Chapter 33 Urology & Nephrology

Functions of the Kidneys
- Forming and eliminating ______________________________________
  - Maintaining blood volume with proper balance of water, electrolytes, and ph
  - Retaining key compounds such as glucose, while excreting wastes such as urea
- Controlling arterial blood pressure
- Regulating ____________________________ development
- Handling of water and electrolytes
  - Diuresis and antidiuresis
- Handling of __________________________ and urea

General Mechanisms of Nontraumatic Tissue Problems
- ______________________________ or Immune-Mediated Disease
- Infectious Disease
- Physical Obstruction

General Pathophysiology, Assessment and Management
- Differentiating GI and ______________________________ Complaints
  - Often difficult to differentiate when based on pain alone
  - Key is in the ______________________________ history and physical exam
  - Inquire about urinary output

General Pathophysiology, Assessment and Management
Causes of Pain:
- ______________________________ Infections causes pain that often worsens when urine flows over the affected tissue during urination
- ______________________________ stones causes a sharp pain that may ease or worsen when the stone shifts
- Other causes include trauma, STDs, and other ______________________________ processes

General Pathophysiology, Assessment and Management
Types of Pain:
- ______________________________ pain: pain arising in hollow organs such as the ureter and bladder
  - Normally an achy or cramping pain felt deep within the body and poorly localized
- ______________________________ pain: pain felt in a location other than that of its origin
  - Occurs when nerve fibers carrying the pain message merge with other pain-carrying fibers at the junction with the spinal cord

General Assessment
- Scene Size-up
- ______________________________ Assessment
- Focused History
  ⊗ OPQRST History
  ⊗ Prior History of Similar Event
  ⊗ History of Nausea, Vomiting, and Weight Loss
  ⊗ Change in ______________________________ Habits and Stool
General Assessment

Physical Exam:
- Appearance
  - __________ appearance.
- Posture
  - Lying with __________ drawn up.
  - Relief with walking.
- Level of Consciousness
  - Determine if changes are acute or chronic.

General Assessment

Physical Exam:
- Apparent State of Health
- Skin Color
- Examination of the __________
  - Inspection for distention, __________, or scarring
  - Pain associated with __________ of abdomen
  - Palpation
    - Normal or __________ pregnancy
    - Masses

General Assessment

Physical Exam:
- Vital signs
- Pain on __________ of the costovertebral angle (CVA-where the last rib meets the lumbar vertebrae) is known as Lloyd's sign and is indicative of __________ (infection of the kidney and renal pelvis).

General Management

- ABCs, Oxygen as needed
- Pharmacologic Interventions
  - IV access and __________
- Nonpharmacological Interventions
  - Nothing by mouth (NPO).
  - Maintain position of comfort.
  - Reassess __________ status and vital signs frequently.

Renal and Urologic Emergencies

Risk Factors:
- Older Patients
- History of __________
- History of __________
- Multiple Risk Factors

Renal and Urologic Emergencies
- Acute Renal Failure
  - __________ Renal Failure
- Renal __________ (stones)
Urinary Tract Infection

Acute Renal Failure
ARF is a sudden drop in ___________________________ output to less than 400-500 cc per day
3 types of ARF:
- ______________________________________ Acute Renal Failure
- Renal Acute Renal Failure
- ______________________________________ Acute Renal Failure

Prerenal Acute Renal Failure
- Dysfunction ___________________________ the level of kidneys
  - Insufficient blood supply to kidneys resulting in hypoperfusion
- Bloodstream retains water and hyperkalemia may develop
- Most common and most easily ___________________________
- Causes:
  - ___________________________, heart failure, sepsis, and shock

Renal Acute Renal Failure
- Dysfunction within the kidneys themselves
- 3 causes:
  - Injury to small blood ___________________________
  - Injury to tubular cells
  - ___________________________
- Often due to toxic compounds including drugs
  - ___________________________, NSAID, diuretics

Postrenal Acute Renal Failure
- Obstruction ___________________________ to the kidneys
  - Ureters, bladder, or urethra
- Normally due to obstruction of the bladder or urethra
  - ___________________________ ureters must be blocked for postrenal ARF to develop
- If not relieved, urine backs up into the kidneys

Assessment of Acute Renal Failure
Focused History:
- Change in ___________________________ output
- Swelling in face, hands, feet, or torso
- Presence of heart ___________________________ or irregularity
- Changes in mental function

Assessment of Acute Renal Failure
- Impaired mental status or clear ___________________________ in consciousness in a person with previously good mental function suggest severe ARF and a potential threat to life.
- Rule out other causes
  - ___________________________
  - Stroke
  - ___________________________
  - Other disease processes
Physical Assessment of Acute Renal Failure

Signs/Symptoms:
- Altered mental status
- ________________________________
- Tachycardia
- Pale, cool, moist skin
- ECG indicative of ________________________________
  - Tall P-waves in lead II, V3, V4, and V5

12 Lead ECG Indicating Hyperkalemia

Physical Assessment of Acute Renal Failure
- ________________________________ of face, hands, or feet
- ________________________________ findings dependent on the cause of ARF

Management of Acute Renal Failure
- Airway, Breathing, Circulation
  - Oxygen
  - IV Access
    - Protect fluid ________________________________.
    - Consider ________________________________
  - Monitor ECG
  - Position with ________________________________ up and legs down

Chronic Renal Failure
- Inadequate kidney function due to permanent loss of ________________________________
- Leading causes are diabetes and ________________________________
- Leads to End-Stage Renal Failure (ESRF)
  - Treatment options are ________________________________ or kidney transplant

Chronic Renal Failure
Impairment of Kidney Functions:
- Maintenance of ________________________________ volume with proper balance of water, electrolytes, and pH
  - Increased sodium, water, and ________________________________ retention
- Retention of key compounds such as glucose with excretion of wastes such as urea
  - Loss of ________________________________ and buildup of urea within the blood

Chronic Renal Failure
Impairment of Kidney Functions (Cont’d):
- Control of ________________________________ blood pressure
  - Disruption of the renin-angiotensin loop resulting in HTN
- Regulation of ________________________________ development
  - Development of chronic anemia

Assessment of Chronic Renal Failure
Focused history and physical exam.
- Determine between acute and chronic
Uremic Frost

Management of Chronic Renal Failure

Immediate Management:
- Monitor and support ABCs.
- Establish IV access.
  - ________________ fluid volume.
- Monitor vital signs and ________________ rhythm.
- Expedite transport to an appropriate facility.
- Give no ________________

Long-Term Management
- Renal ________________
- Kidney Transplant

Renal Calculi (Kidney Stone)

Pathophysiology
- May form in ________________ disorders such as gout and hyperthyroidism, which produces excessive amounts of uric acid and calcium
- Results when “too much insoluble stuff” ________________ in the kidneys.
- Primary danger is ________________ that can lead to infection and sepsis

Renal Calculi (Kidney Stone)

Stone types
- ________________ salts (most common)
  - 75-85%
- ________________ stones
  - Associated with chronic UTI
  - 10-15%
- ________________ acid (less than 5%)
- ________________ (least common)

Renal Calculi (Kidney Stone)

Signs/Symptoms:
- Severe pain in one flank that increases in intensity and migrates from the flank to the ________________
- Painful, frequent urination with visible ________________
Renal Calculi (Kidney Stone)
Management:
● Maintain ABCs.
● Maintain position of comfort.
● Establish IV access.
   - Fluid may promote stone movement and urine formation.
● Consider medication administration.
   - narcotic analgesics may be indicated.

Priapism
● Painful and prolonged erection of the .
● Priapism affects only the corpora cavernosa resulting in blood retention in the penis.
● The most common cause of nontraumatic priapism is cell disease.

Other Causes of Priapism
1. Leukemia
2. Multiple myeloma
3. Spinal cord injury
4. Spinal anesthesia
5. Carbon monoxide poisoning
6. Malaria
7. Black widow bites
8. Prescription and nonprescription

Urinary Tract Infection
● Infection of the urethra, bladder, or gland in males
● Includes the gland in males
● Pathophysiology
● Risk Factors
   - Increased risk in or catheterized patients
   - Sexual activity
● Upper UTI: kidneys
● Lower UTI: urethra, bladder, and prostate

Urinary Tract Infection
● : infection and inflammation of the urethra
● Cystitis: infection and inflammation of the bladder
● : infection and inflammation of the prostate gland
● Pyelonephritis: infection and inflammation of the kidney
Urinary Tract Infection
Community-acquired vs. nosocomial infections:
- Community-acquired infection: occurring in a non-hospitalized patient who is not undergoing regular procedures, including catheterization
- ____________________________ infection: an infection acquired in a medical facility

Urinary Tract Infection
Signs/Symptoms:
- ____________________________ pain
- Frequent, painful urination
- A “______________________________ sensation” associated with urination
- Difficulty beginning and continuing to void
- Strong or foul-smelling ____________________________
- Similar past episodes

Urinary Tract Infection
Physical Exam:
- ____________________________, uncomfortable appearance.
- Presence of a ____________________________.
- Vital signs vary with degree of pain.
Management:
- Maintain ABCs.
- Establish IV access.
- Consider ____________________________.
- Transport to appropriate facility.

Urinary Lab Values
BUN
- Blood Urea Nitrogen
- Normal adult range: __________ - _________ mg/dL
- Optimal for adults: __________ mg/dL
- Increases may be due to increased protein intake, low fluid intake, intestinal bleeding, or heart failure
- Decreases may be due to poor diet, malabsorption, liver damage, or low nitrogen intake

Creatinine
- Waste product produced in muscles
- Normal adult range: __________ - _________ mg/dL
- Optimal adult reading: 1.05mg/dL
- Low levels sometimes seen in kidney damage, protein starvation, liver disease, or
- ____________________________
- High levels sometimes seen in kidney disease, muscle degeneration, and some drugs involved in impairment of kidney function

Uric Acid
- Normal adult female: __________ - _________ mg/dL
- Optimal adult female reading: __________ mg/dL
- Normal adult male: __________ - _________ mg/dL
● Optimal adult male reading: ___________ mg/dL
● High levels are noted in gout, infections, kidney disease, 
  ______________________________, high protein diets, and with toxins in 
  pregnancy
● Low levels could indicate kidney disease, malabsorption, poor diet, liver damage, or overly 
  acidic kidneys