HEV IgG/IgM Rapid Test Cassette (WB/S/P)

English

For professional and in vitro diagnostic use only.

[INTENDED USE]

The HEV IgG/IgM Rapid Test Cassette is a lateral flow immunoassay for the qualitative detection of antibodies (IgG and IgM) to hepatitis E virus in human whole blood/serum/plasma. It provides an aid in the diagnosis of HEV infection.

[SUMMARY]

Hepatitis E is an acute, usually self-limiting disease of the liver caused by hepatitis E virus (HEV). HEV is transmitted from person to person, primarily by the faecal-oral route. The incidence of hepatitis E is closely related to socioeconomic development, and seroepidemiological studies show that prevalence of anti-HEV antibodies in the general population varies from 15% to close to 100% in different parts of the world.

[PRINCIPLE]

The HEV IgG/IgM Rapid Test Cassette is a qualitative membrane strip based immunoassay for the detection of Hepatitis E virus antibodies (IgG and IgM) in whole blood/serum/plasma. The test cassette consists of: 1) a burgundy colored conjugate pad containing HEV recombinant envelope antigens conjugated with colloidal gold (HEV conjugates); 2) a nitrocellulose membrane strip containing two test lines (IgM and IgG lines) and a control line (C line). The IgM line is pre-coated with the Mouse anti-Human IgM antibody, IgG line is coated with Mouse anti-Human IgG antibody. When an adequate volume of test specimen is dispensed into the sample well of the test cassette, the specimen migrates by capillary action across the cassette. IgG anti-HEV, if present in the specimen, will bind to the HEV conjugates. The immunocomplex is then captured by the reagent pre-coated on the IgG line, forming a burgundy colored IgG line, indicating a HEV IgG positive test result and suggesting a recent or repeat infection. IgM anti-HEV, if present in the specimen, will bind to the HEV conjugates. The immunocomplex is then captured by the reagent coated on the IgM line, forming a burgundy colored IgM line, indicating a HEV IgM positive test result and suggesting a fresh infection. Absence of both T lines (IgM and IgG) suggests a negative result. To serve as a procedural control, a colored line will always appear at the control line region indicating that proper volume of specimen has been added and membrane wicking has occurred.

[WARNINGS AND PRECAUTIONS]

- For professional and *in vitro* diagnostic use only.
- For healthcare professionals and professionals at point of care sites.
- Do not use after the expiration date.
- Please read all the information in this leaflet before performing the test.
- The test cassette should remain in the sealed pouch until use.
- All specimens should be considered potentially hazardous and handled in the same manner as an infectious agent.
- The used test cassette should be discarded according to federal, state and local regulations.

[COMPOSITION]

The test contains a membrane strip coated with Mouse anti-Human IgG antibody and Mouse anti-Human IgM antibody on the test line, Goat anti-HEV polyclonal antibody on the control line, and a dye pad which contains colloidal gold coupled with HEV recombinant envelope antigens.
The quantity of tests was printed on the labeling.

Materials Provided

- Test cassette
- Buffer
- Package insert
- Dropper

Materials Required But Not Provided

- Specimen collection container
- Timer

[STORAGE AND STABILITY]

- Store as packaged in the sealed pouch at temperature (4-30℃ or 40-86℉). The kit is stable within the expiration date printed on the labeling.
- Once open the pouch, the test should be used within one hour. Prolonged exposure to hot and humid environment will cause product deterioration.
- The LOT and the expiration date were printed on the labeling.

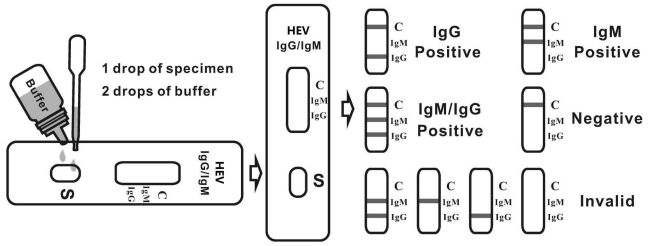
[SPECIMEN]

- The test can be used to test whole blood/serum/plasma specimens.
- To collect whole blood, serum or plasma specimens following regular clinical laboratory procedures.
- Separate serum or plasma from blood as soon as possible to avoid hemolysis. Use only clear non-hemolyzed specimens.
- Store specimens at 2-8℃ (36-46℉) if not tested immediately. Store specimens at 2-8℃ up to 7 days. The specimens should be frozen at -20℃ (-4℉) for longer storage. Do not freeze whole blood specimens.
- Avoid multiple freeze-thaw cycles. Prior to testing, bring frozen specimens to room temperature slowly and mix gently. Specimens containing visible particulate matter should be clarified by centrifugation before testing.
- Do not use samples demonstrating gross lipemia, gross hemolysis or turbidity in order to avoid interference on result interpretation.

[TEST PROCEDURE]

Allow the test device and specimens to equilibrate to temperature (15-30℃ or 59-86℉) prior to testing.

1. Bring the pouch to room temperature before opening it. Remove the test cassette from the sealed pouch and use it as soon as possible.
2. Place the test cassette on a clean and level surface.
3. Hold the dropper vertically and transfer 1 drop of specimen (approximately 10 µL) to the specimen well (S) of the test cassette, then add 2 drops of buffer (approximately 70 µL) and start the timer. See illustration below.
4. Wait for the colored line(s) to appear. Read results at 15 minutes. Do not interpret the result after 20 minutes.



(The picture is for reference only, please refer to the material object.)

[INTERPRETATION OF RESULTS]

Positive: Control line and at least one test line appear on the membrane. The appearance of IgG test line indicates the presence of HEV specific IgG antibodies. The appearance of IgM test line indicates the presence of HEV specific IgM antibodies. And if both IgM and IgG line appear, it indicates that the presence of both HEV specific IgG and IgM antibodies.

Negative: One colored line appears in the control region (C). No apparent colored line appears in the test line region.

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]

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

[LIMITATIONS]

- The HEV IgG/IgM Rapid Test Cassette is limited to provide a qualitative detection. The intensity of the test line does not necessarily correlate to the concentration of the antibody in the blood.
- The results obtained from this test are intended to be an aid in diagnosis only. Each physician must interpret the results in conjunction with the patient's history, physical findings, and other diagnostic procedures.
- A negative test result indicates that antibodies to HEV are either not present or at levels undetectable by the test.

[PERFORMANCE CHARACTERISTICS]

Accuracy

A side-by-side comparison was conducted using the HEV IgG/IgM Rapid Test and commercially available HEV IgG/IgM Rapid Test. 1025 clinical specimens from three Professional Point of Care sites were evaluated with the HEV IgG/IgM Rapid Test and the commercial kit. The specimens were checked with a commercially available ELISA to confirm the presence of HEV IgG/IgM antibodies in the specimens. The following results are tabulated from these clinical studies:

HEV-IgG:

Agreement with Commercial HEV Rapid Test

HEV-IgG		Commercial HEV Rapid Test		Total
		Positive	Negative	
	Positive	354	6	360
	Negative	4	661	665
Total		358	667	1025

The agreement between these two devices is 98.88% for positive specimens, and 99.10% for negative specimens. This study demonstrated that the HEV IgG Rapid Test is substantially equivalent to the commercial device.

Agreement with ELISA

HEV-IgG		ELISA		Total
		Positive	Negative	
	Positive	351	8	359
	Negative	6	660	666
Total		357	668	1025

A statistical comparison was made between the results yielding a clinical sensitivity of 98.32%, a clinical specificity of 98.80% and an accuracy of 98.63%.

HEV-IgM:

Agreement with Commercial HEV Rapid Test

HEV-IgM		Commercial HEV Rapid Test		Total
		Positive	Negative	
	Positive	355	5	360
	Negative	3	662	665
Total		358	667	1025

The agreement between these two devices is 99.16% for positive specimens, and 99.25% for negative specimens. This study demonstrated that the HEV IgM Rapid Test is substantially equivalent to the commercial device.

Agreement with ELISA

HEV-IgM		ELISA		Total
		Positive	Negative	
	Positive	353	7	360
	Negative	6	659	665
Total		359	666	1025

A statistical comparison was made between the results yielding a clinical sensitivity of 98.33%, a clinical specificity of 98.95% and an accuracy of 98.73%.

Cross-Reactivity and Interference

1. Other common causative agents of infectious diseases were evaluated for cross-reactivity with the test. Some positive specimens of other common infectious diseases were spiked into the HEV positive and negative specimens and tested separately. No cross-reactivity was observed with specimens from patients infected with HIV, HAV, HBsAg, HCV, HTLV, CMV and TP.
2. Potentially cross-reactive endogenous substances including common serum components, such as lipids, hemoglobin, bilirubin, were spiked at high concentrations into the HEV positive and negative specimens and tested separately. No cross-reactivity or interference was observed to the device.

Analytes	Conc.	Specimens	
		Positive	Negative
Albumin	20 mg/mL	+	-
Bilirubin	20 µg/mL	+	-
Hemoglobin	15 mg/mL	+	-
Glucose	20 mg/mL	+	-
Uric Acid	200 µg/mL	+	-
Lipids	20 mg/mL	+	-

3. Some other common biological analytes were spiked into the HEV positive and negative specimens and tested separately. No significant interference was observed at the levels listed in the table below.

Analytes	Conc.	Specimens	
		Positive	Negative
Acetaminophen	200 µg/mL	+	-
Acetoacetic Acid	200 µg/mL	+	-
Acetylsalicylic Acid	200 µg/mL	+	-
Benzoylecgonine	100 µg/mL	+	-
Caffeine	200 µg/mL	+	-
EDTA	800 µg/mL	+	-
Ethanol	1.0%	+	-
Gentisic Acid	200 µg/mL	+	-
β-Hydroxybutyrate	20,000 µg/mL	+	-
Methanol	10.0%	+	-
Phenothiazine	200 µg/mL	+	-
Phenylpropanolamine	200 µg/mL	+	-
Salicylic Acid	200 µg/mL	+	-

Reproducibility

Reproducibility studies were performed for HEV IgG/IgM Rapid Test at three physician office laboratories (POL). Sixty (60) clinical serum specimens, 20 negative, 20 borderline positive and 20 positive, were used in this study. Each specimen was run in triplicate for three days at each POL. The intra-assay agreements were 100%. The inter-site agreement was 100%.

[BIBLIOGRAPHY]

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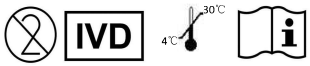
2. Subrat, Kumar. Hepatitis E virus: the current scenario. International Journal of Infectious Disease. Retrieved 2016.
3. Hoofnagle, J. H.; Nelson, K. E.; Purcell, R. H. Hepatitis E. New England Journal of Medicine 367 (13): 1237-1244.



Index of Symbol

Do not reuse	*In vitro* diagnostic medical device
Store between 4-30℃	Consult instructions for use
Caution	Lot number
Use by	Contains sufficient for <n> tests
Keep away from sunlight	Keep dry
Manufacturer	Do not use if package is damaged

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