

Syphilis Laboratory Interpretation

TEST			INTERPRETATION		
Syphilis Screen (Treponemal) e.g. EIA, CMIA, CLIA	RPR (Non Treponemal)	TP-PA (Treponemal)	Most Likely Interpretation		
			(RESULTS SHOULD BE INTERPRETED IN CONJUNCTION WITH HISTORY AND CLINICAL FINDINGS) (see Canadian Guidelines on STIs-2010 edition; www.phac-aspc.gc.ca)		
			Alternative Causes for Reactive Serological Tests		
			False Positive Results for Non Treponemal Tests * (RPR)	False Positive Results for Treponemal Tests * (SCREEN & TP-PA)	
Reactive	Reactive (dilutions may vary)	Reactive OR Indeterminate	<p>Consistent with recent or prior syphilis infection. Results may indicate the following:</p> <ul style="list-style-type: none"> (a) Infectious syphilis (primary, secondary, early latent), especially if titre \geq 1:8 & history of symptom(s), contact with an infected partner, other risk factors OR (b) Late latent syphilis or latent syphilis of unknown duration, especially if titre <1:8 & no history of treatment OR (c) Old treated syphilis OR (d) ** In persons from endemic countries, yaws (e.g. Caribbean), pinta (e.g. Central America), or bejel <p>PLAN: repeat blood work in 2-4 weeks to observe rise in titre or TPPA seroconversion</p>	<p>INFECTIOUS</p> <ul style="list-style-type: none"> • bacterial endocarditis (e.g. rheumatic heart disease) • chancroid • chickenpox • infectious mononucleosis (e.g. EBV) • leprosy (e.g. Hansen's disease) • lymphogranuloma venereum (LGV) • malaria • mumps • mycoplasma pneumonia • pneumococcal pneumonia • rickettsial disease • tuberculosis • viral hepatitis • viral pneumonia • other treponemal infections: yaws, pinta, or bejel ** 	<p>INFECTIOUS</p> <ul style="list-style-type: none"> • brucellosis • genital herpes • infectious mononucleosis (e.g. EBV) • leprosy • leptospirosis • Lyme disease • malaria • other treponemal infections: yaws, pinta, or bejel **
Reactive	Non Reactive	Reactive	<p>Consistent with recent or prior syphilis infection. Results may indicate the following:</p> <ul style="list-style-type: none"> (a) Usually late latent syphilis or latent syphilis of unknown duration, with no history of treatment OR (b) Old treated syphilis OR (c) Incubating infectious syphilis (primary), especially if history of symptom(s), contact with an infected partner, or other risk factors OR (d) ** In persons from endemic countries, yaws (e.g. Caribbean), pinta (e.g. Central America), or bejel <p>PLAN: repeat blood work in 2-4 weeks to observe rise in titre</p> <ul style="list-style-type: none"> • if results change, reinterpret 		
Reactive	Non Reactive	Indeterminate	<p>Inconclusive syphilis serology results. Possible interpretations include:</p> <ul style="list-style-type: none"> (a) Incubating infectious syphilis (primary), especially if history of symptom(s), contact with an infected partner, or other risk factors OR (b) Old treated or untreated syphilis OR (c) Biological false positive <p>PLAN: repeat blood work in 2-4 weeks to observe rise in titre or TPPA seroconversion</p> <ul style="list-style-type: none"> • if results change, reinterpret 		
Reactive	Non Reactive	Non Reactive	<p>Usually biological false positive. Alternate interpretations include incubating infectious syphilis, previously treated syphilis, or rarely, late latent syphilis</p> <p>PLAN: repeat blood work in 2-4 weeks to observe rise in titre or TPPA seroconversion</p> <ul style="list-style-type: none"> • if results change, reinterpret 	<p>NON INFECTIOUS</p> <ul style="list-style-type: none"> • advancing age • chronic liver disease (e.g. hepatitis) • connective tissue disease (e.g. rheumatoid arthritis) • immunizations • injection drug use • malignancy • multiple myeloma • pregnancy • ulcerative colitis 	<p>NON INFECTIOUS</p> <ul style="list-style-type: none"> • advancing age • chronic liver disease (e.g. hepatitis) • drug addiction • hyperglobulinemia • scleroderma • systemic lupus erythematosus • thyroiditis
Reactive	Reactive (dilutions may vary)	Non Reactive	<p>Inconclusive syphilis serology results. Possible interpretations include:</p> <ul style="list-style-type: none"> (a) Incubating infectious syphilis (primary), especially if history of symptom(s), contact with an infected partner, or other risk factors OR (b) Old treated or untreated syphilis OR (c) Biological false positive <p>PLAN: repeat blood work in 2-4 weeks to observe rise in titre or TPPA seroconversion</p> <ul style="list-style-type: none"> • if results change, reinterpret 		
Non Reactive	Test not done	Test not done	<ul style="list-style-type: none"> • No confirmatory testing performed when screen is non-reactive • Early incubating syphilis can be non-reactive before antibodies develop <p>PLAN: If clinical suspicion of early syphilis repeat blood work in 2-4 weeks to observe rise in titre or TPPA seroconversion</p>		

Adapted from: Public Health Agency of Canada. January 2010 Edition. Canadian Guidelines on Sexually Transmitted Infections; Public Health Laboratory (2017). Syphilis (*Treponema pallidum*) Serologic Testing Update – Changes to Screening Test and Algorithm. Labstract, LAB-SD-057-002

* Health Canada. January 2010 Edition. Canadian STD Guidelines.

** for information regarding endemic treponemal infections, please refer to Heymann, David L. (Editor) 2015. Control of Communicable Disease Manual, 20th edition, American Public Health Association. Washington.

Syphilis Infection

STAGE	INCUBATION PERIOD	DISEASE MANIFESTATIONS	TREATMENT (for alternative treatment for penicillin-allergic patients, refer to Canadian Guidelines on STIs-2010 Edition; www.phac-aspc.gc.ca)	POST TREATMENT SEROLOGICAL MONITORING		PARTNER NOTIFICATION (time period)
				Monitoring Schedule	Adequate Response (2-tube drop = 4 fold drop e.g. from 1:32 to 1:8)	
PRIMARY (infectious)	3-90 days (average is 21 days)	Chancre, and/or regional lymphadenopathy	Benzathine penicillin G 2.4 million units IM as a single dose	3, 6, 12 months after treatment	2-tube drop at 6 months 3-tube drop at 12 months 4-tube drop at 24 months	4 months and 1 week (17 weeks) prior to the onset of symptoms
SECONDARY (infectious)	2-12 weeks	Rash, fever, malaise, lymphadenopathy, mucus lesions, condyloma lata, alopecia, (for meningitis, headaches, uveitis, and/or retinitis, refer to neurosyphilis)	Benzathine penicillin G 2.4 million units IM as a single dose	3, 6, 12 months after treatment	3-tube drop at 6 months 4-tube drop at 12 months	8 months (34 weeks) prior to the onset of symptoms
EARLY LATENT (infectious)	< 1 year	Asymptomatic	Benzathine penicillin G 2.4 million units IM as a single dose	3, 6, 12 months after treatment	2-tube drop at 12 months	1 year prior to the diagnosis
LATE LATENT SYPHILIS or LATENT SYPHILIS OF UNKNOWN DURATION (not infectious)	≥ 1 year	Asymptomatic	Benzathine penicillin G 2.4 million units IM weekly for 3 doses	12 and 24 months after treatment	Response will be variable	As late latent syphilis is not considered infectious, consider the assessment of marital or other long-term partners and children as appropriate
TERTIARY (not infectious)					<ul style="list-style-type: none"> • Response will be variable • Refer to STI Guidelines 	Assess marital or other long term partners and children as appropriate
Cardiovascular Syphilis	10-30 years	Aortic aneurysm, aortic regurgitation, and/or coronary artery ostial stenosis	Benzathine penicillin G 2.4 million units IM weekly for 3 doses	12 and 24 months after treatment		
Neurosyphilis (can occur at any stage)	<2-20 years	Cerebrospinal examination to diagnose. Symptoms include headaches, vertigo, personality changes, dementia, ataxia, meningitis, auditory symptoms, cranial nerve abnormalities, uveitis, and/or retinitis	Penicillin G 3-4 million units IV q4h (16-24 million units/day) for 10-14 days	6, 12 and 24 months after treatment		
Gumma	1-46 years (most cases 15 years)	Tissue destruction of any organ; manifestations depend on site involved	Benzathine penicillin G 2.4 million units IM weekly for 3 doses	12 and 24 months after treatment		
HIV INFECTED (at any stage)			<ul style="list-style-type: none"> • Treat for stage of diagnosis. Additional doses have not been shown to be more effective for HIV+ individuals. Careful follow-up is essential as there may be increased risk of neurological complications or serologic treatment failure. Updated 2014. • Refer to STI Guidelines 	3, 6, 12 and 24 months after treatment and yearly thereafter	<ul style="list-style-type: none"> • Response will be variable and may take longer to decline • Refer to STI Guidelines 	Assess partners based on the stage of diagnosis
PREGNANT WOMAN			<ul style="list-style-type: none"> • Primary, secondary and early latent cases (due to difficulty in accurately staging cases) in pregnancy should be treated with two doses of benzathine penicillin G 2.4 million units 1 week apart • There is no alternative to penicillin for the treatment in pregnancy • Refer to STI Guidelines 			Assess partners based on the stage of diagnosis and infant should be assessed at delivery

Adapted from: Public Health Agency of Canada. January 2010 Edition. Canadian Guidelines on Sexually Transmitted Infections.

Centers for Disease Control and Prevention. 2010 STD Treatment Guidelines.

Toronto Public Health STI Program 416-338-2373

- Free medication for reportable syphilis, other STIs and condoms are available from Toronto Public Health.
- Toronto Public Health STI program can assist in partner notification.