

HEMAPROMPT FG Fecal & Gastric Occult Blood Testing

I. Principle of the Test

Blood in the feces is often the first and only sign of colonic or rectal malignancy. Blood found in gastric contents may be used for early detection of conditions such as gastritis, ulcers or cancer. The HemaPrompt FG test is based on the oxidation of phenolic compounds present in guaiac to quinones, resulting in the production of a blue color. If blood is present in the fecal or gastric sample, the heme portion of the hemoglobin molecule can function in a pseudoenzymatic manner, catalyzing the release of oxygen from the hydrogen peroxide, which in turn causes the oxidation of guaiac. HemaPrompt FG is composed of guaiac-impregnated paper mounted on a cardboard frame that permits sample applications to one side with development and interpretation from the reverse side. A buffer has been added to the paper to increase the pH of the gastric specimen, thus decreasing the likelihood of false negative test results, which may be seen with low pH gastric specimens. The stool or gastric aspirate specimen containing occult blood contacts the guaiac-impregnated paper and a pseudo-peroxidase reaction occurs when developing solution is brought into contact with the guaiac paper, by pulling the tab. The test paper will turn blue within 30 to 60 seconds in the presence of more than 2 mg hemoglobin per gram feces / 100 mcg hemoglobin per ml gastric juice.

II. Specimen

Fecal:

- A. It is recommended that the patient be placed on a high residue diet for two days before collecting the stool specimen. Eliminate red meat, raw fruit, and vegetables high in peroxidase (turnips, red radishes, and horseradish). Drugs to avoid that could interfere with test results include the following: Vitamin C, alcohol, aspirin, Iron, Ibuprofen, Naproxin and other arthritis medicines. (Refer to X. Interfering Substances for complete list of those dietary/medication items that interfere with patient results) However, the special diet may be omitted initially with diet restrictions imposed upon re-testing of all positive results.
- B. Stool samples from three consecutive bowel movements or three bowel movements closely spaced in time should be collected.
- C. Collect specimens in a clean specimen collection container with a screw-capped top. Alternately, the stool sample may be applied directly to the HemaPrompt FG test card after performing a rectal examination.

Gastric:

- A. Gastric contents obtained from a naso-gastric tube or vomitus may be applied directly to the HemaPrompt FG test card from the NG tube or by means of cotton tipped swab.

III. Materials

- A. Supplies
 1. HemaPrompt FG test cards
 2. Applicator sticks
 3. Gloves (recommended during HemaPrompt FG testing)

IV. Storage and Stability

Store HemaPrompt FG test cards at room temperature 10-24°C (50-75°F) in original packaging. Protect cards from heat, sunlight, fluorescent light, UV radiation, humidity, volatile chemicals and

gases. Do not refrigerate or freeze. Test cards are stable until the expiration date stamped on each test card label, after which time the cards should not be used.

V. Quality Control

Quality Control is automatically performed on a test card each time a patient sample is tested. After the developer has been added, a blue checkmark (internal positive control) will appear at the right side of the test card and the background behind the blue checkmark will remain white (internal negative control). These controls verify that the test has been performed correctly and the card is functioning properly.

1. Turn the Hemaprompt FG test card over to the reverse side.
2. Holding the card facing you, gently lift up the silver tab and slowly pull it all the way to the right and completely remove it from the test card.
3. A blue checkmark (positive control) will appear through the clear plastic window within 60 seconds after pulling the tab.
4. The background behind the blue checkmark should remain white, which serves as the negative control.
5. Record Quality Control result on removable test card label (place a check mark in QC box to indicate the positive and negative control functioned correctly, as described above in V.3 & V.4)

VI. Quality Control Remedial Action

1. If the positive control area does not produce the blue* checkmark and/or the background behind the blue checkmark does not remain white, check the expiration date of all supplies involved and repeat the test with a new card.
2. If internal controls do not give expected results, patient results are not valid and should not be reported.
3. The guaiac paper of the test card should be white or off-white in color prior to testing. Do not use cards if the guaiac paper is blue or gray.

* *NOTE:* If the checkmark is pink after the developer tab has been pulled, this indicates that the developer pad was dry (no developer was applied to the sample) – Do not accept patient results. Repeat the test with a new card.

VII. Procedure

1. Open the Hemaprompt FG test card so both specimen windows are visible.
2. Apply the specimen to the test card windows
Fecal Specimen:
 - A. Using Universal Precautions, collect a small fecal sample on the applicator stick provided in Hemaprompt FG kit.
 - B. Apply a very thin smear of stool to the first window (do not completely cover window)
 - C. Reuse applicator to obtain a second sample from a different part of the specimen.
 - D. Apply a thin smear to the second window (do not completely cover window).**Gastric Specimen:**
 - A. Using Universal Precautions, collect and apply a thin smear of specimen directly from NG tube or by means of a cotton tipped applicator.
 - B. Apply gastric specimen to both windows on the test card (do not completely cover window)
3. Close the cover of the test card, avoiding finger pressure to card.
4. Turn the card over to the back. Holding the card facing you, gently lift up the silver tab so that the white developer pad is exposed.
5. While gripping the tab with thumb and finger of other hand, slowly and steadily pull the long silver tab all the way to the right and completely remove it from the test card.
6. Wait one minute after pulling tab before interpreting the test result. (Note: Interpret all results before 3 minutes)

VIII. Results

A. Interpretation:

1. Positive - Any blue color in either specimen window. Look for any shade of blue, even if only a faint tinge.
2. Negative - No detectable blue color on either window.

IX. Limitations

- A. Stool samples should not be collected if the patient is experiencing menstrual bleeding, constipation bleeding, bleeding hemorrhoids or when rectal suppositories or medication is being used.
- B. Gastro-intestinal cancers, adenomas and ulcerations do not always bleed. Also, blood if present, may not be distributed uniformly in the fecal specimen. Consequently, a test result may be negative even when disease is present.
- C. HemaPrompt test cards are designed for preliminary screening as an aid to diagnosis. They are not intended as a replacement for other diagnostic procedures. Further testing and examination by the physician such as gastroscopy, sigmoidoscopy, barium enema, and x-ray studies need to be performed to determine the exact cause and source of the occult blood in the stool/gastric specimen.
- D. HemaPrompt test results are to be read 1 minute after pulling the silver tab, but before 3 minutes. After 3 minutes, intensity of blue color may decrease or fade, and possibly appear negative.
- E. Gastric samples may occasionally appear green or blue when applied to the test card. When this occurs, care must be taken that only the formation of additional blue can be regarded as positive.

X. Interfering Substances

A. Fecal specimens

1. Red and rare meats, horseradish, raw fruits and vegetables such as broccoli, cauliflower, red radish, cantaloupe, parsnips and turnips, or other high peroxidase-containing vegetables, which can cause false positive results.
2. Certain medications such as aspirin, indomethacin, phenylbutazone, reserpine, corticosteroids and non-steroidal anti-inflammatory drugs can cause gastrointestinal bleeding and give false positive results. Iron containing compounds may cause false positive results.
3. Vitamin C in dosages greater than 250 mg per day has been shown to cause false negative results.

B. Gastric specimens

1. All foods and medications listed above may cause false positive (or negative) results in gastric specimens.
2. Cimetidine (Tagamet) may cause false positive results.

C. Hemaprompt FG Re-testing

After false positive result is obtained, discontinue food item believed to have caused the false positive test for 2 days, then retest. Medications need to be discontinued at the advice of the physician for 7 days before and during the test period.

XI. Procedural Notes

- A. Gloves should be worn during testing to prevent skin contact with developer solution.
- B. Test cards with fecal specimen applied may be developed for up to 5 days post-application when test cards are stored at room temperature 10-24°C (50-75°F).

XII. Reference

HemaPrompt FG Product Information. 1996. Aerscher Diagnostics, Chestertown, MD. (Updated March 2014)