

Occult Blood Testing

- Points** Points are awarded for Skills, including general lab requirements, as well as successful and timely completion of Study Questions.
- Objectives**
1. According to the standards set by the instructor, the student will use the appropriate manufacturer's instructions to analyze prepared specimen(s) for the presence of occult blood with 100% accuracy.
 2. The student will be able to in writing or verbally:
 - A. Explain the purpose for performing the occult blood test.
 - B. Provide a definition for "occult" blood.
 - C. Provide dietary directions to be given to a patient as they prepare for the occult blood test including listing of foods / medications to be avoided and foods they are encouraged to eat prior to the testing period.
 - D. State the principle of the occult blood test, including the appearance of a positive reaction and listing of any interfering substances.
 - E. State how the slide is prepared, including the length of time the slide may be used.
 3. According to the standards set by the instructor, use appropriate recording format.
 4. View: <http://www.operationalmedicine.org/ed2/Video/Hemoccult.mpg>
 5. Use quality control results to determine the acceptability of test results
 6. Answer all pre-test and study questions using related information found in the textbook, lecture guide, and this lab procedure.
- Equipment & Supplies**
1. Prepared occult blood testing slides.
 2. Appropriate color developer.
 3. Manufacturers product insert / instructions.
 4. Appropriate PPE, disinfection and disposing materials.
- References**
- Package inserts
Course lecture guide & Powerpoints
Mundt, L.A., & Shanahan, K., Graff's Textbook of Urinalysis and Body Fluids, 2nd ed. Lippincott Williams & Wilkins. Chapter 13. OR current course textbook.
- Discussion**
1. Blood may be found in stool samples as a result of various reasons including:
 - A. recent gastrointestinal surgery
 - B. colorectal and gastric (stomach) cancers
 - C. ulcers
 - D. hemorrhoids
 - E. polyps
 - F. inflammatory bowel disease
 - G. irritations or lesions of the gastrointestinal tract caused by medications (such as nonsteroidal anti-inflammatory drugs, also called NSAIDs)
 - H. irritations or lesions of the gastrointestinal tract caused by stomach acid disorders, such as reflux esophagitis
 2. Blood present in stool samples may or may not retain its bright red color due to the digestive process. The term "occult" blood is used to describe blood that is not obvious or is hidden.
 3. The occult blood is recommended for use as a diagnostic aid during routine physical examination, when hospital patients are first admitted, to monitor for bleeding in patients recuperating from surgery and other conditions, and in screening programs for colorectal cancer.
 4. The occult blood test does not 'test' colorectal cancer or any other specific disease. It is used as a qualitative aid to the diagnosis of various gastrointestinal conditions which manifest themselves by the presence of fecal occult blood. The occult blood tests detects excess blood loss which may have significance when related to certain diseases such as colorectal cancer.

5. A positive result on a properly collected and performed occult blood test should be followed up medically. A negative test usually indicates no significant blood present.
6. The accuracy of the test depends upon the status of the patient at the time the specimen is taken and may be affected by interfering substances.

Principle The hemoglobin portion of whole blood is capable of exerting a peroxidase -like activity and thus able to catalyze the oxidation of alpha-guaiaconic acid.

The reaction between alpha-guaiaconic acid in the guaiac resin (on the special absorbent paper) and hydrogen peroxide (in the developer) is catalyzed by the hemoglobin fraction of blood (if present in the specimen) producing a visible blue color.

- Overview**
1. A smear of a (stool) sample is applied to one side of a special absorbent paper impregnated with natural guaiac resin and allowed.
 2. A short period of time (some manufactures recommend 3 minutes.) should be provided to allow any blood present the opportunity to interact with the guaiac the paper.
 3. The paper is turned over and a special developer is added.
 4. The developer will react with hemoglobin released from lysed red blood cells resulting in the formation of blue color if blood is present.
 5. The test reaction is based on the oxidation of guaiac by hydrogen peroxide to a blue-colored compound. Hemoglobin, if present in the (fecal) specimen, acts as a pseudo-peroxidase material, catalyzing the oxidation of alpha guaiaconic acid (active component of guaiac paper) by hydrogen peroxide (active component of the developer) to form a highly conjugated blue quinone compound.
 6. Appearance of any blue color on the specimen area of the slide is an indication of the presence of occult blood.

- Patient Preparation**
1. If possible the patient should be placed on a red meat-free low-peroxidase diet for at least two (2) days prior to and during the testing period to reduce the possibility of positive results due to diet.
 2. The patient may consume:
 - * Generous amounts of cooked and uncooked vegetables such as lettuce, corn and spinach.
 - * Moderate amounts of high fiber foods such as bran cereal, peanuts, and popcorn. (Roughage that may help uncover silent lesions which may bleed intermittently and may increase the rate of detection of true positive reactions.)
 - * Well cooked pork, poultry and fish.
 - * Prunes, grapes, plums and apples.

If any of the above dietary restrictions and recommendations are known to cause discomfort, patients should be instructed to inform their physician. The patient should always consult the physician before discontinuing or interrupting any prescription medications.

3. The patient should **not** consume:
 - * Rare and lightly cooked meats, especially beef.
 - * Cauliflower, turnips or broccoli, unless very well cooked.
 - * Horseradish, radishes or cantaloupe.
 - * Iron rich supplements
 - * Vitamin C in excess of 250 mg per day. (False negative reactions have been noted with linked to vitamin C. Patient should discontinue vitamin C supplements 2 days prior to and during collection period.)

- * Aspirin and other anti-inflammatory drugs / medications which may cause gastrointestinal irritation should be avoided for 7 days prior to and during the test period. (Certain other medications may also cause false positive results.)
- * Excessive amounts of alcoholic drinks.

Specimen Collection 1. The specimen required is a small stool sample which should be applied as a **very thin smear** onto the both windows of the slide. NOTE: sampling should be obtained from various parts of the stool sample to increase reliability of test results.

2. The window flap should be secured closed after sample is applied and the sample sent to the laboratory area for testing.
3. After the very short incubation time, slides may be developed, or may be stored and developed up to 8 days after specimen application.
4. Once the slides have been prepared with a specimen, keep them away from heat and light.
5. The work area should be kept clean and free of blood to avoid accidental contact of blood with the slides.
6. Patients experiencing hemorrhoidal bleeding, having a menstrual period, or bleeding from the nose, gums, etc. should delay testing for at least 48 hours from the time that all such bleeding has stopped.
7. To increase the chances of detecting intermittent gastrointestinal bleeding, it is recommended that stool samples be collected from three consecutive bowel movements and that two smears be made from two different areas of each bowel movement, especially from darkened or discolored areas of the feces. Excessive GI bleeding may result in black, tarry stools.

- Procedure** 1. Write the patient information from the front flap of the slide onto your report form.
2. Turn the slide over and open the flap to expose the test area. **Caution:** The slides have fecal material on them, handle with care.

Note: The procedure directions that follow are for general information /use; **always follow the manufacturer's specific directions for the procedure / kit being used.**

3. Apply two drops of developer solution to each smear in the Specimen Test Area.
4. Read results within 30 to 60 seconds. Any trace of blue color is positive for occult blood. Color begins to fade after 2 to 4 minutes.
5. Develop the performance control only after specimen tests have been completed and interpreted. Apply one drop of developer solution to the Performance control Line. A blue color should appear within 30 seconds when the reagent test paper and developer are performing according to specifications.
6. Use appropriate format for recording patient and performance control results on the report form provided. Result forms not using appropriate format will have a 50% penalty.
 - * Recording of any laboratory result MUST be in black or blue ink.
 - * Acceptable recording for positive results:
Positive / Pos
 - * Acceptable recording for negative results:
Negative / Neg

Occult Blood Test - Recording Results

5 points.

Name _____ Date _____

- NOTES**
1. Record results as "Positive" or "Negative."
 2. If manufacturer does not provide the negative control, mark the "Negative" area under the Control Result as "NA" for not available.

Patient Name	ID Number	Control Result		Patient Result
		Positive	Negative	
1.				
2.				



OCCULT BLOOD & FECAL ANALYSIS

Points

Name _____

Date _____

Instructions: Use lecture / lab reference materials as well as textbook to answer the following questions. Unless otherwise noted, each question is worth 1 point. Study Questions are due the class period following the lab period, unless otherwise directed by the course instructor.

(2 pts)

1. State four (4) reasons for performing a fecal analysis.

2. Define steatorrhea.

3. What types of conditions is the occult blood used to monitor or diagnose?

(2 pts)

4. What is the principle of the occult blood test?

5. What could cause a false positive fecal occult blood test result?

6. What could cause a false negative fecal blood test result?

(2 pts)

7. List four foods which should be avoided two days before performing the occult blood test.

(2 pts)

8. List four foods which patients should be encouraged to eat three days prior to the occult blood test.

9. List at least two conditions which would require the patient to postpone / delay the sample collections for at least 48 hours.

10. What is the minimum time that the sample should be in contact with the guaiac paper before the developer is applied?

11. How long can the occult blood slides be stored after application of the specimen and before tested?

(2 pts)

12. Briefly describe the recommended procedure for collection of stool samples for occult blood testing that would increase the chances of detecting intermittent GI bleeding? (Do not need to address dietary concerns here.)

(3 pts)

13. The immunochemical fecal occult blood test (iFOBT) is replacing the guaiac based tests. Complete the table that follows to answer the questions.

How does this testing differ from guaiac?	
What makes this testing unique and specific to human blood?	
What is the name of the commercial product?	