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VIVA : CLINICAL MEDICINE

**Q1: What is the role of Nuclear medicine in diagnosis and treatment of thyroid diseases?**

**Ans: Nuclear Medicine For Thyroid Gland:**

Nuclear medicine play a major role in treatment and as well as in diagnosis thyroid diseases. Thyroid gland disorder therapeutic modalities includes radioiodine and surgery.

### **Diagnosis with Nuclear Medicine**

Thyroid scan work with nuclear medicine. In nuclear medicine, the procedure uses a small amount of radioactive material in order to diagnose the thyroid disease.

Mostly the thyroid scans or test uses a radioactive iodine. As know the thyroid gland uses iodine and the thyroid cancer absorb the iodine easily that's why a radioactive iodine mostly used. The scanner or gamma camera is introduced to detect the emission caused by the radioactive iodine in the thyroid glands.

Then from the obtained result the doctor will calculate the proper function of the thyroid.

### **Uses**

It is used to see or determines the malfunctioning or abnormalities found in a laboratory test or physical exam. The resultant images obtained from performing the test can be used to diagnose the following:

- Swelling.
- Inflammation.
- Thyroid cancer.
- Nodules (cysts).
- Hyperthyroidism.
- Over Growths.
- Lumps.
- Goiter.

### **Treatment With Nuclear Medicine**

Nuclear medicine are also used for the treatment of thyroid gland disorders. Including hyperthyroidism and thyroid cancer.

Therapy with nuclear medicines uses a small amount of radioactive iodine 1-131 is given to the patient to swallow.

(RADIOACTIVE IODINE IS AN ISOTOPE WHICH EMIT RADIATION)

The radioactive materials is the get absorbed into the blood stream and is get concentrated by the thyroid gland, where it begins destroying the glands cells.

Nuclear medicine are used treat the following various diseases.

- Cancers.
- Heart diseases.
- Neurological or Endocrine disorders.

- Gastrointestinal.

Nuclear medicine can identify disease in its earliest stages. It can also give an idea of the patient's condition and whether he is responding to treatment.

It is mostly like that some or most of the thyroid gland cells may be destroyed using nuclear medicine procedures. As thyroid hormones are used in metabolism, so the patient will have to take thyroid medicine or thyroid pills for the rest of their whole life. No other side effects are there for the nuclear medicine procedure of the thyroid gland.

**Q2: What do you know about polycystic kidneys? Explain in detail**

**ANS: Polycystic Kidneys:**

Polycystic kidney disease (PKD) is an inherited kidney disorder. It causes fluid-filled cysts to form in the kidneys. PKD may impair kidney function and eventually cause kidney failure.

PKD is the fourth leading cause of kidney failure. People with PKD may also develop cysts in the liver and other complications.

**Symptoms:**

Many people live with PKD for years without experiencing symptoms associated with the disease. The cysts typically grow 0.5 inches or larger before a person starts noticing symptoms. Initial symptoms associated with PKD can include:

- pain or tenderness in the abdomen

- blood in the urine
- frequent urination
- pain in the sides
- kidney stones
- skin that bruises easily
- pale skin color
- fatigue
- joint pain

Children with autosomal recessive PKD may have symptoms that include:

- high blood pressure
- UTI
- frequent urination

Symptoms in children may resemble other disorders. It's important to get medical attention for a child experiencing any of the symptoms listed above.

### **Causes:**

#### **Autosomal dominant PKD:**

Autosomal dominant (ADPKD) is sometimes called adult PKD. According to the National Kidney Foundation, it accounts for about 90 percent of cases. Someone who has a parent with PKD has a 50 percent chance of developing this condition.

Symptoms usually develop later in life, between the ages of 30 and 40. However, some people begin to experience symptoms in childhood.

## **Autosomal recessive PKD**

Autosomal recessive PKD (ARPKD) is much less common than ADPKD. It's also inherited, but both parents must carry the gene for the disease.

People who are carriers of ARPKD won't have symptoms if they have only one gene. If they inherit two genes, one from each parent, they'll have ARPKD.

## **Acquired cystic kidney disease**

Acquired cystic kidney disease (ACKD) isn't inherited. It usually occurs later in life.

ACKD usually develops in people who already have other kidney problems. It's more common in people who have kidney failure or are on dialysis.

### **Treatment:**

The goal of PKD treatment is to manage symptoms and avoid complications. Controlling high blood pressure is the most important part of treatment.

Some treatment options may include:

- pain medication, except ibuprofen (Advil), which isn't recommended since it may worsen kidney disease
- blood pressure medication
- antibiotics to treat UTIs
- a low-sodium diet
- diuretics to help remove excess fluid from the body

surgery to drain cysts and help relieve discomfort

In 2018, the Food and Drug Administration approved a drug called tolvaptan (brand name Jynarque) as a treatment for ADPKD. It's used to slow the progression of kidney decline.

One of the serious potential side effects of tolvaptan is severe liver damage, so your doctor will regularly monitor the health of your liver and kidneys while on this medication.

### **Diagnose:**

Because ADPKD and ARPKD are inherited, your doctor will review your family history. They may initially order a complete blood count to look for anemia or signs of infection and a urinalysis to look for blood, bacteria, or protein in your urine.

To diagnose all three types of PKD, your doctor may use imaging tests to look for cysts of the kidney, liver, and other organs. Imaging tests used to diagnose PKD include:

- **Abdominal ultrasound.** This noninvasive test uses sound waves to look at your kidneys for cysts.

- **Abdominal CT scan.** This test can detect smaller cysts in the kidneys.
- **Abdominal MRI scan.** This MRI uses strong magnets to image your body to visualize kidney structure and look for cysts.
- **Intravenous pyelogram.** This test uses a dye to make your blood vessels show up more clearly on an X-ray.

## *Kidney failure and transplant options*

One of the most serious complications of PKD is kidney failure. This is when the kidneys are no longer able to:

- filter waste products
- maintain fluid balance
- maintain blood pressure

When this occurs, your doctor will discuss options with you that may include a kidney transplant or dialysis treatments to act as artificial kidneys.

If your doctor does place you on a kidney transplant list, there are several factors that determine your placement. These include your overall health, expected survival, and time you have been on dialysis.

It's also possible that a friend or relative could donate a kidney to you. Because people can live with only one kidney with relatively few complications, this can be an option for families who have a willing donor.

The decision to undergo a kidney transplant or donate a kidney to a person with kidney disease can be a difficult one. Speaking to your

nephrologist can help you weigh your options. You can also ask what medications and treatments can help you live as well as possible in the meantime.

**Q3: What is lithotripsy? Is it a therapeutic or diagnostic tool? What is general criteria for performing lithotripsy?**

**Ans: Lithotripsy**

Lithotripsy is a medical procedure used to treat certain types of kidney stones and stones in other organs, such as your gallbladder or liver.

Kidney stones occur when minerals and other substances in your urine crystallize in your kidneys, forming solid masses, or stones. These may consist of small, sharp-edged crystals or smoother, heavier formations that resemble polished river rocks. They usually exit your body naturally during urination.

However, sometimes your body can't pass larger formations through urination. This can lead to kidney damage. People with kidney stones may experience bleeding, severe pain, or urinary tract infections. When stones begin to cause these types of problems, your doctor may suggest lithotripsy.

**Is it a therapeutic or diagnostic tool?**

Lithotripsy is used for breaking up larger stone into place so they can easily exit the body it uses shock waves to do so. By this property, it's a therapeutic tool.

## **CRITERIAS FOR PROCEDURE:**

General criteria for lithotripsy are as follows;

- No Anticoagulation.
- There should be no bleeding diathesis.
- Woman should not be pregnant.
- Sever skeletal malformation should not be present.
- No distal obstruction in the patient.
- Fasting before procedure.
- Blood test and other diagnostic tests.
  
- **Stone Criteria's:**
  - Multiple stone
  - Lower pole stone
  - Stone size > 2cm
  - Hounsfield unit >100
  
- **Patient criteria's:**
  - Pelvic kidney
  - Calyceal diverticulum
  - Horseshoe kidney

- Obesity – skin to stone distance > 10cm

- **Technical Factor to look at which optimizes the result or outcomes of lithotripsy:**

- General anesthesia
- Wider focal zone
- Active intraoperative monitoring
- Low shock wave rate (60 shock per minute)
- Optimal coupling

**Q4: Describe all the terms used in medical dictionary with suffix “otomy”.**

**Ans: Definition**

The suffix "-otomy," or "-tomy," refers to the act of cutting or making an incision, as in a medical operation or procedure. This word part is derived from the Greek -tomia, which means to cut.

**Examples:**

**Autotomy (aut-otomy):** the act of removing an appendage from the body in order to escape when trapped. This defense mechanism is exhibited in animals such as lizards, geckos, and crabs. These animals can use regeneration to recover the lost appendage.

**Craniotomy (crani-otomy):** surgical cutting of the skull, typically done to provide access to the brain when surgery is needed. A craniotomy may require a small or large cut depending on the type of surgery

needed. A small cut in the skull is referred to as a burr hole and is used to insert a shunt or remove small brain tissue samples. A large craniotomy is called a skull base craniotomy and is needed when removing large tumors or after an injury that causes a skull fracture.

**Episiotomy (episi-otomy):** surgical cut made into the area between the vagina and anus to prevent tearing during the child birthing process. This procedure is no longer routinely performed due to associated risks of infection, extra blood loss, and possible increase in the size of the cut during delivery.

**Gastrostomy (gastr-otomy):** surgical incision made into the stomach for the purpose of feeding an individual who is incapable of taking in food through normal processes.

**Hysterotomy (hyster-otomy):** surgical incision made into the uterus. This procedure is done in a Cesarean section to remove a baby from the womb. A hysterotomy is also performed in order to operate on a fetus in the womb.

**Phlebotomy (phleb-otomy):** incision or puncture made into a vein in order to draw blood. A phlebotomist is a health care worker who draws blood.

**Laparotomy (lapar-otomy):** incision made into the abdominal wall for the purpose of examining abdominal organs or diagnosing an abdominal problem. Organs examined during this procedure may include the kidneys, liver, spleen, pancreas, appendix, stomach, intestines, and female reproductive organs.

**Lobotomy (lob-otomy):** incision made into a lobe of a gland or organ. Lobotomy also refers to an incision made into a lobe of the brain to sever nerve tracts.

**Rhizotomy (rhiz-otomy):** surgical severing of a cranial nerve root or spinal nerve root in order to relieve back pain or decrease muscle spasms.

**Tenotomy (ten-otomy):** incision made into the tendon in order to correct a muscle deformity. This procedure helps to lengthen a defective muscle and is commonly used to correct a club foot.

**Tracheotomy (trache-otomy):** incision made into the trachea (windpipe) for the purpose of inserting a tube to allow air to flow the lungs. This is done to bypass an obstruction in the trachea, such as swelling or a foreign object.

**Q5: What do u know about urinary tract infection UTI?  
Explain in detail**

## **Ans: Urinary Tract Infection UTI:**

A urinary tract infection (UTI) is an infection in any part of your urinary system — your kidneys, ureters, bladder and urethra. Most infections involve the lower urinary tract — the bladder and the urethra.

Women are at greater risk of developing a UTI than are men. Infection limited to your bladder can be painful and annoying. However, serious consequences can occur if a UTI spreads to your kidneys.

Doctors typically treat urinary tract infections with antibiotics. But you can take steps to reduce your chances of getting a UTI in the first place.

### **Symptoms:**

Urinary tract infections don't always cause signs and symptoms, but when they do they may include:

- A strong, persistent urge to urinate
- A burning sensation when urinating
- Passing frequent, small amounts of urine
- Urine that appears cloudy
- Urine that appears red, bright pink or cola-colored — a sign of blood in the urine
- Strong-smelling urine
- Pelvic pain, in women — especially in the center of the pelvis and around the area of the pubic bone

## **Types of urinary tract infection**

Each type of UTI may result in more-specific signs and symptoms, depending on which part of your urinary tract is infected.

### **Part of urinary tract affected**

- Kidneys (acute pyelonephritis)

### **Sign and symptoms**

Upper back and side (flank) pain

High fever

Shaking and chills

Nausea

Vomiting (acute pyelonephritis)

- Bladder (cystitis)

### **Sign and symptoms**

Pelvic pressure

Lower abdomen discomfort

Frequent, painful urination

Blood in urine

## **Causes:**

Urinary tract infections typically occur when bacteria enter the urinary tract through the urethra and begin to multiply in the bladder. Although the urinary system is designed to keep out such microscopic invaders, these defenses sometimes fail. When that happens, bacteria may take hold and grow into a full-blown infection in the urinary tract.

The most common UTIs occur mainly in women and affect the bladder and urethra.

**Infection of the bladder (cystitis).** This type of UTI is usually caused by *Escherichia coli* (*E. coli*), a type of bacteria commonly found in the gastrointestinal (GI) tract. However, sometimes other bacteria are responsible.

Sexual intercourse may lead to cystitis, but you don't have to be sexually active to develop it. All women are at risk of cystitis because of their anatomy — specifically, the short distance from the urethra to the anus and the urethral opening to the bladder.

**Infection of the urethra (urethritis).** This type of UTI can occur when GI bacteria spread from the anus to the urethra. Also, because the female urethra is close to the vagina, sexually transmitted infections, such as herpes, gonorrhea, chlamydia and mycoplasma, can cause urethritis.

## **Complication:**

When treated promptly and properly, lower urinary tract infections rarely lead to complications. But left untreated, a urinary tract infection can have serious consequences.

Complications of a UTI may include:

- Recurrent infections, especially in women who experience two or more UTIs in a six-month period or four or more within a year.
- Permanent kidney damage from an acute or chronic kidney infection (pyelonephritis) due to an untreated UTI.
- Increased risk in pregnant women of delivering low birth weight or premature infants.
- Urethral narrowing (stricture) in men from recurrent urethritis, previously seen with gonococcal urethritis.
- Sepsis, a potentially life-threatening complication of an infection, especially if the infection works its way up your urinary tract to your kidneys.

## **Prevention:**

You can take these steps to reduce your risk of urinary tract infections:

**Drink plenty of liquids, especially water.** Drinking water helps dilute your urine and ensures that you'll urinate more frequently — allowing

bacteria to be flushed from your urinary tract before an infection can begin.

**Drink cranberry juice.** Although studies are not conclusive that cranberry juice prevents UTIs, it is likely not harmful.

**Wipe from front to back.** Doing so after urinating and after a bowel movement helps prevent bacteria in the anal region from spreading to the vagina and urethra.

**Empty your bladder soon after intercourse.** Also, drink a full glass of water to help flush bacteria.

**Avoid potentially irritating feminine products.** Using deodorant sprays or other feminine products, such as douches and powders, in the genital area can irritate the urethra.

**Change your birth control method.** Diaphragms, or unlubricated or spermicide-treated condoms, can all contribute to bacterial growth.