

Norovirus Rapid Test Cassette (Faeces)

Package Insert

REF NOR01 English

A rapid, one step test for the qualitative detection of Norovirus in human faeces.

For professional *in vitro* diagnostic use only.

【INTENDED USE】

The Norovirus Rapid Test Cassette (Faeces) is a rapid chromatographic immunoassay for the qualitative detection of Norovirus in human faecal specimens to aid in the diagnosis of Norovirus infection.

【SUMMARY】

Noroviruses (NoV) are a genetically diverse group of single stranded RNA, nonenveloped viruses belonging to the Caliciviridae family. For decades they were called "small round structured viruses" (SRSV) or "Norwalk-like viruses" until recently when their taxonomy was investigated using modern molecular techniques. Initially four antigenic types of SRSV were recognized, but more recently three genogroups have been identified with the genus Norovirus. Genogroup 1 and Genogroup 2 are associated with human infections whilst Genogroup 3 is associated with bovine and porcine infection.

Noroviruses are a major cause of acute gastroenteritis worldwide, often causing explosive outbreaks in institutions. They are highly contagious, with an inoculum of as few as ten particles being able to cause infection. Transmission occurs through ingesting contaminated food and water and by person-to-person spread. Transmission is predominantly faecal-oral but may be airborne due to aerosolisation of vomitus, which typically contains abundant infectious virus particles. Outbreaks may involve several routes of transmission. The illness is acute, usually mild, although it has caused fatalities among the frail elderly, and self-limiting and follows an incubation period of 24-48 hours although cases can occur within 12 hours of exposure. The ability of Noroviruses to cause outbreaks in institutions has become a major public health issue. Outbreaks of Norovirus infection can be associated with restaurants and institutions as diverse as nursing homes, hospitals and elite sporting camps. Infections in infants, elderly or frail patients can be fatal if left untreated.

The symptoms of Norovirus illness usually include nausea, vomiting, diarrhea, and some stomach cramping. Sometimes people additionally have a low-grade fever, chills, headache, muscle aches, and a general sense of tiredness. The illness often begins suddenly, and the infected person may feel very sick. In most people the illness is self-limiting with symptoms lasting for about 1 or 2 days. In general, children experience more vomiting than adults.

【PRINCIPLE】

The Norovirus Test Cassette (Faeces) is a qualitative, lateral flow immunoassay for the detection of Norovirus in human faecal specimens.

The assay uses Genogroup 1 and Genogroup 2 specific monoclonal antibodies coated on the test membrane. During testing, the stool specimen reacts with the conjugate antibodies. The mixture migrates upward on the membrane chromatographically by capillary action to react with Genogroup 1 and 2 antibodies on the membrane and generates a coloured line at the level of the T1 and T2 region respectively. The presence of a coloured line in T1 region indicates a positive result for Genogroup 1 and in T2 region for Genogroup 2 respectively, while its absence indicates a negative result. To serve as a procedural control, a coloured line will always appear in the control reaction region (C) indicating that proper volume of specimen has been added and membrane wicking has occurred.

【REAGENTS】

The test contains Genogroup 1 and Genogroup 2 monoclonal antibody coated particles and Genogroup 1 and Genogroup 2 monoclonal antibodies coated on the membrane.

【PRECAUTIONS】

- For professional *in vitro* diagnostic use only. Do not use after expiration date.
- The test cassette should remain in the sealed pouch until use.
- Do not eat, drink or smoke in the area where the specimens or kits are handled.
- Do not use test if pouch is damaged.
- Handle all specimens as if they contain infectious agents. Observe established precautions against microbiological hazards throughout testing and follow standard procedures for proper disposal of specimens.
- Wear protective clothing such as laboratory coats, disposable gloves and eye protection when specimens are being tested.
- The used test should be discarded according to local regulations.
- Humidity and temperature can adversely affect results.

【STORAGE AND STABILITY】

Store as packaged in the sealed pouch either at room temperature or refrigerated (2-30°C). The test is stable through the expiration date printed on the sealed pouch. The test must remain in the sealed pouch containing desiccant until use. **DO NOT FREEZE.** Do not use beyond the expiration date.

【SPECIMEN COLLECTION AND PREPARATION】

- Viral detection is improved by collecting the specimens at the onset of the symptoms. It has been reported that the maximum excretion of Norovirus in the faeces of patients with gastroenteritis occurs 3-13 days after onset of symptoms. If the specimens are collected long after the onset of diarrheic symptoms, the quantity of antigen may not be sufficient to obtain a positive reaction or the antigens detected may not be linked to the diarrheic episode.
- The faecal specimen must be collected in clean, dry, waterproof container containing no detergents, preservatives or transport media.
- Bring the necessary reagents to room temperature before use.

【MATERIALS】

Materials Provided

- Test cassettes
- Specimen collection tube with extraction buffer

Materials Required But Not Provided

- Specimen collection containers
- Timer
- Droppers
- Centrifuge and pipette to dispense 80 µL if required

【DIRECTIONS FOR USE】

Allow the test, specimen, buffer, and/or controls to reach room temperature (15-30°C) prior to testing.

- To collect faecal specimens:

Collect sufficient quantity of faeces (1-2 mL or 1-2 g) in a clean, dry specimen collection container to obtain enough virus particles. Best results will be obtained if the assay is performed within 6 hours after collection. Specimen collected may be stored for 3 days at 2-8°C if not tested within 6 hours. For long term storage, specimens should be kept below -20°C.

- To process faecal specimens:

For Solid Specimens:

Unscrew the cap of the specimen collection tube, then randomly **stab the specimen collection applicator into the faecal specimen in at least 3 different sites** to collect approximately **50 mg of faeces** (equivalent to 1/4 of a pea). Do not scoop the faecal specimen.

For Liquid Specimens:

Hold the dropper vertically, aspirate faecal specimens, and then transfer 50 µL into the specimen collection tube containing the extraction buffer.

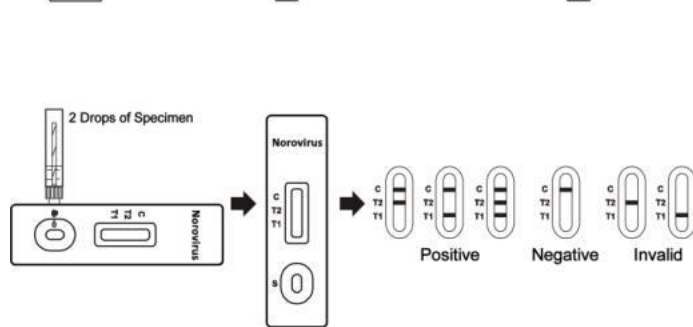
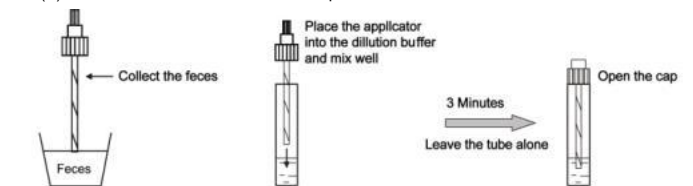
Tighten the cap onto the specimen collection tube, then **shake the specimen collection tube vigorously** to mix the specimen and the extraction buffer.

- Bring the pouch to room temperature before opening it. Remove the test cassette from the foil pouch and use it as soon as possible. Best results will be obtained if the test is performed immediately after opening the foil pouch.

- Hold the specimen collection tube upright and **unscrew the small cap** of the specimen collection tube. Invert the specimen collection tube and **transfer 2 full drops of the extracted specimen** (approximately 80 µL) to the specimen well (S) of the test cassette, then start the timer. Avoid trapping air bubbles in the specimen well (S). See illustration below.

- Read the results at 15 minutes after dispensing the specimen.** Do not read results after 20 minutes.

Note: If the specimen does not migrate (presence of particles), centrifuge the diluted sample contained in the extraction buffer vial. Collect 80 µL of supernatant, dispense into the specimen well (S). Start the timer and continue from step 5 onwards in the above instructions for use.



【INTERPRETATION OF RESULTS】

(Please refer to the illustration above)

Genogroup 1 POSITIVE: **Two distinct coloured lines appear.** One coloured line should be in the control line region (C) and another apparent coloured line should be in the Genogroup 1 region (T1).

Genogroup 2 POSITIVE: **Two distinct coloured lines appear.** One coloured line should be in the control line region (C) and another apparent coloured line should be in the Genogroup 2 region (T2).

Genogroup 1& Genogroup 2 POSITIVE: **Three distinct coloured lines appear.** One coloured line should be in the control region (C) and two coloured lines should be in the Genogroup 1 region (T1) and Genogroup 2 region (T2). A positive result in the Genogroup 1 region and Genogroup 2 region indicates that Genogroup 1 antigen and Genogroup 2 antigen were detected in the sample.

***NOTE:** The intensity of the colour in the test line region (T) will vary depending on the concentration of Norovirus antigen present in the specimen. Therefore, any shade of colour in the test line region (T) should be considered positive.

NEGATIVE: **One coloured line appears in the control line region (C).** No line appears in the test line regions (T1/T2).

INVALID: **Control line (C) 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】

An internal procedural control is included in the test. A coloured line appearing in the control line region (C) is an internal positive 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 a good laboratory practice to confirm the test procedure and to verify proper test performance.

【LIMITATIONS】

- This test should be used for detection of Norovirus antigens in human stool only.
- The Norovirus Rapid Test Cassette only indicates the presence of Norovirus antigen in the specimen and should not be used as the sole criteria for the diagnosis of Norovirus infection.
- Stool sample from infant under one year old can produce a false positive result.
- As with all diagnostic tests, result must be considered together with other clinical information available to the physician.
- If the test result is negative and clinical symptoms persist, additional follow-up testing using other clinical methods is suggested. A negative result at any time does not preclude the possibility of Norovirus infection.

【EXPECTED VALUES】

The Norovirus Rapid Test Cassette (Faeces) has been compared with RT-PCR method, demonstrating an overall accuracy of 94.3%.

【PERFORMANCE CHARACTERISTICS】

Clinical Sensitivity, Specificity and Accuracy

The performance of the Norovirus Rapid Test Cassette has been evaluated with 70 clinical specimens collected from children and young adults in comparison with RT-PCR method. The results show that the relative sensitivity of the Norovirus Rapid Test Cassette (Faeces) is 95.7% and the relative specificity is 91.7%.

One Step Norovirus Rapid Test Cassette vs. RT-PCR

Method	RT-PCR		Total Results
	Results	Positive	Negative
One Step Norovirus Rapid Test Cassette	Positive	44	2
	Negative	2	22
Total Results		46	24

Relative Sensitivity: 95.7% (95%CI: *85.16%-99.57%)

Relative Specificity: 91.7% (95%CI: *73.00%-98.97%)

Relative Accuracy: 94.3% (95%CI: *86.01%-98.42%) *Confidence Intervals

Precision

Intra-Assay

Within-run precision has been determined by using 10 replicates of four specimens: a negative, a low positive, a medium positive and a high positive. The specimens were correctly identified >99% of the time.

Inter-Assay

Between-run precision has been determined by 10 independent assays on the same four specimens: a negative, a low positive, a medium positive and a high positive. The specimens were correctly identified >99% of the time.

Cross-Reactivity

Cross reactivity with following organisms has been studied at 1x10⁷ organisms/mL. The following organisms were found negative when tested with the Norovirus Rapid Test Cassette (Faeces).

<i>Corynebacterium diphtheria</i>	<i>Neisseria gonorrhea</i>	<i>Shigella sonnei</i>
<i>Pseudomonas aeruginosa</i>	<i>Shigella flexneri</i>	<i>Clostridium difficile</i>
<i>Enterococcus faecalis</i>	<i>Proteus vulgaris</i>	<i>Gardnerella vaginalis</i>
<i>Shigella dysenteriae</i>	<i>Enterococcus faecium</i>	<i>Helicobacter pylori</i>
<i>Candida albicans</i>	<i>Proteus mirabilis</i>	<i>E.coli</i>

【BIBLIOGRAPHY】

- Shiota, T., Okame, M., Takanashi, S., Khamrin, P., Takagi, M., Satou, K., Masuoka, Y., Yagyu, F., Shimizu, Y., Kohno, H., Mizuguchi, M., Okitsu, S., Ushijima, H. (2007). Characterization of a Broadly Reactive Monoclonal Antibody against Norovirus Genogroups I and II: Recognition of a Novel Conformational Epitope. J. Virol. 81: 12298-12306
- Nguyen, T. A., Khamrin, P., Takanashi, S., Le Hoang, P., Pham, L. D., Hoang, K. T., Satou, K., Masuoka, Y., Okitsu, S., Ushijima, H. (2007). Evaluation of Immunochromatography Tests for Detection of Rotavirus and Norovirus among Vietnamese Children with Acute Gastroenteritis and the Emergence of a Novel Norovirus GII.4 Variant. J. Trop. Pediatr. 53: 264-269
- M Okame, T Shiota, G Hansman, M Takagi, F Yagyu, S Takanashi, TG Phan, Y Shimizu, H Kohno, S Okitsu, H Ushijima (2007). Anti-norovirus polyclonal antibody and its potential for development of an antigen-ELISA. J Med Virol (2007) 79: 1180-6.
- Tracy Dewese Parker & al., Identification of genogroup I and genogroup II broadly reactive epitopes on the norovirus capsid, Journal of Virology, June 2005: 7402-7409.

Index of Symbols			
	Attention, see instructions for use		Tests per kit
	For in vitro diagnostic use only		Use by
	Store between 2-30°C		Lot Number
	Do not use if package is damaged		Manufacturer
	Authorized Representative		Do not reuse
	Catalog #		Consult Instructions For Use

Number: 145095502
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