

SUBJECT:                   GASTRIC OCCULT BLOOD AND pH  
                                  USING THE  
                                  GASTROCCULT® TEST CARD

Original Date: 2/1997  
Effective Date: 2/1997

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**I.     PURPOSE:**

The Gastrocult® test is a semi-quantitative guaiac method for detecting occult blood in gastric aspirate or vomitus. It is recommended for diagnostic use as an aid in the diagnosis and management of various gastric conditions which may be encountered in intensive care areas, the emergency room, surgical recovery room and other clinical settings. The dual identification of occult blood and pH can be useful in the early detection of gastric trauma or deteriorating gastric condition, and evaluation of antacid therapy. The Gastrocult® test is designed for use as a preliminary screening aid and is not intended to replace other diagnostic procedures such as gastroscopic examination or X-ray studies.

**II.    DEFINITION:**

Van Deen discovered the use of guaiac in detecting blood. In this test, alpha guaiaconic acid (active component of guaiac) reacts with hydrogen peroxide (active component of the developer) in the presence of heme (peroxidative type of catalyst present in hemoglobin) to produce a highly conjugated blue quinone compound. The pH test is based on changes in the color of dyes due to changes in hydrogen ion concentration.

**III.   POLICY:**

A.   GENERAL

1. Staff who have documented evidence of training and competency may perform the Gastrocult® test. All personnel performing the test must be tested for difficulty with visual color discrimination. Because this test is visually read and requires color differentiation, it should not be interpreted by the visually impaired.
2. New personnel will be oriented to the procedures for performing the Gastrocult® test during orientation.
3. Skill validation in testing procedures will occur on nursing units during orientation. Thereafter, all personnel will be validated annually. Individual records will be maintained on the unit documenting current satisfactory performance.
4. The Gastrocult® test is not recommended for use with fecal specimens.
5. Patient specimens, and all materials that come in contact with them, should be handled as potentially infectious and disposed of according to Standard Precautions guidelines.

B.   SPECIMEN

1. Gastric aspirate obtained by nasogastric intubation or vomitus are appropriate specimens for use with the Gastrocult® test. Specimen may be applied by using the applicators provided in the kit, or by any other method whereby a small amount of test material is applied to the reaction areas.
2. No special patient preparation is necessary. It is recommended that specimens be tested immediately after collection. If this is not possible, the following procedure will yield satisfactory results:
  - a. Apply the sample in the pH Test Area and Gastrocult® Test Area (for occult blood). Read the pH within 30 seconds after sample application. The Gastrocult® Test Area may be developed immediately or up to 4 days, at room temperature 15-25 C, after sample application.
  - b. Specimens for occult blood testing may be stored, prior to application, in a clean sealed container (plastic or glass) for 24 hours at room temperature 15-25 C or 5 days, refrigerated 2-8 C.

#### C. REAGENTS AND MATERIALS

The Gastrocult® test consists of two main components:

- Gastrocult® Slides (consists of standardized, high-quality filter paper treated with natural guaiacs resin and dyes sensitive to hydrogen ion concentration)
- Gastrocult® Developer (a developing solution containing a stabilized mixture of less than 2.9% hydrogen peroxide and 30% denatured ethyl alcohol in citrate-buffered aqueous solution)

##### **Slides**

Do not use after the expiration date which appears on each slide. Keep flap of slide sealed until ready to use. Gastrocult® slides present no hazard to the user.

##### **Developer**

Gastrocult® Developer should be protected from heat and the bottle kept tightly capped when not in use. It is flammable and subject to evaporation. Gastrocult® Developer is an irritant. Avoid contact with skin. Do not use in eyes. Should contact occur, rinse promptly with water. Do not use after expiration date on bottle. Developer must be labeled with the date opened.

##### **Storage and Stability**

Do not refrigerate or freeze. Store at controlled room temperature 15-30 C in original packaging. Protect from heat and light. Do not store with volatile chemicals (e.g., iodine, chlorine, bromine, or ammonia). The Gastrocult® slides and Developer, stored as recommended, will remain stable until the expiration dates, which appear on each slide and developer bottle.

Only use Gastrocult® Developer to develop the Gastrocult® test. Do not use Hemocult Developer or any other developing solution for the Gastrocult test.

Gastrocult® slides and Developer may be obtained from Owens and Minor(vendor). Product #5891-066040\*12061. Owens & Minor ph# 804-228-8963.

#### D. QUALITY ASSESSMENT

1. The function and stability of the guaiac paper and developer can be tested using the on-slide Performance Monitor (quality control) feature located to the right of the occult blood test area. The positive Performance Monitor area contains a hemoglobin-derived

catalyst, which, upon application of developer, will turn blue within 10 seconds. The color will remain stable for at least 60 seconds.

2. The negative Performance Monitor area contains no catalyst and should not turn blue upon application of Developer.
3. The following manufacturer recommendations for quality control should be performed on each Gastrocult® slide:
  - a. Perform quality control procedure only after patient test area has been developed, read and interpreted.
  - b. Apply one drop of Hemocult Developer between the positive and negative Performance Monitor areas.
  - c. Result must be read within 10 seconds.
  - d. If the slide and developer are functional, a blue color will appear in the positive Performance Monitor area, while no blue color will appear in the negative Performance Monitor area.
4. Quality control must be performed when opening a new box on the pH Test area of the Gastrocult® slide using two pH buffers with concentrations of 4 and 7 when the box is opened. pH buffers may be obtained from the laboratory (828-6767 ext.334). Do not use slides beyond expiration date on box.
5. If the Performance Monitor or the pH Test area quality control does not perform as described, disregard test results and repeat test using a new card. If the Performance Monitor areas do not perform appropriately on the repeat test, seek supervisory assistance. Consult the Charge Nurse, Clinical Coordinator, Nurse Manager or Point-of-Care Testing Supervisor in the laboratory.
6. Problems related to performance of test which cannot be resolved will be reported to the Charge/resource Nurse of Point-of-Care Testing Supervisor.

#### E. RESULT REPORTING AND REVIEWING

1. Results are reported as positive or negative for occult blood and from 1-7+ for pH.
2. Gastric Occult Blood and pH testing performed, using the approved supplies, by licensed professionals (who qualify as supervisors according to CLIA 88 guidelines) are reviewed at the time of test performance, prior to being transferred to the patient chart. Once the result is transferred to the chart, the person transcribing the result should reconfirm the result. If a patient test is performed by anyone other than a licensed professional, the test result must be initialed by a licensed professional, when it is transferred to the patient chart.
3. If an error is detected by a licensed professional upon review of the test result, corrective actions must be initiated immediately. The corrective action involves making the correction to the patient chart and initialing it.
4. Point-of-care testing results that do not correlate with patient condition should be followed up by confirmatory testing in the main laboratory.

#### IV. PROCEDURES:

##### **PROCEDURE A: SPECIMEN COLLECTION/TEST PERFORMANCE/QUALITY CONTROL**

Requisites:

Gastrocult® Slides  
Gastrocult® Developer  
Applicator or 1 ml syringe  
Clean Specimen Collection Container  
Gloves

Patient Preparation:

None required

Specimen Collection:

1. Wash hands and put on gloves.
2. Verify patient identification (In-patient: check name and medical record number on the patient's ID bracelet; Out-patient: verbally confirm patient identification). Position patient in high Fowler's position in bed or chair.
3. Close bedside curtains or door to room.
4. Insert nasogastric tube, if indicated.
5. Obtain specimen of gastric contents by attaching bulb syringe to nasogastric tube and aspirating to 10 ml; obtain sample of emesis with 1 ml syringe or wooden applicator.

Procedure:

1. Write patient name and medical record # (or other patient-specific identifier) on the Gastrocult® slide. Open slide.
2. Using applicator or syringe, apply 1 drop of gastric specimen to pH test circle and one drop to occult blood test area.
3. Determine pH of specimen by visual comparison of test area to pH color comparator. **This must be done within 30 seconds after sample application.**
4. Apply two drops of Gastrocult® Developer directly over the sample in the occult blood test area. **IMPORTANT NOTE:** Occasional gastric specimens may be highly colored and appear as blue or green on the test area. Test results should only be regarded as positive if additional blue is formed after developer is added.
5. Interpret occult blood results within 60 seconds.

Interpretation:

The development of any trace of blue color in the occult blood test area is regarded as a positive result.

Considerations:

Many foods (e.g., incompletely cooked meat, raw fruits, and vegetables, etc.) have peroxidase activity which can produce a positive Gastrocult® test result. Thus, a positive result does not always indicate the presence of human blood.

Quality Control (occult blood):

1. Apply one drop of Gastrocult® Developer **between** the positive and negative Performance Monitor areas.
2. Interpret Performance Monitor results within 10 seconds.

Interpretation:

- A. If the slide and developer are functional, a blue color will appear in the positive Performance Monitor area, while no blue will appear in the negative Performance Monitor area. Note: If the specimen is applied in such a way that it contacts the Performance Monitor areas, the negative Performance Monitor area may appear positive. This should be avoided.
- B. Any blue originating from the Performance Monitor areas should be ignored when reading the specimen test results.
- C. Neither the intensity nor the shade of the blue from the positive Performance Monitor area should be used as a reference for the appearance of positive test results.

Quality Control (pH – performed per box):

1. Apply one drop of pH buffer (4) to the pH test circle.
2. Within 30 seconds, determine pH by visual comparison of test area to pH color comparator.
3. Repeat procedure with pH buffer (7).

\*Document all patient test results on the flowsheet. Describe characteristics of gastric contents.

\*\*Document quality control for Occult Performance Monitor results on the Quality Control Tracking Log once each day. Document quality control for pH buffer on Quality Control Tracking Log each time a new box of Gastrocult® cards is opened.

\*\*Dispose of patient specimens and all materials that come in contact with them following Standard Precautions guidelines.

**V. APPENDIX:**

**APPENDIX A: ABOUT THE TEST**

Evaluation:

Assess quantity and character of emesis or gastric secretions.  
Compare test findings with normal expected results.

Expected Outcomes:

Gastric secretions are greenish to clear, with no evidence of bleeding or clots.  
pH level is 2-3 in a normal, healthy individual; in an active ulcer patient, pH level is 1-2.  
Test is negative for occult blood.

Unexpected Outcomes:

Gastric secretions may contain clots or be bloody. Emesis may have “coffee grounds” appearance.  
pH level is above or below expected range.  
Test is positive for occult blood.

Interfering Substances:

#### Antacids

It is unlikely that there will be any inhibition of the occult blood test by antacids if gastric specimens are tested no sooner than 60 minutes after last antacid administration and following stomach irrigation.

#### Ascorbic Acid

Ascorbic acid (vitamin C) has been shown to cause false-negative test results for occult blood. This can be expected to be true for the Gastrocult® test also.

#### Procedural Limitations Provided by Manufacturer:

The results of the Gastrocult® test cannot be considered conclusive evidence of the presence or absence of upper gastrointestinal bleeding or pathology.

Many foods (e.g., incompletely cooked meat, raw vegetables and fruits, etc.) have peroxidase activity which can produce a positive Gastrocult® test result. Thus, a positive result does not always indicate the presence of human blood.

Gastrocult® tests are designed as an aid to diagnosis, and are not intended to replace other diagnostic procedures such as gastroscopic examination or X-ray studies.

Gastrocult® test results should be used only in conjunction with other information relevant to the clinical status of the patient. A positive test result may suggest the need for more careful monitoring of the patient.

#### **VI. REFERENCES:**

Gastrocult® Test For Gastric Occult Blood and pH, Product Instructions, SmithKline Diagnostics, Inc., San Jose, CA 1993.

Gastrocult® Test For Gastric Occult Blood and pH, Policy A.462405, SmithKline Diagnostics, Inc., San Jose, CA 1993.

SmithKline Diagnostics, Inc., Technical Support.

Perry & Potter, Skill 45-12 Obtaining Gastric Specimens, p. 964-966.

#### **VII. RESOURCES:**

Procedure Committee  
Department of Clinical Pathology