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Treponema pallidum user information sheet - Version: 2.0. Index: S - 3135. Printed: 02-Nov-2026 12:49

Treponema pallidum testing at Micropathology Ltd.

Treponema is a genus of Gram-negative spirochaetes. The treponemal diseases can be subdivided into syphilis (*Treponema pallidum* subsp. *pallidum*) and the endemic treponematoses: *Treponema pallidum* subspecies *endemicum* (Bejel), *Treponema pallidum* subspecies *pertenue* (Yaws) and *Treponema carateum* (Pinta). *Treponema carateum* may also be referred to as *Treponema pallidum* subspecies *carateum*; its nomenclatural status is undefined. These four pathogens are morphologically and antigenically identical and can only be differentiated by mode of transmission, epidemiology, clinical manifestations and genetics.

Treponema pallidum subsp. pallidum is the causative agent of syphilis and resides only in humans. Syphilis can be broadly split into acquired syphilis (transmission by direct contact with an infectious lesion) and congenital syphilis (mother-to-child transmission during pregnancy) In heterosexual patients, transmission of acquired syphilis is typically genital, however, among gay and bisexual men who have sex with men (GBMSM) 32%-36% of transmissions may be at extra genital (i.e. anal, rectal and oral) sites. Intravenous drug use and blood transfusion are possible, but uncommon routes of transmission.

Syphilis is a multi-stage, multi-system disease. Infection is broken down into four stages: primary syphilis, secondary syphilis, latent syphilis and tertiary syphilis.

Following infection, the incubation period is typically 21 days (ranging from 9-90 days). Primary syphilis is characterized by the development of a chancre and moderate regional lymphadenopathy; however, syphilis should be considered a systemic disease since the bacterium enters the blood stream soon after infection. If left untreated, patients may go on to develop secondary syphilis 6 weeks to 6 months after initial infection. In secondary syphilis patients often present with a widespread non-irritant rash and generalized lymphadenopathy. In warm, moist areas (e.g. perineum and anus), the rash may develop wart-like structures (condylomata lata) and “snail-track ulcers”. Secondary syphilis will resolve spontaneously in 3-12 weeks and the diseases enters an asymptomatic latent stage. Tertiary stage occurs in approximately one third of untreated patients around 20-40 years following the initial infection. Tertiary syphilis is characterised by formation of gummas (destructive lesions). It is subdivided into subcategories based on the location of these gummas: benign gummatous disease (skin, cartilage, and bone), cardiovascular (walls of the aorta), and neurosyphilis (brain and spinal cord).

Diagnosis may be made by a combination of the following: serological testing, direct detection methods such as dark ground microscopy and/or molecular diagnostics. In

the UK, initial serology screening is performed using treponemal tests. Positive results are confirmed using a second treponemal test. A quantitative non-treponemal test is then used when screening tests are positive. Polymerase chain reaction has been shown to have higher sensitivity than dark ground microscopy, and higher specificity than both serology and dark ground microscopy. Molecular testing for *Treponema pallidum* is appropriate on lesions where the organism may be expected to be located.

At Micropathology Ltd, a real time probe-based assay is employed for the qualitative detection of *Treponema pallidum* DNA. The PCR target is the *polA* gene. Samples types that were assessed as part of the validation are CSF, genital swabs and ulcer swabs. At present a caveat is required to define the UKAS accreditation status on the assay. This assay is not yet UKAS accredited.

Congenital syphilis is included in the list of notifiable diseases on the government website (https://www.gov.uk/guidance/notifiable-diseases-and-how-to-report-them), and so must be reported to UKHSA within 3 days by the appropriate medical practitioner.

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