Medical/Surgical Nursing II

NSG 325

University of Ibadan Distance Learning Centre
Open and Distance Learning Course Series Development

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Vice-Chancellor's Message

The Distance Learning Centre is building on a solid tradition of over two decades of service in the provision of External Studies Programme and now Distance Learning Education in Nigeria and beyond. The Distance Learning mode to which we are committed is providing access to many deserving Nigerians in having access to higher education especially those who by the nature of their engagement do not have the luxury of full time education. Recently, it is contributing in no small measure to providing places for teeming Nigerian youths who for one reason or the other could not get admission into the conventional universities.

These course materials have been written by writers specially trained in ODL course delivery. The writers have made great efforts to provide up to date information, knowledge and skills in the different disciplines and ensure that the materials are user-friendly.

In addition to provision of course materials in print and e-format, a lot of Information Technology input has also gone into the deployment of course materials. Most of them can be downloaded from the DLC website and are available in audio format which you can also download into your mobile phones, IPod, MP3 among other devices to allow you listen to the audio study sessions. Some of the study session materials have been scripted and are being broadcast on the university's Diamond Radio FM 101.1, while others have been delivered and captured in audio-visual format in a classroom environment for use by our students. Detailed information on availability and access is available on the website. We will continue in our efforts to provide and review course materials for our courses.

However, for you to take advantage of these formats, you will need to improve on your I.T. skills and develop requisite distance learning Culture. It is well known that, for efficient and effective provision of Distance learning education, availability of appropriate and relevant course materials is a *sine qua non*. So also, is the availability of multiple plat form for the convenience of our students. It is in fulfilment of this, that series of course materials are being written to enable our students study at their own pace and convenience.

It is our hope that you will put these course materials to the best use.

Prof. Abel Idowu Olayinka

Vice-Chancellor

Foreword

As part of its vision of providing education for "Liberty and Development" for Nigerians and the International Community, the University of Ibadan, Distance Learning Centre has recently embarked on a vigorous repositioning agenda which aimed at embracing a holistic and all encompassing approach to the delivery of its Open Distance Learning (ODL) programmes. Thus we are committed to global best practices in distance learning provision. Apart from providing an efficient administrative and academic support for our students, we are committed to providing educational resource materials for the use of our students. We are convinced that, without an up-to-date, learner-friendly and distance learning compliant course materials, there cannot be any basis to lay claim to being a provider of distance learning education. Indeed, availability of appropriate course materials in multiple formats is the hub of any distance learning provision worldwide.

In view of the above, we are vigorously pursuing as a matter of priority, the provision of credible, learner-friendly and interactive course materials for all our courses. We commissioned the authoring of, and review of course materials to teams of experts and their outputs were subjected to rigorous peer review to ensure standard. The approach not only emphasizes cognitive knowledge, but also skills and humane values which are at the core of education, even in an ICT age.

The development of the materials which is on-going also had input from experienced editors and illustrators who have ensured that they are accurate, current and learner-friendly. They are specially written with distance learners in mind. This is very important because, distance learning involves non-residential students who can often feel isolated from the community of learners.

It is important to note that, for a distance learner to excel there is the need to source and read relevant materials apart from this course material. Therefore, adequate supplementary reading materials as well as other information sources are suggested in the course materials.

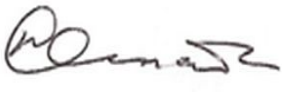
Apart from the responsibility for you to read this course material with others, you are also advised to seek assistance from your course facilitators especially academic advisors during your study even before the interactive session which is by design for revision. Your academic advisors will assist you using convenient technology including Google Hang Out, You Tube, Talk Fusion, etc. but you have to take advantage of these. It is also going to be of immense advantage if you complete assignments as at when due so as to have necessary feedbacks as a guide.

The implication of the above is that, a distance learner has a responsibility to develop requisite distance learning culture which includes diligent and disciplined self-study, seeking available administrative and academic support and acquisition of basic information technology skills. This is why you are encouraged to develop your computer skills by availing yourself the opportunity of training that the Centre's provide and put these into use.

In conclusion, it is envisaged that the course materials would also be useful for the regular students of tertiary institutions in Nigeria who are faced with a dearth of high quality textbooks. We are therefore, delighted to present these titles to both our distance learning students and the university's regular students. We are confident that the materials will be an invaluable resource to all.

We would like to thank all our authors, reviewers and production staff for the high quality of work.

Best wishes.



Professor Bayo Okunade

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COURSE CODE/COURSE TITLE:NSG 325/MEDICAL-SURGICAL NURSING II

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Course Code & Course Name: NSG 325: Medical Surgical Nursing III

Credit points: 4 Units

Year: 300-Level:

Semester: Second Semester

You are welcome to NSG 325. This is an online course that runs in the distance learning mode. It is a compulsory course which is opened to all nursing students, it is a 4-unit course with 45 hours of interaction among teachers and learners for the period of the course.

About the Course: The course will divided and discussed in three modules. Each module will focus on different aspect of nursing as follows: renal and urology nursing, sensory systems and the endocrinology nursing.

Module one : Renal and Urology Nursing: This aspect of the course introduces the students to nursing assessment and management of problems associated with the urinary system including the kidneys. Common disorders of micturition including incontinence, retention will be discussed with impacts on quality of life. The management of patients with complex renal conditions involving dialysis and kidney transplant will be discussed.

Module Two: Sensory System Nursing: Focuses on special senses such as Ophthalmology and Oto-rhinolaryngology (Ear, nose and throat). The structure and function of the eye, ear, nose and throat will be discussed. Students will be able to apply nursing process as a framework to manage clients with specific problems, including the genetic and gerontologic considerations. Finally, the

Module three: Endocrinology Nursing will introduces the students to structure and functions of endocrine system, with specific hormones secreted by thyroid, parathyroid, adrenals and the pancreas. It provides opportunity for students to differentiate between normal and common abnormal findings in the assessment of endocrine system. Collaborative management will also be discussed.

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Study Session 1: Renal and Urology Nursing

Introduction

Renal and urinary function is essential to life. According to Johnson (2012), bones can break, muscles can atrophy, glands can loaf and even the brain can go to sleep without immediate danger to survival. But should the kidneys fail, neither the bones, muscles glands or brain could carry on.

This statement underscores the critical nature of kidney to survival and the fact that the kidneys are the principal organs of the urinary system. Patients with disorders of the kidneys or lower urinary tract often exhibit similar symptoms regardless of the underlying disorder.

The aim of the course is to provide students with an understanding of the structure and function of the renal system. Nursing assessment and management of problems associated with the urinary system including the kidneys will be the focus. Other conditions will include the characteristics, risk factors and quality of life issues of patients with urological problems. The role of the nurse in preventing and promoting health will be emphasized.

Learning Outcomes for Study Session 1

At the end of this study session, you should be able to:

1.1 Explain the Structures of the urinary system

1.2 Highlight the functions of each organ

1.3 Use the functional health patterns to obtain a Nursing Health History

1.4 Describe the correct techniques for physical examination of the urinary system

1.5 Explain Diagnostic Test

In-text Question: Describe the structure and function of the urinary system

1.1:Structure and Assessment of the Urinary System

The urinary system is composed of the kidneys, ureters, bladder, and urethra. A thorough understanding of the urinary system and renal physiology is necessary both to assess and to plan and implement appropriate nursing care for healthy patients and those

with renal or urinary dysfunction. The system performs excretory, regulatory, and secretory functions and the structures of which precisely maintain the internal chemical environment in the body.

1.1.1 Structure of the Kidneys

There are two kidneys located behind and outside the peritoneal cavity(retroperitoneally) on the posterior wall of the abdomen from the level of 12th thoracic vertebra to the 3rd lumbar vertebra. The weight of the kidney in an adult kidney is between 120 and 170g and measures 12cm (about 4.5inches) long, 6cm wide, and 2.5cn thick.

The kidneys are well protected by the ribs, muscles, fascia, peritoneal fat, and renal capsule, which surround each kidney. It should be noted that the right kidney is lower than the left kidney. This is because of the space occupied by the liver. The kidney is surrounded by a considerable amount of fat and covered by a fibrous capsule, which protects the kidney and serve as a shock absorber.

On the medial surface of each kidney is a depression called the hilus. This serve as an entry point for nerves, blood vessels, and the ureters enter the kidney. The hilum gives the kidney its typical bean shape.

- **The Internal structure of the Kidney:** The kidney consists of two major sections: the outer cortex and medulla.
    a) **The Cortex:** This is the outer portion of the kidney, containing the glomeruli, proximal and distant tubules, and cortical collecting ducts and their adjacent per tubular capillaries. Part of the loop of Henle is embedded in the cortex.
    b) **The Medulla:**The medulla resembles pyramids because of the long loops of Henle and the medullary collecting ducts and their corresponding capillaries, known as vasa recta. The apices (tops) of the pyramids are called *papillae*. Urine passes through these papillae into the calyces. The minor calyces merge to form the major calyces which in turn merge to form the *renal pelvis.* Urine from the renal pelvis is drained through the ureters to the bladder.

- **The Nephron:** This is the functional unit of the kidney. There are about one million nephrons in each kidney, each containing the glomerulus (formed by arterioles), bowman capsule and a tubular system. The tubular system is divided into sections: *proximal convoluted tubule, loop of Henle, distal convoluted tubule and the collecting tubules.*

  It should be noted that the glomerulus, bowman capsule, proximal convoluted tubule and the distal tubule are embedded in the cortex (Cortical nephron), while the loop of Henle and the collecting tubules make up the Medullary nephron.
- **Blood Supply:**The blood supply is thugh the renal artery which is a branch of the abdominal aorta. Approximately 20 to 25% of the cardiac output flows to the kidney. The renal artery divides into smaller branches forming the afferent arterioles.

  The afferent arterioles further divide into a network of capillaries known as the glomerulus (a tuft of 50 network of capillaries), which unite to form the efferent arterioles, splitting to form capillary network called the peritubular capillaries which surrounds the tubular system. Below is the diagram of the kidney showing the internal structures

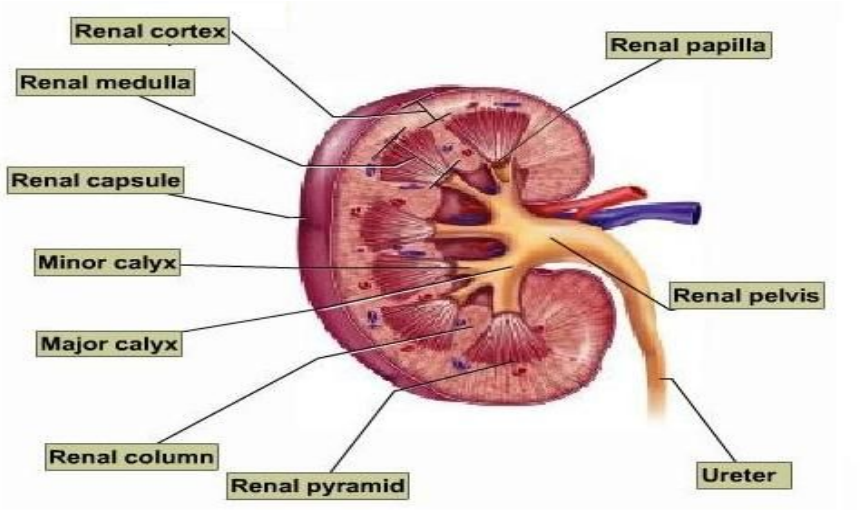

Figure 1: Structure of the Kidney

1.1.2 Ureters, Bladder, and Urethra

1. **Ureters**: The ureter is a long fibro muscular tube that connects each kidney to the bladder. It measures about 25 to 35 cm in length, and 0.2 to 0.8 cm in diameter. The ureter transports urine from the renal pelvis to the bladder.

   At the ureter pelvic (UP) junction, the ureters enter the kidney and passes through the psoas muscle, over the brim of the pelvis to enter the bladder at ureterovesical junction (UVJ). At the two junctions, the lumen of the ureter is narrowest and this structure explains why the structure can easily be occluded by calcui, tumors, adhesions and inflammatory processes.

   Urine, which is formed within the nephrons, flows into the ureter. The ureters are composed of longitudal and circular smooth muscle fibres which control one-way flow of urine and thereby prevent a reflux of urine into the pelvis.

2. **Bladder:** The urinary bladder is a hollow muscular, distensible organ which lies behind the syphilis pubis, anterior to the vaginal (female) and the rectum. However when the bladder fills it distends into the abdominal cavity. Its primary function is to serve as a reservoir for urine and to eliminate waste product from the body. In the normal adult urine output is approximately 1500ml/day which varies with food and fluid intake.

   The triangle formed at the point of entry of the two ureters and the opening of the urethra at the base of the bladder is termed the **Trigone.** The trigone is fixed to the pelvis by ligaments and the shape does not change even when the bladder is filling or emptying. It is attached to the abdominal wall by an umbilical ligament called **The Urachus.** As a result of this attachment, as the bladder fills, it rises towards the umbilicus.

   The mucosal lining of the bladder is composed of transitional epithelium also referred to as urothelium. This is unique to the urinary system as it is resistant to absorption of urine. This is why the urinary waste from the kidneys do not leak out but remains in the urinary system.

3. **The Urethra:** The urethra is a small muscular tube that leads from the bladder neck to the external meatus. It serves as a passage forurine during voiding and semen during ejaculation. The structure is composed of the urothelium and subcutaneous layers, which are continuous with the bladder. Smooth muscle

fibers from the neck of the bladder extend into the urethra and are supported by circular smooth muscle fibers.

There are specialized C-shaped striated muscle fibers which form the Rhapdosphincter or external sphincter. This surrounds a portion of the urethra. Voluntary contraction of the muscles (sphincter) prevents leaking of urine when bladder pressure increases.

In the female, measuresabout 1-2inches (3-5cm) long and lies behind the syphilispubis: anterior to the vagina. The Rhapdosphincter encircles the middle 1/3 of the urethra.

The matus is located 1.0-1.5cm below the clitoris. Proximal two thirdsare lined by transitional epithelium while distal one third of the urethra is lined by stratified squamous epithelium. The short length of the female urethra contributes to the increased incidence of urinary tract infections in women.

In-text Question

Describe the male urethra

The male Urethra: The male urethral originates at the bladder neck and extends through the length of the penis. It measures about 8-10inches (20-25cm) long. It consists of four parts:

a. **Intramural or Preprostatic Part:**Thismeasures0.5-1.5cm long and extends almost vertically through neck of the bladder. It is surrounded by the internal urethral sphincter. The diameter and length varies depending on whether bladder is filling or emptying.
b. **Prostatic urethra: This section extends f**rom neck of bladder through the prostate to the urogenital diaphragm. It is the widest and the most dilated part and measures 3.0-4.0cm.
c. **Membranous urethra:** This is a short least distensible portion. It passes through perennial pouch and is surrounded by circular fibers of external urethral sphincter. Measures about 1.0-1.5cm. It is the common site of stricture formation after instrumentation procedure.

d. **Spongy urethra/ penile urethra:** This sections courses through the corpus spongiosum. The initial widening occurs in the bulb of penis, and again widens distally as navicular fossa in the glans penis. It measures approximately 15cm in length. The spongy urethra terminatesat the urinary meatus.

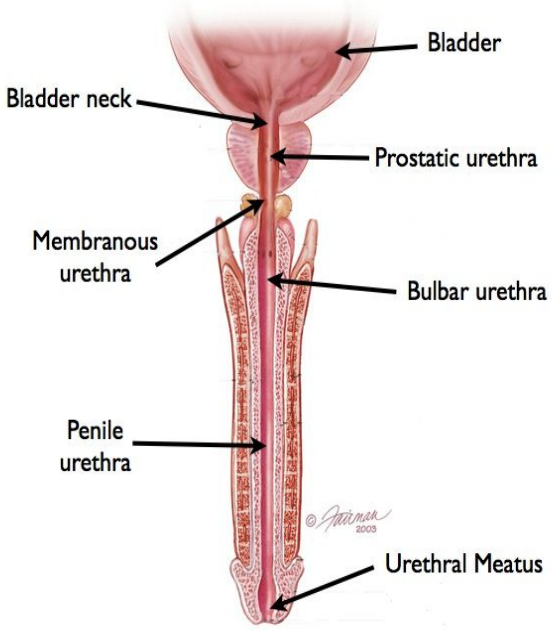

Figure 1.2: Parts of the male Urethra

Blood supply: In the male, the arterial blood supply is by inferior vessical artery, middle rectal artery, andthe internalpudenda artery and the venous drainage is into prostatic venous plexus.

In female, the arterial blood supply is by the internal pudendaand vaginal artery and the venous drainage by corresponding veins.

The Nerve supply inthe male is derived from the prostatic plexus while in the female it arises from the vessical plexus and the pudenda nerves.

1.1.3 Functions of the kidney

1. The main function of the kidney is electrolyte and acid base balance. Other functions include:
2. Urine formation
3. Excretion of waste production
4. Control of water balance

5. Control of blood pressure
6. Renal clearance
7. Regulation of red blood cell production
8. Synthesis of vitamin D to active form
9. Secretion of prostaglandins

In- Text Question

_____ system is composed of the kidneys, ureters, bladder, and urethra**?**

A. Urinary System
B. Renaldysfunction
C. Digestive System
D. All of the Above

In- Text Answer

The correct answer is option "A" Urinary System

1.1.4 Functions of Ureters, Bladder and Urethra

Urine formed by the kidney flows from the renal pelvis through the ureters into the bladder. This movement is enhanced by peristaltic waves from contraction of the smooth muscle in the walls of the ureter. There are no sphincters between the ureters and the bladder, whereas there is a sphincter in the urethra.

- **Storage of urine:** The bladder is principally the reservoir for urine. The wave of peristalsis produced by the muscles is unidirectional, thereby preventing a backflow (Reflux) of urine from the bladder. This is also possible because each ureter enters the bladder at an oblique angle. However, when the bladder is over distended, pressure in the bladder is elevated.

  This elevated pressure can be transmitted back through the ureters, leading to ureteral distention and possible reflux or backup of urine in the kidney. A condition known as pyelonephritis (kidney infection) can ensure. In addition kidney damage from the elevated pressure causing hydronephrosis may result.
- **Voiding:** Controlled voiding is influenced by muscle and nerves. Voluntary control is a learned behaviour and not present at birth.

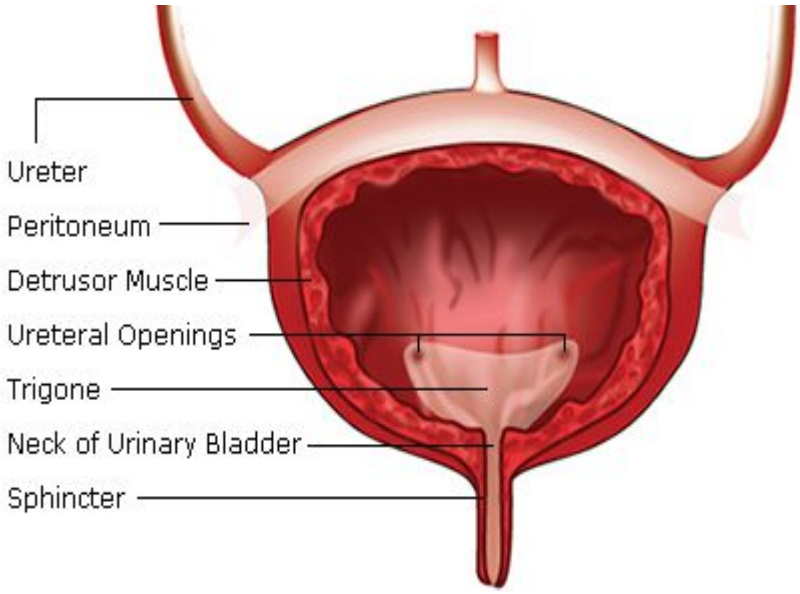

Figure 1.3: Structure of the Bladder.

1.1.5 Age related Changes in the Urinary system

At this point, we will discuss the changes that take place in the structures of the urinary system as a result of ageing process.

Kidneys: During the process of aging, between the third and ninth decade of life, there is 20 to 30% reduction in size and weight of the kidneys. Other changes include

- Reduction in kidney mass
- Reduction in blood flow and about 10% reduction in the glomerulo-filtraton rate (GFR) after age 30.
- Decreased drug clearance.

Bladder: Reduced bladder elasticity, muscle tone, capacity occurs.

- Increased post void residual, nocturnal urine production.
- In males, prostate enlargement with risk of benign prostatic hypertrophy (BPH).

Clinical Implications: The age-related changes are associated with the following clinical situations:

- Reduced renal functional reserve
- Risk of renal complications in illness.
- Risk of nephrotoxic injury and adverse reactions from drugs.

- Risk of volume overload (in heart failure), dehydration, hypernatremia (with thiazide diuretics), hypernatremia (associated with fever), hyperkalemia (with potassium-sparing diuretics). Reduced excretion of acid load.
- Increased risk of urinary urgency, incontinence, urinary tract infection, nocturnal polyuria.
- Potential for falls.

1.2 Nursing Assessment of the Urinary System

Collecting data about previous health problems or diseases provides useful information to the health care team when evaluating the patient's current renal or urologic problem. A comprehensive health history to elicit information on risk factors is the first step in assessing a patient with urologic dysfunction.

A variety of diseases or clinical situations can place a patient at increased risk for developing renal or urologic problems. In this lecture, the functional health pattern will be used to obtain nursing history. Excellent communication skills are required, because many patients are embarrassed about or uncomfortable discussing genitourinary functions or symptoms. The nurse must be sensitive to use of language and choice of words which the patient can readily understand.

1.3 The Functional Health Patterns

1. **Health Perception – Health Management Pattern***:* The general health of the patient including feelings of tiredness, weight changes, headaches, malaise, smoking, exposure to chemicals (textile workers, painter's hairdressers), such jobs may place the patient at risk of bladder tumors. A history of cigarrete smoking should be noted, family history of urologic and renal problems example, polycystic renal disease, congenital abnormalities of the urinary tract etc.
2. **Nutritional Metabolic Pattern:** The quantity of fluid intake in 24hours should be noted because inadequate fluid may be associated with urinary tract infection, calculi formation and even renal failure. Caffeine, carbonated beverages, or spicy foods aggravate urinary inflammation; Herbal teas may cause diuresis.

Unexplained weight gain maybe associated with fluid retention secondary to renal problems.

3. **Elimination Pattern:** Urinary elimination Pattern such as daytime and nocturnal voiding. The frequency should be noted. Experiences of urinary frequency, urgency and incontinence. Bothersome lower tract urinary symptoms (LUTS). The nurse should inquire about changes in urine color at beginning, throughout or end of urination.

   The nurse should also not constipation and fecal impaction may obstruct the urethra resulting in incomplete bladder emptying and urinary overflow. Information regarding the use of assistive devices such as catheter or collective device should be noted. Valsava maneuver (straining), creeds method (pressing lower abdomen), stretching the rectum to empty bladder to empty urine should also be explored.
4. **Activity- Exercise Pattern:** Explore patients' level of activity. Sedentary lifestyles may result in urinary stasis. Physical Immobilityresult in demineralization of bones and increased calcium precipitation. Explore for weak pelvic floor muscles post pelvic surgery, which may beresponsible for urinary leakage with activities. Explore for experience of prostatitis or epididymitis after long distance driving, or lifting heavy loads.
5. **Sleep-Rest pattern:** LUTS may result in sleep deprivation, daytime sleepiness, fatigue. Nocturnal maybe related to polyuria and poorly controlled diabetes mellitus, alcoholism or excessive fluid intake
6. **Cognitive-Perceptual Pattern:** Visual acuity, alertness, ability to understand instructions. Assess the patient for pain, such as dysuria, groin pain, costo-vertebral pain, supra pubic pain. Explore the location, character, duration etc. Pain is a frequent symptom of urinary tract problems and must be investigated.
7. **Self-Perception-Self Concept Pattern***:* Patients experiencing lower urinary symptoms such as incontinence, retention may experience loss of self-esteem(A feeling of fatigue may also occur).
8. **Role –Relationship Pattern*:*** Effect of urinary problems on relationships and work. Poor health and negative body image can affect roles

9. **Sexuality Reproductive Pattern:** Effect of urologic problems on sexual satisfaction and intimate relationships should be explored. Problems associated with personal hygiene and fatigue may affect sexual relationship, which maybe an indication for counseling of both partners.

1.4 Physical Examination of the Urinary System

Because renal dysfunction affects all body systems, a head to toe assessment is indicated, with emphasis on the urinary tract specifically. The techniques of inspection, palpation, percussion and auscultation are followed. Let us begin with inspection

1. **Inspection**: This involves using the sense of sight. Examine the patient's skin for pallor, yellow-gray cast on the skin, excoriations, changes in skin turgor, bruises, texture (e.g. rough, dry skin). Mouth stomatitis, ammonia breath. Inspect the face & extremities for generalized and peripheral edema, bladder distention, masses, and enlarged kidney.

   Examine the abdomen for midline mass in the lower abdomen (may indicate urinary retention) or unilateral mass. Check client's weight: weight gain secondary to edema, weight loss and muscle wasting in renal failure.

   Edema may be observed, particularly in the face and dependent parts of the body, such as the feet and sacral areas, and is suggestive of fluid retention. An increase in body weight often accompanies edema. A 1kg weight gain equals 1000mL of fluid gained.
2. **Palpation:** The costovetebral angle (CVA) is a useful landmark to palpate the kidneys. This is the angle formed by the rib cage and the vertebral column**.** Direct palpitation may help determine the size and mobility of the kidneys. It may be possible to feel the smooth, rounded lower pole of the kidney between the hands; the right kidney is felt more easily than the left kidney because it is lower than the left one.

   Palpate for CVA tenderness, non -palpable kidney and palpable masses. Enlargement of the kidney may suggest the presence of tumors
3. **Percussion:** Tenderness in the flank may be detected by fist percussion. If CVA tenderness and pain are present, a kidney infection or polycystic kidney disease should be suspected.

4. **Auscultation:** The abdominal aorta & renal arteries are auscultated for a bruit, which indicates impaired blood flow to the kidney.

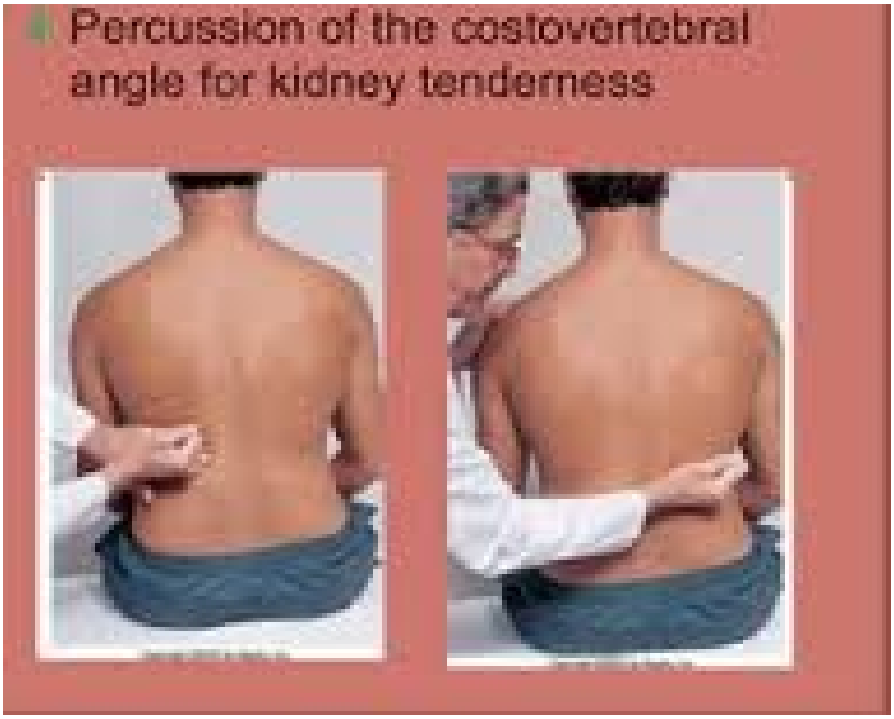

Figure1.4: Percussion of the Costovertebral angle for kidney tenderness

1.5 Diagnostic Test

The following diagnostic tests are required to confirm diagnosis of renal and urinary problems.

1. **Urinalysis:** A clean catch specimen of the first AM urine is helpful for the following tests.
    a) **Specific Gravity:** kidney's ability to concentrate urine. This may be measured using a multiple-test dipstick. An urinimeter is also used even though it provides the least accurate result. A decrease in specific gravity occurs commonly in less concentrated urine, increased fluid intake, diuretic administration, diabetes insipidus. On the other hand, an increased specific gravity reading is usually obtained in concentrated

urine, insufficient fluid intake, decreased renal perfusion, or the presence of ADH.

b) **Urine Culture & Sensitivity**: For presence of microorganisms, and to determine the specific treatment regimen.

2. **Creatinine Clearance Test**: This is the most accurate measure of renal function. This is because all creatinine in the blood is excreted by the kidney

Procedure:

- Obtain a blood sample and a timed urine specimen .
- Blood is drawn at the start of the test & the AM of the day that the 24-hour urine specimen collection is complete.
- Maintain the urine specimen on ice or refrigerate. Encourage adequate fluids before & during the test.

Formula: Creatine clearance=

$$\frac{\text{Urinecreatinine (mg/dl) x urine volume (ml/min)}}{\text{Serum creatine(mgdL}}$$

N**ormal range:** 70-135mL/min

3. **Vanillymandelic acid (VMA) Test:** This is used to diagnose tumor of the adrenal gland: Pheochromocytoma. The test identifies an assay of urinary catecholamines in the urine.

   What the Nurses' should do before the test: Instruct the client to avoid foods such as caffeine, cocoa, cheese, gelatin at least 2 days prior to beginning of the collection and during collection. Save all urine on ice or refrigerate. . Also instruct the client to avoid stress and to maintain adequate food and fluids intake during the test.

4. **Uric acid measurement:** A 24-hour collection to screen for disorder of purine metabolism such gout. But can also be useful in diagnosis of kidney disease.Encourage fluids and a regular diet during testing. Place the specimen on ice or refrigerate.
5. **Kidney, ureters, bladder (KUB)radiograph:** An x-ray film that views the urinary system and adjacentstructures, to detect urinary calculi.

6. **Bladder ultrasonography:** A noninvasive method of measuring the volume of urine in the bladder.
7. **Intravenous pyelogram (IVP)-** the injection of a radiopaque dye that outlines the renal system: position, size, shape of kidneys.
8. **Renal angiography-** the injection of a radiopaque dye through a catheter for examination of the renal arterial supply. Assess the client for allergies to iodine, seafood & radiopaque dyes. Inform about possible burning feeling of heat along the vessel when the dye is injected.
9. **Computed tomography (CT) and Magnetic Resonance Imaging(MRI):** Provide cross-sectional views of the kidney & urinary tract.
10. **Renal Scan:** This requires injection of an intravenous radiopaque substance, for visual imaging of renal blood flow. Before the procedure, instruct the client that imaging may be repeated at various interval before the test is complete. Assess for signs of delayed allergic reactions, such as itching and hives**.**
11. **Cystometrogram (CMG)**:The test evaluates bladder and detrusor muscles tone to record the pressures exerted at varying phases of the bladder.
12. **Cystoscopy:** to examine bladder mucucosa for inflammation, calculi or tumors using a a cystoscope, and biopsy may be obtained. The nurse should instruct the client that NPO status should be maintained after MN before the test. After the test, the nurse should monitor for postural hypotension. Note that a pink-tinged or tea-colored urine is common. Monitor for bright, red blood or clots.
13. **Renal biopsy**- Insertion of a needle into the kidney to obtain a sample of tissue for exam. NPO after midnight. Provide pressure to the biopsy site for 30 minutes. Check site for bleeding. Force fluids to 1500-2000 mL. Instruct to avoid heavy lifting & strenuous activity for 2 weeks.

Summary of Study Session 1

In this unit we have discussed the structure and functions of the kidney, ureter, bladder and the urethra. The kidney is a very significant organ of urinary system and any functional abnormality affects other organs of the body. In this unit, the age related changes in the urinary system was also discussed.

SELF ASSESSMENT QUESTIONS (SAQs)

Now thatyou have completed this Study Session, you will need to access yourself if you have achieved the learning outcomes. Try to answer the questions below. Compare your answers to the correct one at the end of the study session.

SAQ 1.1

1.1 Describe the Structure of the kidney

SAQ 1.2

1.2 Highlight the functions of each organ of the urinary system

SAQ 1.3

1.3 Use the functional health patterns to obtain a Nursing Health History

SAQ 1.4

1.4 Describe the correct techniques for physical examination of the urinary system

SAQ 1.5

1.5 List the diagnostic Tests

Answers to self-Assessment questions

SAQ 1.1 Structure of the Kidney

There are two kidneys located behind and outside the peritoneal cavity (retroperitoneally) on the posterior wall of the abdomen from the level of 12th thoracic vertebra to the 3rd lumbar vertebra. The weight of the kidney in an adult kidney is between 120 and 170g and measures 12cm (about 4.5inches) long, 6cm wide, and 2.5cn thick.

The kidneys are well protected by the ribs, muscles, fascia, peritoneal fat, and renal capsule, which surround each kidney. It should be noted that the right kidney is lower than the left kidney. This is because of the space occupied by the liver. The kidney is surrounded by a considerable amount of fat and covered by a fibrous capsule, which protects the kidney and serve as a shock absorber.

On the medial surface of each kidney is a depression called the hilus. This serve as an entry point for nerves, blood vessels, and the ureters enter the kidney. The hilum gives the kidney its typical bean shape.

- **The Internal structure of the Kidney:** The kidney consists of two major sections: the outer cortex and medulla.
    a. **The Cortex:** This is the outer portion of the kidney, containing the glomeruli, proximal and distant tubules, and cortical collecting ducts and their adjacent per tubular capillaries. Part of the loop of Henle is embedded in the cortex.
    b. **The Medulla:** The medulla resembles pyramids because of the long loops of Henle and the medullary collecting ducts and their corresponding capillaries, known as vasa recta. The apices (tops) of the pyramids are called *papillae*. Urine passes through these papillae into the calyces. The minor calyces merge to form the major calyces which in turn merge to form the *renal pelvis.* Urine from the renal pelvis is drained through the ureters to the bladder.
- **The Nephron:** This is the functional unit of the kidney. There are about one million nephrons in each kidney, each containing the glomerulus (formed by arterioles), bowman capsule and a tubular system. The tubular system is divided into sections: *proximal convoluted tubule, loop of Henle, distal convoluted tubule and the collecting tubules.*

  It should be noted that the glomerulus, bowman capsule, proximal convoluted tubule and the distal tubule are embedded in the cortex (Cortical nephron), while the loop of Henle and the collecting tubules make up the Medullary nephron.
- **Blood Supply:** The blood supply is thugh the renal artery which is a branch of the abdominal aorta. Approximately 20 to 25% of the cardiac output flows to the kidney. The renal artery divides into smaller branches forming the afferent arterioles.

  The afferent arterioles further divide into a network of capillaries known as the glomerulus (a tuft of 50 network of capillaries), which unite to form the efferent arterioles, splitting to form capillary network called the peritubular capillaries which surrounds the tubular system. Below is the diagram of the kidney showing the internal structures

SAQ 1.2: Highlights of the functions of each organ of the urinary system

Kidney:

1. The main function of the kidney is electrolyte and acid base balance. Other functions include:
2. Urine formation
3. Excretion of waste production
4. Control of water balance
5. Control of blood pressure
6. Renal clearance
7. Regulation of red blood cell production
8. Synthesis of vitamin D to active form
9. Secretion of prostaglandins

Functions of bladder, Ureters and Urethra

- Urine formed by the kidney flows from the renal pelvis through the ureters into the bladder.
- This movement is enhanced by peristaltic waves from contraction of the smooth muscle in the walls of the ureter. There are no sphincters between the ureters and the bladder, whereas there is a sphincter in the urethra.
- The bladder act as a storage of urine
- Voiding of urine

SAQ 1.3: Use the functional health patterns to obtain a Nursing Health History

1. **Health Perception – Health Management Pattern***:* The general health of the patient including feelings of tiredness, weight changes, headaches, malaise, smoking, exposure to chemicals (textile workers, painter's hairdressers), such jobs may place the patient at risk of bladder tumors. A history of cigarrete smoking should be noted, family history of urologic and renal problems example, polycystic renal disease, congenital abnormalities of the urinary tract etc.

2. **Nutritional Metabolic Pattern:** The quantity of fluid intake in 24hours should be noted because inadequate fluid may be associated with urinary tract infection, calculi formation and even renal failure. Caffeine, carbonated beverages, or spicy foods aggravate urinary inflammation; Herbal teas may cause diuresis. Unexplained weight gain maybe associated with fluid retention secondary to renal problems.
3. **Elimination Pattern:** Urinary elimination Pattern such as daytime and nocturnal voiding. The frequency should be noted. Experiences of urinary frequency, urgency and incontinence. Bothersome lower tract urinary symptoms (LUTS). The nurse should inquire about changes in urine color at beginning, throughout or end of urination.

   The nurse should also not constipation and fecal impaction may obstruct the urethra resulting in incomplete bladder emptying and urinary overflow. Information regarding the use of assistive devices such as catheter or collective device should be noted. Valsava maneuver (straining), creeds method (pressing lower abdomen), stretching the rectum to empty bladder to empty urine should also be explored.
4. **Activity- Exercise Pattern:** Explore patients' level of activity. Sedentary lifestyles may result in urinary stasis. Physical Immobility result in demineralization of bones and increased calcium precipitation. Explore for weak pelvic floor muscles post pelvic surgery, which may be responsible for urinary leakage with activities. Explore for experience of prostatitis or epididymitis after long distance driving, or lifting heavy loads.
5. **Sleep-Rest pattern:** LUTS may result in sleep deprivation, daytime sleepiness, fatigue. Nocturnal may be related to polyuria and poorly controlled diabetes mellitus, alcoholism or excessive fluid intake
6. **Cognitive-Perceptual Pattern:** Visual acuity, alertness, ability to understand instructions. Assess the patient for pain, such as dysuria, groin pain, costo-vertebral pain, supra pubic pain. Explore the location, character, duration etc. Pain is a frequent symptom of urinary tract problems and must be investigated.

7. **Self-Perception-Self Concept Pattern***:* Patients experiencing lower urinary symptoms such as incontinence, retention may experience loss of self-esteem (A feeling of fatigue may also occur).
8. **Role – Relationship Pattern*:*** Effect of urinary problems on relationships and work. Poor health and negative body image can affect roles
9. **Sexuality Reproductive Pattern:** Effect of urologic problems on sexual satisfaction and intimate relationships should be explored. Problems associated with personal hygiene and fatigue may affect sexual relationship, which maybe an indication for counseling of both partners.

SAQ 1.4 : Correct techniques for physical examination of the urinary system

1. **Inspection**: This involves using the sense of sight. Examine the patient's skin for pallor, yellow-gray cast on the skin, excoriations, changes in skin turgor, bruises, texture (e.g. rough, dry skin). Mouth stomatitis, ammonia breath. Inspect the face & extremities for generalized and peripheral edema, bladder distention, masses, and enlarged kidney.

   Examine the abdomen for midline mass in the lower abdomen (may indicate urinary retention) or unilateral mass. Check client's weight: weight gain secondary to edema, weight loss and muscle wasting in renal failure.

   Edema may be observed, particularly in the face and dependent parts of the body, such as the feet and sacral areas, and is suggestive of fluid retention. An increase in body weight often accompanies edema. A 1kg weight gain equals 1000mL of fluid gained.
2. **Palpation:** The costovetebral angle (CVA) is a useful landmark to palpate the kidneys. This is the angle formed by the rib cage and the vertebral column**.** Direct palpitation may help determine the size and mobility of the kidneys. It may be possible to feel the smooth, rounded lower pole of the kidney between the hands; the right kidney is felt more easily than the left kidney because it is lower than the left one.

   Palpate for CVA tenderness, non -palpable kidney and palpable masses. Enlargement of the kidney may suggest the presence of tumors

3. **Percussion:** Tenderness in the flank may be detected by fist percussion. If CVA tenderness and pain are present, a kidney infection or polycystic kidney disease should be suspected.
4. **Auscultation:** The abdominal aorta & renal arteries are auscultated for a bruit, which indicates impaired blood flow to the kidney.

SAQ 1.5: Diagnostic Tests

1. Urinalysis for Urine Culture & Sensitivity
2. Creatinine Clearance Test
3. Vanillymandelic acid (VMA) Test
4. Uric acid measurement:
5. Kidney, ureters, bladder (KUB) radiograph.
6. Bladder ultrasonography
7. Intravenous pyelogram (IVP).
8. Renal angiography
9. Computed tomography (CT) and Magnetic Resonance Imaging(MRI)
10. Renal Scan
11. Cystometrogram (CMG)
12. Cystoscopy

Study Session 2: Urinary and Renal Dysfunction

Introduction

In this Study session, we will discuss the common problems of the urinary system, such as those involving the urethra, bladder and the kidneys. Urinary tract infections will be discussed in detail. The role of the nurse in preventing these problems will be emphasized.

Learning Outcomes for Study Session 2

At the end of this study session, you should be able to:

2.1 Define Urinary Incontinence

2.2 Explain Urinary Retention

2.1 Urinary Incontinence (UI)

Introduction: Urinary incontinence (UI) comes with significant psychological problems including embarrassment, loss of self-esteem, and social isolation. In the elderly, it decreases their ability to maintain an independent lifestyle thereby promoting dependence on caregivers and institutionalization. It should be noted that UI affects people of all ages but is particularly common in elderly people.

Box 2.1 Definition of Urinary Incontinence

The International continence Society defines Urinary incontinence (UI) as complaints of involuntaryor uncontrolled loss of urine (Haylen Ridder, Freeman et al. 2010)

It is one of the problems which remain widely underdiagnosed and underreported. This is mainly because patients more often patients feel too embarrassed to seek help,thereby they either ignore the problem or conceal and live with the symptoms.

It is not a normal consequence of ageing, even though changes in the urinary system which are associated with ageing process may place the elderly at risk for UI.The older multiparous women young, nulliparous women, especially during high-impact vigorous activity are also reported to experience UI.

2.1.1 Risk factors for urinary incontinence

- Pregnancy- vaginal delivery, episiotomy
- Menopause
- Genitourinary surgery
- Pelvic muscle weakness
- Incompetent urethra due to trauma or sphincter relaxation
- Immobility
- High-impact exercise
- Diabetes mellitus
- Stroke
- Age-related changes in the urinary tract
- Morbid obesity
- Cognitive disturbances- dementia, Parkinson's disease
- Medications- diuretics, sedatives, hypnotics, opioids
- Caregiver or toilet unavailable

2.1.2 Types of Incontinence and Clinical manifestations

The clinical manifestation of incontinence depends on the type of incontinence. Let us examine the different types of incontinence.

a. **Stress Incontinence** is the involuntary loss of urine through an intact urethra as a result of a sudden increase in intra-abdominal pressure (sneezing, coughing, or changing position). It mostly affects women and can be as a result of obstetric injury, fistulas, extrinsic pelvic disease etc.

b. **Urge Continence** is an involuntary loss of urine associated with urgency. The patient is aware of the need to void but is unable to reach the toilet in time.

c. **Reflex Incontinence** is the loss of urine due to hyperreflexia or involuntary urethral relaxation in the absence of normal sensations usually associated with voiding. This commonly occurs in paraplegic patients because they have no sensory awareness of the need to void.

d. **Overflow Incontinence** is an involuntary urine loss associated with over distention of the bladder. The bladder cannot empty normally and becomes over distended. Despite frequent urine loss, the bladder never empties.

2.1.3 Diagnostic studies

The following assessment parameters are necessary to diagnose UI

- Refocused history, physical assessment, and a bladder log or voiding record whenever possible.
- Obtain information on the onset of urinary incontinence, factors that provoke urinary leakage and associated conditions.
- The physical examination: assessment of general health and functional issues associated with urinary function including mobility, dexterity and cognitive function.
- A pelvic examination: careful inspection of the perennialskin for signs of erosion or rashes related to urinary incontinence and existence of pelvic organ prolapse.
- Local innervations and pelvic floor muscle strength: A digital examination of the pelvic muscle to determine weakness or tension.
- Ask the client to keep a bladder log or voiding diary: to document the timing of urinations, episodes of urinary leakage and frequency of nocturnal for at least 1-7days.
- A urinalysis: to identify possible factors contributing to transient urinary incontinence.eg. Urinary tract infections, diabetes mellitus.
- The Post void residual (PVR) volume is obtained by asking the patient to urinate, this is followed by catheterization within a relatively brief period (preferably 10 to 20 minutes) or an ultrasound can be used to estimate the residual volume. *Normal PVR (50-75mls)*
- Urodynamic testing in selected cases of UI maybe required
- Imaging studies(ultrasound) for associated upper urinary tract involvement.

Table 1.Nursing Management

Types of UI	Causes	Treatment
Stress incontinence: Sudden increase in intra-abdominal pressure causes involuntary passage of urine. Occur during coughing laughing, sneezing or physical activities such as heavy lifting, exercising. usually small leakage may not be daily.	Commonly in women with relaxed pelvic floor musculature due to delivery(multiple deliveries) Instrumental vaginal delivery or multiple pregnancies Atrophy the female urethra during menopause (decreased estrogen).	Kegel exercises Weight loss if obese. cessation of smoking, topical estrogen Urethral inserts, patches or bladder neck support devices to correct underlying problem. Biobehavioural interventions including bladder retraining
Urge Incontinence: involuntary urination is preceded by warning of few seconds or minutes, with periodic and frequent leakage.	Uncontrolled contraction or over activity of detrusor muscle. Disorders of the CNS (CVD, Alzheimer's disease) and bladder disorders (Carcinoma in situ, interstitial cystitis)	with urge suppression decrease in dietary irritants, bowel regularity, and pelvic floor muscle exercises. Anticholinergic drugs such as oxybutynin, tolterodine at bed time. Containment devices (externalcondom catheters.
Overflow incontinence: Condition occurs when the pressure of urine in overfull bladder overcomes sphincter control. Leakage of small amount of urine is frequent throughout day and night Urination may also occur in small amounts Bladder remains distended and is usually palpable	Obstruction in the neck of bladder(urethral stricture, pelvic organ prolapsed) Underactive detrusor muscle due to myogenic or neurogenic factor e.g. herniated disk, diabetic neuropathy Post anesthesia and surgery(hemorrhoidectomy, herniorrhaphy, cystoscopy, neurogenic bladder) (flaccid)	Urinary catheterisation to depress bladder Intra vaginal device such as the pessary to support prolapse Intermittent catheterisation Surgery to correct underlying problem Treat the underlying cause

Reflex Incontinence No warning or stress precedes periodic involuntary urination frequent, moderate volume. occurs equally both day and night	Spinal cord lesion above S2 interfering CNS system inhibition Disorder results in detrusor hyperreflexia and interferes with pathways coordinating detrusor contraction and sphincter relaxation	Bladder decompression to prevent ureteral reflux and hydronephrosis. Intermittent self-catheterisation Diazepam to relax external sphincter prophylactic antibiotics surgical sphinterectomy

In-Text Questions

_____ is the complaints of involuntary or uncontrolled loss of urine

a. Chronic Retention
b. Urinary incontinence
c. Urinary Retention
d. All of the Above

In-Text Answer

The correct answer is option “b” Urinary Incontinence

2.1.4. Principles of Nursing Management of a patient with urinary incontinence:

The guiding principles in managing patients with UI are that first the nurse must understand that incontinence is not an inevitable part of illness or aging. Secondly, it is often a reversible and treatable condition regardless of age. The nurse must recognize both the physical and the emotional problems associated with urinary incontinence. Maintain patient’s dignity, privacy and feelings of self-worth.

The following interventions are helpful:

Lifestyle Modifications:

- Encourage smoking cessation because smoking increases the risk of stress incontinence.
- Counsel about the relationship between constipation, urinary incontinence and urinary retention.
- Aggressive management of constipation with adequate fluid intake, increase dietary fibre, light exercise and judicious use of stool softeners.
- Wight reduction program
- Teach the patient about consumption of an adequate volume of fluids and reduction or elimination of bladder irritant especially caffeine and alcohol from the diet.

Scheduling Voiding Regimen

- Maintain a regular, flexible schedule of urination (usually every 2 – 3hours while awake).
- Timed voiding: A fixed schedule of toileting typically every 2-3hrs during working hours
- Habit retaining: Scheduled holding toileting , with adjustments of voiding intervals which maybe longer or shorter based on the individuals voiding pattern
- Prompted voiding: Scheduled toileting that requires prompts to void from a caregiver, usually every 3hrs in conjunction with operant conditioning techniques (rewards for maintaining continence).
- Bladder retraining and urge suppression strategies: Scheduled toileting with progressive intervals of voiding. It involves teaching of urge-control strategies, relaxation and distractions techniques, self-monitoring, use of re-enforcement and other strategies such as conscious contraction of pelvic floor muscles

Pelvic floor Muscle Rehabilitation:

- Pelvic floor muscle exercises: It involves gently tightening the same muscle used to stop flatus or the stream of urine for 5-10 seconds increment, followed by 10 second resting phases. Repeated and maintained 2-3times day to at least 6

weeks. A longer period is suggested for the elderly clients to strengthen the pelvic floor muscles

- Vaginal weight training or vaginal tone retention exercises: The exercises are similar toKegel or pelvic floor exercises.
- Electrical Stimulation: This involves application of low voltage electric current to sacral and pudenda afferent fibers through vaginal, and or surface electrodes, to inhibit bladder over activity and improve awareness, contractility and efficiency of pelvic muscle contraction.

Anti-incontinence devices

- Intravaginal support devices (Pessaries): These devices support bladder neck, relieve minor pelvic organ prolapse and change pressure transmission to the urethra
- Intraurethral occlusive device (urethral plug): These are latex or silicon single use devices worn in the urethral to provide mechanical obstruction to prevent urine leakage. Remove for voiding. Other forms occlusive devices are urine seal (an adhesive foam pads worn over urethral opening), urethral inserts (a small plug, inserted into the urethra. Usually removed before urination), bladder neck support device, artificial urinary sphincter.
- Penile compression device: Mechanically fixed compression device applied to the penis to prevent urine flow or leakage via the urethra . Must be released hourly forvoiding.

Containment Devices

- Suggest containment devices to manage existing urinary leakage
- External collection devices: External catheter systems (such as penile sheaths) direct urine into a drainage bag. Most commonly used by men.
- Absorbent products: Disposable pads and undergarment systems.

For inpatient or those in long term facilities, nursing management include offering the urinal or bed pan and assisting the patient to the bathroom every 2 to 3hours or at scheduled times. Ensure toilet is accessible to patient. Provide adequate privacy to allow effective urine elimination.

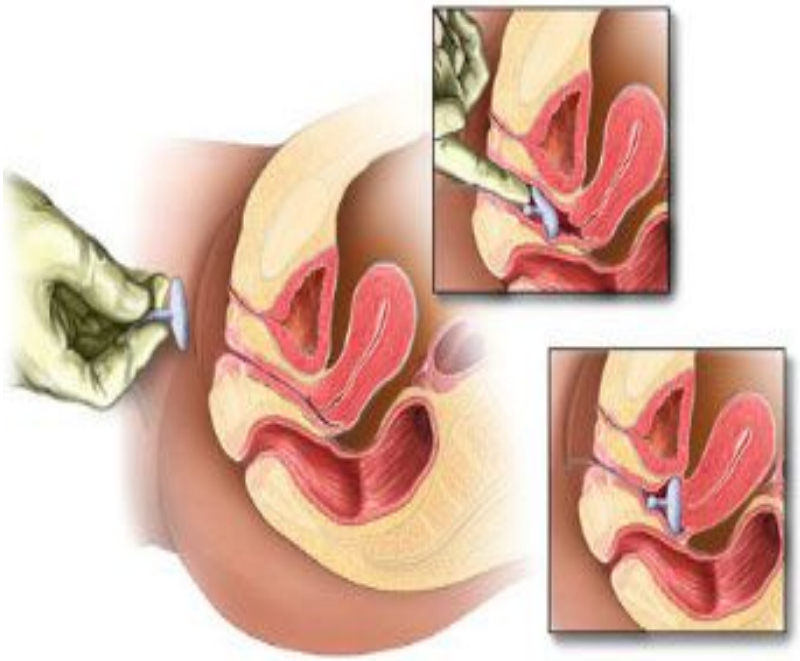

Figure 1. Inserting vaginal pessary in prolapse

Figure 2. Pelvic floor exercises

2.2 Urinary Retention

Introduction: Urinary retention can occur in any post-operative patient, particularly in those who have undergone surgery on the perineal or anal regions that resulted in reflex spasm of the sphincters. Retention maybe acute or chronic.

Box 2.2 Definition of Urinary Retention

Urinary retention can be definedas the inability to empty the bladder completely during attempts to void.

Inability to empty the bladder despite micturition or the accumulation of urine in the bladder. It also describes partial or incomplete emptying of the bladder. It affects more men at age 60 due to prostate gland enlargement and in women with cystocele.

In acute retention the patient experiences total inability to pass urine through micturition. Chronic urinary retention describes a state of incomplete bladder emptying despite urination.

2.2.1 Causes of Urinary retention

- Urinary tract obstruction
- Nerve problems or disease of the spinal cord that interfere with signals between the brain and the bladder. Examples include events or conditions that can damage nerves and nerve pathways such as:
    i. Infection of the brain or spinal cord
    ii. Stroke
    iii. Accidents that injures the brain or spinal cord
    iv. Pelvic injury or trauma

- **Surgery:** Postoperative complications: in perineal or anal region, causing reflex spasm of the sprinters. Furthermore during surgery and with administration of anesthesia and intravenous fluid to compensate for possible blood loss.This combination may result in a full bladder with impaired nerve function.
- **Medication:** Some medications cause urinary retention, either by inhibiting contractility of the bladder or by increasing bladder outlet resistance. Some

drugs used to treat allergies, muscle spasms, anxiety or depression may cause retention of urine. They include:Antihistamine, anticholinergic, sedatives, antispasmodics, anesthetic agents particularly spinal anesthesia.

- Other causes of urinary retention may be as a consequence of diabetes, prostatic enlargement, urethral pathology (infection, tumor, calculus), trauma (pelvic injuries), pregnancy, or neurologic disorders cerebrovascular accident, spinal cord injury, multiple sclerosis).

2.2.2 Pathophysiology of urinary retention

The Pathophysiology of urinary retention is based on three major pathological mechanisms:

- Increase urethral resistance secondary to bladder outlet obstruction as occur in bladder Stone , prostate enlargement , infection, urethral stricture and constipation
- Impaired bladder contractibility
- Loss of normal bladder sensory or motor innervations.

2.2.3 Clinical manifestations.

The following are the common manifestations of urinary retention.

Acute Urinary Retention:

- Pain in the pelvis
- Increased abdominal pressure
- Inability to urinate
- Lack of urge to urinate

Chronic Urinary Retention:

- Back pain
- Fever
- Painful urination
- Frequent urination
- Nocturia
- Hesitancy (difficulty starting to urinate)
- Difficulty fully emptying the bladder.

2.2.4 Nursing Assessment and investigation

The nurse should elicit the following assessment data from a client with suspected urinary retention.

- Time of last voiding and how much of urine was excreted
- Assess if the patient experiences small but frequent voiding
- Any dribbling of urine?
- Note patient's complaints of pain or discomfort of in the lower abdomen?
- Examine the pelvic area for full bladder which appears swollen or rounded
- Does percussion of the supra public region or elicit dullness?
- Does a post void bladder ultrasound test reveal residual urine?
- Physical examination of the lower abdomen can be done to feel the distended bladder through percussion.

2.2.5 Diagnostic Test

- Urine Sample: for signs of infection
- Bladder scan: Post void residual urine
- X-ray and computerized CI scan: X-ray to detect obstruction
- CT scans using multi x-ray images to construct a better view of internal organs to diagnose stones or other causes of obstruction.
- Urodynamic Tests: to measure the patient's ability to empty the bladder steadily and completely.
- Electromyography: To measure the muscle activity in the urethral sphincter

2.2.6 Management Principles

The management will be considered under two subheadings:

Figure 2.2: Management Principles

Medical Management

Goals: The following goals are usually borne in mind: to relax the muscle of the bladder and empty the bladder, prevent infection and prevent further complications.

Drugs: Bethanicol Chloride (10mls) prescribed to treat bladder muscle problems and to help the bladder muscle to squeeze better thereby improving the ability to urinate

Neostigmino Bromide: To improve muscle strength in patients with certain muscle disease. (Myasthenia gravis)., thereby preventing the breakdown of acetylcholine which is needed for normal muscle functions.

Alpha receptor blockers such as alfuzosin. This relaxes the muscle at the neck of the bladder, and reducesthe obstruction to the flow of urine.

Laxatives and enemas are suggested if retention is secondary to constipation.

Catheterization*:* This is done to prevent over distention of the bladder in acute urinary retention. It forms an initial treatment to relieve the immediate distress of a full bladder and prevent permanent bladder damage. If catheterization is to be used for long-term treatment, the indication for use will depend on the cause of urinary retention. It may be used for continuous bladder drainage. A supra pubic catheter maybe necessary if the obstruction is in the urethra, which prevents urethral catheteterization.

For Suprapubic catheterization, an opening is made through the skin over the pubic bone, where the catheter is placed directly into the bladder. The tube will provide temporary drainage until the situation can be managed.

Figure 2.3: Position of a suprapubic catheter and direction to clean the stoma

2.2.7 Nursing Management

The goals of nursing management strategies in urinary retention are to prevent over distention of the bladder, correct obstruction and treat infection. Careful nursing assessment and appropriate nursing interventions can prevent complications. The nurse should explain why normal voiding is not occurring and monitor urine output closely. Nursing measures to encourage voiding:

- Provide privacy
- Ensure an environment and a position conducive to voiding.
- Assist the patient with the use of the bathroom, rather than a bed pan. This provides a natural setting for the voiding and may stimulate the urge to void.
- If this is not effective, apply warm compresses on the perineum to relax the sphincters.
- Simple trigger techniques such as turning on the water faucet while the patient is trying to void, stroking the abdomen or inner thighs, or tapping above the public area. A combination of techniques may be necessary to initiate voiding.

Summary of Study Session 2

1. The International continence Society defines Urinary incontinence (UI) as complaints of involuntary or uncontrolled loss of urine (Haylen Ridder, Freeman et al. 2010)

2. Urinary retention can be defined as the inability to empty the bladder completely during attempts to void.
3. The Pathophysiology of urinary retention is based on three major pathological mechanisms:
   - Increase urethral resistance secondary to bladder outlet obstruction as occur in bladder Stone , prostate enlargement , infection, urethral stricture and constipation
   - Impaired bladder contractibility
   - Loss of normal bladder sensory or motor innervations.

SELF ASSESSMENT QUESTIONS (SAQs)

Now that you have completed this Study Session, you will need to access yourself if you have achieved the learning outcomes. Try to answer the questions below. Compare your answer to the correct one at the end of the study session.

SAQ 2.1

13.1 Define Urinary Incontinence

SAQ 2

2.2 Explain Urinary Retention

Answers to Assessment Questions

SAQ 2.1 : Urinary Incontinence

Urinary incontinence (UI) as complaints of involuntary or uncontrolled loss of urine

SAQ 2: Explain Urinary Retention

Inability to empty the bladder despite micturition or the accumulation of urine in the bladder. It also describes partial or incomplete emptying of the bladder. It affects more men at age 60 due to prostate gland enlargement and in women with cystocele.

In acute retention the patient experiences total inability to pass urine through micturition. Chronic urinary retention describes a state of incomplete bladder emptying despite urination.

Study Session 3: Urinary Tract Infections

Introduction

A urinary tract infection (UTI) is an infection that affects any part of your urinary system this may include any of the following: your kidneys, ureters (which connect the kidneys and the bladder), bladder and urethra. Most of the infections involve the lower urinary tract, the bladder and the urethra. Women have greater risk of developing a UTI than men are likely to. Infection limited to your bladder can be hurting and bothersome. However, severe consequences abound if a UTI spreads to your kidneys. Most UTIs are caused by bacteria. They can also be caused by fungi or viruses. UTIs are the second easily transmittable type of infection in humans. In this study we would deal into Urinary Tract infections,

Learning Outcomes to Study Session 3

At the end of this study you should be able to:

3.1 Define the Urinary Tract infection

3.2 Describe the causes Urinary Tract infections

3.3 Discuss the management of Urinary Tract infections

3.1: Urinary Tract

What Is the Urinary Tract?

Your kidneys are two bean-shaped organs; they are found in the abdomen on both side of the spine. The kidneys sieve your blood to sieve out excess water, salt, potassium, urea and other substances and then the waste products are excreted as urine. The ureters are thin, spaghetti-shaped tubules. They transport urine from the kidney to the bladder.

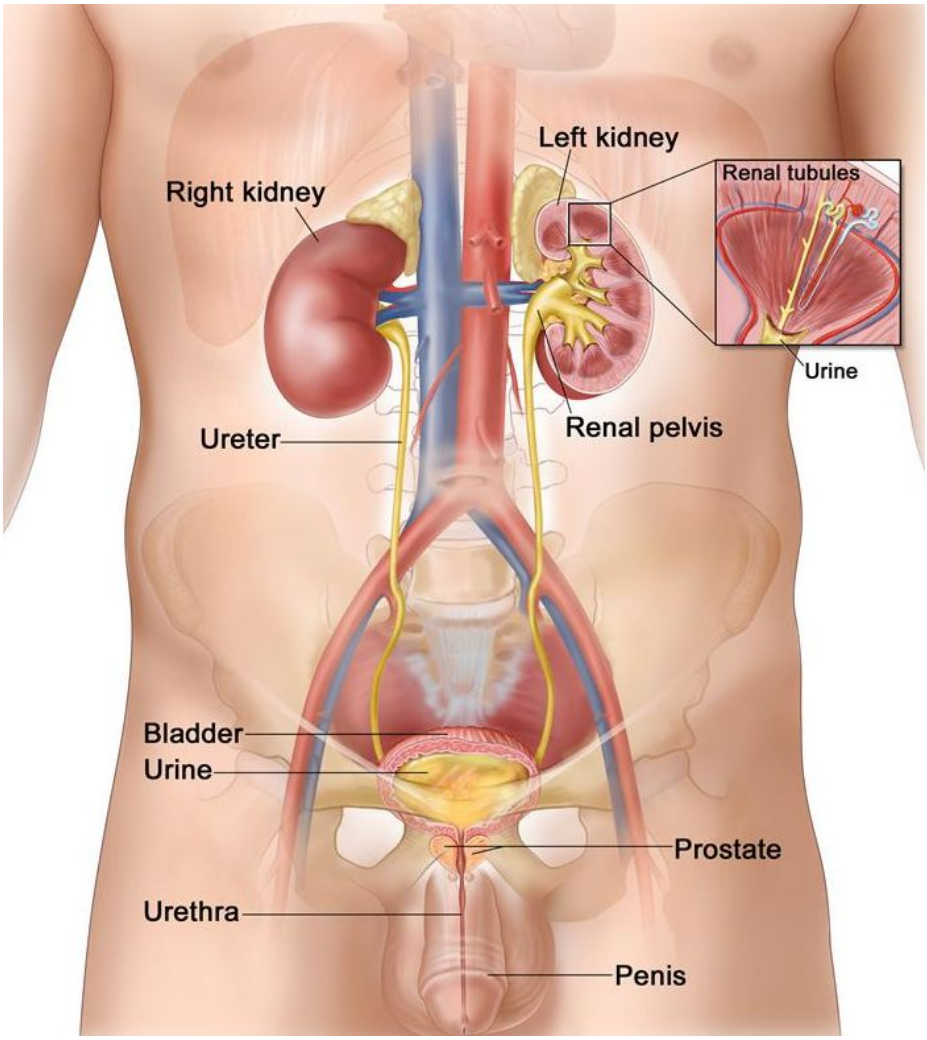

***Figure 1.1**: Male Urinary system*

***Source**: http://cancergenome.nih.gov/images/cdr/Live/CDR664288-750.jpg*

The bladder is a small, balloon-shaped organ sited in the pelvis. For women, the bladder is situated in front of the uterus. In men, the bladder is located just above the prostate gland. The urethra is the tube through which urine moves to the bladder. The urethra in women is shorter than it is in men. In men, it travels through the prostate and the penis.

3.1.1: Risk Factors and Causes for UTIs

Anything that reduces bladder emptying or irritates the urinary tract can cause UTIs. Many factors can put someone at risk.

Bathroom Hygiene

Wiping your body from back to front after going to the bathroom can lead to a UTI, this motion do drag bacteria from the rectal area towards the urethra.

Sexual Activity

Pressure on the urinary tract during sex can transfer bacteria from the colon into the bladder, most women always transfer bacteria in their urine after intercourse. However, the body usually can get rid of these pathogens within 24 hours. Bowel bacteria may have properties that allow them to stick to the bladder.

Gender

Women are more likely to get UTIs. This is because their urethras are shorter. UTIs in men are less common and more serious.

Condoms

Latex condoms can cause increased friction during intercourse. They may also irritate the skin. This may increase the risk of UTI in some individuals. However, condoms are important for reducing the spread of sexually transmitted infections.

Obstructions

Blockages that make it difficult to empty the bladder can cause a UTI. Obstructions can be caused by an enlarged prostate, kidney stones, and certain forms of cancer.

Diaphragms

Diaphragms may put pressure on the urethra. This can decrease bladder emptying. Some studies have seen a higher UTI risk in women who use diaphragms.

Spermicides

Spermicides can increase UTI risk. They may cause skin irritation in some women. This increases the risk of bacteria entering into the bladder.

Loss of Estrogen

After menopause, a loss of estrogen changes the normal bacteria in the vagina. This can increase the risk of UTI.

Diabetes

Diabetes may make patients more susceptible to UTI.

Prolonged Use of Bladder Catheters

Catheters are used when someone cannot urinate normally. These thin, flexible tubes are inserted into the bladder. They allow urine to drain into a container. Long-term

catheter use can increase the risk of UTI. They may make it easier for bacteria to get into the bladder. Treatment for a catheter-associated UTI may require removal of the device.

In Text Question

The body usually can get rid of these pathogens within …….hours

a. 21 b. 22 c. 23 d. 24

In Text Answer

d. 24hours

3.1.2: Symptoms of UTI

Symptoms of UTI depends upon what part of the urinary tract is infected. Lower UTIs are infections of the urethra and bladder. Their symptoms include:

a. burning with urination
b. increased frequency of urination with scant amounts of urine being passed
c. bloody urine
d. cloudy urine
e. urine that looks like cola or tea
f. strong odor to urine
g. pelvic pain (women)
h. rectal pain (men)

Upper UTIs are infections of the kidneys

These are potentially life threatening, if bacteria move from the infected kidney into the blood. This condition is called sepsis. Sepsis can cause dangerously low blood pressures, shock, and death. Symptoms of upper UTI include:

- pain and tenderness in the upper back and sides
- chills
- fever
- nausea
- vomiting

Women who are pregnant and have symptoms of UTI should see their doctor right away. UTIs during pregnancy can cause premature delivery and high blood pressure. UTIs during pregnancy are also more likely to spread to the kidneys.

3.1.3: Diagnosis of UTI

History and physical exam may suggest lower or upper UTI. Definitive diagnosis requires a "clean catch" urine specimen. This is urine collected from the middle of the urinary stream. The goal is to avoid picking up bacteria from the skin.

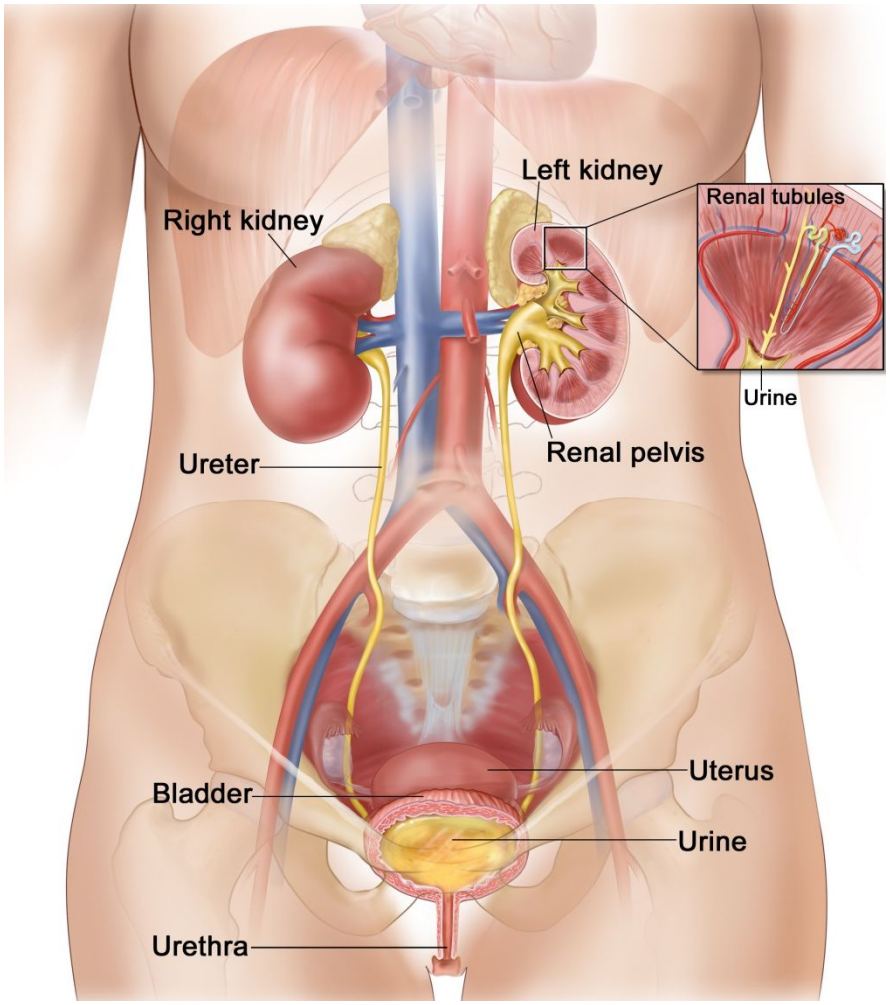

***Figure 1.2**: Female Urinary system*

***Source**: http://www.harvard-wm.org/the-body-of-anatomy-female/*

- A large number of white blood cells in urine. This can signal an infection.
- Urine culture for bacteria and the cause of infection. It also helps the choice of appropriate treatment.
- A complete blood count is required if an upper UTI is suspected.
- People with recurrent UTIs may need to be checked for obstructions. Some tests for this include:

- ✓ ultrasound
- ✓ Intravenous pyelogram (IVP) – this injected dye allows doctors to see your entire urinary tract
- ✓ cystoscopy, which uses a small camera to examine the bladder. During a cystoscopy, a small piece of bladder tissue may be taken for biopsy. A biopsy can be used to rule out bladder cancer.

3.1.4 Treatment of UTI

Antibiotics are used to treat UTIs. Lower UTIs can be treated with oral antibiotics. Upper UTIs require intravenous antibiotics. Sometimes, bacteria develop resistance to antibiotics. Urine cultures can help to select an effective antibiotic treatment.

3.1.5 Prevention

Researchers are trying to develop a vaccine to prevent recurrent UTIs. In the meantime, there are simple steps you can take to help prevent UTIs. WomensHealth.gov recommends:

1. wiping from front to back after urinating or having a bowel movement
2. drinking six to eight glasses of water daily
3. drinking water after having sex
4. not holding urine for long periods of time
5. cleaning your vaginal and rectal areas daily
6. taking showers instead of baths
7. wearing comfortable underwear, tight fabric traps moisture
8. wearing underpants with a cotton crotch

While these steps are useful, they do not guarantee that a UTI would not occur.

In Text Question

Symptoms of upper UTI include the following except:

a. Fever b. Nausea c. Coughing d. Vomiting

In Text Answer

c. Coughing

SAQ 3.1 (Tests Learning Outcome 3.1)

List five risk factors and causes for UTIs

Notes to (SAQs) for Study Session 3

SAQ 1

Bathroom Hygiene

Sexual Activity

Gender

Condoms

Obstructions

Study Session 4: HEPATITIS B

Introduction

Hepatitis B infection is an infectious and contagious disease. In cases such as Viral inflammation of the liver nurses/ health worker are particularly at risk HBV been isolated in blood, saliva, semen, vaginal secretion can be transmitted through mucous membrane and break in skin.

The liver lies on the right side of the abdominal cavity beneath the diaphragm. Blood is carried to the liver via two large vessels called the hepatic artery and the portal vein: the hepatic artery carries oxygen-rich blood from the aorta; the portal vein carries blood containing digested food from the small intestine.

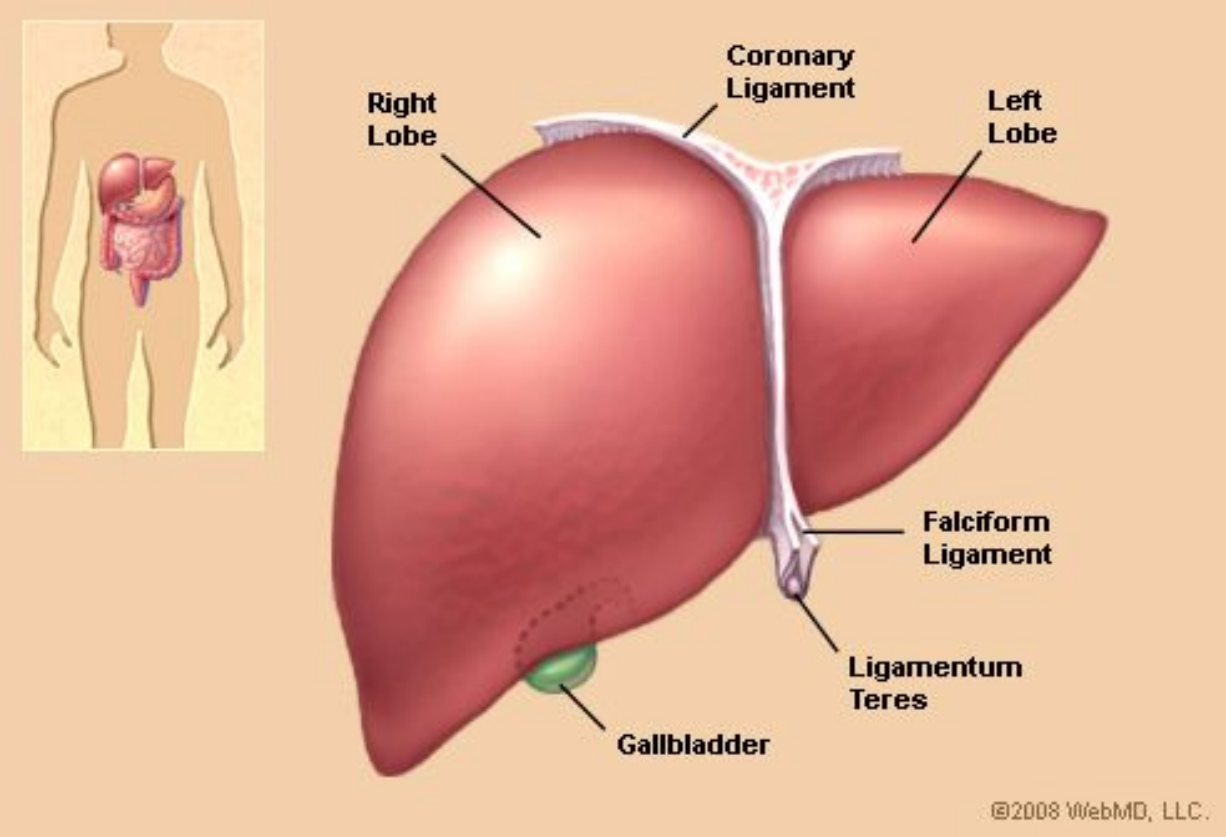

***Figure 3.3**: Structure of the liver*

These blood vessels subdivide in the liver repeatedly, terminating in very small capillaries. Each capillary leads to a lobule. Liver tissue is composed of thousands of

lobules, and each lobule is made up of hepatic cells, the basic metabolic cells of the liver.

- Sinusoids (capillaries) arranged between the rows
- Sinusoids are lined with *kupffer cells (phagocytic) removing bacteria and toxins*
- *Hepatic cells secrete bacteria into the canaliculi*

Pathophysiology

Liver function:

a) **Metabolic functions**:
   - CHO metabolism:
   - Glycogenesis,(*conversion of glucose to glycogen*
   - *Glycogenolysis : breaking glycogen to glucose*
   - *Gluconeogenesis: formation of glucose from amino acid*

b) Protein metabolism:
   - *synthesis of non essential amino acids,*
   - *plasma protein,*
   - *Development of clotting factors,*
   - *urea formation from ammonia (NH3)*

c) Fat Metabolism
   - Synthesis of lipoproteins
   - breakdown of triglycerides into fatty acids and glycerol
   - Formation of ketone bodies
   - Synthesis of fatty acids from amino acids and glucose
   - synthesis and breakdown of cholesterol

d. Inactivation of drugs and harmful substances and excretion of the products.
   - Steroid metabolism: *conjugation and excretion of gonadal and adrenal corticosteroid hormones.*

e. Metabolism and elimination of bilirubin

Storage Functions of the liver

- Glucose (glycogen)
- Vitamins (fat soluble A,D,E,K),

- water soluble (B1, B2, cobalamin, folic acid)
- Fatty acids
- Minerals (iron, copper)
- Amino acids (albumin, beta-globulins)

HBV leads to inflammation of the liver cells and disruption in vital functions. Inability of the metabolize bile leads to accumulation of unconjugated bilirubin

Appearance of bile pigments in urine: Dark colored urine

Nauseas and vomiting due to insufficient bile delivery to the intestine: For emulsification of fat/ oil Poor digestion, irritation of the GIT.

3.2.1 Manifestations

1. Fever
2. Anorexia
3. Nausea and vomiting
4. Headache
5. Splenomegaly
6. Weight loss
7. Pruritus
8. Clay colored stool
9. Dark urine
10. Fatigue

Diagnostic Procedure

Detailed patients story: History

- ✓ Hematologic analysis for HBV
- ✓ Liver function test
- ✓ Serum bilirubin estimation
- ✓ Prothrombin time

MANAGEMENT: Goals

a) Rest the liver
b) Maintain nutritional intake
c) Prevent spread of disease

d) Avoid toxic agents e. alcohol
e) Provide adequate information about the disease

Functional Health Patterns

Health perception health management pattern:

- History of disease, possible exposure to HBV
- Ingestion of hepatotoxic agents
- High risk sexual behavior

Nutritional metabolic pattern:

- Weight loss, nausea and vomiting, feeling of fullness in the right upper quadrant

Elimination pattern

- Dark urine
- Light -colored stool
- Constipation or diarrhea

Activity Exercise pattern

- Fatigue
- Myalgia
- Arthralgia

Cognitive perceptual pattern

- Right upper quadrant pain
- Liver tenderness
- Headache
- Pruritus

Nursing Diagnoses

- Altered thermoregulation related to infection and inflammatory process
- Altered nutrition less than body requirement related to nausea and vomiting
- Activity intolerance related to fatigue and disease process
- Self-care deficit Altered family process related to disease and hospitalization

NOC

a. Adequate rest
b. Good nutrition
c. Prevention of transmission
d. Relief of symptoms
e. Health education

Evaluation

- Evaluate effectiveness of nursing care:
- Freedom of household members of infection
- Client can verbalize appropriate measure to prevent infection
- Adequate rest
- Weight remains stable.

4.2.2 Prevention of Viral Hepatitis

HAV:General measures: hand washing, proper personal hygiene, environmental sanitation, control and screening of food handlers, serologic screening while carrying virus, active immunization: HAV to everyone over 2yrs.Use immune globulin (Post exposure prophylaxis)**,** early administration (1-2weeks post exposure) to those exposed**.** Prophylaxis for travelers to areas of HAV is common if not vaccinated with HAV vaccine.

HBV & HCV: Percutaneous transmission: screening of donated blood, use of disposable needles and syringes. Sexual transmission: acute exposure: HBIG administration to sexual partner of HBV Ag-positive person. Administer HB vaccine to uninfected sexual partners, use condom for sexual intercourse.

General measures: hand washing, avoid sharing toothbrushes, blades, and administer HBIG for one-time exposure (needle stick, contact of mucous membrane with infected material) active immunization with HB vaccine.

HBV Immunization

Standard course: 3 injections over 6 months (1 month and 6 months respectively).

An accelerated course over 2 months is possible: for combined hepatitis A and B vaccines. (Booster dose at 1 year is recommended). Adults who need protection very quickly can have a schedule over 21 days. Administered intramuscularly(IM) into deltoid muscle. A course may give lifelong immunity,

Health professionals: One further booster at 5 years is recommended. Antibody titres should be tested in health professionals 2 to 4 months after the primary course

Notes

A titre above 100 IU/ml is regarded as adequate.

Poor responders (10 to 100 IU/ml) should have a booster.

Titre below 10 IU/ml should repeat the course.

Smokers, Obese and those > 40yrs are more likely to fail to respond.

Alcoholics have lower sero-conversion rates, particularly those with advanced liver disease.

Patients who are immunosuppressed or on renal dialysis may also respond less well and require larger or more doses of vaccine. (CDC 2012)

Failure to produce any antibody after 2 complete courses should not be seen as necessarily meaning no immunity, as immunity to the disease is largely cell-mediated rather than by antibody.

POST EXPOSURE PROPHYLAXIS (PEP)

- Wash immediately with soap and water (If the site of exposure is a needle stick injury, cut or abrasion). Assume infection if status of the source is unknown.
- PEP may be indicated even if the exposed person has received hepatitis B vaccine previously. PEP must be given within 48 hours and not later than 7 days after exposure. Give hepatitis B vaccine and possibly immunoglobulin too.

PEP: Who needs it?

- Non occupational exposure to blood or body fluids
- Sexual or needle sharing contact of an HBsAg-positive person
- Victim of sexual assault.

In Text Question:

Which of the following vitamins is stored in the liver?

a. **Vitamin B**
b. **Vitamin A**
c. **Vitamin K**

d. All of the Above

Answer: d. All of the above.

Study session 5. CHOLECYSTITIS

Introduction

Cholecystitis is a disease affecting the gallbladder. Most cases are caused by gallstones. Normally if one is diagnosed with cholecystitis the person is admitted to the hospital for treatment with pain killers, fluids, (and sometimes antibiotics) directly into the vein. The inflammation may settle down with treatment.

However, removal of the gallbladder is usually advised to prevent further bouts of cholecystitis. Women are more often affected than men. About 1 in every 3 women and 1 in every 6 men form gallstones at some stage in their lives. They become more common with increasing age. Cholecystitis is inflammation of the gallbladder, usually caused by gallstones.

Learning Outcomes to Study Session 5

At the end of this study you should be able to:

5.1. Describe the structure of the gallbladder and the composition of bile
5.2. Define cholecystitis
5.3. Describe the causes of cholecystis
5.4. Discuss the formation and the flow of bile
5.5. Explain the management strategies of cholecystitis.

Structure of the Gallbladder

The gall bladder is a small pear shaped organ (7 – 10cm long). It lies underneath the lobe of the liver in which the bile is stored.

Bile is a fluid made in the liver. It contains various substances, including bile pigment, bile salts, cholesterol and lecithin. Bile is passed into tiny tubes called bile ducts. The bile ducts join together to form the main bile duct.

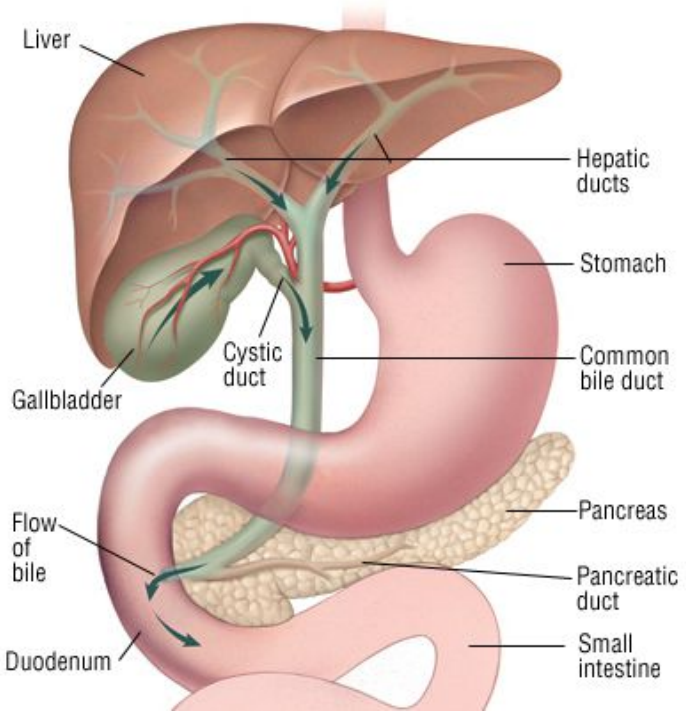

***Figure 3.4**: Bile and Gallbladder*

***Source**:http://www.connecttoresearch.org/images/pubs/AZ_d0197-1.jpg*

Bile constantly drips down the bile ducts, into the main bile ducts and then into the gut. Bile passes (via the hepatic duct) to the gallbladder from the liver, where it is formed, and is released into the duodenum(through the common bile duct)under the influence of the hormone cholecystokinin, which is secreted when food is present.

Signs and Symptoms of cholecystitis

- Pain in the upper abdomen is the main symptom.
- It is usually worse on the right side under the ribs.
- The pain may radiate to the back or to the right shoulder.
- The pain tend to be worse if one breath in deep
- Nausea and vomiting, fever and malaise may also develop

Types of cholecystitis

The following are the types of cholecystitis.

Acute cholecystitis is due to a bacterial infection causing fever and acute pain over the gallbladder. It is usually treated by rest and antibiotics.

Chronic cholecystitis is often associated with gall stone and causes recurrent episodes upper abdominal pain.Recurrent bacterial infection may be the cause of chronic cholecystitis, but the physical process leading to gall stone formation may also be important.It is also associated with cholecystitis glandularis proliferans.

Investigation

An ultrasound scan is commonly done to clarify the diagnosis. An ultrasound scan will usually detect gallstones, and if the wall of the gall bladder is thickened. If the diagnosis is in doubt then other more detailed scan may be done.

Complications

If treatment is delayed or not available, in some cases the gall bladder becomes severely affected and even gangrenous. This can lead to blood poisoning (septicaemia) which is very serious and can be life threatening. The gallbladder may burst or may fun fistula between the gallbladder and gut as a result of continued inflammation.

Treatment

Firstly the person is admitted into the hospital, there will be restriction from food and fluids so that the gall bladder can relax. Fluids and antibiotics can be admitted directly into the vein. The gall bladder is removed to prevent further damage. Laparoscopic cholecystectomy is usually done.

In Text Question

……..is due to a bacterial infection causing fever and acute pain over the gallbladder. It is usually treated by rest and antibiotics.

a. Acute b. cholecystitis c. Acute cholecystitis d. cholecystitis Acute

In Text Answer

c. Acute cholecystitis

Study Session 6: DIABETES MELLITUS

Introduction: A diabetes mellitus is a chronic disorder associated with carbohydrate (CHO), fat and protein disorder. It is multisystem disorder, and it predisposes the sufferer to other conditions: Cardiovascular diseases (CVDs), Renal, Nervous and eye complications. There is an increasing global prevalence: 7% (about 20.8 million Americans).

Learning Outcomes to Study Session 5

At the end of this study you should be able to:

5.1. Describe diabetes mellitus
5.2. Describe the structure of the pancreas
5.3. Discuss the global estimates of diabetes mellitus
5.4. Explain the types of diabetes mellitus and the pathophysiology

Global Estimates

- For all ages in 2000 : 2.8% (171 million)
- Projected estimate in 2030: 4.4% (366million)

Urban population in developing countries is projected to double between 2000 and 2030. The figures indicate 'Diabetes epidemic' will continue even if levels of obesity remain constant. (Diabetes care 2004).

Structure of the Pancreas: The pancreas is a long slender gland which lies behind the stomach. It is located in front of the 1st and 2nd lumbar vertebrae. It consists of 3 parts: head, Body and tail, and contains lobes and lobules.

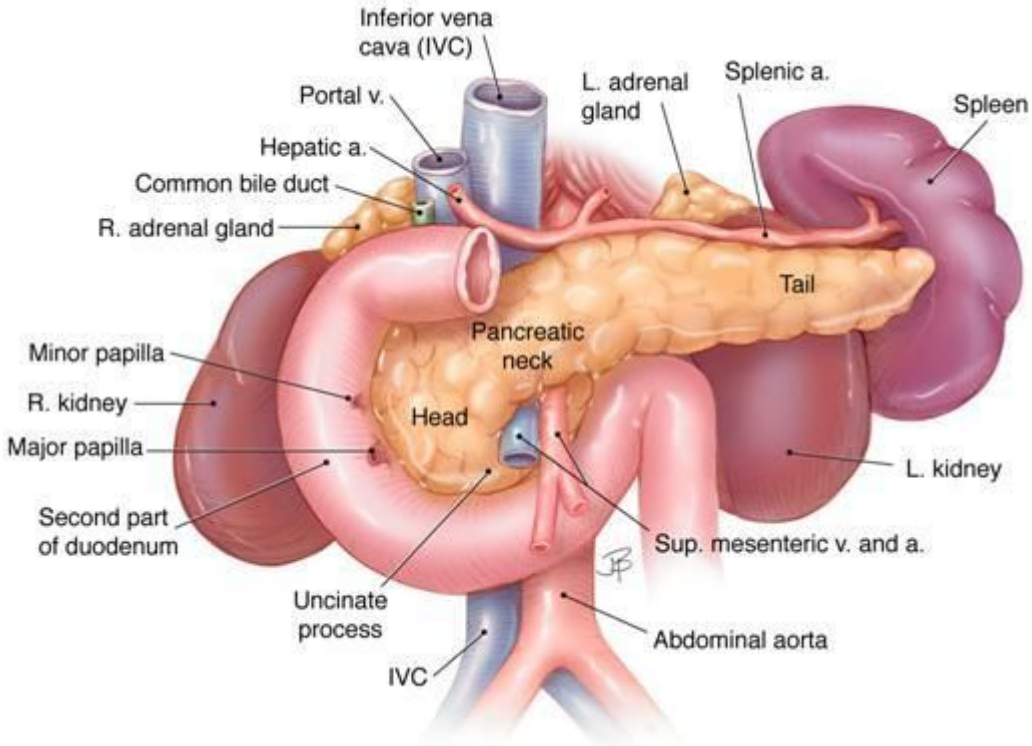

Figure 3.5: *Pancreas*

Source*: http://www.pancreapedia.org/sites/www.pancreapedia.org/files/image4.jpg*

The Pancreatic duct extends along the gland and enters the duodenum through the common bile duct. Consists of both exocrine and endocrine functions:

a. Endocrine functions occur in the islets of Langerhans
b. Beta cell (Islets of Langerhans) secrete insulin
c. Alpha cells secrete glucagon
d. Delta cells secrete somatostatin
e. F cells secrete pancreatic polypeptide

Types of Diabetes Mellitus

The following are the types of DM:

- ❖ Type I: Insulin dependent DM (IDDM)
- ❖ Type II: Non-insulin dependent diabetes (NIDDM)

Pathophysiology: Type I (Insulin dependent diabetes)

Autoimmune response: 80-90% of normal beta cell is destroyed by auto-antibodies of islet cell the body's own T cells attack and destroy pancreatic beta cells

1. Non-insulin production leads to hyperglycemia
2. Blood glucose concentration exceeds renal threshold (Glucosuria)
3. Excess glucose in urine results in osmotic diuresis and excessive fluid loss.
4. Breakdown of body fat and proteins resulting in ketone bodies

Three classical sign: Polydipsia, polyuria and polyphagia

Pathophysiology: TYPE II (Non-insulin dependent diabetes mellitus)

Key factors involved:

- Insulin resistance: Non responsive insulin receptors.
- Insufficient insulin production.
- No breakdown of fat in type II DM.

Uncontrolled Type II results in hyperglycemic , hyperosmolar nonketotic syndrome (HHNS)

Risk Factors

a. Obesity
b. Heredity
c. Metabolic syndrome: cluster of abnormalities that act synergistically to increase the risk of CVDs

Diagnostic test

- Plasma glucose level
- Fasting blood glucose
- Glycocylated hemoglobin

3.4.2: Nursing Management: Functional health patterns

Health perception health management pattern

Symptoms that preceded diagnosis: polyuria, polydipsia, polyphagia, weight loss. Family history of DM includes:

1. Drugs, alcohol.

Nutritional metabolic pattern

- Enquire about normal diet pattern: 72hr diet recall
- Weight loss, food taboo and allergies
- weight loss and gain
- Excessive thirst
- Polyphagia

Elimination pattern

- Polyuria: frequency, urgency
- Signs of diabetic ketoacidosis
- Skin turgor

Activity –exercise pattern

- Exercise tolerance
- Ability to perform self care activities

Cognitive perceptual pattern

- Visual deficits , motor and coordination
- Pains, neurological deficits: pareasthesia, numbness
- Aphasia

Coping stress tolerance pattern

- Social/ family support Fears, anxiety, emotional support.

Sexuality reproductive pattern

- Vulvovaginitis,
- parity

Physical Examination. The nurse should note the following:

a. Skin: rashes, boils, poorly healed ulcer/wounds, dry skin
b. Vital signs: orthostatic hypotension, kussmaul respiration, lethargy
c. Urinalysis
d. Fasting blood sugar (FBS)
e. Weight and Body mass Index (BMI) estimation
f. Laboratory report and values to monitor metabolic acidosis

Nursing Diagnoses

- Risk for fluid volume deficit related to polyuria and dehydration
- Altered nutrition less than body requirement related to imbalance of insulin, food and physical activity
- Knowledge deficit related to diabetic information.

NOC

i. Maintaining fluid and electrolyte
ii. Improving nutritional intake
iii. Reducing anxiety
iv. Improving self-care
v. Monitoring and managing potential complications
vi. Promoting home and continuing care
vii. Compliance to drug regimen

Summary to Study Sessions four, five and six

This study has attempted to examine the following

- HEPATITIS B
- CHOLECYSTITIS
- DIABETES MELLITUS

Hepatitis is an inflammation of the liver parenchyma which constitutes a major public health problem. Health education plays a major role in its prevention with nurses at the fore front. All healthcare providers must be conscious to observe standard precautions

when providing care, to prevent transmission/contacting hepatitis viruses from their patients.

Cholecystitis is a disease affecting the gallbladder. Most cases are caused by gallstones. Normally if one is diagnosed with cholecystitis the person is admitted to the hospital for treatment with pain killers, fluids, (and sometimes antibiotics) directly into the vein.

Diabetes mellitus is a chronic disorder associated with CHO, fat and protein disorder. A multisystem disorder, it predisposes the sufferer to other conditions: CVDs, Renal, Nervous and eye complications. There is an increasing global prevalence: 7% (20.8 million Americans).

SELF-ASSESSMENT QUESTIONS (SAQs)

Now that you have completed this study session, you can assess how well you have achieved its Learning outcomes by answering the following questions. Write your answers in your study Diary and discuss them with your Tutor at the next study Support Meeting. You can check your answers with the Notes on the Self-Assessment questions at the end of this Module.

SAQ 4. (Tests Learning Outcome 4)

Describe HEPATITIS B and list the signs and symptoms

SAQ 5 (Tests Learning Outcome 5)

List the signs and symptoms of CHOLECYSTITIS

SAQ 6 (Tests Learning Outcome 6)

State the types of DM

Notes on SAQ 4

Hepatitis B is an infectious and contagious inflammation of the liver. Nurses and health worker are particularly at risk. HBV been isolated in blood, saliva, semen, vaginal secretion can be transmitted through mucous membrane and break in skin.

Signs and Symptoms

- Pain in the upper abdomen is the main symptom.
- It is usually worse on the right side under the ribs.
- The pain may radiate to the back or to the right shoulder.
- The pain tend to be worse if one breath in deep
- Nausea and vomiting, fever and malaise may also develop

Notes on SAQ 5:

List the signs and symptoms of CHOLECYSTITIS

- Pain in the upper abdomen is the main symptom.
- It is usually worse on the right side under the ribs.
- The pain may radiate to the back or to the right shoulder.
- The pain tend to be worse if one breath in deep
- Nausea and vomiting, fever and malaise may also develop

Notes on SAQ 6

The following are the types of DM:

Type I: Insulin dependent DM (IDDM)

Type II: Non-insulin dependent diabetes (NIDDM)

References

Kenneth Mobily: Integrative Physiology

Mayo Clinic September 1st 2011

Afdhal nh (2008). Diseases of the gallbladder and bile ducts. in Goldman, D ausiello, (eds). cecil medicine,23rd ed., pp. 1152-1161 Philadelphia: Saunders Elsevier.

Fiakowski E, et al (2008) Acute cholecystitis, Accessed December 2006.online version of bmj clinical evidence