251349910. doi: 10.1177/09564624251349910 [published Online First: 20250623]
78. To B, Chai N, Fitzpatrick C, et al. Factors associated with Cryptosporidium in men who have sex with men: A systematic review. *Int J STD AIDS* 2024;35(9):668-74. doi: 10.1177/09564624241249203 [published Online First: 20240426]
79. Modlinski A, Lancaster S, Rabuszko L, et al. The characteristics of men who have sex with men with *Enterobius vermicularis* (threadworms): a systematic review. *Frontline Gastroenterology* 2025;flgastro-2025-103220. doi: 10.1136/flgastro-2025-103220
80. Rabuszko L, Chessell C, Llewellyn C, et al. Factors and presenting symptoms associated with intestinal spirochaetosis in men who have sex with men: A systematic review. *J Eur Acad Dermatol Venereol* 2024;38(4):680-86. doi: 10.1111/jdv.19689 [published Online First: 20231129]
81. Chessell C, Rabuszko L, Richardson D, et al. Factors associated with the sexual transmission of *Strongyloides stercoralis* in men who have sex with men: A systematic review. *J Eur Acad Dermatol Venereol* 2024;38(4):673-79. doi: 10.1111/jdv.19664 [published Online First: 20231128]
82. Bromley T, Lewis K, Fitzpatrick C, et al. Factors Associated with Cytomegalovirus (CMV) Procto-Colitis in Immunocompetent Adults: A Systematic Review. *European Journal of Therapeutics* 2024;30(3):409-18. doi: 10.58600/eurjther2148

83. Nobel YR, Phipps M, Zucker J, et al. Gastrointestinal Symptoms and Coronavirus Disease 2019: A Case-Control Study From the United States. *Gastroenterology* 2020;159(1):373-75.e2. doi: 10.1053/j.gastro.2020.04.017 [published Online First: 20200412]
84. Nelson M, Dockrell D, Edwards S, et al. British HIV Association and British Infection Association guidelines for the treatment of opportunistic infection in HIV-seropositive individuals 2011. *HIV Med* 2011;12 Suppl 2:1-140. doi: 10.1111/j.1468-1293.2011.00944_1.x
85. Kohli M, Reeves I, Waters L. Homophobia in the provision of sexual health care in the UK. *Lancet HIV* 2024;11(2):e125-e30. doi: 10.1016/s2352-3018(23)00302-8 [published Online First: 20240111]
86. Dhairyawan R, Gopal D, Sowemimo A, et al. Tackling structural racism in health for London. *Bmj* 2024;387:q2321. doi: 10.1136/bmj.q2321 [published Online First: 20241025]
87. Zéler A, Troadec C. Doctors Talking About Sexuality: What Are the Patients' Feelings? *Sexual Medicine* 2020;8(4):599-607. doi: 10.1016/j.esxm.2020.08.012
88. NICE. Scenario: Acute diarrhoea (less than 4 weeks) 2023 [Available from: <https://cks.nice.org.uk/topics/diarrhoea-adults-assessment/management/acute-diarrhoea-less-than-4-weeks/> accessed August 2025].
89. Hughes Y, Towns JM, Ong JJ, et al. The Proportion of Treponema pallidum Polymerase Chain Reaction-Positive Primary Syphilis Infections That Are Seronegative for Syphilis: A Systematic Review and Meta-analysis. *Open Forum Infect Dis* 2025;12(9):ofaf471. doi: 10.1093/ofid/ofaf471 [published Online First: 20250812]
90. Chessell C, Williams D, Richardson D. Proton pump inhibitors (PPIs) and sexually transmissible enteric infections in men who have sex with men: PPI-stewardship. *Sexually Transmitted Infections* 2025;sextrans-2025-056594. doi: 10.1136/sextrans-2025-056594
91. Willems RPJ, van Dijk K, Ket JCF, et al. Evaluation of the Association Between Gastric Acid Suppression and Risk of Intestinal Colonization With Multidrug-Resistant Microorganisms: A Systematic Review and Meta-analysis. *JAMA Intern Med* 2020;180(4):561-71. doi: 10.1001/jamainternmed.2020.0009
92. Workowski KA, Bachmann LH, Chan PA, et al. Sexually Transmitted Infections Treatment Guidelines, 2021. *MMWR Recomm Rep* 2021;70(4):1-187. doi: 10.15585/mmwr.rr7004a1 [published Online First: 20210723]
93. Burns-Lynch C, Garcia-Williams A, Besrat B, et al. A Qualitative Evaluation of the Acceptability of Shigellosis Prevention Recommendations Among Gay, Bisexual, and Other Men Who Have Sex With Men. *Sex Transm Dis* 2024;51(8):534-39. doi: 10.1097/olq.0000000000001968 [published Online First: 20240314]
94. McGaughey G, Richardson D, Vera J. Harm reduction services for people engaging in chemsex in Brighton, UK: A pilot qualitative study. *Int J STD AIDS* 2023;34(13):940-44. doi: 10.1177/09564624231188752 [published Online First: 20230712]
95. Thain BK, Lu R, Fitzpatrick C, et al. Beyond-66: A pilot evaluation of a novel, peer-led harm reduction intervention for chemsex dependant men who have sex with men in Kuala Lumpur, Malaysia. *Int J STD AIDS* 2024;35(3):164-68. doi: 10.1177/09564624231213113 [published Online First: 20231108]
96. Samarasekara K, Ringshall M, Parashar K, et al. Contribution of men who have sex with men (MSM) attending due to contact tracing to the diagnoses of HIV, syphilis and gonorrhoea in MSM from a clinic-based population. *Sex Transm Infect* 2022;98(4):307-09. doi: 10.1136/sextrans-2021-055169 [published Online First: 20210827]
97. UKHSA. Recommendations for the Public Health Management of Gastrointestinal Infections 2019: Principles and practice 2019 [updated 2019. Available from: https://assets.publishing.service.gov.uk/media/5e3027c7ed915d1f28fe88ff/management_of_gastrointestinal_infections.pdf accessed August 2025].

98. Grant RM, Lama JR, Anderson PL, et al. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *N Engl J Med* 2010;363(27):2587-99. doi: 10.1056/NEJMoa1011205 [published Online First: 20101123]
99. Luetkemeyer AF, Donnell D, Dombrowski JC, et al. Postexposure Doxycycline to Prevent Bacterial Sexually Transmitted Infections. *N Engl J Med* 2023;388(14):1296-306. doi: 10.1056/NEJMoa2211934
100. Ladhani SN, White PJ, Campbell H, et al. Use of a meningococcal group B vaccine (4CMenB) in populations at high risk of gonorrhoea in the UK. *Lancet Infect Dis* 2024;24(9):e576-e83. doi: 10.1016/s1473-3099(24)00031-8 [published Online First: 20240320]
101. Kenyon C. The Importance of Not Downplaying the Risks That Doxycycline Postexposure Prophylaxis Will Select for Antimicrobial Resistance. *Clinical Infectious Diseases* 2024;80(1):228-29. doi: 10.1093/cid/ciae139
102. Saunders J, Deering J, Dewsnap C, et al. British Association for Sexual Health and HIV (BASHH) UK national guideline for the use of doxycycline post-exposure prophylaxis (DoxyPEP) for the prevention of syphilis, 2025. *Int J STD AIDS* 2025;36(10):756-64. doi: 10.1177/09564624251352053 [published Online First: 20250612]