Syphilis Laboratory Interpretation

TEST			INTERPRETATION		
Syphilis Screen (Screening Test 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)	**Alternative Causes for Reactive Serological Tests**	
				False Positive Results for Non Treponemal Tests (RPR)	**False Positive Results for Treponemal Tests (SCREEN (e.g. EIA, CMIA, CLIA)/TP-PA/FTA-ABS)**
Reactive	Reactive (dilutions may vary)	Reactive	(a) Infectious syphilis (primary, secondary, early latent), especially if titre > 1:8 & history of symptom(s), contact with an infected partner, or 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 **PLAN:** repeat blood work in 2-4 weeks to assist with staging or diagnosis	**INFECTIOUS** • 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 • pneumoncoccal pneumonia • rickettsial disease • tuberculosis • viral hepatitis • viral pneumonia • other treponemal infections: yaws, pinta, or bejel **NON INFECTIOUS** • 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	**INFECTIOUS** • brucellosis • genital herpes • infectious mononucleosis (e.g. EBV) • leprosy • leptospirosis • lyme disease • malaria • other treponemal infections: yaws, pinta, or bejel **NON INFECTIOUS** • advancing age • chronic liver disease (e.g. hepatitis) • drug addiction • hyperglobulinemia • scleroderma • systemic lupus erythematosus • thyroiditis
Reactive	Non Reactive	Reactive	(a) Usually late latent syphilis or latent syphilis of unknown duration, with no history of treatment OR (b) Old treated syphilis OR (c) In persons from endemic countries, yaws (e.g. Caribbean), pinta (e.g. Central America), or bejel OR (d) Incubating infectious syphilis (primary), especially if history of symptom(s), contact with an infected partner, or other risk factors **PLAN:** repeat blood work in 2-4 weeks to assist with staging or diagnosis • if results change, reinterpret • if results are the same consider (a), (b), or (c)		
Reactive	Non Reactive	Non Reactive/ Indeterminate	(a) Usually incubating infectious syphilis (primary), especially if history of symptom(s), contact with an infected partner, or other risk factors OR (b) Late latent syphilis or latent syphilis of unknown duration, with 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 **PLAN:** repeat blood work in 2-4 weeks to assist with staging or diagnosis • if RPR becomes reactive consider primary syphilis (especially, if titre > 1:8) • if results are the same consider (b), (c), or (d)		
Reactive	Non Reactive	Non Reactive	• Usually biological false positive **PLAN:** repeat blood work in 2-4 weeks to assist with staging or diagnosis • if results change reinterpret		
Non Reactive	Test not done	Test not done	• No syphilis or within 12 week window **If history of clinical manifestation repeat in 2-4 weeks; consider presumptive treatment of asymptomatic contacts within 12 week window**		

Important Considerations

- Congenital: Reactive Serology result (non-treponemal and treponemal) from venous blood (not cord blood) in an infant/child with clinical, laboratory or radiographic evidence. See Congenital Syphilis: No Longer Just of Historical Interest/Canadian Paediatric Society (2018).

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Syphilis Infection

STAGE	INCUBATION PERIOD	DISEASE MANIFESTATIONS	TREATMENT For alternative treatment to penecilin allergy contact public health or refer to Canadian STI Guidelines	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 (avg 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	4-fold drop at 6 months 8-fold drop at 12 months	3 months 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	8-fold drop at 6 months 16-fold drop at 12 months	6 months 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	4-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 Cardiovascular and Psychiatric manifestations)	10-30+ years	Aortic aneurysm, aortic regurgitation, and/or coronary artery ostial stenosis. Memory loss and/or personality changes	Benzathine penicillin G 2.4 million units IM weekly for 3 doses	12 and 24 months after treatment	• Response will be variable • Refer to STI Guidelines	Assess marital or other long term partners and children as appropriate
Neurosyphilis (can occur at any stage)	Can occurr at any stage	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		
PREGNANT WOMAN			• Important to accurately stage cases • Some experts recommend that primary, secondary and early latent cases receive two doses of benzathine penicillin G 2.4 million units 1 week apart			Assess partners based on the stage of diagnosis and infant should be assessed at delivery
Early Congenital	Within 2 yrs of birth	Result in stillbirth, hydrops fetalis or preterm birth as well as other systemic complications within first 4-8wks of life	• Refer to ID specialist for treatment	Management varies • refer to Canadian STI Guidelines		N/A

Important Considerations

- Presumptive treatment is recommended for contacts of syphilis within the 12 week window period
- An RPR is stable with at least 2 lab results at 1:4 or less (or RPR is non-reactive)
- If 4-fold increase, consider reinfection, contact public health
- If penicillin allergy – refer to allergist for penicillin sensitivity test
- If anaphylactic penicillin allergy contact public health for alternative options
- For clients with HIV coinfection – contact HIV care provider or public health

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