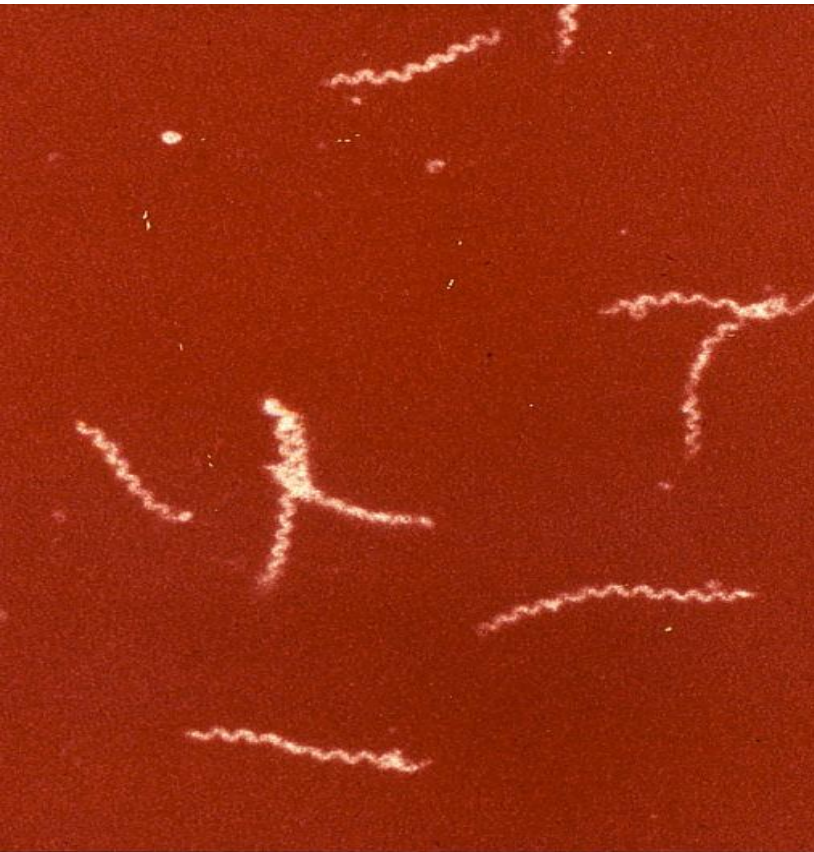


SYPHILIS SEROLOGY



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INTRODUCTION

- Human syphilis is caused by the spirochete *Treponema pallidum*. Antibodies against treponemal antigens and nontreponemal cardiolipin antigens (Wasser-mann antigens) develop and elicit a cell-mediated and humoral Immune response, which results in the formation of immune complexes

- syphilis can be passed from an infected pregnant woman to her fetus.
- four clinical stages
- **1. Primary (early) syphilis**: antibodies that develop are predominantly IgM.
- **2. Secondary syphilis**: Antibodies are mostly IgG.
- **3. latent stage of syphilis**: is contagious and is generally considered to begin after the second year of infection, no clinical symptoms.
- **4. Tertiary syphilis**: granulomatous lesions known as gummata.

- **Congenital syphilis:** Syphilis can be transmitted to a fetus after the 18th week of gestation. Treatment of the infected mother before the 18th week will prevent infection; treatment after the 18th week will cure it.

False-positive reactions may be caused by:

- (a) SLE
- (b) RA
- (c) Infectious mononucleosis
- (d) Pregnancy
- (e) Old age.

False-negative reactions may be caused by:

- (a) Technical errors
- (b) Low antibody titers
- (c) Prozone phenomenon

TESTS FOR SYPHILIS

- based on the detection of non-treponemal antibodies or treponemal antibodies.
 1. Non-treponemal antibody detection.

Reagin antibodies are formed after exposure to *Treponema pallidum* and react with lipoidal antigens used in screening tests for syphilis.

 - a. The Venereal Disease Research Laboratory (VDRL) slide test.

VDRL is a qualitative agglutination test using heat-inactivated patient serum. CSF

- b. The rapid plasma reagin (RPR) test:
In addition to lipoidal antigens and cholesterol, the antigen reagent contains charcoal to facilitate macroscopic interpretation of results.

Results: Nonreactive (NR),
Weakly reactive (WR),
Reactive (R)

TREPONEMAL ANTIBODY DETECTION

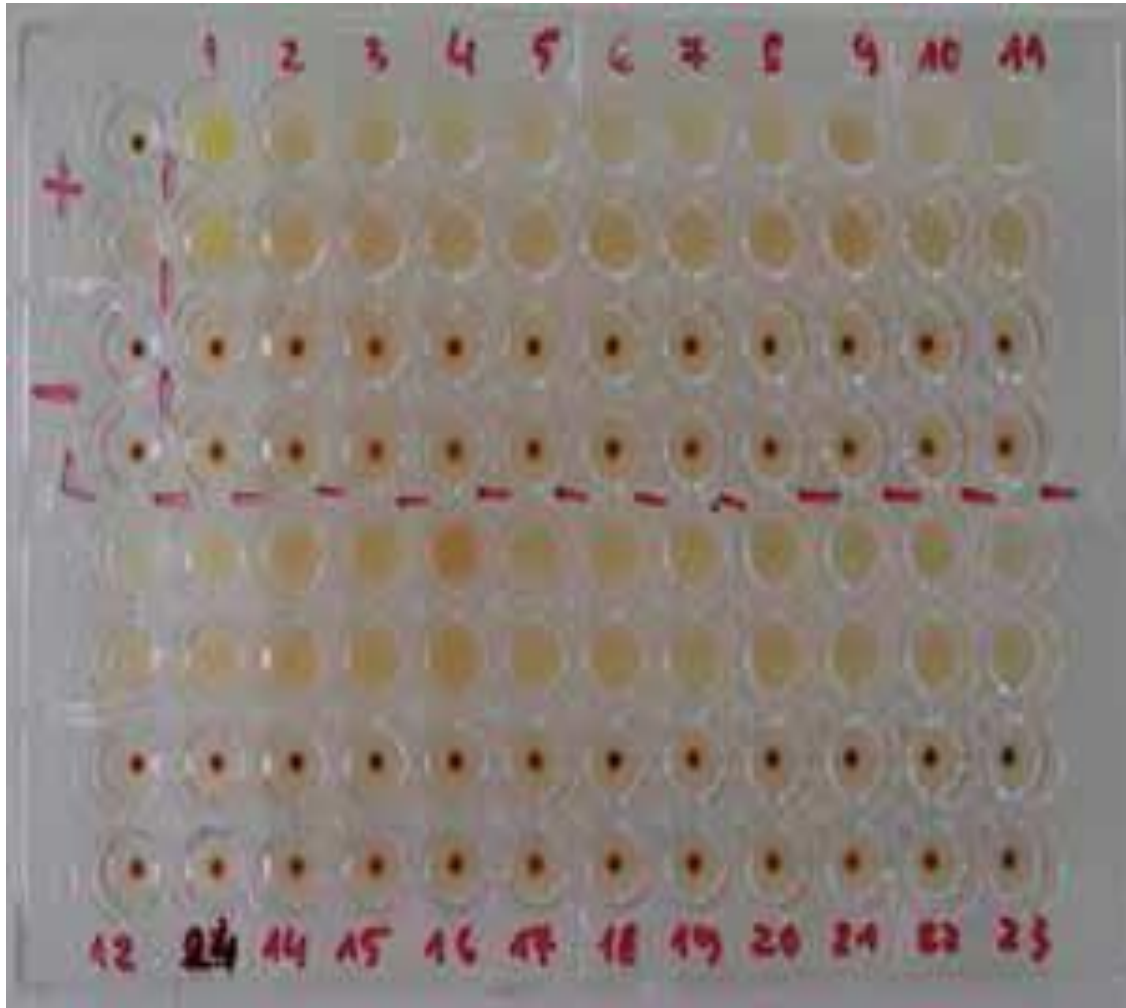
-Antibodies are used as confirmatory tests when reactive results are obtained using screening methods.

-Fluorescent treponemal antibody absorption test (FTA-ABS):

a killed suspension of *T. pallidum* as an antigen and a fluorescein-conjugated antihuman globulin reagent.

-Microhemagglutination assay –*T. pallidum*(MHA-TP):
uses RBCs coated with treponemal antigens to detect antibodies.

T. pallidum hemagglutination assay



T. pallidum hemagglutination assay (TPHA) on a microtitre plate; tanned erythrocytes sensitised with sonicated extracts of T. pallidum added to dilutions of the patient's serum showing agglutination (positive) and buttons showing negative titres.

Laboratory diagnosis of congenital syphilis (CS)

- ❖ Serology titre of IgM in the infant that is equal to or four times that in the mother is strongly suggestive of congenital infection
- ❖ Absence of a ≥ 4 -fold rise in titre does not rule out congenital infection.
- ❖ **Western blot:** Can detect IgM and IgG in congenital syphilis; it is a useful confirmatory test
- ❖ *Treponema pallidum*-specific DNA detection by PCR

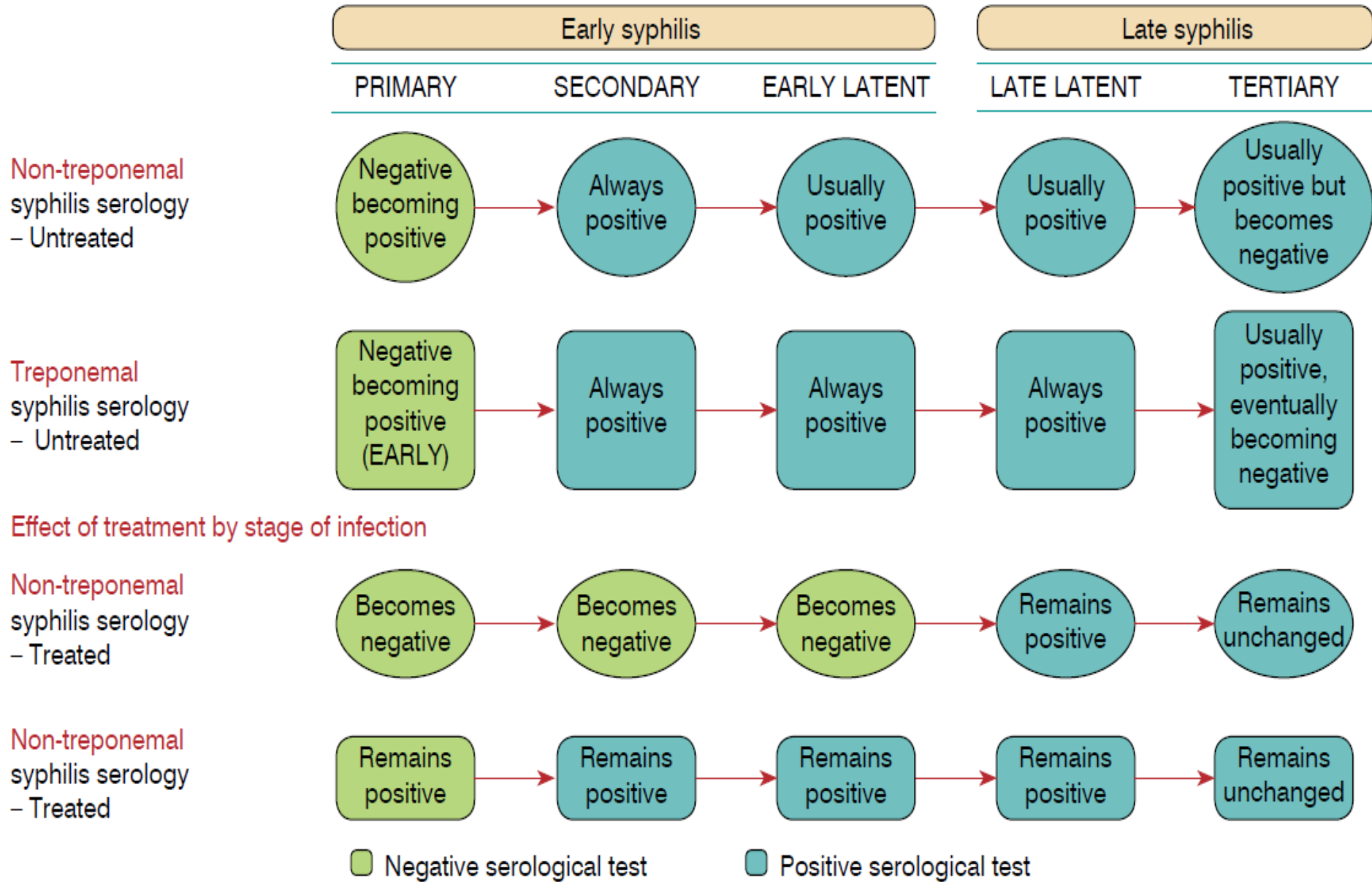
Frequency of reactive serological tests in untreated syphilis (percentage)

Stage	VDRL/RPR	FTA-ABS	TPHA
Primary	70–80%	85–100%	65–85%
Secondary	100%	100%	100%
Latent/late	60–70%	95–100%	95–100%

Reactivity of serological tests by stage of syphilis and effect of treatment

Serological tests	Antigen used	Antibodies detected	Implications
Screening tests Standard tests for syphilis (STS) VDRL RPR	Cardiolipin	IgG/IgM	Positive: Early infection (primary and secondary syphilis) Tertiary—CSF in neurosyphilis Negative: Tertiary and latent Successful treatment Non-venereal syphilis
Confirmatory tests: Specific treponemal antigen-based— FTA-ABS, TPHA, TPPA, EIA	<i>T. pallidum</i> : Reiter's or Nichols strains	IgG/IgM	Positive: All stages of syphilis Remains positive despite treatment May be positive in Lyme disease Negative: Rules out syphilis
Western blot	Whole-cell lysate of <i>T. pallidum</i> or recombinant polypeptide antigens of <i>T. pallidum</i>	IgG/IgM	Positive in infant's serum in congenital syphilis, syphilis in patients with SLE and other autoimmune diseases

Reactivity of serological tests by stage of syphilis



THANK YOU