

Urinary Systems

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Urinary Retention

- What is Urinary retention and what happens
 - A person who is unable to void when there is an urge to void
 - Increases the possibility of infection
 - May cause incontinence
- Causes
 - Response to stress
 - Obstruction of the urethra by calculi (concentration of mineral salts, known as stones)
 - Tumors
 - Infection
 - Interference with the sphincter muscles during surgery
 - A side effect of medication or perineal trauma

Urinary Retention

- What the patient may experience
 - Discomfort and anxiety
 - Frequency of urination
 - Voiding small amounts of urine
 - Distended bladder
- Treatments
 - Urinary analgesics-for pain
 - Antispasmodics-help patient relax
 - Urinary catheter-to empty bladder
 - Surgery-remove any obstruction

Urinary Retention

- Interventions
 - When patient is able to void, check residual
 - Right after the patient voids, catheterization should be done
 - Urine left in bladder, residual urine should be less than 50ml



Urinary Incontinence

- What is Urinary Incontinence
 - Involuntary loss of urine from the bladder
 - A complication of urinary tract problems or neurologic disorders
 - May be permanent or temporary
 - More in older adults
 - Classified as stress, urge, overflow, total, nocturnal enuresis

Urinary Incontinence

- Medications
 - Sedatives
 - Hypnotics
 - Diuretics
 - Anticholinergics-decrease mobility in the GI, decrease gastric secretions
 - Antipsychotics
 - Alpha antagonist-block vasoconstriction induced by endogenous catecholamines



Urinary Incontinence

- Stress Incontinence
 - Leakage of urine when a person does anything that strains the abdomen like coughing, laughing, jogging, dancing, sneezing, lifting, making a quick movement, walking
 - Most common type
 - Anyone can be affected
 - Women are more likely affected

Urinary Incontinence

- Medical management of stress incontinence
 - Often can be cured and alleviated
 - Bladder retraining
 - Medicines-estrogens (Premarin Vaginal Cream)
 - Surgery-restore support of pelvic floor muscles or reconstruct the sphincter
 - Collagen injected-into surrounding tissue the urethra which closes the urethra to prevent urine from leaking out
 - Pelvic floor exercises
 - Kegel exercises

Urinary Incontinence

- Interventions for stress incontinence
 - Assessing the client's voiding pattern
 - Encourage the patient to void 30 minutes before the projected time of incontinence
 - Schedule extended until client can stay dry for 2 hours, gradually increasing time 3-4 hours

Urinary Incontinence

- Urge Incontinence
 - Occurs when a person is unable to suppress the sudden urge or need to urinate
 - Cause-irritated bladder
 - Infection or very concentrated urine may irritate the bladder
- Treatments for Urge Incontinence
 - Clearing up infection
 - Fluid intake of 3000 ml/day-help it be less concentrated (less fluid does not prevent incontinence but may give way for infection)

Urinary Incontinence

- Overflow incontinence
 - Bladder is so full and distended that urine leaks out
 - Occurs when a blocked urethra or bladder weakness prevents normal emptying
 - Prostate enlargement
- Overflow incontinence
 - Occurs mainly in patients with
 - diabetes
 - Drink a lot of alcohol
 - Have decreased nerve function

Urinary Incontinence

- Total incontinence
 - When no urine can be retained in the bladder
 - Management
 - Indwelling catheter
 - Surgery-temporary or permanent urinary diversion
 - Cause
 - Neurologic problem
- Nocturnal Enuresis
 - Incontinence that occurs during sleep
 - Management
 - Limit fluid intake after 6pm
 - Total intake requirement for 24 should remain the same
 - Bladder emptied right before going to bed

Cystitis

- About Cystitis
 - Inflammation of the urinary bladder
 - It is more common in women because of their short urethra
 - Majority of urinary tract infections are caused by Escherichia coli, but some are caused by Candida albicans
 - Common cause
 - Coitus, prostatitis, diabetes mellitus
- Symptoms
 - Urinary frequency
 - Dysuria pyuria
 - Hematuria
 - Sometimes-burning and urgency with urination
 - Foul smelling urine
 - Cloudy urine
 - May become anorexic
 - Low-grade fever

Cystitis

- Test
 - Clean-catch midstream
 - a bacteria count greater than 100,000 organisms/ml confirms the diagnosis
 - Microscopic examination of the urine shows hematuria and pus
 - Urine specimen for C & S

Cystitis

- Treatment
 - Antimicrobial
 - Norfloxacin (Noroxin)-
 - Nitrofurantoin (Furadantin)
 - Ciprofloxacin (Cipro)
 - Sulfonamides-sulfisoxazole (Gantrisin) or trimethoprim-sulfamethoxazole (Bactrim, Septra)
 - Urinary tract analgesic
 - Phenazopyridine hydrochloride (Pyridium)
 - Used for dysuria
 - Causes red-orange urine

Cystitis

- Management
 - Encourage fluids 3-4 liters
 - Intake meats and whole grains discourage growth of bacteria
 - Encourage the drinking cranberry juice
 - Call light answered promptly
 - Have commode chair ready for patient
 - Set up proper and timed bladder emptying

Pyelonephritis

- About Pyelonephritis
 - bacterial infection of the renal pelvis, tubules, and interstitial tissue of one or both kidneys
 - Can be caused by obstruction blocking the kidney or ureter
 - Can occur during pregnancy, with prostatitis, when bacteria are introduced during a cystoscopy, catheterization, or from trauma of the urinary tract
 - Can lead to high B/P, or chronic renal failure
 - Echerichia coli is the culture most often found
 - Kidney becomes edematous, renal blood vessels become congested, sometimes abscesses form in kidney

Pyelonephritis

- Signs and symptoms
 - Urine cloudy, containing mucus, blood, and pus
 - Tenderness on both sides of lower back
 - Elevated temperature, pulse, and respiratory rate
 - Foul smelling urine
 - Some are asymptomatic
- Signs and symptoms
 - Acute phase
 - Fatigue
 - Malaise
 - Urgency in urination
 - Pain during voiding and in flank area
 - Renal colic-severe pain in kidney radiates to groin
 - Impaired urination
 - Complaints of being hot with or without chills
 - Chronic phase
 - N/V, diarrhea, elevated B/P

Pyelonephritis

- Diagnostic test
 - IVP
 - Urinalysis with C&S
 - CBC
 - BUN
 - Serum creatinine

Pyelonephritis



- Treatment
 - Sulfonamides-trimethoprim-sulfamethoxazole (bactrim)
 - Antimicrobial-ciprofloxacin hydrochloride (Cipro)-may not be indicated if there is renal damage
 - Antipyretics-fever reduction
 - Analgesics-pain

Pyelonephritis

- Management
 - Increase fluids 3,000 ml/day
 - Bed rest during acute phase
 - Diversionary activities while bed rest is ordered
 - Be careful for dizziness related to analgesics

Acute Glomerulonephritis

- About acute glomerulonephritis:
 - The glomerulus within the nephron unit becomes inflamed. Primarily a disease of children and young adults when it is bacterial. When acquired during childhood it is known as (BRIGHT's) disease.
- Signs and symptoms :1-3 weeks after upper respiratory infection (tonsillitis or pharyngitis with fever) or skin infection caused most commonly by group b- hemolytic streptococcus.

Acute Glomerulonephritis

- Drug Therapy:
 - Prophylactic antimicrobial therapy. Drug of choice is penicillin. Antihypertensives and lassix such as: lassix
 - Corticosteroids, chemotherapeutic drugs such as cyclophosphamide (cytoxan) and immunosuppressive agents such as azathioprine(imuran) MAY BE ORDERED TO CONTROL THE INFLAMMATORY RESPONSE.

ACUTE GLOMERULONEPHRITIS

- DIET: FLUID RESIRICTION
- PROTEIN WILL BE GIVING ACCORDING TO CLIENT'S CREATINE LEVELS
- NURSING MANAGEMENT:
 - ENCOURAGE REST, MONITOR I&O, TAKE AND RECORD DAILY WEIGHTS, LIMIT SODIUM INTAKE
 - DIAGNOSTIC TEST: DIAGNOSTIC TEST ON BLOOD AND URINE, BUN, SERUM CRATININE, POTASSIUM, ERYTHROCYTE SEDIMENTATION RATE (ESR) AND ANTIRSTREPTOLYSIN O TITER (ASO TITER) WILL BE ELEVATED.
 - ACTIVITY: BED REST IS INDICATED UNTIL INFLAMATION SUBSIDES.

CHRONIC GLOMERULONEPHRITIS

- NRSNG MANAGEMENT: MEASURE I&O, ACCESS AND DOCUMENT COLOR OF URINE , CLEANSE SKIN THOUROGHLY EPECIALLY WHEN CRYSTALS OF UREA ARE PRESENT TO PREVENT ITCHING. MONITOR ELECTROLYTE VALUES, ARRANGE FOR VISIT OF DYALISIS NURSE.
- SIGNS AND SYMPTOMS: HEADACHE, PRURITIS, FATIGUE, AND DYSPNEA UPON PERFORMING ADL'S. ANASCRA (GENERALIZED EDEMA)

CHRONIC GLOMERULONEPHRITIS

- DRUG TREATMENTS: ANTIHYPRTINSIVE MEDICATIONS, ANTIMICROBIAL THERAPY IS GIVEN PROPHYLACTICALLY.
- DIET: AMOUNT OF PROTEIN IS NAVIGATED BY CREATINIE AND BUN LEVELS. SODIUM AND POTASSIUM WILL BE DETERMINED BY SERUM ELECTROLYTE LEVELS .INCREASE CARBOHYDRATE INTAKE TO PROVIDE NEEDED ENERGY.

CHRONIC GLOMERULONEPHRITIS

- ABOUT CHRONIC GLOMERULONEPHRITIS: THE GLOMERULUS WITHIN THE NEPHRON UNIT BECOMES INFLAMED.
- DIAGNOSTIC TEST: BUN , CREATININE, ESR, ASO, KUB, AND X RAYS.

UROLITHIASIS

- ABOUT UROLITHIASIS: IT IS A CALCUS OR STONE FORMED IN THE URINARY TRACT. CAUSE IS UNKNOWN BUT PEOPLE WITH RECURING UTI'S. HYPERPARATHYROID , AND WHO ARE IMMOBLE ARE PREDISPOSED.
- TREATMENT: CATHERAZATION, LITHOTRIPSY(ESWL) WHICH WORKS BY CRUSHING THE CALCULUS WITH ULTRASONIC WAVES. SUGERY MAY BE PERFORMED SUCH AS: NEPHROSCOPIC REMOVAL, PYELOHOTOMY,MEPHROLITHOTOMY, OR URETEROLITHOTOMY, LITHOLAPAXY

UROLITHIASIS

- SIGNS AND SYMPTOMS: DULL AND CONSTANT PAIN IN THE BACK JUST BELOW THE RIBS NEAR THE SPINE WHEN STONE IS IN THE KIDNEY. FLANK PAIN THAT RADIATES INTO THE GROIN, INNER THIGH, OR GENETALIA. SOME PEOPLE ARE ASYMPTOMATIC OTHERS MIGHT COMPLAIN OF DYSURIA, FREQUENCY OF URINATION, OR FEELING VERY WARM.
- DIAGNOSTIC TEST: KUB, IVP, CYSTOSCOPY, AND ULTRASOUND. BUN AND CREATINE LEVELS DETERMINE WETHER LIVER FUNCTION HAS BEEN DAMAGED. URINALYSIS WITH CULTURE CBC TELLS OF PRSENCE OF INFECTION. 24 HOUR URINE COLLECTION IS DONE TO DETERMINE IF ABNORMAL AMINTS OF CALCIUM, OXALATE, PHOSPHORUS, AND URIC ACID ARE BEING EXCERTED.

UROLITHIASIS

- DRUG THERAPY: ANALGESICS FOR SEVERE PAIN AND RENAL COLIC. ANTISPASMODICS: PROPANTHELINE BROMIDE(PRO-BANTHINE) OR BELADONNA FOR URETAL SPASMS. ANTIBIOTICS ARE ORDERED PROPHYLACTICALLY.
- DIET:INCREASE DIETARY INTAKE OF CALCIUM UP T 600MG/DAY. WHEN STONES CONTAIN URIC ACID , PURINE RICH FOODS ARE PROHIBITED SUCH AS : MEAT, FISH, AND POULTRY. FOODS RICH IN OXALIC ACID SUCH AS; BROCOLI, ASPARAGUS, CHOCOLATE, TEA, RHUBARB, AND SPINACH ARE RESTRICTED WHEN OXALATE STONES ARE PRESENT. INCREASE FLUID INTAKE UP TO 4000 ML/DAY TO HELP CALCULI THROUGH THE SYSTEM. CHANGE OF THE PH IN URINE IS USED AS A HELPFUL TECHNIQUE. AND ACID-ASH, OR ALKALINE- ASH DIETS ARE USED, SUCH AS: MEATS, FISH, POULTRY, EGGS, CEREAL, CRANBERRIES, AND PLUMS.

UROLITHIASIS

- NRSNG MANAGEMENT: PROVIDE COMFORT MEASURES AND DIVERSIONARY ACTIVITY'S , ADMINISTER ANALGESICS AS ORDERED, MONITOR URINE AND COLOR AMOUNT, ENCOURAGE FLUIDS, MONITOR I&O, OBSERVE FOR PAIN.

URINARY BLADDER TUMORS

- ABOUT URINARY BLADDER TUMORS: MEN ARE AFFECTED 4 TIMES MORE OFTEN THAN WOMEN, BLADDER CANCER OCCURS MOST FREQUENTLY OVER THE AGE OF 50. THOSE WHO SMOKE NICOTINE HAVE A GRATER CHANCE AT GETTING BLADDER CANCER THAN NON SMOKERS, OTHER RISK FACTORS ARE; WORKING WITH DYES, RUBBER OR LEATHER PRODUCTS, CAFFINE INTAKE, OR USE OF ARTIFICIAL SWEETENERS.

URINARY BLADDER TUMORS

- SIGNS AND SYMPTOMS: URINARY FREQUENCY, PAINLESS INTERMITTENT HEMATURIA,AND FATIGUE.
- DIAGNOSTIC TEST:URINALYSIS, CYSTOSCOPIC VISUALIZATION AND BIOPSY OF LESIONS, AN IVP AND CT SCAN.

URINARY BLADDER TUMORS

- MEDICAL TREATMENT:SURGICAL REMOVAL OF SMALL TUMORS FULGURATION(A PROCESS TO DESTROY TISSUE WITH LONG, HIGH FREQUENCY ELECTRIC SPARKS) TO BURN THE LESIONS ON THE BLADDER WALL, ALSO USED IS LASER SURGERY OR SNARING OF THE LESION, PROCEDURES ARE USUALLY DON USING A CYSTOSCOPICVISUALIZATION. ALSO A URINE DIVERSION CAN BE DONE ALSO URETERS CAN BE IMPLANTED INTO A PIECE OF THE ILEUM AND ATTACHED TO THE ABDOMINAL WALL AS A STOMA THIS IS CALLED AN IDEAL(WET) CONDUIT.

URINARY BLADDER TUMORS

- DRUG THERAPY:CHEMOTHERAPY TREATMENT OF AN ANTINEOPLASTIC DRUG INTO THE URINARY BLADDER(INTRAVESICAL)
- DIET: A LOW RSIDUE DIET IF INFLAMATION OF THE RECTOM OCCURS.
- NRSNG MANAGEMENT: ENCOURAGE FLUID INTAKE UP TO 3000ML/DAY
- MONITOR URINE OUTPUT
- CHANGE LEG BAG TUBING
- TEACH CLIENT HOW TO CARE FOR LEG BAG TUBING

Obstructive Disorders

Renal Tumors

- A unilateral renal adenocarcinoma is the most common tumor, it is seen more often in men between the ages of 50 and 70 yrs.
- Risk factors include smoking, familial incidence and preexisting renal disorders.
- Symptoms: Wt loss, dull flank pain, gross hematuria, a palpable mass in the flank area, lymph nodes, renal vessels and/or the inferior vena cava in the area of the kidney may become involved.
- When ignored early symptoms such as intermittent painless hematuria the symptoms above develop.
- The primary sites of metastases are the lungs, liver, brain and bones.

Obstructive Disorders

Renal Tumors

- **Treatments:**
 - Nephrostomy (to evaluate the function of each kidney),
 - Chemotherapy and radiation have proved to be of minimal benefit.
 - Surgical intervention: Radical Nephrectomy if kidney is healthy and disease is localized.
 - If client is on radiation therapy; antiemetics or antispasmodics are ordered, analgesics are given to control pain and facilitate respirations and ADLs

Obstructive Disorders

Renal Tumors

- **Diet:**
 - Clients are on IV fluids until food is tolerated.
 - Fluid intake =2000mL/day to maintain adequate hydration, use of alcohol should be avoided.
 - If patient is cachectic (in a state of malnutrition and wasting) parenteral nutrition may be indicated.
- Provide patient teaching on discharge
 - Frequent rest period after discharged are encouraged.
 - Ambulation is to be encouraged during client's recovery
- **Diagnostic Tests:** An IVP detects renal mass, renal sonography or arteriogram, MRI, CT scan or a needle biopsy.

Obstructive Disorders

Polycystic Kidney

- PKD may be inherited or acquired
 - Acquired cystic kidney disease is associated with dialysis and end-stage renal disease
 - In PKD multiple grape-like clusters of fluid filled cysts develop in and greatly enlarge both kidneys, they compress and eventually replace functioning kidney tissue.
 - PKD has an insidious onset that become obvious between 30 and 50 years of age.
- **Symptoms:** Early symptoms include HTN, polyuria, UTI, flank pain, headache, recurrent hematuria and proteinuria develops.

Obstructive Disorders

Polycystic Kidney

- **Diagnostic Tests:** X-ray or sonogram showing the cysts, BUN and creatinine are used to monitor kidney function.
- **Medical Management:** Primary Goal is to preserve kidney function, prevent infection and relief pain
- **Treatment:** Antihypertensive meds, diuretics, fluids and dietary modifications. Dialysis or renal transplantation may be needed.

Renal Failure

Acute Renal failure

- The rapid deterioration of renal function with rising blood levels of urea and other nitrogenous wastes (azotemia) is termed ARF
 - Nephrons are unable to regulate fluid and electrolytes or acid-base balance of the blood.
 - Predisposing factors include acute glomerular disease, severe acute kidney infections, decrease cardiac output, trauma or hemorrhage.

Renal Failure

Acute Renal failure

- There are three major forms depending on location of the cause.
 - Post-renal ARF (disrupted urine flow)
 - Pre renal ARF (disrupted blood flow to the kidneys)
 - Intrarenal ARF (Renal tissue damage)
 - Post renal and pre renal ARF are reversible if identified early. They both can lead to Intrarenal ARF

Renal Failure

Acute Renal failure

- **Post renal ARF:** It is caused by obstruction (5% of all of cases)
 - If patient has unexplained decrease in urine output or anuria. It can be easily restored by removing obstruction.
 - Treatment: Catheterization and ultrasound, retrograde pyelogram (used to diagnose obstruction)
- **Post Renal ARF**
 - Obstruction may be caused by renal calculi, blood clots, edema, tumors, urethral strictures, benign prostatic hypertrophy (BPH), or pregnancy.

Renal Failure

Acute Renal failure

- **Pre renal ARF**
 - Any abnormal decline in kidney perfusion that reduces glomerular perfusion can cause pre renal failure
 - In fluid volume excess situations such as low cardiac output due to heart failure, the effective arterial blood volume falls causing pre renal failure.
 - Glomeruli are unable to filter waste from blood
- **Pre renal ARF**
 - Kidneys can resume normal function if perfusion is restored fairly quickly.
 - Ischemia results from prolonged inadequate perfusion which causes acute tubular necrosis (ATN).
 - Symptoms; Pale cool skin, orthostatic hypotension and oliguria. BUN to creatinine ration rises from 10:1 to >20:1.

Renal Failure

Acute Renal failure

- **Pre renal ARF**
 - UA reveals low Na level (<20meq/L), high osmolality (>500mOsm/L) and high specific gravity (>1.020) (These changes are a result of sodium retention)
 - Treatment consists of IV and albumin, plasma or blood to restore the EABV for fluid volume deficit. If cause is inadequate cardiac output inotropic agents such as dobutamine hydrochloride or amrinone lactate are ordered.

Renal Failure

Acute Renal failure

- **Intra renal ARF**
 - Tissue damage of the glomeruli and/or tubules causes a loss of renal function
 - Glomerulonephritis and ATN are the main reasons for renal tissue damage.
 - The majority of all intra renal failure cases are caused by ATN and is the most common cause of nosocomial ARF.
- **Diagnostic Tests**
 - Radiographic contrast dye, pigments (myoglobin and hemoglobin)
 - Aminoglycosides, cephalosporin antibiotics and NSAIDs are all nephrotoxic. They can cause kidney tissue damage and ATN.
 - There are three phases of the clinical course of ATN: Oliguric/non-oliguric, diuretic and recovery.

Renal Failure

Acute Renal failure

- **Intra renal ARF _Treatment**
 - Its is often reversible, complications can be prevented with early diagnosis and treatment. (Dialysis early ATN treatment)
 - Primary goal is to have a kidney function stabilized and normal.
 - Symptoms: Fluid volume overload, electrolyte imbalance, metabolic acidosis, High rate of catabolism, uremia, hematological abnormalities and infection.

Renal Failure

Acute Renal failure

- **Drugs used for treatment include** antihypertensives , diuretics, cardiotonic, phosphate binding antacids, potassium lowering agents and electrolyte replacement. Restrict Activity
- **Diet:** Restrictions include Na, K, Phosphorus, protein and fluids. CHO and fats are increased. TPN also used to provide adequate nutrition.

Chronic Renal failure

End-stage renal disease

- Chronic renal failure is a slow, progressive condition in which the kidneys ability to function ultimately deteriorates (Not reversible)
- Three stages of chronic renal failure
 - Reduce renal reserve
 - Renal insufficiency
 - End-Stage Renal Disease
- Symptoms of reduced renal reserve are not apparent until more than 40% of the nephrons fail. A prolonged urine concentration test or a decline or a decline in glomerular filtration rate (GFR) may be the only evidence of reduced renal reserve.

Chronic Renal failure

End-stage renal disease

- In renal insufficiency 75% of nephrons stop functioning, BUN and creatinine are above normal, nocturia and polyuria are present.
- ESRD occurs when at least 90% of the nephrons fail, BUN and creatinine levels rise, polyuria changes to oliguria, severe fluid and electrolyte imbalance are evident.
- Treatment_ Life time dialysis becomes inevitable unless kidney transplantation is performed and is successful.
- 4 leading causes of chronic renal failure:
 - Diabetes Mellitus
 - Hypertension
 - Glomerulonephritis
 - Cystic Kidney

Chronic Renal failure

End-stage renal disease

- The diagnosis is confirmed when BUN is at least 50mg/dL and the serum creatinine level is greater than 5mg/dL
- Medical management focuses on preserving the remaining kidney function. During medical management, fluid retention increases the risk of complications.

Chronic Renal failure

End-stage renal disease

- Pharmacological treatment includes:
 - Antihypertensives such as methyldopa and propranolol hydrochloride.
 - Diuretics such as furosemide for fluid retention
 - Anticonvulsant such as phenytoin (Dilantin) to control seizures
 - Antiemetics such as Prochlorperazine (Compazine) to control vomiting

Chronic Renal failure

End-stage renal disease

- Pharmacologic treatments (Cont.)
 - Antipruritics such as cyproheptadine hydrochloride to control itching
 - Calcium acetate is used to lower the phosphate level in the blood.
 - Epoetin alfa (Epoen) may be given to treat anemia caused by a low renal erythropoietin. Multivitamins with folic acid are used because dialysis promotes loss of water soluble vitamins

Chronic Renal failure

End-stage renal disease

- Diet restrictions include sodium, potassium, phosphorus and protein.
- Fluids are limited
- With consistent compliance symptoms decrease resulting in fewer complications.
- Activity_ Encourage client to participate in ADLs
- Safety become a significant factor during periods when the client has weakness, fatigue or mental confusion. (Confusion is seen in client who have uremic encephalopathy.
- When bed rest is required, turning, ROM activities, and skin care are important