Urinary calculi, stones in the urinary tract, are the most common cause of upper urinary tract obstruction (Porth, 2002). The term lithiasis means “stone formation”; when the stones form in the kidney, it is known as nephrolithiasis; when they form elsewhere in the urinary tract (for example, the bladder), it is called urolithiasis. Stones may form and obstruct the urinary tract at any point (Figure 26–2). In the United States and other industrialized countries, renal or kidney stones are the most common.

A Client with Cystitis

Miija Waisanen is a 25-year-old second-year nursing student. She was recently married, and she and her husband live in an apartment near the college she attends. Mrs. Waisanen has never been pregnant, and she is using a diaphragm for birth control. She presents at the local urgent care clinic complaining of low back pain, frequency, urgency, and burning on urination that began the day before.

ASSESSMENT

Patrice Ramiros, RN, admits Mrs. Waisanen to the clinic. Mrs. Waisanen denies having had similar symptoms in the past or ever having been diagnosed with a urinary tract infection. She describes her pain as a constant, dull ache that does not change with movement. She feels the need to urinate almost constantly, and experiences difficulty in starting her stream, and burning pain and cramping when voiding. She reports getting up four times the night before to urinate. She denies painful intercourse and states that her last menstrual period began only 2 weeks ago. Physical examination reveals:BP 112/68; P 90 and regular, afebrile. Suprapubic tenderness noted but no flank or costovertebral angle tenderness. Clean-catch urine specimen shows hematuria, multiple WBCs, and a bacteria count greater than 10^5 per milliliter.

The nurse practitioner prescribes trimethoprim-sulfamethoxazole (TMP-SMZ) 160 mg/800 mg PO bid for 3 days, and aspirin or acetaminophen gr x PO every 4 hours as needed for pain. Mrs. Waisanen is instructed to return to the clinic in 7 days for a follow-up urinalysis, or sooner if her symptoms do not improve.

DIAGNOSIS

Ms. Ramiros develops the following nursing diagnoses for Mrs. Waisanen.

- **Pain** related to infection and inflammatory process in the urinary tract
- **Impaired urinary elimination** related to inflammation as evidenced by frequency, urgency, nocturia, and dysuria
- **Deficient knowledge** related to lack of information about risk factors for UTI

EXPECTED OUTCOMES

The expected outcomes for the plan of care are that Mrs. Waisanen will:

- Regain a normal voiding pattern without frequency, urgency, nocturia, and abnormal urine characteristics.
- Verbalize understanding of the disease process, related risk factors, follow-up instructions, and symptoms of recurrence indicating the need for medical attention.

PLANNING AND IMPLEMENTATION

Ms. Ramiros plans and implements the following interventions for Mrs. Waisanen prior to her discharge from the urgent care clinic.

- Teach comfort measures: warm sitz baths, a heating pad on low heat applied to her lower back or abdomen, rest, increased fluid intake, avoiding caffeinated beverages, and aspirin or acetaminophen as ordered.
- Advise to refrain from sexual intercourse until infection and inflammation have cleared to avoid further irritation of inflamed tissues.
- Discuss the possible relationship between using a diaphragm for birth control and UTI in women.
- Discuss dietary and hygiene practices to prevent UTI, symptoms indicating the need for further intervention, and the risks of undertreatment.

EVALUATION

Six months later, Mrs. Waisanen rotates through the urgent care clinic for her community-based nursing experience. Ms. Ramiros asks how she is doing. Mrs. Waisanen reports that her symptoms and urine cleared within about a day after starting the antibiotic and she has had no further problems. She has seen her women's health care nurse practitioner to change her birth control to oral contraceptives, increased her intake of fluid and vitamin C, and no longer puts off urinating until she “has time to go!”

Critical Thinking in the Nursing Process

1. What physiologic and psychosocial factors put Mrs. Waisanen at risk for developing a UTI?
2. Compare and contrast the benefits and drawbacks to short-course therapy versus conventional therapy for UTI.
3. Why was it appropriate for the nurse practitioner to use short-course therapy with the advice to return if symptoms did not clear?
4. Develop a care plan for Mrs. Waisanen for the nursing diagnosis, *Ineffective health maintenance*.

See Evaluating Your Response in Appendix C.

Urolithiasis affects up to 720,000 people annually in the United States (Tierney et al., 2001). In the United States, the incidence varies by region, with the highest frequency in southern and midwestern states. Males are affected more often than females by a 4:1 ratio (Porth, 2002). Calculi are more common among whites than blacks. Most people affected are in young or middle adulthood.

Although the majority of stones are idiopathic (having no demonstrable cause), a number of risk factors have been identified. The greatest risk factor for stone formation is a prior personal or family history of urinary calculi. A genetic predisposi-