

Therapeutics -IV– THEORY
SEMESTER-II, (Credit Hours 2+1)

Special emphasis on clinical diseases and their intensive treatment with regimental therapy (علاج بالتدبير)

Practical

- (a) Study of samples of urine by different techniques (physical method, biochemical method) 25 cases
- (b) To treat the patient by Unani techniques of Turkish Bath (حمام), Phlebotomy/Blood Letting (فصد), Leach (جامة / عمل تعلیق / جونک لگانا), Enema (حقنة) and Cupping (حجامه).

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Al Hijamah (Cupping Therapy): A Brief Introduction with Modern Perspective

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Abstract Alhijamah (cupping therapy) refers to a Unani regimental mode of treatment. Alhijamah is an ancient method which was practically used among the Chinese, Babylonians, Egyptians, Greeks, Romans, Arabs and Indians. The earliest recorded evidence of Alhijamah was discovered in Egyptian medical document Ebers Papyrus dating back to 1550 BC. In Chinese medicine too, Alhijamah is used for the treatment of various diseases. The treatment by vacuum cups has been mentioned in the book of Al-Ambratoor Al-Seeni about 4000 years ago. In Greece, history of cupping dates back to Hippocrates (460–377 BC). This therapy entered Europe through Spain when the Muslim physicians and their scientific literature were the primary sources of medical sciences. This mode of treatment was unavailable for a long period of time. With the advancement in the field of science and technology, this mode of treatment was also proved to be beneficial scientifically in a large number of diseased conditions. With its re-evaluation after scientific validation, nowadays it is used in various countries. In India, several clinical trials have been performed under the supervision of various Unani institutions all over country. **Keywords:** Al Hijamah (cupping therapy), Unani

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INTRODUCTION Unani medicine, also called Unani Tibb, Arabian medicine, Graeco-Arabian medicine, or Islamic medicine, a traditional alternative system of healing and health maintenance is observed in South Asia. The origins of Unani medicine are found in the doctrines of the ancient Greek physicians Hippocrates and Galen. As a field, it was later developed and refined through systematic experiment by the Arabs, most prominently by Muslim scholar-physician Avicenna [1]. Unani medicine is based on Hippocratic doctrine of four humors (Akhlāt) theory, which are Dam (blood), Balgham (phlegm), Safra (yellow bile) and Sauda (black bile). The body has the power of self-control to maintain an optimum balance of these humors, which is called as Quwwat-e-Mudabbirah-e-Badan (Medicatrix Naturae). One of the most important functions of Akhlāt is to maintain the ideal qualitative states associated with Mizaj (temperament) of an individual. Humeral imbalance is often root cause in the origin and development of a particular illness. In Unani system of medicine, treatment of ailments is carried out in the following three ways: 1) Ilaj bit Tadbeer (regimental therapy) 2) Ilaj bid Dawa (pharmacotherapy) 3) Ilaj bil Yad (surgery) [2–5]. **Literal Meaning** The word Hijamah comes from the root Al-hajm. Its various meanings have been mentioned in different Arabic lexicons and dictionaries. Out of all these meanings, most relevant that has been correlated by

various writers is that Al-hajm means “to suck.” Ibn Manzur writes in Lisan-ul-Arab: “And the basic meaning of the Al-hajm is to suck.” Hajjam (cupper) or Massas (sucker) is one who performs the operation termed Hajm or one who scarifies and draws blood with the Mihjamah. On the other hand, Mihjam or

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(5) (PDF) *Al Hijamah (Cupping Therapy): A Brief Introduction with Modern Perspective*. Available from: https://www.researchgate.net/publication/289980040_Al_Hijamah_Cupping_Therapy_A_Brief_Introduction_with_Modern_Perspective [accessed Apr 02 2020]. **CBC blood test**

A complete blood count (CBC) test measures the following:

- The number of red blood cells (RBC count)
- The number of white blood cells (WBC count)
- The total amount of hemoglobin in the blood
- The fraction of the blood composed of red blood cells (hematocrit)

The CBC test also provides information about the following measurements:

- Average red blood cell size (MCV)
- Hemoglobin amount per red blood cell (MCH -mean corpuscular hemoglobin)
- The amount of hemoglobin relative to the size of the cell (hemoglobin concentration) per red blood cell (MCHC- mean corpuscular hemoglobin concentration)
- The platelet count is also usually included in the CBC.

Test Method

A blood sample is needed.

Preparation for the Test

There is no special preparation needed. When the needle is inserted to draw blood, you may feel moderate pain. Some people feel only a prick or stinging. Afterward there may be some throbbing or slight bruising. This soon goes away.

Indications

A complete blood count (CBC) is a commonly performed lab test. It can be used to detect or monitor many different health conditions. Your health care provider may order this test:

- As part of a routine check-up
- If you are having symptoms, such as fatigue, weight loss, fever or other signs of an infection, weakness, bruising, bleeding, or any signs of cancer
- When you are receiving treatments (medicines or radiation) that may change your blood count results
- To monitor a chronic health problem that may change your blood count results, such as chronic kidney disease

Normal Results

Blood counts may vary with altitude. In general, normal results are:

RBC count:

- Male: 4.7 to 6.1 million cells/mcL
- Female: 4.2 to 5.4 million cells/mcL

WBC count:

- 4,500 to 10,000 cells/mcL

Hematocrit:

- Male: 40.7 to 50.3%
- Female: 36.1 to 44.3%

Hemoglobin:

- Male: 13.8 to 17.2 gm/dL
- Female: 12.1 to 15.1 gm/dL

Red blood cell indices:

- MCV: 80 to 95 femtoliter
- MCH: 27 to 31 pg/cell
- MCHC: 32 to 36 gm/dL

Platelet count:

- 150,000 to 450,000/dL

The examples above are common measurements for results of these tests. Normal value ranges may vary slightly among different laboratories. Some labs use different measurements or test different samples.

What Abnormal Results Mean

High RBC, hemoglobin, or Hematocrit may be due to:

- A lack of enough water and fluids, such as from severe diarrhea, excessive sweating, or water pills used to treat high blood pressure
- Kidney disease with high erythropoietin production
- Low oxygen level in the blood for a long time, most often due to heart or lung disease
- Polycythemia vera
- Smoking

Low RBC, hemoglobin, or Hematocrit is a sign of anemia, which can result from:

- Blood loss (either sudden, or from problems such as heavy menstrual periods over a long time)
- Bone marrow failure (for example, from radiation, infection, or tumor)
- Breakdown of red blood cells (hemolysis)
- Cancer and cancer treatment
- Certain long-term (chronic) medical conditions, such as chronic kidney disease, ulcerative colitis, or rheumatoid arthritis
- Leukemia
- Long-term infections such as hepatitis
- Poor diet and nutrition, causing too little iron, folate, vitamin B12, or vitamin B6
- Multiple myeloma

A lower than normal white blood cell count is called leucopenia. A decreased WBC count may be due to:

- Alcohol abuse and liver damage
- Autoimmune diseases (such as systemic lupus erythematosus)
- Bone marrow failure (for example, due to infection, tumor, radiation, or fibrosis)

- Chemotherapy medicines used to treat cancer
- Disease of the liver or spleen
- Enlarged spleen
- Infections caused by viruses, such as mono or AIDS
- Medications

A high WBC count is called leukocytosis. It can result from:

- Certain medicines, such as corticosteroids
- Infections
- Diseases such as lupus, rheumatoid arthritis or allergy
- Leukemia
- Severe emotional or physical stress
- Tissue damage (such as from burns or a heart attack)

A high platelet count may be due to:

- Bleeding
- Diseases such as cancer
- Iron deficiency
- Problems with the bone marrow

A low platelet count may be due to:

- Anemia (various types)
- Disorders where platelets are destroyed
- Pregnancy
- Enlarged spleen
- Bone marrow failure (for example, due to infection, tumor, radiation, or fibrosis)
- Chemotherapy medicines used to treat cancer

Risks

There is very little risk involved with having your blood taken. Veins and arteries vary in size from one person to another and from one side of the body to the other. Taking blood from some people may be more difficult than from others.

Other risks associated with having blood drawn are slight but may include:

- Excessive bleeding
- Fainting or feeling light-headed
- Hematoma (blood accumulating under the skin)
- Infection (a slight risk any time the skin is broken)

Considerations

RBCs transport hemoglobin which, in turn, carries oxygen. The amount of oxygen received by body tissues depends on the amount and function of RBCs and hemoglobin.

WBCs are mediators of inflammation and the immune response. There are various types of WBCs that normally appear in the blood:

- Neutrophils (polymorphonuclear leukocytes)
- Band cells (slightly immature neutrophils)
- T-type lymphocytes (T cells)
- B-type lymphocytes (B cells)
- Monocytes
- Eosinophils
- Basophils

Alternative Names

Complete blood count

Reactive Protein Testing



Practical No.2

Reactive Protein

Reference values

None present; reported as less than 0.8mg/dl (SI, less than 8 mg/L)

Highly specific (hs-CRP): 0.020 to 0.800 mg/dl (SI, 0.2-8 mg/L)

Abnormal Findings

Elevated levels:

- Rheumatoid arthritis (RA), rheumatic fever, myocardial infarction, cancer (active, widespread), acute bacterial and viral infections, inflammatory bowel disease, Hodgkin's disease, systemic lupus erythematosus.
- Increased risk of cardiac events such as MI (elevations of hs-CRP)

Nursing Implications

- Be aware that elevated levels may be present postoperatively, but that levels decline after the fourth day.
- Anticipate the need for further testing.
- Prepare the patient to follow-up.
- Provide emotional support to the patient and his family.
- Monitor the patient's cardiac status closely for changes; assess changes in mobility and functional level related to inflammatory conditions.

Purpose

- To evaluate the inflammatory disease course and severity in conditions, including tissue necrosis (MI, malignancy, RA)
- To monitor acute inflammatory phases of RA and rheumatic fever so that early treatment can be initiated.
- To monitor the patient's response to treatment or determine whether the acute phase is declining.
- To help interpret the erythrocyte sedimentation rate (ESR)
- To monitor the wound-healing of internal incisions, burns and organ transplantations.

Description

C-reactive protein (CRP) is an abnormal protein that appears in the blood during an inflammatory process. It's absent from the blood of healthy people. This nonspecific protein is mainly synthesized in the liver and is found in many body fluids (pleural, peritoneal, pericardial, and synovial). It appears in the blood 18 to 24 hours after the onset of tissue damage, with levels that increase up to 1000-fold and then decline rapidly when the inflammatory process regresses. CRP has been found to rise before increases in antibody titers and ESR levels occur. It also decreases sooner than ESR levels.

CRP is also a valuable cardiac marker to evaluate a patient with MI. Levels correlate with creatine kinase MB (CK-MB) iso-enzyme but typically peak 1-3 days after CK-MB. However, if CRP doesn't return to normal, it's highly of ongoing myocardial tissue damage. A more highly specific test for CRP, the hs-CRP levels, which helps determine the risk of MI in patients with acute coronary syndromes.

Interfering Factors

- Steroids and salicylates (false-normal level)
- Hormonal contraceptives (false increase)
- Intrauterine contraceptive devices (increase) and pregnancy (third trimester)

Nursing Considerations

Before the Test

- Confirm the patient identity using two patient identifiers according to facility policy.
- Explain to patient that presence of infection or to monitor treatment.
- Inform the patient that he needs to restrict all fluids except for water for 8-12 hours before the test.
- Tell the patient that the test requires a blood sample.
- Explain to the patient that he may experience slight discomfort from the tourniquet and needle puncture.
- Notify the laboratory and the practitioner of medications the patient is taking that may affect test results; they may need to be restricted.

During the test

- Perform a venipuncture. Collect the sample in a 5-mL clot activator tube.
- Send the specimen to the laboratory immediately; keep the sample away from heat.

After the test

- Apply direct pressure to the venipuncture site until bleeding stops.
- Assess the venipuncture site for development of a hematoma; if one develops, apply pressure.
- Instruct the patient that he may resume his usual diet and medications that were discontinued before the test, as ordered.

Creatinine Serum Testing



Practical No.3

Creatinine, Serum

Reference values

Females: 0.6 to 0.9 mg/dl(SI, 53-97 $\mu\text{mol/L}$)

Males: 0.8 to 1.2 mg/dL (SI,62 – 115 $\mu\text{mol/L}$)

Critical values

Less than 0.4 mg/dL(SI, 35 $\mu\text{mol/L}$) or 2.8 mg/dL (SI 247 $\mu\text{mol/L}$)

Abnormal Findings

Elevated levels

- Plasma, creatinine of 2 mg/dL indicates that renal disease has seriously damaged 50% or more of the nephrons

- Gigantism and acromegaly

Nursing implications

- Anticipate the need for additional testing.
- Prepare the patient for the follow up and treatment.
- Monitor fluid balance and intake and output.

Decreased levels

- Liver disease
- Deficient levels of protein in the diet
- Small build
- Loss of muscle mass

Nursing implications

- Anticipate the need for additional testing.
- Prepare the patient for the follow up and treatment.
- Monitor fluid balance and intake and output.

Purpose

- To assess glomerular filtration
- To screen for renal damage

Description

Serum creatinine levels provide a more sensitive measure of renal damage than do blood urea nitrogen levels. Creatinine is a non-protein end product of creatine metabolism that appears in Serum in amounts proportional to the body muscle mass.

Interfering Factors

- Ascorbic acid, batbiturates, and diuretics (possible increase).
- Exceptionally large muscle mass, such as is found in athletes (possible increase despite normal renal function)
- Phenosulfonphthalein given within the previous 24 hours.

Nursing considerations

Before the Test

- Confirm the patient's identity using two patient identifiers according to facility policy
- Explain to the patient that the serum creatinine test is used to evaluate kidney function.
- Tell the patient that the test requires a blood sample.
- Explain to the patient that he may experience slight discomfort from the tourniquet and the needle puncture.
- Instruct the patient that he doesn't need to restrict food and fluids.

- Notify the laboratory and the practitioner of medications the patient is taking that may affect test results they may need to be restricted.

During the Test

- Perform a venipuncture and collect the sample in a 3» or 4 mL clot activator tube.
- Handle the sample gently to prevent hemolysis.

After the Test

- Send the sample to the laboratory immediately.
- Apply direct pressure to the vein puncture site until bleeding stops.
- Assess the venipuncture site for hematoma formation; if one develops, apply pressure.
- Inform the patient that he may resume his usual medications that were discontinued before the test, as ordered.

Creatinine, Urine testing



Practical No.4

Creatinine, urine

Reference values

Females: 11 to 20 mg/kg body weight/24 hours (SI, 97-177 $\mu\text{mol/kg weight/day}$)

Males: 14 to 26 mg/kg body weight/24 hours (SI, 124-230 umol/kg body weight/day)

Abnormal Findings

Decreased levels

- Impaired renal perfusion or renal disease resulting from urinary tract obstruction.
- Chronic bilateral pyelonephritis, acute or chronic glomerulonephritis, and polycystic kidney disease.

Nursing implications

- Anticipate the need for additional testing.
- Prepare the patient for the follow up and treatment.
- Monitor fluid balance and intake and output.

Purpose

- To help assess glomerular filtration
- To check the accuracy of 24-hour urine collection, based on the relatively constant levels of creatinine excretion.

Description

This test measures urine creatinine levels, the chief metabolite of creatine. Produced in amounts proportional to total body muscle mass, creatinine is removed from plasma, primarily by glomerular filtration and is excreted in the urine. Because the body doesn't recycle it, creatinine has a relatively high, constant clearance rate, making it an efficient indicator of renal function. However, the creatinine clearance test, which measures urine and plasma creatinine clearance, is a more precise index than this test. A standard method for determining urine creatinine levels is based on Jaffe's reaction; in which creatinine treated with an alkaline picrate solution yields a bright orange red complex.

Interfering Factors

- Amphotericin B, corticosteroids, diuretics, gentamicin, and tetracyclines (possible decrease)

Nursing considerations

Before the test

- Confirm the patient's identity using two patient identifiers according to facility policy.
- Explain to the patient that the urine creatinine test helps evaluate kidney function.
- Inform the patient that he doesn't need to restrict fluids, but that he shouldn't eat an excessive amount of meat (protein) before the test.
- Advise the patient that he should avoid strenuous physical exercise during the collection period.
- Tell the patient that the test usually requires urine collection over a 24-hour period, and teach him the proper collection technique.

- Notify the laboratory and the practitioner of medications the patient is taking that may affect test results; they may need to be restricted.

During the test

- Collect the patient's urine over a 24 hour period, discarding the first specimen and start the timing of the collection at that point, also retaining the last specimen. Use a specimen bottle that contains a preservative to prevent creatinine degradation.
- Refrigerate the specimen or keep it on ice during the collection period.

After the Test

- Send the specimen to the laboratory immediately after the collection is completed
- Instruct the patient that he may resume his usual activities, diet, and medications, as ordered.

Creatinine clearance (CrCl) Testing



Practical No.5
Creatinine clearance (CrCl)

Reference Values

Adults (<40 years)

Females: 72 to 110 ml/sec/1.73 m² (SI, 0.69-1.06 ml/sec/m²)

Males: 94 to 140 mL/sec/1.73 m² (SI, 0.91-1.35 ml/sec/m²)

Abnormal findings

Elevated levels

- Poor hydration
- Exercise
- Pregnancy
- Burns
- Carbon monoxide poisoning
- Hypothyroidism

Nursing implications

- Anticipate the need for additional testing
- Prepare the patient for follow up and treatment.
- Assess hydration level; encourage fluids as appropriate.
- Monitor intake and output.

Decreased levels

- Reduced renal blood flow (associated with shock or renal artery obstruction), acute tubular necrosis, acute or chronic glomerulonephritis, advanced bilateral chronic pyelonephritis, advanced bilateral renal lesions (which may occur in polycystic kidney disease, renal tuberculosis, and cancer) and nephrosclerosis.
- Heart failure
- Severe dehydration

Nursing implications

- Anticipate the need for additional testing
- Prepare the patient for follow up and treatment.
- Monitor intake and output.
- Assess fluid balance status.

Purpose

- To assess renal function(primarily glomerular filtration rate[GFR])
- To monitor progression of renal insufficiency

Description

A creatine anhydride, creatinine is formed and excreted in constant amounts by a irreversible reaction and functions solely as the main end product if creatine. Creatinine production is proportional total muscle mass and is relatively unaffected by urine volume or diet,

An excellent diagnostic indicator of renal function, the creatinine clearance test determines how efficiently the kidneys are clearing creatinine from the blood. The clearance' rate is in terms of the volume of blood (in milliliters) that can be cleared of creatinine in 1 minute.

Reference values vary with age, but creatinine levels become abnormal when more than 50% of the nephrons have been damaged.

Interfering Factors

- Amphotericin B, aminoglycosides, furosemide, and thiazide diuretics(possible decrease)
- High protein diet or strenuous exercise (increase)

Nursing Considerations

Before the test

- Confirm the patient's identity using two patient identifiers according to facility policy.
- Explain to the patient that the creatinine clearance test assesses kidney function.
- Inform the patient that he may need to avoid meat, poultry, fish, tea, or coffee for 6 hours before the test.
- Advise the patient that he should avoid strenuous physical exercise during the collection period.
- Tell the patient that the test requires timed or 24-hour urine specimen and at least one blood sample. Tell the patient hoe the urine specimen will be collected and that he may feel some discomfort from the needle puncture.
- Notify the laboratory and the practitioner of medications the patient is taking that may affect test results; they may need to be restricted.

During the test

- Collect a timed urine specimen at 2,6,12,24 hours in a bottle containing a preservative to prevent creatinine degradation.
- Perform a venipuncture ant time during the collection period, and collect the sample in a 7-mL tube without additives.
- Refrigerate the urine specimen or keep it on ice during the collection period.

After the test

- Send the specimen to the laboratory as soon as the collection is completed.
- Apply direct pressure to the venipuncture site until bleeding stops.
- Assess the venipuncture site for hematoma formation; if one develops, apply direct pressure.
- Instruct the patient that he may resume his usual activities, diet, and medications, as ordered.

Blood Cultures



Practical No.6
Blood Culture

Indications

- Bacterial invasion (bacteremia)
- Systemic spread of infection (septicemia)
- Thrombophlebitis
- Bacterial endocarditis

Equipment

- Tourniquet
- Gloves
- Antiseptic pad
- 10-ml syringes for adults, 6-ml syringes for Children
- Three or four 20G 1.5 needles
- Two or three blood culture bottles(50 ml bottles for adults & 20 ml for infants and children) with sodium poly ethanol sulfate added (one aerobic bottle containing a suitable medium, such as Trypticase soy broth with 10% carbon dioxide atmosphere, one anaerobic bottle with prereduced medium; and, possibly, one hyperosmotic bottle with 10% sucrose medium)
- Laboratory request form.
- 2x2 gauze pads
- Small adhesion bandages
- Labels

Essential steps

- Check the expiration dates on the culture bottles and replace outdated bottles.
- Confirm the patient's identity using two patient identifiers according to facility policy.
- Tell the patient that you need to collect a series of blood samples to check for infection.
- Explain the procedure to ease his anxiety and promote cooperation.
- Wash your hands and put on gloves.
- Tie a tourniquet 2" (5cm) proximal to area chosen.
- Clean the venipuncture site with an antiseptic pad, starting the site and working outward in a side to side motion.
- Wait 30 to 60 seconds for the skin to dry.
- Perform a venipuncture drawing 10ml of blood from an adult.

Special considerations

- Obtain each set of cultures from a different site. Infants will rarely have three separate blood cultures run; they usually have one.

- Avoid using existing blood lines for culture unless the sample is drawn when the line is inserted or catheter sepsis is suspected.

Complications

Hematomas are the most common venipuncture complication. If a hematoma develops, apply direct pressure to the site.

Documentation

Record:

- Blood sample collection date and time
- Test name
- Amount of blood collected
- No .of bottles used
- Patient s temperature
- Adverse reactions to the procedure.

Sputum Container



Practical No.7
Sputum collection

Indications

- Respiratory tract Infection
- To identify respiratory pathogens

Equipment

For expectoration

- Sterile specimen container with tight-fitting cap
- Gloves
- Label
- Laboratory request form
- Aerosol(10% sodium chloride, propylene glycerol, acetylcysteine, or sterile or distilled water)

For tracheal Suctioning

- # 12 to #14 French sterile suction catheter
- Water soluble lubricants
- Sterile gloves
- Mask
- Goggles
- Sterile specimen trap(Lukens trap)
- Normal saline solution
- Portable suction machine, if wall suction is unavailable
- Oxygen therapy equipment

Essential steps

Collecting by Expectoration

- Confirm the patient's identity using two patient identifiers according to facility policy.
- Inform the patient that you need to collect a sputum specimen by expectoration.
- Explain the procedure
- Plan to collect the specimen early in the morning, before breakfast.
- Instruct the patient to sit on chair or at the edge of the bed. If he can't sit up, place him in high fowler's position.
- Ask him rinse his mouth with water to reduce specimen contamination. Avoid mouthwash or toothpaste because they may affect the mobility of organisms in the sputum sample.
- Then tell him to cough deeply and expectorate directly into the specimen container.
- Ask him to produce at least 15 ml of sputum. Check the specimen carefully to make sure it includes thick mucus.
-

If the patient is unable to hold the specimen container, put on gloves and place it near his mouth.

- Cap the container and, if necessary, clean the exterior.
- Remove and discard your gloves and wash your hands thoroughly.
- Label the container with the patient's name, room number, time of collection and initial diagnosis.
- Include the laboratory request form whether the patient was febrile or taking antibiotics.
- Send the specimen to the laboratory immediately.

Collecting by Tracheal Suctioning

- Collect a specimen from suctioning if a patient can't produce an adequate specimen by coughing.
- Explain the suctioning procedure to him. Inform him that he may cough, gag, or feel short of breath during the procedure.
- Check the suction equipment to sure it is functioning properly.
- Place the patient in high Fowler's or semi-Fowler's position.
- Administer oxygen to the patient before beginning the procedure.
- Wash your hand thoroughly.
- Position a mask or goggles over your face.
- Put on sterile gloves, consider one hand sterile and other hand clean to prevent across contamination.
- Connect the suction tubing to male adapter of the inline specimen trap.
- Attach the sterile suction catheter to the rubber tubing of the trap.
- Tell the patient to tilt his head back slightly.
- Lubricate the catheter with normal saline solution.
- Gently pass the catheter through the patient nostrils without suction, when the catheter reaches the larynx, the patient will cough. As he does, quickly advance the catheter into the trachea.
- Tell him to take several deep breaths through his mouth.
- Apply suction for 5-10 seconds, but never longer than 15 seconds. (prolonged suction can cause hypoxia)
- If the procedure must be repeated, let the patient rest four to six breaths.
- When collection is completed, discontinue the suction.
- Gently remove the catheter.
- Administer oxygen.
- Detach the catheter from the in-line trap and gather it up in your dominant hand.
- Pull the glove cuff inside-out and down around the used catheter to enclose it for disposal.
- Remove, discard the other gloves your mask and goggles.
- Detach the trap from the tubing connected to suction machine.
- Seal the trap tightly by connecting the rubber tubing to male adapter of the trap.
- Examine the specimen to make sure that it is actually sputum.
- Label's the trap's container as an expectorated specimen. Send it to laboratory immediately with the completed laboratory request form.

- Offer the patient a glass of water or mouthwash

Special Considerations

- If tracheal suctioning doesn't produce a sputum specimen, perform chest percussion to loosen and mobilize secretions.
- Position of the patient for optimal drainage.
- If unsuccessful during the first attempts, wait 20 to 30 min and repeat the tracheal suctioning procedure.
- Before sending the specimen to laboratory, examine it to make sure it's actually sputum, not saliva.
- Remove the catheter immediately if the patient becomes hypoxic or cyanotic and administer oxygen.
- Watch for aggravated bronchospasms if using an aerosol with more than 10% concentration of sodium chloride or acetyl-cysteine in patients with asthma or chronic bronchitis.
- Don't use more than 20% propylene glycol with water when inducing a sputum specimen in suspected of having tuberculosis. A higher concentration of propylene glycol inhibits growth of the pathogens and causes erroneous test results.
- Use 10% to 20% acetyl-cysteine with water or sodium chloride if propylene glycol isn't available.

Complications

Patient may develop:

- Arrhythmias, especially in patient with cardiac disease when the specimen is obtained by suctioning.
- Tracheal trauma or bleeding
- Vomiting
- Aspiration
- Hypoxemia

Documentation

Record:

- Collection method
- Collection time and date
- Patient tolerance of the procedure
- Color and consistency of the specimen

Practical No.8

Stool collection

Indications

It is indicated in the presence of

- Blood
- Parasites and their ova
- Bile
- Fat
- Pathogens
- Ingested drugs

Equipment

- Specimen container with lid
- Gloves
- Two tongue blades
- Paper towel
- Bedpan or portable commode
- Two patient-care reminders
- Laboratory request form
- Enema(optional)

Essential steps

- Confirm the patient identity using two patient identifier according to facility policy.
- Explain the procedure to the patient and his family members.

Collecting a Random specimen

- Tell the patient to have notice about when he has urge to defecate.
- Have him defecate into clean, dry bedpan commode.
- Instruct him to avoid contaminating the specimen with urine or toilet tissue.
- Put on gloves.
- Using a tongue blade, transfer the most representative stool specimen from bedpan to the container, then cap the container.
- Include any blood, mucus or the pus that produced with the stool.
- Wrap the tongue blade in a paper towel and discard it.
- Remove and discard your gloves.
- Wash your hands thoroughly to prevent cross-contamination.

Collecting a timed specimen

- Place a patient-care reminder starting “save all stool” over the patient’s bed, in his room, and in the utility room.

Put on gloves.

- Collect the first specimen, and include this in the total specimen.
- Obtain the timed specimen, transferring all stool into the specimen container.
- If stool must obtain with an enema use only tap water or normal saline solution.

- Send each specimen to the laboratory immediately with laboratory request form or if permitted, refrigerate the specimen collected during the test period and send them when collection is complete.
- Remove and discard the gloves
- Make sure that patient is comfortable with this procedure
- Provide the patient the opportunity to thoroughly clean his hands and perianal area.
- Perform perianal care if necessary.

Special considerations

- Never place a stool specimen in a refrigerator that contains food or medication.
- Notify the practitioner if the stool specimen looks unusual.
- For at home collection, instruct the patient to collect the specimen in the clean container in a brown paper bag, and keep it to refrigerator until it can be transported.

Documentation

Record:

- Specimen collection and laboratory transport time.
- Stool color, odor and consistency.
- Any unusual characteristics.
- Whether the patient had difficulty passing the stool.

Urine Collection



Practical No.9
Urine collection

A random urine specimen usually collected as part of the physical examination or during hospitalization, permits screening for urinary and systemic disorders as well as drugs. A clean catch midstream specimen is replacing random collection because it provides a virtually uncontaminated specimen without the need for catheterization.

An indwelling catheter specimen obtained by clamping the drainage tube and emptying the accumulated urine into a container or by aspirating a specimen with a syringe_ requires sterile collection technique to prevent catheter contamination and UTI.

Equipment

For a random specimen

- Clean bedpan or urinal with cover, if necessary
- Gloves
- Graduated container
- Specimen container with the lid
- Label
- Laboratory request form

For a Clean-Catch Midstream Specimen

- Soap and water
- Gloves
- Graduated container
- Three sterile 2x2 gauze pads
- Povidone-iodine solution
- Sterile specimen container with lid
- Label
- Bedpan or urinal
- Laboratory request form

For an Indwelling Catheter Specimen

- Gloves
- Alcohol pad
- 10-mL syringe
- 21G or 22G 1.5 needle
- Tube clamp
- Sterile specimen container with lid
- Label
- Laboratory request form

Essential steps

- Confirm the patient's identity using two patient identifier according to facility policy.
- Inform the patient that you need a urine specimen for laboratory analysis.

Explain the procedure to him to promote cooperation and prevent accidental disposal of specimens.

Collecting a random specimen

- Provide privacy

- Instruct the patient on the bed rest to void into a clean bedpan or urinal, or ask the ambulatory patient to void into either one in the bathroom.
- Put on gloves.
- Pour at least 120 mL of urine into specimen container, and cap the container securely.
- If the patient's urine output must be measured and recorded, pour the remaining urine into the graduated container. Otherwise, discard the remaining urine.
- If you inadvertently spill urine on the outside of the container, clean and dry it to prevent cross-contamination.
- After you label the sample container with the patient's name and the room number, and the date and time of collection, attach the request form and send it to the laboratory immediately.
- Clean the graduated container and urinal or bedpan, and return them to their proper storage.
- Wash your hands thoroughly to prevent cross-contamination.
- Offer the patient a washcloth and soap and water to wash his hands.

Collecting a Clean catch Midstream Specimen

- Because the goal is a virtually uncontaminated specimen, explain the procedure to the patient carefully.
- Provide illustrations, if possible, to emphasize the correct collection technique.
- Instruct the patient to remove all the clothing from the waist down and stand in front of the toilet as for urination or, if female to sit far back on the toilet seat and spread her legs.
- Instruct the patient to clean the periurethral area (tip of the penis or labial folds, vulva and urethral meatus) with soap and water and wipe the area three times, each time with fresh 2x2 gauze pad soaked in the Povidone-iodine, or with the wipes provided in a commercial kit.
- Instruct the patient to begin voiding into the bedpan, urinal or toilet. Then without stopping the urine stream, the patient should move the collection container into the stream, collecting about 30-50 mL at the midstream portion of the voiding. Tell the patient to finish voiding into the bedpan, urinal or toilet.
- Put on gloves before discarding the first and last portion of the voiding, and measure the remaining urine in a graduated container for intake and output records, if necessary. Be sure to include the amount in the specimen container when recording the total amount voided.
- Take the sterile container from the patient, and cap it securely. Avoid touching the inside of the container or the lid.
- If the outside of the container is soiled, clean and wipe it dry.
- Remove gloves and discard them properly.

Wash your hands thoroughly. Tell the patient to wash his hands also.

- Label the container with the patient's name and room number, name of the test and type of specimen, collection time and suspected diagnosis, if known.
- If a urine culture has been ordered, note any current antibiotic therapy on the laboratory request form.
- Send the container to the laboratory immediately, or place it to prevent specimen deterioration and altered test results.

Collecting and Indwelling Catheter Specimen

- About 30 minutes before collecting the specimen, clamp the drainage tube to allow urine to accumulate.
- Put on gloves
- If the drainage tube has a built-in sampling port, wipe the port with an alcohol pad. Uncap the needle on the syringe, and insert the needle into the sampling port at a 90-degree angle to the tubing. Then aspirate the specimen into the syringe.
- If the drainage tube doesn't have a sampling port and the catheter is made of rubber, obtain the specimen from the catheter.
- To withdraw the specimen from a rubber catheter, wipe it with an alcohol pad just above where it connects to the drainage tube. Insert the needle into the rubber catheter at a 45 degree angle and withdraw the specimen. Transfer the specimen to a sterile container, label it and send it to the lab immediately or place it on ice.
- If urine culture is to be performed, be sure to list any current antibiotic therapy on the laboratory request form.
- If the catheter isn't made of rubber or has no sampling port, wipe the area where the catheter joins the drainage tube with an alcohol pad. Disconnect the catheter, and allow urine to drain into the sterile specimen container.
- When you've collected the specimen, wipe both connection sites with an alcohol pad and join them. Then cap the specimen container with the patient's name and room number, name of the test type of the specimen, collection time, and suspected diagnosis if known. Send it to the laboratory immediately or place it on ice.

Echocardiogram



Practical No. 10
Echocardiogram

An echocardiogram is a test that uses sound waves to create pictures of the heart. The picture is more detailed than a standard x-ray image. An echocardiogram does not expose you to radiation.

Test Procedure

- A trained sonographer performs the test. A heart doctor (cardiologist) interprets the results.
- An instrument called a transducer is placed on your ribs near the breast bone and directed toward the heart. This device releases high-frequency sound waves. Images will be taken at other locations as well, including underneath and slightly to the left of your nipple and in the upper abdomen.
- The transducer picks up the echoes of sound waves and transmits them as electrical impulses. The echocardiography machine converts these impulses into moving pictures of the heart. Still pictures are also taken.

An echocardiogram allows doctors to see the heart beating. It also shows the heart valves and other structures.

In some cases, your lungs, ribs, or body tissue may prevent the sound waves and echoes from providing a clear picture of heart function. If this is a problem, the sonographer may inject a small amount of liquid (contrast) through an IV to better see the inside of the heart.

Rarely, more invasive testing using special echocardiography probes may be needed.

Preparation for the Test

- You will need to take off your clothes from the waist up and lie on an exam table on your back.
- Electrodes will be placed on your chest to monitor your heart beat.
- A gel is spread on your chest and the transducer will be moved over your skin. You will feel a slight pressure on your chest from the transducer.
- You may be asked to breathe in a certain way or to roll over onto your left side. Sometimes a special bed is used to help you stay in the proper position.

Indications

This test is done to evaluate the valves and chambers of the heart from the outside of your body. The echocardiogram can help detect:

- Abnormal heart valves
- Abnormal heart rhythms
- Congenital heart disease
- Damage to the heart muscle from a heart attack

Heart murmurs

- Inflammation (pericarditis) or fluid in the sac around the heart (pericardial effusion)

- Infection on or around the heart valves (infectious endocarditis)
- Pulmonary hypertension
- Ability of the heart to pump (for people with heart failure)
- Source of a blood clot after a stroke or TIA

Normal Results

A normal echocardiogram reveals normal heart valves and chambers and normal heart wall movement.

Abnormal Results Mean

An abnormal echocardiogram can mean many things. Some abnormalities are very minor and do not pose major risks. Other abnormalities are signs of serious heart disease. You will need more tests by a specialist in this case. It is very important to talk about the results of your echocardiogram with your health care provider.

Considerations

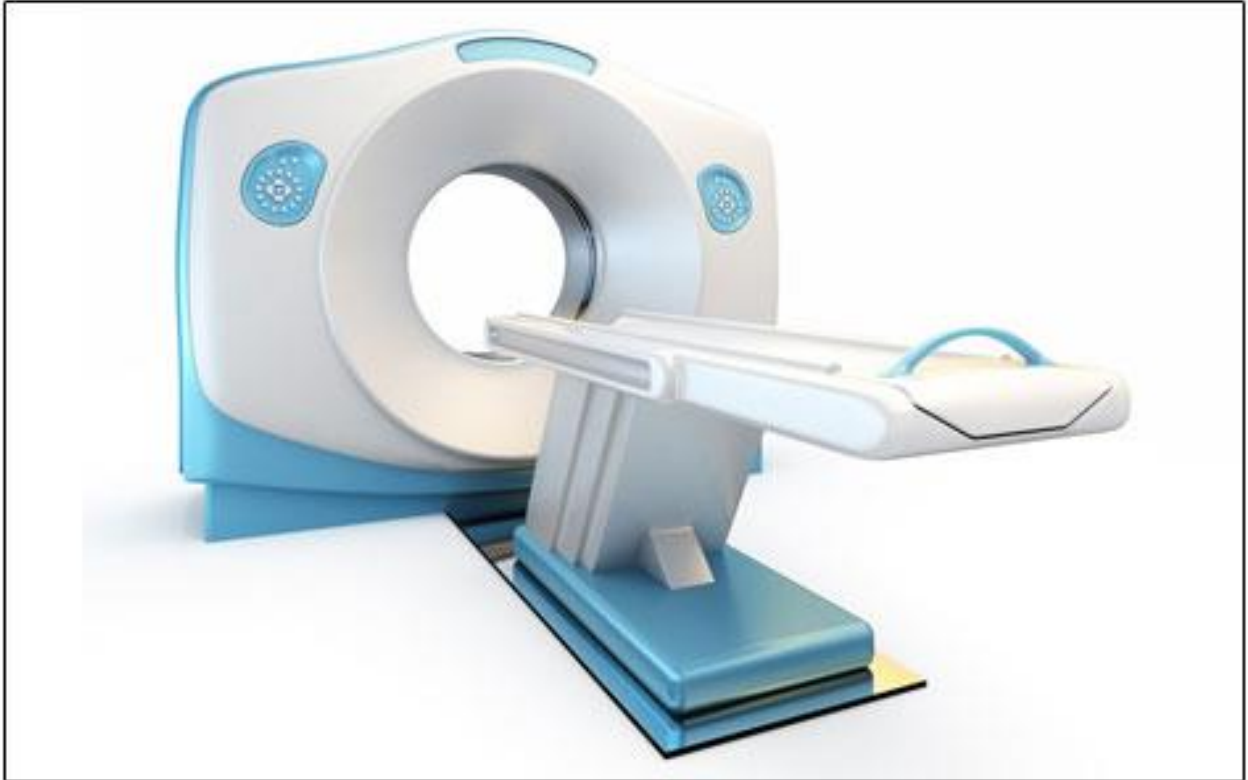
Abnormal results may indicate:

- Heart valve disease
- Cardiomyopathy
- Pericardial effusion
- Other heart abnormalities

This test is used to evaluate and monitor many different heart conditions.

Computed tomography

CT scanner



Practical No. 11
Computed Tomography

(CT scan)

A computed tomography (CT) scan is an imaging method that uses x-rays to create pictures of cross-sections of the body.

Related tests include:

- Abdominal CT scan
- Cranial CT scan
- Lumbosacral spine CT scan
- Orbit CT scan
- Thoracic CT scan

Test Method

- You will be asked to lie on a narrow table that slides into the center of the CT scanner.
- Once you are inside the scanner, the machine's x-ray beam rotates around you. Modern "spiral" scanners can perform the exam without stopping.
- A computer creates separate images of the body area, called slices. These images can be stored, viewed on a monitor, or printed on film. Three-dimensional models of the body area can be created by stacking the slices together.
- You must stay still during the exam, because movement causes blurred images. You may be told to hold your breath for short periods of time.
- Complete scans usually take only a few minutes. The newest scanners can image your entire body in less than 30 seconds.

Preparation for the Test

Certain exams require a special dye, called contrast, to be delivered into your body before the test starts. Contrast helps certain areas show up better on the x-rays.

Let your doctor know if you have ever had a reaction to contrast. You may need to take medicines before the test in order to avoid another reaction.

Contrast can be given several ways, and depends on the type of CT being performed.

- It may be delivered through a vein (IV) in your hand or forearm.
- It may be given into your rectum using an enema.
- You might drink the contrast before your scan. When you drink the contrast depends on the type of exam being done. The contrast liquid may taste chalky, although some are flavored. The contrast passes out of your body through your stools.

If contrast is used, you may also be asked not to eat or drink anything for 4-6 hours before the test.

Before receiving the contrast, tell your health care provider if you take the diabetes medication metformin (Glucophage). People taking this medicine may need to stop temporarily.

Find out if the CT machine has a weight limit if you weigh more than 300 pounds. Too much weight can cause damage to the scanner.

You will need to remove jewelry and wear a hospital gown during the study.

How the Test Will Feel

- Some people may have discomfort from lying on the hard table. Contrast given through an IV may cause a slight burning feeling, a metallic taste in the mouth, and a warm flushing of the body. These sensations are normal and usually go away within a few seconds.

Indications

A CT scan creates detailed pictures of the body, including the brain, chest, spine, and abdomen. The test may be used to:

- Diagnose an infection
- Guide a surgeon to the right area during a biopsy
- Identify masses and tumors, including cancer
- Study blood vessels

Normal Results

Results are considered normal if the organs and structures being examined are normal in appearance.

Abnormal Results

Abnormal results depend on the part of the body being studied. Talk to your health care provider about questions and concerns.

Risks

Risks of CT scans include:

- Allergic reaction to contrast dye
- Being exposed to radiation

CT scans expose you to more radiation than regular x-rays. Having many x-rays or CT scans over time may increase your risk for cancer. However, the risk from any one scan is small. You and your doctor should weigh this risk against the value of the information that will come from a CT scan.

Some people have allergies to contrast dye. Let your doctor know if you have ever had an allergic reaction to injected contrast dye.

- The most common type of contrast given into a vein contains iodine. If you have an iodine allergy, type of contrast may cause nausea or vomiting, sneezing, itching or hives.
- If you absolutely must be given such contrast, your doctor may give you antihistamines (such as Benadryl) or steroids before the test.
- Your kidneys help remove iodine out of the body. You may need to receive extra fluids to flush iodine out of the body if you have diabetes or kidney disease.

Rarely, the dye may cause a life-threatening allergic response called anaphylaxis. If you have any trouble breathing during the test, tell the scanner operator immediately. Scanners come with an intercom and speakers, so the operator can hear you at all times.

Alternative Names

CAT scan; Computed axial tomography scan; Computed tomography scan

MRI – Device



Practical No.12

Magnetic Resonance Imaging

(MRI)

An MRI (magnetic resonance imaging) scan is an imaging test that uses powerful magnets and radio waves to create pictures of the body. It does not use radiation (x-rays).

Single MRI images are called slices. The images can be stored on a computer or printed on film. One exam produces dozens or sometimes hundreds of images.

- Abdominal MRI
- Chest MRI
- Cranial MRI
- Heart MRI
- Spine MRI

Test Method

- You may be asked to wear a hospital gown or clothing without zippers or snaps (such as sweatpants and a t-shirt). Certain types of metal can cause blurry images.
- You will lie on a narrow table, which slides into a large tunnel-shaped scanner.
- Some exams require a special dye (contrast). Most of the time, the dye will be given through a vein (IV) in your hand or forearm before the test. The dye helps the radiologist see certain areas more clearly.
- Small devices, called coils, may be placed around the head, arm, or leg, or other areas to be studied. These help send and receive the radio waves, and help the quality of the images.
- During the MRI, the person who operates the machine will watch you from another room. The test lasts about 30 to 60 minutes, but may take longer.

Preparation for the test

You may be asked not to eat or drink anything for 4 to 6 hours before the scan.

Tell your doctor if you are afraid of close spaces (have claustrophobia). You may be given a medicine to help you feel sleepy and less anxious, or your doctor may suggest an "open" MRI, in which the machine is not as close to the body.

Before the test, tell your health care provider if you have:

- Artificial heart valves
- Brain aneurysm clips
- Heart defibrillator or pacemaker
- Inner ear (cochlear) implants
- Kidney disease or dialysis (you may not be able to receive contrast)
- Recently placed artificial joints
- Vascular stents.
- Worked with sheet metal in the past (you may need tests to check for metal pieces in your eyes)

Because the MRI contains strong magnets, metal objects are not allowed into the room with the MRI scanner:

- Items such as jewelry, watches, credit cards, and hearing aids can be damaged.
- Pens, pocketknives, and eyeglasses may fly across the room.
- Pins, hairpins, metal zippers, and similar metallic items can distort the images.
- Removable dental work should be taken out just before the scan.

How the Test Will Feel

- An MRI exam causes no pain. If you have difficulty lying still or are very nervous, you may be given a medicine to relax you. Too much movement can blur MRI images and cause errors.
- The table may be hard or cold, but you can request a blanket or pillow. The machine produces loud thumping and humming noises when turned on. You can wear ear plugs to help reduce the noise.
- An intercom in the room allows you to speak to someone at any time. Some MRIs have televisions and special headphones that you can use to help the time pass.
- There is no recovery time, unless you were given a medicine to relax. After an MRI scan, you can resume your normal diet, activity, and medications.

Indications

- Having MRIs with other imaging methods can often help your doctor make a diagnosis.
- MRI images taken after a special dye (contrast) is delivered into your body may provide extra information about the blood vessels.
- An MRA, or magnetic resonance angiogram, is a form of magnetic resonance imaging that creates three-dimensional pictures of blood vessels. It is often used when traditional angiography cannot be done.

Normal values

A normal result means the body area being studied looks normal.

Abnormal Results

Results depend on the part of the body being examined and the nature of the problem. Different types of tissues send back different MRI signals. For example, healthy tissue sends back a slightly different signal than cancerous tissue. Consult your health care provider with any questions and concerns.

Risks

MRI does not use ionizing radiation. No side effects from the magnetic fields and radio waves have been reported.

The most common type of contrast (dye) used is gadolinium. It is very safe. Allergic reactions rarely occur. However, gadolinium can be harmful to people with kidney problems who are on dialysis. Tell your health care provider before the test if you have kidney problems.

The strong magnetic fields created during an MRI can cause heart pacemakers and other implants not to work as well. The magnets can also cause a piece of metal inside your body to move or shift.

Alternative Names

Magnetic resonance imaging; Nuclear magnetic resonance (NMR) imaging

Practical # 13

Thallium Stress Test

A thallium stress test is a nuclear imaging test that shows how well blood flows into the heart while you're exercising or at rest. This test is also called a cardiac or nuclear stress test. During the procedure, a radioisotope (nuclear liquid) is administered through an IV. The radioisotope will flow through your blood stream and end up in your heart. Once the radiation is in your heart, a special camera called a gamma camera can detect the radiation and reveal any issues your heart muscle is having.

Indications

- If heart isn't getting enough blood flow (oxygen) when it's under stress (exercise)
- If patient have chest pain or worsening angina
- If patient have had a previous heart attack
- To check how well medications are working
- To determine whether or not a procedure or surgery was successful
- To determine if heart is healthy enough to start an exercise program

The thallium stress test can show

- the size of the heart chambers
- how effectively the heart pumps (ventricular function)
- how well the coronary arteries supply the heart with blood (myocardial perfusion)
- if the heart muscle is damaged or scarred from previous heart attacks

Preparation for a Thallium Stress Test

Patient will probably need to fast after midnight the night before the test or at least 4 hours before the test. Fasting can prevent getting sick during the exercise portion. Wear comfortable clothes and shoes for exercising.

Twenty-four hours before the test, Patient will need to avoid all caffeine — even decaffeinated coffee and drinks have small amounts of caffeine — including tea, soda, coffee, chocolate, and certain pain relievers. Drinking caffeine can cause heart rate to be higher than it normally would be.

Doctor should ask all medications that patient is taking. This is because some medications — like ones that treat asthma — can interfere with test results.

Thallium Stress Test Procedure

The test must be done at a hospital, medical center, or doctor's office. A nurse or healthcare professional will insert an IV usually on the inside of the elbow. A radioisotope or radiopharmaceutical medication such as thallium or sestamibi is injected through the IV. The nuclear material will mark your blood flow and will be picked up by the gamma camera.

The test will include an exercise and resting portion, and your heart will be photographed during both. The doctor administering test will determine the order that these tests are performed in.

Resting Portion

Patient will lie down for 15 to 45 minutes while the medication works its way through your body to your heart. Patient will then lie down on an exam table with his/her arms above his/her head and a gamma camera above him will take pictures.

Risks and Complications of a Thallium Stress Test

Most people tolerate the test very well. Patient may feel a sting as the medication that simulates exercise is injected, followed by a warm feeling. Some people may experience headache, nausea, and a racing heart.

The nuclear material will leave the body through urine. Complications from the nuclear material injected into the body are very rare.

Rare complications from the test may include:

- arrhythmias (irregular heart beat)
- increased angina (pain from poor blood flow in the heart)
- difficulty breathing
- asthma-like symptoms
- large swings in blood pressure
- skin rashes
- shortness of breath
- chest discomfort
- dizziness
- heart palpitations (an irregular heart beat)

Alert the test administrator if you experience any of these symptoms during your test.

Results of the Thallium Stress Test Mean

Results depend on the reason for the test, how old you are, your history of heart problems, and other medical issues.

Normal Results

A normal result means blood flowing through the coronary arteries in the heart is normal.

Abnormal Results

Abnormal results may indicate:

- reduced blood flow to part of the heart (narrowing or blockage of one or more arteries that supply your heart muscle)
- scarring of the heart muscle due to a previous heart attack
- coronary artery disease (heart disease)
- a too-large heart (indicating other heart complications)

Exercise Portion

In the exercise portion of the test, patient will walk on a treadmill or pedal an exercise bicycle. Most likely, doctor will ask patient to start slowly and progressively pick up the pace into a jog. Patient may need to run on an incline to make it more challenging.

If patient is unable to exercise, doctor will give him a medication that will stimulate heart and make it beat faster. This simulates how the heart would act during exercise.

Blood pressure and heart rhythm are monitored while patient exercise. Once heart is working as hard as it can, patient will get off the treadmill. After about 30 minutes, will lie down on an exam table again.

The gamma camera will record pictures that show the flow of blood through your heart. Doctor will compare these pictures with the set of resting images to evaluate how weak or strong the blood flow to your heart is.

Practical#14**Serum amylase test****Indications:**

- Amylase tests are ordered in the following cases:
- To diagnose and monitor acute and chronic pancreatitis or other conditions of the pancreas
- Urine amylase may be done to monitor kidney dysfunction.

- To monitor progress made in pancreatic cancer treatment
- To monitor progress after gall stone removal

Physiology

Amylase is an enzyme which is produced mainly by the salivary glands and the pancreas. It initiates the process of digestion and plays an important role in converting dietary starch into simpler sugars.

Amylase (alpha amylase) is also present in pancreas and this aid in hydrolyzing the starch in our diet into disaccharides and trisaccharides, which are eventually converted into glucose by other enzymes. Amylase is also produced by some forms of bacteria and plants.

Test Method

A blood sample is taken from a vein.

Preparation for the test

- No special preparation is needed. However, patient should avoid alcohol before the test. The health care provider may ask patient to stop taking drugs that may affect the test. DO NOT stop taking any medicines without first talking to healthcare provider.
- Drugs that can increase amylase measurements include:
 - Asparaginase
 - Aspirin
 - Birth control pills
 - Cholinergic medications
 - Ethacrynic acid
 - Methyldopa
 - Opiates (codeine, meperidine, and morphine)
 - Thiazide diuretics
- Patient may feel slight pain or a sting when the needle is inserted to draw blood. Afterward, there may be some throbbing.

Normal Results

- The normal range is 23 to 85 units per liter (U/L). Some laboratories give a range of 40 to 140 U/L.

- Note: Normal value ranges may vary slightly among different laboratories. Talk to your doctor about the meaning of your specific test results.
- Some laboratories use different measurements or may test different specimens.

Abnormal Results

Increased blood amylase levels may occur due to:

- Acute pancreatitis
- Cancer of the pancreas, ovaries, or lungs
- Cholecystitis
- Gallbladder attack caused by disease
- Gastroenteritis (severe)
- Infection of the salivary glands (such as mumps) or a blockage
- Intestinal blockage
- Pancreatic or bile duct blockage
- Perforated ulcer
- Tubal pregnancy (may have burst open)

Risk

Slight risks from having blood drawn may include:

- Excessive bleeding
- Fainting or feeling light-headed
- Hematoma (blood accumulating under the skin)
- Infection (a slight risk any time the skin is broken)

Practical#15

Thyroid stimulating hormone

The thyroid-stimulating hormone (TSH) test is often the test of choice for evaluating thyroid function and/or symptoms of thyroid disorder, including hyperthyroidism or hypothyroidism.

TSH is produced by the pituitary gland, a tiny organ located below the brain and behind the sinus cavities. It is part of the body's feedback system to maintain stable amounts of the thyroid hormones thyroxine (T4) and triiodothyronine (T3) in the blood and to help control the rate at which the body uses energy.

A TSH test is frequently ordered along with or preceding a free T4 test. Other thyroid tests that may be ordered include a free T3 test and thyroid antibodies (if autoimmune-related thyroid disease is suspected). Sometimes TSH, free T4 and free T3 are ordered together as a thyroid panel.

Indications

- TSH testing is used to:
- Diagnose a thyroid disorder in a person with symptoms.
- Screen newborns for an underactive thyroid.
- Monitor thyroid replacement therapy in people with hypothyroidism
- Monitor anti-thyroid treatment in people with hyperthyroidism
- Help diagnose and monitor infertility problems in women
- Help evaluate the function of the pituitary gland (occasionally)
- Screen adults for thyroid disorders

Procedure

There is no preparation needed for this test. Ask health care provider about any medicines taking that may affect the test results. Do not stop taking any medicines without first asking your health care provider.

Medicines you may need to temporarily stop include:

- Amiodarone
- Dopamine
- Lithium
- Potassium iodide

Prednisone or other glucocorticoid medicine

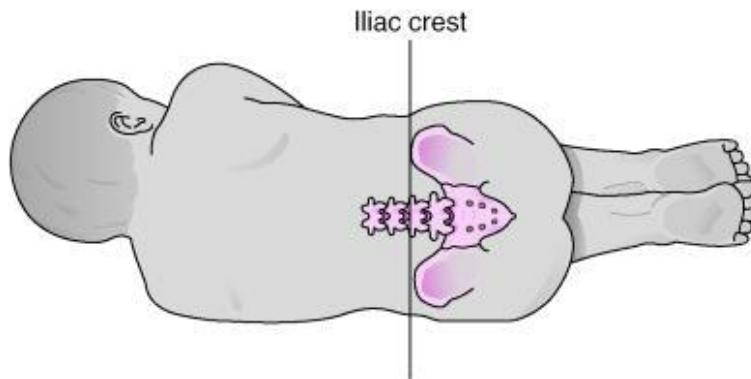
A high TSH result may mean that:

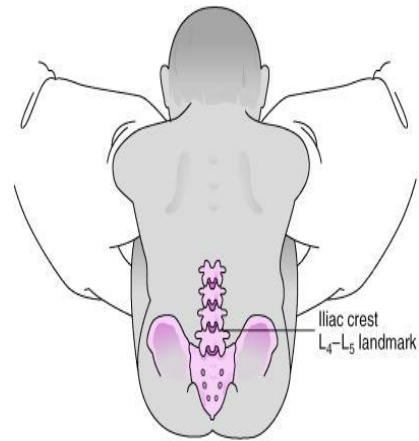
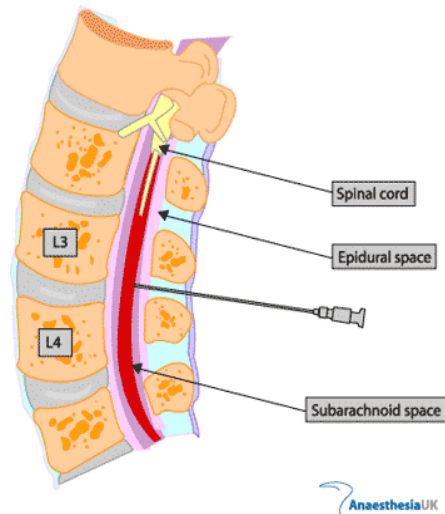
- The person tested has an underactive thyroid gland that is not responding adequately to the stimulation of TSH due to some type of acute or chronic thyroid dysfunction.
- A person with hypothyroidism or who has had their thyroid gland removed is receiving too little thyroid hormone replacement medication and the dose may need to be adjusted.

- A person with hyperthyroidism is receiving too much anti-thyroid medication and the dose needs adjusting.
- There is a problem with the pituitary gland, such as a tumor producing unregulated levels of TSH

A low TSH result may indicate:

- An overactive thyroid gland (hyperthyroidism)
- Excessive amounts of thyroid hormone medication in those who are being treated for an underactive (or removed) thyroid gland
- Insufficient anti-thyroid medication in a person being treated for hyperthyroidism; however, it may take a while for TSH production to resume after successful anti-thyroid treatment. This is why the American Thyroid Association recommends monitoring this treatment with tests for thyroid hormones (T4 and T3) as well as TSH levels.
- Damage to the pituitary gland that prevents it from producing adequate amounts of TSH





Practical no#16

Lumber Puncture

Indications

- Diagnosis of central nervous system (CNS) infection
- Diagnosis of subarachnoid hemorrhage (SAH)
- Evaluation and diagnosis of inflammatory CNS processes
- Infusion of anesthetic, chemotherapy, or contrast agents into the spinal canal
- Treatment of intracranial hypertension.

Contraindication

- Alteration of intracranial pressure due to cerebral mass.
- Uncorrected coagulopathy.
- Acute spinal cord trauma.
- Skin infection near site of LP.

Equipment:

- 18G or 20G sterile spinal needle with stylet
- (22G needle for children).
- Three-way stopcock.
- Manometer.
- Small adhesive bandage.-
- Sterile gloves for the physician.
- Sterile gloves for the nurse.
- Sterile gauze pad.
- Antiseptic solution (e.g. Iodine).
- 25G sterile needle for injecting anesthetic.
- Three sterile collection tubes with stoppers.
- Overbed table.
- 3-ml syringe for local anesthetic.
- Laboratory request forms and laboratory biohazard transport bag.
- Labels and light source.
- Disposable lumbar puncture trays contain most of the needed sterile equipment

Preparation:

- 1- Determine whether written consent for the procedure has been obtained.
- 2- Explain the procedure to the patient.
- 3- Instruct the patient to void before the procedure.

Performance:

- The patient is positioned on lateral recumbent position or sitting upright position.
- Small pillow may be placed under the patient's head.
- A pillow may be placed between the legs.
- The patient is encouraged to relax and is instructed to breathe normally.
- The physician cleanses the puncture site with an antiseptic solution and drapes the site.
- Overlying skin cleaned with povidone-iodine.
- The physician injects local anesthetic to numb the puncture site
- The physician inserts a spinal needle into the subarachnoid space through the third and fourth or fourth and fifth lumbar interspace.
- A specimen of CSF is removed and usually collected in three test tubes, labeled in order of collection.

- A pressure reading may be obtained.
- The needle is withdrawn.
- The physician applies a small dressing to the puncture site.
- The tubes of CSF are sent to the laboratory immediately.
- Instruct the patient to lie prone for 2 to 3 hours.
- Monitor the patient for complications of lumbar puncture.
- Notify physician if complications occur.
- Encourage increased fluid intake.

Complication

- Headache
- Apnea (central or obstructive)
- Back pain
 - Occasionally with short-lived referred limp
 - Disc herniation if needle advanced too far
- Bleeding or fluid leak around spinal cord
- Infection, pain, hematoma
- Subarachnoid epidermal cyst
- Ocular muscle palsy (transient)
- Nerve Trauma
- Brainstem herniation