Background While syphilis transmission is increasing, precisely how Treponema pallidum is transmitted sexually is unclear. This study of MSM with early syphilis determined the frequency of Treponema pallidum shedding from potentially asymptomatic sites and the stage with the most frequent shedding.

Methods MSM were recruited between 2015 and 2019, at Melbourne Sexual Health Centre, Australia. Men were eligible if they reported sex with men during the previous year, were aged ≥18 years and had laboratory-confirmed primary, secondary, or early latent syphilis. All syphilis lesions were swabbed. Non-lesion samples collected were oral rinse, oral cavity swab, anal canal swab, anal canal swab, urine, and semen. Specimens were tested for T. pallidum using two PCR assays.

Results 200 men with serologically-confirmed early syphilis were included: 54 (27%) primary, 93 (46%-5%) secondary and 53 (26%-5%) early latent cases. T. pallidum DNA was detected orally in 48 (24%; 95% CI: 18.3–30.5%) men by oral rinse and/or oral lesion swab, 24 with no oral lesion. Oral T. pallidum detection was most frequent during secondary syphilis compared to other stages, (44%/19.9%) versus 7% (7/107), p <0.0001); and in men with RPR titres ≥1:64 (32% (37/117) versus 13% (11/83), p = 0.0026). T. pallidum was detected by anal canal swab and/or anal lesion swab in 45/196 (23%; 95% CI: 17.3–29.5%) men, 10 with no anal lesion. 74% (69/93) of men with secondary syphilis had T. pallidum detected at any site: 26% (24/93) had detection at ≥2 separate sites. T. pallidum was detected in 6% (12/198) of urine and 12% (29.5%) men, 10 with no anal lesion. 74% (69/93) of men with secondary syphilis had T. pallidum DNA was detected by oral rinse, oral cavity swab, and/or oral lesion swab, 24 with no oral lesion.

Conclusion Unrecognised oral and anal shedding of T. pallidum may be a factor in sustaining syphilis transmission. Secondary syphilis may be the most infectious stage, with oral transmission possibly being important. Earlier detection and treatment for syphilis to prevent progression to the secondary stage may improve syphilis control.