

ACTIVITY WEEK 2

Recourse Person : Rika Nilapsari/Yani Triyani
 Subject : Chemical Examination of Urine and Stool analysis (Fecal Occult Blood)
 Department : Clinical Pathology

A.	Sequent		
	I	Introduction	: 30 minutes
	II	Pretest	: 10 minutes
	III	Lab Activities	: 40 minutes
	IV	Post test	: 10 minutes
B.	Topic		
	Chemical Examination of Urine Fecal Occult Blood		: 40 minutes
C.	Venue		
	Biomedical Laboratory, Faculty of Medicine, Unisba, Jl. Tamansari No.22 Bandung 40116		
D.	Equipment		
	<ol style="list-style-type: none"> 1. Gloves 2. Hand disinfectant 3. Fresh urine samples 4. Reagent strip with color chart 5. Laboratory tissue 6. Test tube 7. Test tube rack 8. Urinalysis report form 		
E.	Pre-requisite/Pre-test		
	Note: If the pre-test score less than 50, the student can't allow to do lab. Activities		
F.	Lab Activities 1:		
	<ol style="list-style-type: none"> 1. The Students were divided into six group 2. Each group do lab. Activities accompanied by tutor <p>The purposes of performing routine urinalysis are :</p> <ol style="list-style-type: none"> 1. To aid diagnosis in the disease 2. To screen for symptomatic, congenital or hereditary disease 3. To monitor disease progression 4. To monitor therapy effectiveness or complication <p>SPECIMEN TYPES</p>		

TABLE 3-1 Urine Specimen Types

Specimen Type	Description	Uses
Random	<ul style="list-style-type: none"> Urine collected at any time 	<ul style="list-style-type: none"> Routine screening Cytology studies (with prior hydration) Fluid deprivation tests
First morning	<ul style="list-style-type: none"> First urine voided after sleep (=6 to 8 hours) Most concentrated urine 	<ul style="list-style-type: none"> Routine screening; good recovery of cells and casts To confirm postural or orthostatic proteinuria Cytology studies
Timed	<ul style="list-style-type: none"> Collect all urine during a specific timed interval (e.g., 24-hour, 12-hour, 2-hour) Preservatives and/or refrigeration during collection may be required 	<ul style="list-style-type: none"> Quantitative chemical analysis Clearance tests Cytology studies Evaluation of fistula

Urinalysis Steps :

PRE-ANALYTIC : patient preparation, samples collection, samples handling, labelling, refrigeration, preservatives of urine specimens.

ANALYTIC: principle of procedures, measurements, interpretation, conventional & rapid and sophisticated

POST-ANALYTIC: recording, reporting, use of units : conventional unit and international unit

QUALITY CONTROL (QC):calibration, control solution to get good and reliable results

PRE ANALYTIC

Specimen collection

- Requisition form** must accompany with specimen delivered to the lab; the form include : patient's name, I.D number, date and time of collection and additional information : age, location, physician's name, type of specimen/method, interfering medication and clinical information
- Container** clean, dry, leak proof, disposable
- All specimens must be properly labeled** must be attach to the container, not to the lid, should not become detached if the container is refrigerated
- The information on form requisition** match with the inform on the label

ANALYTIC STAGE

Method :

Manual/ Conventional
Automatic

Classification :

Screening Test

Confirmatory test

SCREENING TEST

- Physical examination(macroscopis)
- Microscopis
- Chemical dipstik urinaysis

CONFIRMATORY TEST

- Culture urine
- 24 h quantitative proteinuria
- Oval fat bodies. Etc

CHEMICAL DIPSTIK URINALYSIS

CONVENTIONAL:

RAPID : SOPHISTICATED

pH : Lakmus

SG : Urinometry, Refractometry

Protein: Bang (sulfosalysilic acid)

Glucose : Benedict (redox)

Urobilinogen : Schmidt

Urobilin : Schlessinger

**Bilirubin : Foam test, Harrison,
Hawkinson**

Ketones : Rothera, Gerhardt

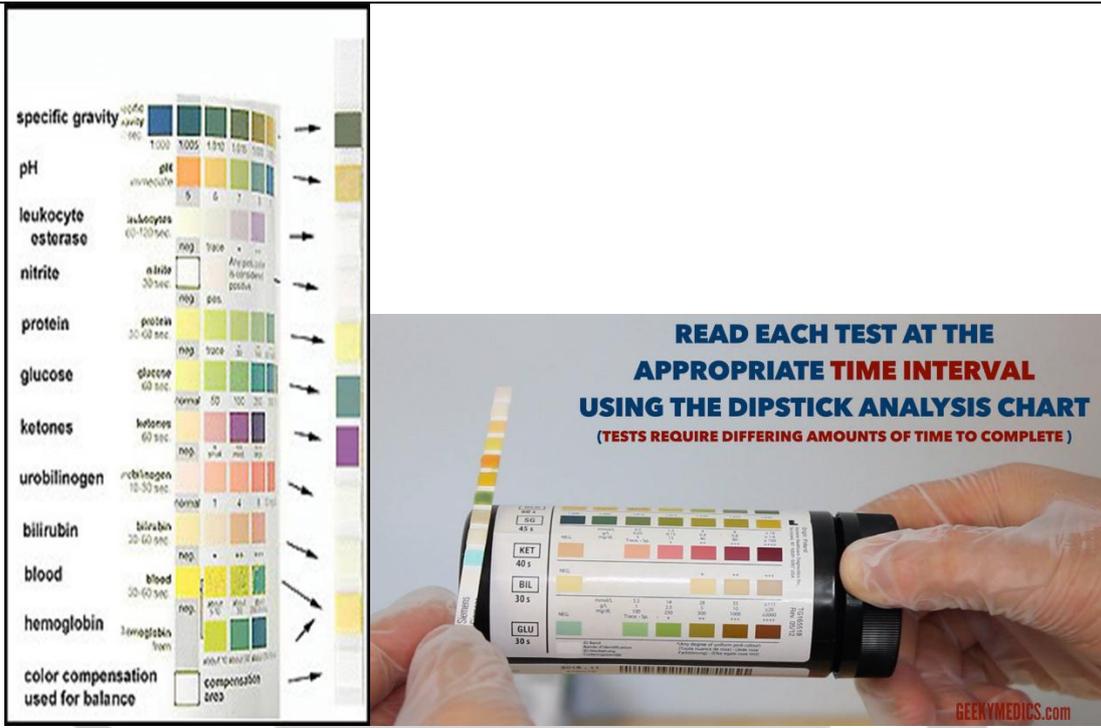
Blood : Benzidine

REAGENT STRIPS :

COMBUR, URISCAN, MULTISTIX

READER :

**visual or by using an automated ins-
trument (photometry)**



PROCEDURE

- Wash hands with disinfectant and put on gloves
- Assemble equipment and materials
- Obtain urine specimen.
- Dip reagent strip into urine sample, moistening all pads
- Remove strip from urine immediately and tap to remove excess urine; blot edge on tissue paper. Begin timing as strip is withdrawn from urine.
- Observe reagent pads and compare colors to color chart at appropriate time intervals
- Record results on urinalysis worksheet
- Discard reagent strip into biohazard container

**STUDENT TASK :
WORKSHEET
CHEMICAL EXAMINATION OF URINE**

Name : Date :

Specimen ID :

REAGENT STRIP	OBSERVED RESULT	REFERENCE VALUE
pH	5.5 – 8.0
Protein	negative, trace
Glucose	negative

Ketone	.....	negative
Bilirubin	.....	negative
Blood	.....	negative
Urobilinogen	.....	0.1 – 1.0 EU/dL
Nitrite	.....	negative
Leucocyte esterase	.....	negative
Specific gravity	.....	1.005 – 1.030

Lab Activities 2 :

FECAL OCCULT BLOOD

Examination of stool provides important information that aids in the differential diagnosis of various gastrointestinal tract disorders, which range from maldigestion and malabsorption to bleeding or infestation by bacteria, viruses, or parasites.

By far the test that currently is most commonly performed on stool is the chemical test for occult, or hidden, blood. Fecal occult blood is recognized as the earliest and most frequent initial symptom of colorectal cancer.

PREANALYTICAL:

Patient Preparation:

A. It is recommended that the patient be placed on a high residue diet starting 2 days before and continuing through the test period.

DIET MAY INCLUDE:

1. Meats: Only small amounts of well-cooked chicken, turkey and tuna.
2. Vegetables: Generous amounts of both raw and cooked vegetables including lettuce, corn, spinach, carrots and celery. Avoid raw vegetables with high peroxidase activity.
3. Fruits: Plenty of fruits, especially prunes and apples.
4. Cereals Bran and bran-containing cereals.
5. Moderate amounts of peanuts and popcorn daily. If any of the above foods are known to cause discomfort, the patient is instructed to consult his/her physician.

TO BE AVOIDED:

1. Meat: Diet should not include any red or rare meat.
2. Raw fruits and vegetables containing high peroxidase activity: Turnip Cauliflower Red radishes, Broccoli Cantaloupe, Horseradish Parsni

B. Alternately, the special diet may be omitted initially with dietary restrictions imposed upon the retesting of all positive results. However, because gastrointestinal lesions may bleed intermittently and blood in feces is not distributed uniformly, all patients with positive tests regardless of diet, should have follow-up diagnostic procedures done.

C. Other factors which affect the test:

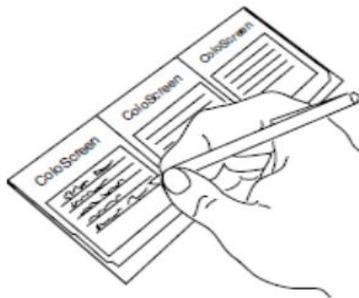
1. Medications: For 7 days prior to and during the testing, do not ingest aspirin or other antiinflammatory medicines. For 2 days prior to and during testing, do not use rectal medicines, or tonics or vitamin preparations which contain Vitamin C (ascorbic acid) in excess of 250 mg per day.
2. Bleeding hemorrhoids or open cuts on hands.
3. Collection of specimen during menstrual cycle.
4. Improper specimen collection.
5. Other diseases of the gastrointestinal tract such as colitis, gastritis, diverticulitis and bleeding ulcers.
 - ◆ The stool must be freshly collected (2-4 hours) directly into a disposable container.
 - ◆ Stool Specimen Collection: Clean, dry, widemouth, leakproof, tight-fitting lid, Not contaminated with urine or water, examination within 2 hours after collection.

ANALYTICAL: Stool Exam for Occult Blood

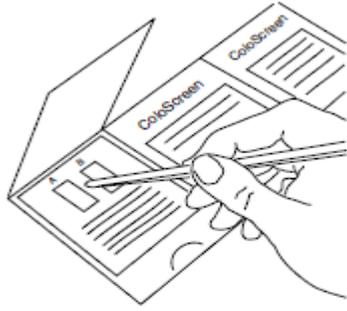
Fecal occult blood tests are valuable for detecting occult blood (hidden GI bleeding), which may be present with colorectal cancer, and for distinguishing between true melena and melena-like stools.

A. Screen Slide (contain Guaiac)

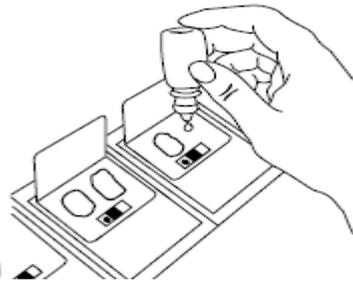
1. Supply all information listed on the front flap of the Screen Slide.



2. Open the front flap
3. Using the applicator provided, collect a small amount of stool specimen from the toilet, on one end of applicator. Apply a very thin smear in Box A.
4. Reuse applicator to obtain a second sample from a different part of the stool specimen. Apply a very thin smear inside Box B. (On subsequent bowel movements, repeat above steps on additional slides.)



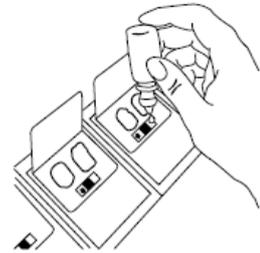
5. Allow the specimen to air dry, then close the cover.
6. Open perforated window on the back of the slide.



7. Apply two (2) drops of reagen developer solution (Hidrogen Peroxida) to the back side of boxes A and B.
8. Read results after 30 seconds and within 2 minutes.

Check Monitors.

1. To develop Check Monitors, place one or two drops of reagen developer solution between the Positive and Negative Monitor boxes.
2. Read the results after 30 seconds and within 2 minutes.
3. Positive ColoCheck Monitor should turn blue, but the Negative Check Monitor should not have any trace of blue.



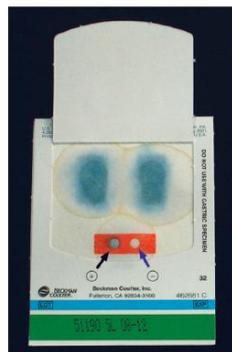
Guaiaac-based fecal occult blood tests (gFOBTs) are based on the pseudoperoxidase activity of the heme moiety of hemoglobin. In the presence of an indicator and hydrogen peroxide, the heme moiety catalyzes oxidation of the indicator, which results in a color change

Principle FOBTs:

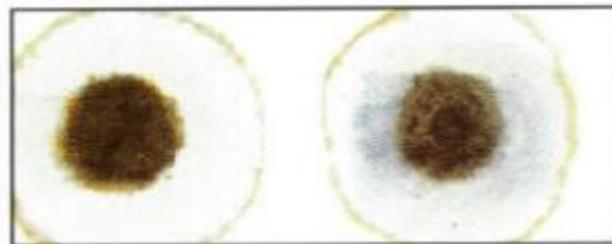
Hemoglobin + Developer



Oxidation of Guaiaac



Negative and Positive Smears*



Positive Guaiaac-Based Fecal Occult Blood Test

◆ POST ANALYTICAL:

There are Interferings factor this examination:

1. Drugs such as: salicylate, steroid, NSAID, anticoagulant, colchicin, iron are associated with increased GI blood loss.
2. Drugs that may cause a false positive test include: Boric acid, Bromide, Colchicin, inorganic iron, e. Oxidizing agent.
3. Food that may cause false positive result include: meat (Hb, myoglobin, enzyme), can give false positive test for up to 4 days, Vegetables with peroxidase activity (eg horse raddish)
4. The testing methode may be followed exactly
5. Other factors affecting the test: Bleeding hemorrhoids, Menstrual periode, Long distance runners.

G. Homework

1. Please **explain** about Examination of urine (microscopic, macroscopic and chemical) and normal range
2. Please **explain** principle of FOB and its interfering factor

H.	Reference
	<ol style="list-style-type: none"><li data-bbox="268 239 1372 304">1. Textbook of Urinalysis and Body Fluids. Mundt LA, Shanahan K, 3th ed. 2016. Wolters Kluwer Health / Lippincott Williams & Wilkins . Section II, Chapter 6-8<li data-bbox="268 315 1372 380">2. Henry JB. Clinical Diagnosis and Management by Laboratory Methods. 20th edition. WB Saunders Co. PhiladelphiaLondon. 2001.<li data-bbox="268 392 1372 423">3. Fundamentals of Urine and Body Fluids. Brunzel.NA. 2018<li data-bbox="268 434 1372 465">4. Helena Laboratories. Coloscreen a test for accult blood

