HBsAg/HCV/HIV/Syphilis Combo Rapid Test
Cassette(Serum/Plasma)

Package Insert

REF-IDZ 345 English

A rapid test for the qualitative detection of Hepatitis B surface antigen (HBsAg), antibodies to Hepatitis C Virus, antibodies to HIV type 1, type 2 and syphilis-antibodies (IgG and IgM) to Treponema Pallidum (TP) in serum or plasma.

For professional in vitro diagnostic use only.

[INTENDED USE]
The HBsAg/HCV/HIV/Syphilis Combo Rapid Test Cassette(Serum/Plasma) is a radioimmunometric assay for the qualitative detection of Hepatitis B surface antigen (HBsAg), antibodies to Hepatitis C Virus, antibodies to HIV type 1, type 2 and syphilis-antibodies (IgG and IgM) to Treponema Pallidum (TP) in serum or plasma.

[SUMMARY]
The HBsAg Rapid Test (Serum/Plasma) is a rapid test to qualitatively detect the presence of HBsAg in serum or plasma specimen. The test utilizes a combination of monoclonal and polyclonal antibodies to selectively detect elevated levels of HBsAg in serum or plasma. Viral hepatitis is a systemic disease primarily involving the liver. Most cases of acute viral hepatitis are caused by Hepatitis A virus, Hepatitis B virus (HBV) or Hepatitis C virus. The complex antigen found on the surface of HBV is called HBsAg. Previous designations included the Australia or Au antigen.

The presence of HBsAg in serum or plasma is an indication of an active Hepatitis B infection, either acute or chronic. In a typical Hepatitis B infection, HBsAg will be detected 2 to 4 weeks before the ALT level becomes abnormal and 3 to 5 weeks before symptoms or jaundice develop. HBsAg has four principal subtypes: adw, ayr, aay and ayr. Because of antigenic heterogeneity of the determinant, there are 10 major serotypes of Hepatitis B virus identified.

The HCV Rapid Test (Serum/Plasma) is a rapid test to qualitatively detect the presence of antibody to HCV in serum or plasma specimen. The test utilizes colloidal gold conjugated with multiple antigens, monoclonal antibodies to selectively detect antibodies to HCV in serum or plasma. The recombinant HCV proteins used in the test kit are encoded by the genes for both structural (nucleocapsid) and non-structural proteins. Hepatitis C Virus (HCV) is a small, enveloped, positive-sense, single-stranded RNA Virus. HCV is now known to be the major cause of parenterally transmitted non-A, non-B hepatitis. HCV is found in over 80% of patients with well-documented non-A, non-B hepatitis.

Conventional methods fail to isolate the virus in cell culture or visualize it by electron microscopy. Cloning the viral genome has made it possible to develop recombinant antigens for diagnostic use. Compared to the first generation HCV EIA's using single recombinant antigen, multiple antigens using recombinant protein and/or synthetic peptides have been added in new serological tests to increase cross-reactivity and to increase the sensitivity of the HCV antibody tests.

The HIV 1.2 Rapid Test (Serum/Plasma) is a rapid test to qualitatively detect the presence of HIV 1 and/or HIV 2 antibodies in serum or plasma specimen. The test utilizes latex conjugate and multiple recombinant HIV proteins to selectively detect antibodies to the HIV 1.2 virus in serum or plasma. HIV is the etiologic agent of Acquired Immune Deficiency Syndrome (AIDS). The virus is surrounded by a lipid envelope that is derived from host cell membrane. Several viral glycoproteins are on the envelope. Each virus contains two copies of viral RNA that is single-stranded, positive-sense RNA. The virion is surrounded by a lipid envelope that is derived from host cell membrane. Some key factors that have contributed to this rise include the crack cocaine epidemic and the spread of HIV through the use of intravenous drug use.

The HCV Rapid Test (Serum/Plasma) is a qualitative, sandwich immunoassay for the detection of antibody to HCV in serum or plasma. The membrane is pre-coated with recombinant HCV antigens on the test line region of the cassette. During testing, the serum or plasma specimen reacts with the particle coated with anti-HCV antibodies. The mixture migrates upward on the membrane chromato graphically by capillary action to react with recombinant HCV antigen on the membrane and generate a colored line. The presence of this colored line in the test region indicates a positive result, while its absence indicates a negative result. To serve as a procedural control, a colored line will always appear in the control line region indicating that proper volume of specimen has been added and membrane wicking has occurred.

The HCV Rapid Test (Serum/Plasma) is a qualitative, sandwich immunoassay for the detection of antibody to HCV in serum or plasma. The membrane is pre-coated with recombinant HCV antigen coated colloidal gold. The mixture migrates upward on the membrane chromatographically by capillary action to react with recombinant HCV antigen on the membrane and generate a colored line. The presence of this colored line in the test region indicates a positive result, while its absence indicates a negative result. To serve as a procedural control, a colored line will always appear in the control line region indicating that proper volume of specimen has been added and membrane wicking has occurred.

The Syphilis Rapid Test (Serum/Plasma) is a qualitative membrane based immunoassay for the detection of TP antibodies (IgG and IgM) in serum or plasma. In this test procedure, recombinant Syphilis antigen is immobilized in the test line region of the test cassette. When the specimen antibody to TP reacts with the immobilized antigen, then the immunocomplex is captured by the second antibody conjugated to colloidal gold. If the specimen contains TP antibodies, a colored line will appear in the test line region, indicating a positive result. The presence of this colored line indicates a positive result.

[PRECAUTIONS]
- For professional in vitro diagnostic use only. Do not use after expiration date.
- Do not eat, drink or smoke in the area where the specimens or kits are handled.
- Handle all specimens as if they contain infectious agents. Observe established precautions against microbial and chemical hazards throughout the procedure and follow the standard operating procedures for 20 minutes of specimens.
- Wear protective clothing such as laboratory coats, disposable gloves and eye protection when specimens are assayed.
- Humidity and temperature can adversely affect results.

[STORAGE AND STABILITY]
The kit can be stored at room temperature or refrigerated (2-30°C). The test cassette is stable through the expiration date printed on the sealed pouch. The test cassette must remain in the sealed pouch until use. DO NOT FREEZE. Do not use beyond the expiration date.

[TEST SPECIMEN COLLECTION AND PREPARATION]
The HBsAg/HCV/HIV/Syphilis Combo Rapid Test Cassette(Serum/Plasma) can be performed using either serum or plasma.

- Separate the serum or plasma from blood as soon as possible to avoid hemolysis. Only clear, non-hemolyzed specimens can be used.
- Testing should be performed immediately after the specimens have been collected. Do not allow the specimen to reach room temperature for more than 30 minutes. Specimens may be stored at 2-8°C for up to 3 days. For long term storage, specimens should be kept below -20°C.
- Bring specimens to room temperature prior to testing. Frozen specimens must be completely thawed and mixed well prior to testing. Specimens should not be frozen and thawed repeatedly.
- If specimens are to be stored, they should be packed in compliance with federal regulations for transportation of toxicologic agents.
- EDTA K2, Heparin sodium, sodium Citrate and potassium Oxalate can be used as the coagulant tube for collecting the blood specimen.

[MATERIALS]
- Tested specimens
- Buffer

[STORAGE]
Materials provided
- Testing Cassette
- Buffer

Materials required but not provided
- Specimen collection containers
- Centrifuge (for plasma only)
- Timer

[DIRECTIONS FOR USE]
- Aliquot, non-HBsAg/HCV/HIV/Syphilis positive human serum, buffer and/or controls to equilibrate room temperature (15-30°C) prior to testing.
- Bring the pouch to room temperature before opening it. Remove the test cassette from the sealed pouch and use it as soon as possible. Best results will be obtained if the assay is performed within one hour.
- Place the test cassette on a clean and level surface. Hold the dropper vertically and transfer 2 drops of serum or plasma (approximately 50μL) to the test line region of the test cassette.
- Place the test cassette in test apparatus or machine. Close the test apparatus or machine and start the timer. (Note: the timer is not provided). A positive result will take 15-20 minutes using a field reader (approximately 40μL), respectively. Start the timer. See the illustration below.
- Note: It is suggested not to use the buffer after 30 days, or using a new buffer before the expiration date.

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- Handle all specimens as if they contain infectious agents. Observe established precautions against microbial and chemical hazards throughout the procedure and follow the standard operating procedures for 20 minutes of specimens.
- Wear protective clothing such as laboratory coats, disposable gloves and eye protection when specimens are assayed.
- Humidity and temperature can adversely affect results.
**INTERPRETATION OF RESULTS**

(Please refer to the illustration above)

**POSITIVE**: Two distinct colored lines appear. One colored line should be in the control region (C) and another colored line should be in the test region (T).

**NEGATIVE**: One colored line appears in the control region (C), No colored line appears in the test region (T).

**INVALID**: Control line fails to appear. Insufficient specimen volume or incorrect procedural techniques are the most likely reasons for control line failure. Review the procedure and repeat the test with a new test cassette. If the problem persists, discontinue using the test kit immediately and contact your local distributor.

**QUALITY CONTROL**

Internal procedural controls are included in the test. A colored line appearing in the control region (C) is an internal positive procedural control. It confirms sufficient specimen volume and correct procedural technique. Control standards are not supplied with this kit; however, it is recommended that positive and negative controls be tested as a good laboratory practice to confirm the test procedure and to verify proper test performance.

**LIMITATIONS**

1. This test is for in vitro diagnostic use only.
2. This test has been developed for testing serum/plasma specimens only. The performance of the test using other specimens has not been substantiated.
3. This test is a qualitative screening assay. It is not designed to determine the quantitative concentration of HBsAg, HCV antibody, HIV 1.2 antibody or syphilis antibody.
4. The HBsAg Rapid Test cannot detect less than 1 PEI ng/ml of HBsAg in specimens.
5. As with all diagnostic tests, all results must be considered with other clinical information available to the physician.
6. If the test result is negative and clinical symptoms persist, additional follow-up testing using other clinical methods is recommended. A negative result time does not preclude the possibility of HBsAg and/or Hepatitis C virus and/or HIV 1.2 and/or syphilis infection.

**EXPECTED VALUES**

The HBsAg/HCV/HIV/Syphilis Combo Rapid Test Cassette (Serum/Plasma) has been compared with a leading commercial ELISA test. The correlation between these two systems is 99%.

**PERFORMANCE CHARACTERISTICS**

**Sensitivity and Specificity**

1. **HBsAg**

   The HBsAg Rapid Test (Serum/Plasma) has been tested with a sensitivity panel ranging from 0 to 100ng/ml of HBsAg and produced positive results on The HBsAg Rapid Test (Serum/Plasma). The test can detect 1 PEI ng/ml of HBsAg in specimens.

   Antibodies used for the HBsAg Rapid Test (Serum/Plasma) were developed against whole Hepatitis B antigen isolated from Hepatitis B virus. Specificity of The HBsAg Rapid Test (Serum/Plasma) was tested as it was used with laboratory strains of Hepatitis A and Hepatitis C. They all yielded negative results.

   **Method**
<table>
<thead>
<tr>
<th>ELISA</th>
<th>Total Results</th>
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<tbody>
<tr>
<td>Positive</td>
<td>163</td>
</tr>
<tr>
<td>Negative</td>
<td>163</td>
</tr>
<tr>
<td>Total</td>
<td>326</td>
</tr>
</tbody>
</table>

   **Relative Sensitivity**: >99.9% (95%CI*: 97.7%-100%)
   **Confidence Intervals Relative Specificity**: 99.7% (95%CI*: 98.5%-100%)
   **Accuracy**: 99.8% (95%CI*: 98.9%-100%)

   2. **HCV**

   The recombinant antigen used for the HCV Rapid Test Cassette (Serum/Plasma) is encoded by genes for both structural (nucleocapsid) and non-structural proteins. The HCV Rapid Test Cassette (Serum/Plasma) has passed a seroconversion panel and compared with a leading commercial HCV ELISA test using clinical specimens.

   The results show that the relative sensitivity of the HCV Rapid Test Cassette (Serum/Plasma) is >99.9%, and the relative specificity is 99.7%.

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   **Relative Sensitivity**: >99.9% (95%CI*: 98.2%-100%)
   **Confidence Intervals Relative Specificity**: 99.8% (95%CI*: 98.4%-100%)
   **Accuracy**: 99.9% (95%CI*: 99.0%-100%)

3. **HIV 1.2**

   The HIV 1.2 Rapid Test (Serum/Plasma) has correctly identified specimens of a seroconversion panel and has been compared to a leading commercial TPPA HIV test using clinical specimens. The results show that the relative sensitivity of the HIV 1.2 Rapid Test (Serum/Plasma) is >99.9% and the relative specificity is 99.9%.

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   **Relative Sensitivity**: >99.9% (95%CI*: 97.0%-100%)
   **Confidence Intervals Relative Specificity**: 99.9% (95%CI*: 98.6%-100%)
   **Accuracy**: 99.9% (95%CI*: 99.0%-100%)

4. **Syphilis**

   The Syphilis Rapid Test (Serum/Plasma) has correctly identified specimens of a seroconversion panel and compared with a leading commercial TPHA Syphilis test using clinical specimens. The results show that the relative sensitivity of the Syphilis Rapid Test C (Serum/Plasma) is >99.9% and the relative specificity is 99.7%.

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**INTERFERING SUBSTANCES**

The following potentially interfering substances were added to HBsAg, HCV antibody, HIV 1.2 antibody and syphilis antibody negative and positive specimens.

- Acetaminophen: 20 mg/dL
- Acetylsalicylic Acid: 20 mg/dL
- Ascorbic Acid: 2g/dL
- Creatin: 200 mg/dL
- Hemoglobin: 100/mg/dL
- Bilirubin: 1g/dL
- Oxalic Acid: 60/mg/dL

None of the substances at the concentration tested interfered in the assay.

**BIBLIOGRAPHY**