

GastroVir-Strip^{color} CE

In vitro Rapid Diagnostic Test for Rotavirus and Adenovirus gastro-enteritis (serotypes 40/41)

FOR IN VITRO USE

For professional use only

Reference : C-1016, 25 tests per kit

EN

C-1516, 10 individually packaged tests per kit, sampling instruments supplied

C- 1216, 20 individually packaged tests per kit

I. INTRODUCTION.

Human gastroenteritis can be caused by viruses (Rotavirus, Adenovirus, Astrovirus, Calcivirus, etc), by bacteria such as Salmonella and by protozoan organisms such as *C. parvum* and *G. lamblia*.

In children under 4 years, virus account for 40% of cases. Among these cases, Rotavirus is the most important cause of the disease (45% of the cases). Each year, rotavirus causes approximately 111 million episodes of gastroenteritis requiring only home care, 25 million clinic visits, 2 million hospitalizations, and 440 000 deaths on average in children <5 years of age. By age 5, nearly every child will have an episode of rotavirus gastroenteritis, 1 in 5 will visit a clinic, 1 in 65 will be hospitalized, and approximately 1 in 293 will die. (CDC, may 2003)⁷ Enteric Adenovirus (EAd) are considered to be the second cause with 5% to 20% of the cases. Although non enteric Adenovirus (NEAd) are found in stool, the serotypes 40 and 41 of subgenes F (EAd) are dominant (30 to 80% of all adenovirus detected in feces) and have been shown to be the main causative agents in enteric infections. Serotypes 40 and 41 are found almost exclusively in stool of ill patients while NEAd serotypes are shed in stool of both ill and control patients. Furthermore, most of the NEAd serotypes found in stool are known to be responsible of respiratory infections (serotypes 1, 2, 3, 4, 5, 6, 7) and for some there are no evidence of being causes of gastroenteritis (serotypes 12, 18).¹⁻²⁻³⁻⁴⁻⁵⁻⁶

Rotavirus is transmitted by faecal-oral contact. After an incubation period of about three days it triggers fever, vomiting, and diarrhea that can persist for up to ten days. Adenovirus infection occurs also by the faecal-oral route, but can also result from inhalation. The incubation period is from five to eight days and the symptoms of the stomach and intestinal inflammation are watery diarrhea, vomiting, fever, and abdominal cramps.

The GastroVir-Strip^{color} detects all Rotavirus group A and Adenovirus subgroup F (serotypes 40/41).

II. PRINCIPLE OF THE TEST

This is a ready-to-use test that is based on the homogeneous membran system technology with latex microspheres. The faecal sample must be diluted in the dilution buffer that is supplied with the test. A nitrocellulose membrane is sensitized with antibodies directed against Rotavirus and Adenovirus. The test's specificity comes from two monoclonal antibodies directed against Group A VP6 proteins of human Rotavirus and specific proteins of human Adenovirus serotype 40/41, respectively, that are conjugated to latex microspheres. These conjugates are dried on a polyester membrane.

When the strip is dipped into the liquid phase of the faecal suspension, the solubilized mixed conjugate migrates with the sample by passive diffusion and the conjugate and sample material come into contact with monoclonal antibody directed against specific Adenovirus proteins. If the sample contains Adenovirus 40/41, the conjugate-Adenovirus complex remains bound to the monoclonal antibody adsorbed to the nitrocellulose and a red line develops. The solution continues to migrate to encounter an anti-Rotavirus monoclonal antibody that is adsorbed to the nitrocellulose. If the sample contains Rotavirus, the conjugate-Rotavirus complex will remain bound to the anti-Rotavirus monoclonal antibody and a blue line will develop. The result is visible within ten minutes. The solution continues to migrate to encounter a third reagent (control reagent) that binds the control conjugate, thereby producing the green control line that confirms that the test is working properly.

III. REAGENTS AND MATERIALS

Each kit contains: GastroVir-Strip^{color} strips, a HC dilution buffer and optional components (for C-1516):

1. GastroVir-Strip^{color} strips

Each strip is sensitized with a mouse monoclonal antibody directed against the VP6 Rotavirus antigen, a mouse monoclonal antibody directed against the Hexon antigens of Adenovirus, and a goat anti-chicken IgY reagent.

The anti-Rotavirus conjugate is produced with a mouse monoclonal antibody and the anti-Adenovirus conjugate is produced with a mouse monoclonal antibody that recognizes the antigens of Adenovirus groups F (serotypes 40/41).

The control conjugate is produced with chicken IgY. These strips come in a bottle or a pouch with a desiccant.

2. HC Dilution buffer (15 ml)

Saline solution buffered to pH 7.5 with Tris and containing EDTA, Na₃ (<0.1%), a detergent, and charged proteins.

Required materials not supplied:

- 3 or 5 ml test tubes
- inoculating loops for taking the faecal samples.

3. Instruction for use (1 X)

4. Required materials (supplied with C-1516)

- 3 or 5 ml test tubes;
- inoculating loops for taking the faecal samples.

IV. SPECIAL PRECAUTIONS

- All operations related to the use of the test must be performed in accordance with Good Laboratory Practices.
- The GastroVir-Strip^{color} are for *in vitro* diagnostic use only.
- Avoid touching the nitrocellulose with your fingers.
- Wear gloves when handling the samples.
- Dispose of gloves, swabs, test tubes, and sensitized strips in accordance with GLP.
- Never use reagents from another kit.
- If strips are stored in contenair, the contenair must be resealed as soon as the necessary number of strips has been removed, since the strips are sensitive to humidity. Make sure that the desiccant sachet is present.
- If strips are stored in individual pouches, pouch must be opened with care to avoid damaging the strip.
- Three green lines indicate the antibody adsorption sites. They disappear during the course of the test.
- Discard the buffer solution if it is contaminated with bacteria or mould.
- The reagents' quality cannot be guaranteed beyond their shelf-life dates or if the reagents are stored under inappropriate conditions.

To avoid diluting the conjugate in the solution, take care not to immerse the strip above the line placed under the arrow.

V. STORAGE

An unopened GastroVir-Strip^{color} kit may be kept between 4 and 30°C and used until the shelf-life date on the packaging. The strips remain stable for 15 weeks (in the closed contenair) after the bottle is opened if they are kept at between 4 and 30°C and in a dry environment. Real-time long-term stability is under evaluation. Intermediate results are available at Coris BioConcept. The GastroVir-Strip^{color} strips and the buffer must not be frozen.

VI. SAMPLES

The stool specimens must be tested as soon as possible after they are collected. If necessary, they may be stored at 2-8°C for 24 hours or -20°C for longer periods of time.

Make sure that the specimens are not treated with solutions containing formaldehyde or its derivatives.

VII. PROCEDURE

Preparations:

If the GastroVir-Strip^{color} kit was kept at 4°C, let all the reagents in the unopened packaging warm up to room temperature before proceeding with the test. Write the patient's name or specimen number on the test tube (prepare one test tube per sample). Place the marked test tubes in a rack.

Procedure:

1. Add 0.5 ml or 15 drops of the dilution buffer solution to each tube.
2. Dip the inoculating loop containing the stool sample into the tube. **The dilution ratio must be at most 4% w/v. For liquid samples, take 2 loops of 10 µL, for solid samples, take 1 loop.**
3. Stir to homogenize the solution and let to stand for 1-2 minutes.
4. Discard the inoculating loop and dip the sensitized strip in the direction indicated by the red arrow.
5. Let react for 10 minutes
6. **Result must be read on still wet strip**

VIII. INTERPRETING THE RESULTS

The results are to be interpreted as follows:

One green line = negative
One green line AND one blue line = Rotavirus
One green line AND one red line = Adenovirus
No line = invalid*

Green, blue and red lines should appear in the case of a Rotavirus + Adenovirus 40/41 infection.

The absence of the control line, which is the upper green line, makes the result invalid. In this case, the sample must be retested.

The intensity of the test line may vary according to the quantity of antigens found in the sample. Any signal, even weak, on each test line must be regarded as a positive result. Nevertheless, the test is qualitative and cannot predict the quantity of antigens present in the sample. The clinical presentation and other test results must be taken into consideration to establish diagnosis. During the drying process, a very faint shadow may appear at the test line. It should not be regarded as a positive result.

To store the results, let the strip dry after removing the absorbent material at its base.

IX. QUALITY CONTROL

In accordance with Good Laboratory Practices, we recommend checking the test's performance regularly in line with the laboratory's requirements. GastroVir Control Test (C-1096), in which the strips are immersed, may be used. Please refer to the C-1096 package insert.

X. PERFORMANCES

A. Sensitivity - Specificity (Correlation):

Rotavirus

1°) The kit was validated on 214 faecal samples by comparison with an EIA method by a third party (France)

EIA	Positive	Negative	Total
GastroVir-Strip^{color} (rota)			
Positive	104	0	104
Negative	2	108	110
Total	106	108	214

Sensitivity: 98.1 % Positive Predictive Value: 100 %
 Specificity: 100 % Negative Predictive Value: 98.2 %

Adenovirus

The kit was validated on 148 faecal samples in comparison with microscopy. Positive were confirmed by EIA.

Microscopy	Positive	Negative	Total
GastroVir-Strip^{color} (40/41 Adeno)			
Positive	11	0	11
Negative	0	137	137
Total	11	137	148

Sensitivity: 100 % Positive Predictive Value: 100 %
 Specificity: 100 % Negative Predictive Value: 100 %

B. Accuracy:

To check the intra-lot accuracy, one rotavirus positive sample and one 40/41 adenovirus positive sample, and a dilution buffer solution (as negative control sample) have been tested 15 times on sticks of the same production lot in the same experimental conditions. All observed results were similar as expected.

To check the inter-lot accuracy, same samples (positive in rotavirus, positive in 40/41 adenovirus and dilution buffer) were tested on three different production lots. All results were similar as expected.

C. Interference

Cross-reactivity to samples positive for the following pathogens was tested and found to be negative: *Enterovirus*, *Rhinovirus*, *HSV*, *Candida albicans*, *Aspergillus niger*, *Haemophila influenza*, *H.pylori*, *Cryptosporidium parvum*, *Giardia lamblia*, *E. coli* K99, *E.coli* (ATCC25922, ATCC35150), *Coronavirus*.

XI. LIMITS OF THE KIT

GastroVir-Strip^{color} kit results must be compared with all other available clinical and laboratory information.

A positive test does not rule out the possibility that other pathogens may be present.

The GastroVir-Strip^{color} is an acute-phase screening test. Stool specimens that are collected after this phase may contain antigen titers below the reagent's sensitivity threshold.

XII. TECHNICAL PROBLEMS / COMPLAINTS

If you encounter a technical problem, or if performances do not correspond to those indicated in this package insert:

- 1- Note the lot No. of the kit in question
- 2- If necessary, store the problem sample in the freezer as soon as possible
- 3- Contact Coris Bioconcept or your local distributor.

XIII. BIBLIOGRAPHIC REFERENCES

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