

# LABLINK MEDICAL LABORATORY TESTING GUIDELINE FOR THE DIAGNOSIS OF TYPHOID

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No	Test / Objective	Specimen	Container	Transportation Requirement	Method	Note
1.	<p><b>Test:</b></p> <p>Blood Culture</p> <p><b>Objective:</b></p> <p>Isolation of <i>Salmonella typhi</i> and <i>Salmonella paratyphi</i> bacteria in blood.</p>	<p>Venous Blood</p> <p><b>Note 1:</b></p> <p>Specimen must be collected in the acute phase of the infection or bacteremic phase; at the start of day 1 to day 7 onset of symptoms.</p> <p><b>Note 2:</b></p> <p>It is advisable not to send serologic sample during acute phase of infection, because antibodies are not shown yet.</p>	<p>Blood Culture Bottles</p> <p><b>Adult:</b></p> <p>Aerobic bottle</p> <p>Anaerobic bottle</p> <p><b>Paediatric:</b></p> <p>Paediatric bottle</p>	<p>Room Temperature</p> <p><b>Best Practice:</b></p> <p>The best practice is to place the bottle(s) in Continuous Monitoring Blood Culture System (CMBCS) within 2 hours of specimen collection.</p>	<p>Culture and Sensitivity</p>	<p>CLSI emphasize that 2-3 sets of blood cultures (1 set = 1 aerobic &amp; 1 anaerobic bottle) are to be drawn for initial evaluation for adult. Cumulative yield of <i>Salmonella typhi</i> blood culture sets;</p> <p>1 Set : 65% Recovery of <i>Salmonella typhi</i>. 2 Sets : 80% Recovery of <i>Salmonella typhi</i> 3 Sets : 96% Recovery of <i>Salmonella typhi</i>.</p> <p><b>Note:</b></p> <p>Clinical illness is accompanied by a fairly sustained but low level of secondary bacteraemia (1 to 10 bacteria per ml of blood).</p>

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No.	Test	Specimen	Container	Transportation Requirement	Method	Note
2.	<p><b>Test:</b></p> <p>Stool Culture</p> <p><b>Objective:</b></p> <p>Isolation of <i>Salmonella typhi</i> and <i>Salmonella paratyphi</i> in stool.</p>	<p>Stool</p> <p><b>Note 1:</b></p> <p>Acceptable to send specimen during:</p> <p><b><u>Acute infection</u></b></p> <p>Day 1 – Day 7</p> <p><b><u>Immune State</u></b></p> <p>Day 8 onwards</p> <p><b><u>Screening of carrier</u></b></p> <p>Day of illness is Not Applicable</p> <p><b>Note 2:</b></p> <p>If stool is not available; rectal swab can be used as an alternative.</p>	<p>Sterile Container - Stool</p> <p><b>Note 1:</b></p> <p>It is advisable to describe stool appearance and consistency based on Bristol Stool Chart.</p> <p>The best sample for isolation of the bacteria is Bristol Stool Chart Type 5, 6 or 7.</p> <p><b>Note 2:</b></p> <p>Rectal Swab - Carry Blair Transport Medium.</p>	<p>Room Temperature</p> <p><b>Note:</b></p> <p>The best practice is to subculture in Selenite F broth after 2 hours of specimen collection.</p>	<p>Culture and Sensitivity</p>	<p><b>Note:</b></p> <p>Stools can be collected from acute patients and they are especially useful for the diagnosis of typhoid carriers. The isolation of <i>S. typhi</i> from stools is suggestive of typhoid fever. However, the clinical condition of the patient should be considered.</p>

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No.	Test	Specimen	Container	Transportation Requirement	Method	Note
3.	<p>Test:</p> <p>Widal Weil Felix – WWF</p> <p>Objective:</p> <p>This test measures agglutinating antibody levels against O and H antigens.</p>	<p>Serum</p> <p><b>Acute Sample:</b> Day 1 to day 7 onset of infection.</p> <p><b>Convalescent Sample:</b> Specimen collection after Day 5 to Day 7 of sending the first sample.</p>	<p>Plain Tube or</p> <p>Plain Tube with Serum Separator.</p>	Room temperature	Serology - Agglutination	<p><b>Note 1:</b> The levels are measured by using doubling dilutions of sera in large test tubes. Usually, O antibodies appear on days 6-8 and H antibodies on days 10-12 after the onset of the disease.</p> <p><b>Note 2:</b> The test is usually performed on an acute serum (at first contact with the patient). A convalescent serum should preferably also be collected so that paired titrations can be performed. In practice, however, this is often difficult.</p> <p><b>Note 3:</b> The test has only moderate sensitivity and specificity. It can be negative in up to 30% of culture-proven cases of typhoid fever. This may be because of prior antibiotic therapy that has blunted the antibody response. On the other hand, <i>S. typhi</i> shares O and H antigens with other <i>Salmonella</i> serotypes and has cross-reacting epitopes with other Enterobacteriaceae, and this can lead to false-positive results. Such results may also occur in other clinical conditions, e.g. malaria, typhus, bacteraemia caused by other organisms, and cirrhosis.</p>

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No.	Test	Specimen	Container	Transportation Requirement	Method	Note
4.	<p><b>Test:</b></p> <p>Rapid Test <i>Salmonella typhi</i> IgG and IgM.</p> <p><b>Objective:</b></p> <p>Detection of <i>Salmonella typhi</i> IgG and IgM antibodies.</p>	<p>Serum</p> <p><b>Note:</b></p> <p>It is advisable to send serologic sample after 5-7 days of onset of symptoms, because antibodies start to arise after day 5.</p> <p><b>Note 2:</b></p> <p>Do not use this test for screening of typhoid carrier among food handlers who have received injection for typhoid vaccine.</p>	<p>Plain Tube or</p> <p>Plain Tube with Serum Separator.</p>	Room temperature	Serology – Immuno-chromatography	<p><b>Note 1:</b></p> <p>A rapid and reliable diagnostic test for typhoid fever as an alternative to Widal Weil Felix (WWF) test.</p> <p><b>Note 2:</b></p> <p>Give a false negative result if sample collected in the acute phase of typhoid. (Day 1 – Day 7 of onset of symptoms)</p> <p><b>Note 3:</b></p> <p>Give a false positive result in individual who has received typhoid vaccine.</p> <p><b>Note 4:</b></p> <p><b>IgM - Relative Sensitivity: 91%; Relative Specificity: 99.3%</b></p> <p><b>IgG – Relative Sensitivity: 92.9%; Relative Specificity: 99.3%</b></p> <p>Note 5:</p> <p>Any reactive specimen with the typhoid IgG/ IgM rapid test must be confirmed with alternative testing methods such as Blood C&amp;S, Bone Marrow C&amp;S, Stool C&amp;S and Specific anatomic lesion sample C&amp;S.</p>

**Disclaimer for Rapid Salmonella typhi IgG/ IgM test:**

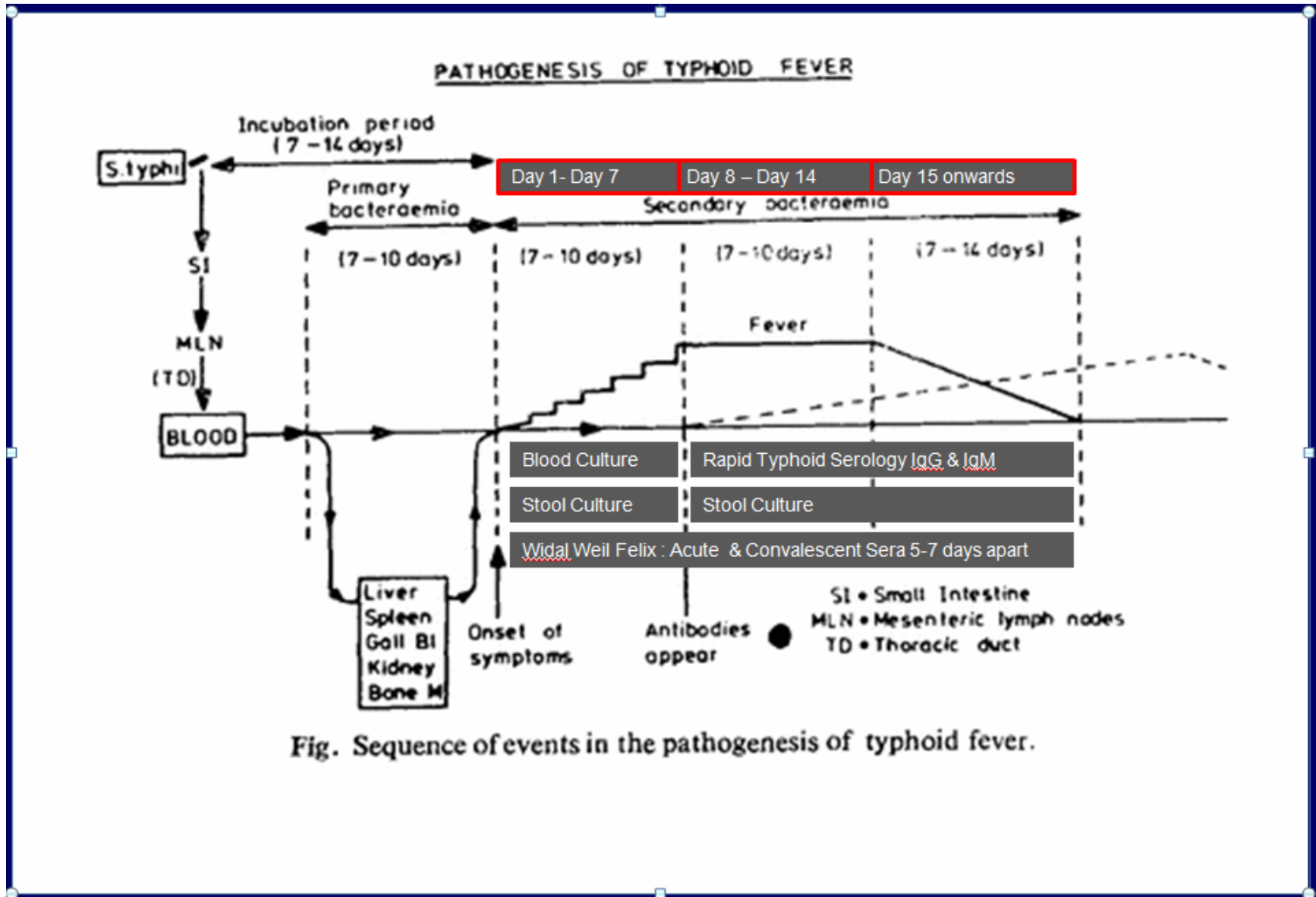
It is advisable to send serologic sample after 5-7 days of onset of symptoms, because antibodies start to arise after day 5.

Do not use this test for screening of typhoid carrier among food handlers who have received injection for typhoid vaccine.

Give a **false negative** result if sample collected in the acute phase of typhoid. (Day 1 – Day 7 of onset of symptoms)

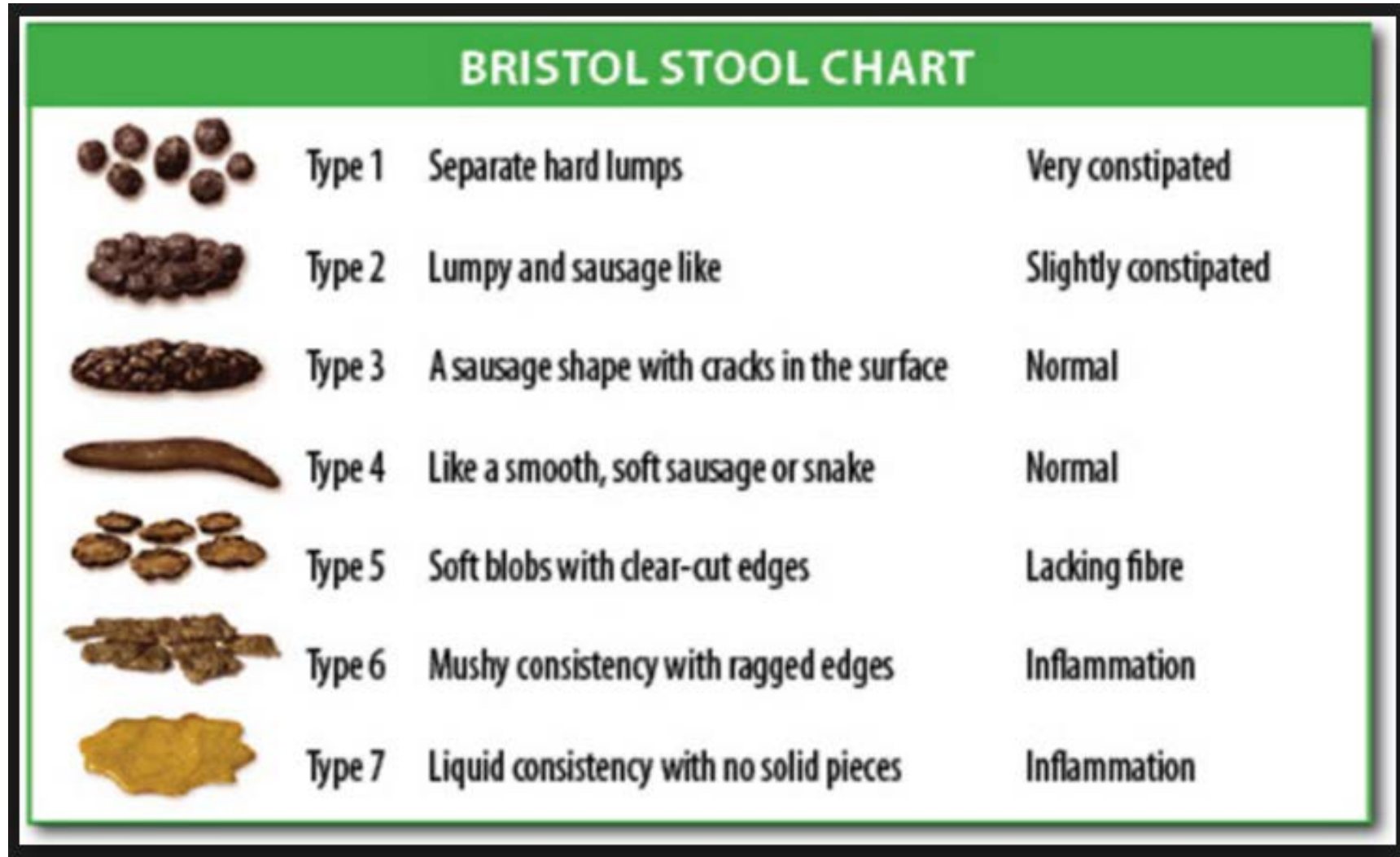
Give a **false positive** result in individual who has received typhoid vaccine.

Any reactive specimen with the typhoid IgM and IgG & IgM rapid test must be confirmed with alternative testing methods such as Blood C&S, Bone Marrow C&S, Stool C&S, Urine C&S and other specific anatomic lesion sample C&S.



Version 2 - 23-09-2016

**BRISTOL STOOL CHART**





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