UNIT 2 PROCEDURES FOR BASIC TESTS

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2.0 INTRODUCTION

As a mid level health care provider you have to supervise and at times directly get involved in collection of specimen for various tests and interpret the results.

While collecting any specimen for diagnostic purposes, you would have to take certain precautions to protect yourself and others from pathogens found in the blood and other body fluids. All blood samples and other body fluids must be considered as infectious irrespective of client status. Labelling of the sample is very important for proper treatment. So for quality care one need to collect samples cautiously to safe guard yourself as well as the clients.

2.1 OBJECTIVES

After completing this unit, you shall be able to:

- collect urine, stool, sputum and blood sample correctly;

- label the samples correctly and send them for investigation;
- perform the procedure of urine testing for routine and pregnancy test and interpret the results;
- collect stool sample and send to laboratory with correct labelling;
- collect specimen for sputum examination; and
- collect and send sample for blood examination.

2.2 PRECAUTIONS/GUIDELINES IN COLLECTION OF SPECIMENS

While collecting any specimen you should take precautions keeping following guidelines in mind:

- Ensure that specimen to be collected before starting antibiotic therapy.
- Collect from the site where suspected organisms are most likely to be found (highly infected site).
- If possible provide additional information regarding the risk of infection (Hepatitis B, HIV etc) associated with handling of the sample.
- All urine collection and / or transport containers should be clean and free of particles or interfering substances.
- The collection container should have a secure lid and be leak resistant container.
- Specimen container should not be reused.
- Proper labelling should be applied to the collection container or tubes.
- Use disposable needles and syringes to collect blood sample and discard them in puncture proof container.
- Always wear gloves while collecting the specimen.
- Wash your hand before and after the specimen collection.

2.3 METHOD OF URINE SAMPLE COLLECTION AND URINE TESTING

Let us now discuss collection of a random or clean catch mid stream urine specimen. It is collection of urine for an investigation to aid diagnosis and/ or treatment of medical condition.

Using the urine specimen in a community health setting can be beneficial in determining the albumin and sugar levels in urine.

2.3.1 Specimen Collection and Transportation Guidelines

- Explain the reason for procedure of specimen collection.
- Assist patient to bathroom if needed
- Provide specimen container
- Wash and dry hands.

- Clean perineum prior to voiding, using wipes or antiseptic soaked cotton
- Instruct to clean from center to periphery.
- Initiate voiding and place the container in the stream of urine filling it about half. The first portion of the voiding is discarded and subsequent mid stream urine is collected.
- Complete voiding in the toilet.
- Cover container tightly without touching inside of cover.
- Label the specimen and send to the lab as soon as possible.
- After getting the lab report, record the findings.
- Inform patient about the result of lab test.

Remember :
Mid stream urine is the most ideal specimen for diagnosis of UTI.

2.3.2 Types of Urine Examination

- Routine microscopic
- 24 hours urine
- Pregnancy test
- Urine for Albumin / Sugar

2.3.3 Points to Remember

- Ensure cleanliness of all articles.
- Take fresh urine sample in a wide mouthed clean bottle.
- Pay special attention to method and technique, as small variation can alter the result.
- Repeat test after few days if any abnormality is detected.
- Make second test when first is doubtful.
- Keep mouth of the test tube away from you while boiling urine for albumin test.
- To minimise contamination of urine-

  i) Ask the client to clean genital area with soap and water.

  ii) Take mid stream urine sample.

  iii) Don't take urine sample during menstruation.

  Record and report accurately at the end.

2.3.4 Articles Required

- Clean container for routine test/ sterile container for culture
- Disposable gloves
- Anti-septic solution
- Cotton balls

2.3.5 Procedure of Urine Test for Sugar/Albumin Using Dipstick

Urine test for sugar/albumin using dipstick is as follows:

- Remove one strip from bottle of dipstick and replace the cap.
- Dip regent area of the strip in urine and remove immediately to avoid dissolving the reagent. To remove excess urine-run the edge of the strip against bottle rim.
- For urine albumin – match colour against the bottle immediately.
- For urine sugar – read after 30 seconds, by comparing the colour of reagent area to the colour chart on the table of the bottle.

2.3.6 Procedure of Pregnancy Test Using - Pregnancy Test Kit.

- Carefully read the instructions included in your test kit before collecting urine sample.
- Make sure the test's expiration date hasn't passed.
- Look for the manufacturer's toll-free number on the package, and call it if you have any questions about using the test.
- Remove the pregnancy test card from kit, and keep on flat surface.
- Use first morning urine one to two weeks after clients first missed period.
- Pour 2–3 drops of urine on the test kit.
- Wait for 5 minutes.
- Look for lines on the test kit.

2.3.7 Result

- If one line appears it is negative for pregnancy and if two lines appear on the test kit it is indicative of positive for pregnancy.

2.4 METHOD OF STOOL SAMPLE COLLECTION

The stool sample is collected for analysis of faeces to help diagnose certain conditions affecting the digestive tract.

Stool sample is usually collected in a plastic or waxed container, once collected it should be transported immediately to the laboratory. If not possible to send immediately, or there is delay of more than 2–4 hours then you must use in a suitable transport medium

- Cary- blair transport medium
- Stuart's transport medium

If stool sample is not available then a rectal swab can be taken.

2.4.1 Points to Rremember

- Specify whether the samples is a routine screening sample or an investigation for suspected intestinal infection.
- Use the scoop attached to inside of the lid of the specimen container to place faecal material into the container.
- Avoid mixing of stool with urine.

2.4.2 Articles Required

- Specimen container with lid/wax container/plastic container
- Wooden spatula
- Gloves
- Plastic bag

2.4.3 Procedure of Stool Specimen Collection

- Discuss procedure with patient about what specimen is required and reason.
- Ask patient to pass urine so that preventing mixing of urine with stool.
- Give container to the patient / client.
- Instruct patient to collect sample. Lift up a portion of stool 15–30 ml from the centre of the mass and place it directly into container using wooden spatula.
- Close container tightly and put in plastic bag.
- Help patient with hygiene if required.
- Remove the gloves and wash hands.
- Label the container and send for lab investigation.
- After getting the lab report, record the findings.
- Inform patient about the result of lab test.

2.4.4 Normal Laboratory Values : Urine

Urine Normal values are as follows:

- Colour – Yellow (light/pale to dark/deep amber)
- Clarity/turbidity – Clear or cloudy
- pH – 4.5–8
- Specific gravity – 1.005–1.025
- Glucose – ≤130 mg/d
- Ketones – None
- Nitrites – Negative
- Leukocyte esterase – Negative
- Bilirubin – Negative
- Urobilirubin – Small amount (0.5–1 mg/dl)
- Blood – ≤ 3 RBCs
- Protein – ≤ 150 mg/d
- RBCs – ≤ 2 RBCs/hpf
- WBCs – ≤ 2-5 WBCs/hpf
- Squamous epithelial cells – ≤ 15-20 squamous epithelial cells/hpf
- Casts – 0–5 hyaline casts/lpf
- Crystals – Occasionally
- Bacteria – None
- Yeast – None

2.4.5 Normal Laboratory Values: Stool

Test	Conventional Units	SI Units
Fat	< 5 g/day in patients on a 100-g fat diet	—
Nitrogen	< 2 g/day	—
Urobilinogen	40-280 mg/24 h	68-473 mg/24 h
Weight	< 200 g/day	—

2.5 METHODS OF SPUTUM COLLECTION

It is collection of sputum specimen for analysis to determine the presence of micro-organism or abnormal cells.

2.5.1 Points to Remember

- Container for sample collection should be clean and wide mouth. Explain the patient to rinse mouth with plain water (without any antiseptic mouth wash), avoiding brushing of teeth and taking the food.
- Amount of the sample should be adequate.
- The best time for sputum collection is in the morning.

2.5.2 Articles Required

- Clean wide mouthed container with cover
- Gloves
- Facial tissue
- Toothbrush and/or mouthwash
- Cup and water

2.5.3 Procedure

- Explain the procedure and purpose to the patient.
- Ask patient to clean mouth thoroughly rinse the mouth with water.
- Instruct patient to hold the specimen container without touching inside of the container or lid.
- Ask patient to cough deeply and expectorate in container, repeating until sufficient quantity of sputum is obtained. Specimen should contain lumps of mucoid sputum and little saliva by deep coughing.
- Secure the lid tightly before removing the gloves.
- In case of suspected tuberculosis, two specimen are collected. One on the spot and second early next morning.
- Label container and send to the laboratory as soon as possible.
- Wash hands properly.
- After getting the lab report, record the findings.
- Inform patient about the result of lab test.

2.6 METHOD OF BLOOD SAMPLE COLLECTION

Let us now discuss the method of Blood Sample Collection:

2.6.1 Points to Remember

- Observe universal safety precautions.
- Needles and hub are single use and should be disposed off in appropriate sharp container as one unit.
- Needles are never recapped, removed, broken or bent after use.
- Contaminated surface should be cleaned with freshly prepared 10% bleach solution.

2.6.2 Articles Required

- Hand hygiene material such as soap and water / alcohol rub
- Well fitting gloves
- Single use disposable needle and syringe or launching device
- Tourniquet

2.6.3 Steps of Procedure

It is an amount of a person's blood taken from their body for use in medical tests.

Let us discuss steps of blood sample collection as given below:

- Explain the procedure and its purpose the patient.
- Place all the equipment needed in safe and easy reach.
- Check the laboratory form.
- Put on gloves
- Make patient comfortable in supine position.
- Place a clean towel under patient's arm.
- Extend the patients arm and inspect the anticubital fossa or forearm.
- Locate a vein of good size that is visible, straight and clear.
- Apply tourniquet abour 4–5 finger width above the venepuncture site and re-examine the vein.
- Clean the site with alcohol swab for 30 seconds and allow it to dry completely (30 seconds).
- Apply firm but gentle pressure.
- Do not touch the clean site.
- Ask patient to form a fist, so the veins are more prominent.
- Insert the needle swiftly at 30 degree angle or less and continue to insert the needle along the vein.
- Once sufficient blood has been collected release the tourniquet before withdrawing the needle.

- Withdraw the needle gently and apply gentle pressure to the site with clean gauze or dry cotton ball.
- Ask the patient to hold the gauze/cotton in place for sometime.
- Before dispatch invert the tubes containing additives for the required number of times.
- Cross check details of container with investigation form and send for testing.
- Discard the needle syringe and blood sampled device into puncture proof container.
- Remove and discard gloves.
- Wash hands.

2.6.4 Normal Values: Complete Blood Count (CBC)

The following are normal complete blood count results for adults:

Red blood cell count	**Male:** 4.32-5.72 trillion cells/L*(4.32-5.72 million cells/mcL**) **Female:** 3.90-5.03 trillion cells/L(3.90-5.03 million cells/mcl)
Haemoglobin	**Male:** 13.5-17.5 grams/dL***(135-175 grams/L) **Female:** 12.0-15.5 grams/dL(120-155 grams/L)
Haematocrit	**Male:** 38.8-50.0 percent **Female:** 34.9-44.5 percent
White blood cell count	3.5-10.5 billion cells/L(3,500 to 10,500 cells/mcL)
Platelet count	150-450 billion/L(150,000 to 450,000/mcL**)

* L = liter
** mcL = microlitre
*** dL = decilitre

2.7 LET US SUM UP

In this unit we have discussed basic tests, collection of samples and steps of doing the procedure such as urine test for pregnancy, urine test for sugar & protein. Stool sample collection, transportation, normal values for urine stools sample is usually collected for AFB (Acid Fast Bacilli) for diagnosing tuberculosis. Blood Sample Collection procedure and normal values are also been explained.

2.8 ACTIVITY

1) Identify patients with symptoms of illness such as:
   - Cough
   - Anaemia
   - Itching in perineal area
   - Lower backache

Collect suitable specimens and give reasons why you collected particular specimen.

2) Practice to select vein for blood collection and if required collect blood samples if prescribed by doctor.

3) Identify diabetic/pregnant woman and do urine test for albumin / sugar.