CHAPTER 6 – GENITOURINARY SYSTEM

First Nations and Inuit Health Branch (FNIHB) Clinical Practice Guidelines for Nurses in Primary Care.
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The following characteristics of each symptom should be elicited and explored:

- Onset (sudden or gradual)
- Acuity or chronicity
- Chronology
- Current situation (improving or deteriorating)
- Location and character
- Radiation
- Timing (frequency, duration, intermittent or constant)
- Severity and extent
- Precipitating and aggravating factors
- Relieving factors
- Associated symptoms
- Effects on daily activities
- Previous diagnosis of similar episodes
- Previous treatments
- Efficacy of previous treatments
- Associated symptoms (for example, fever, chills, trauma, repetitive activity)

Assess and monitor pain or discomfort using a pain intensity instrument such as the Wong-Baker Faces Pain Scale, the Numeric Rating Scale, or the Comfort Scale (available at: http://painconsortium.nih.gov/pain_scales/). Also assess presence of night pain, radiation or referred pain and course.

**CARDINAL SYMPTOMS**

In addition, the general characteristics outlined above should be explored for each symptom described below, if applicable.

**Urinary System (Male and Female)**

- Frequency of urination
- Amount of urine (large or small)
- Urgency (client’s sense that he or she must void now, cannot wait)
- Dysuria and its timing during voiding (at beginning or end, throughout)
- Nocturia (new onset or increase in usual pattern)
- Urinary retention or anuria
- Polyuria
- Incontinence (including urge, overflow, enuresis, mixed, and stress)
- Leakage of urine involuntarily
- Leakage of urine when coughing, laughing or exercising
- Leakage of urine when walking to the washroom
- Use of pads or other devices to catch urine
- Inability to completely empty bladder
- Amount of urine lost each time
- Nature of urine stream (speed, strength, volume)
- Colour and odour of urine
- Presence of sediment, sand or stones in urine
- Hematuria
- Presence of urethral or genital discharge or lesions
- Pain in costovertebral angle, flank or abdomen
- Suprapubic pain
- Perineal, genital, groin or low back pain
- Painful intercourse
- Libido
- Fertility

**Male Genital System**

- Difficulty in starting or stopping urinary stream
- Voluntary bearing down (straining) to urinate
- Hesitancy, intermittency
- Post-void dribbling or post-void fullness
- Circumcision
- Discharge from penis, itching
- Blood in sperm
- Lesions on the external genitalia
- Genital, groin, suprapubic or low back pain
- Testicular or scrotal pain or swelling
- Erectile dysfunction
- Testicular self-examination (frequency, regularity)
- History of hydrocele, epididymitis, prostatism, varicocele, hernia, undescended testis, spermatocele, recent vasectomy
Other Associated Symptoms
- Fever, chills, rigors, malaise
- Nausea, vomiting
- Diarrhea, constipation
- Decrease in appetite
- Weight loss
- Change in sleep pattern
- Lymphadenopathy

MEDICAL HISTORY (SPECIFIC TO GENITOURINARY SYSTEM)
- Cystitis, pyelonephritis
- Renal disease
- Congenital structural abnormalities in the genitourinary tract
- Renal stones
- Recent onset of or increase in sexual activity
- Recent genitourinary tract instrumentation (for example, catheter, urethral dilatation, cystoscopy)
- Menopause (with no hormone replacement therapy)
- Diabetes mellitus
- Immunocompromised state
- Sexually transmitted infections (including HIV and hepatitis)
- Sexual abuse
- Mental status (can contribute to urinary incontinence)
- Allergies
- Exposure to chemical irritants
- Medications (for example, immunosuppressants, oral contraceptives, antihypertensives, antipsychotics)
- Surgical procedures
- Risk behaviours (for example, unprotected sex, substance abuse, use of illicit injection drugs)

FAMILY HISTORY (SPECIFIC TO GENITOURINARY SYSTEM)
- Urinary tract infections
- Renal disease (for example, renal cancer, polycystic kidneys)
- Prostate cancer
- Diabetes mellitus
- Kidney stones
- Sexual or physical abuse

PERSONAL AND SOCIAL HISTORY (SPECIFIC TO GENITOURINARY SYSTEM)
- Personal hygiene, toileting habits
- Fluid intake
- Recent injury or trauma
- Current sexual activity; last sexual contact
- Sexual orientation (male and/or female partners)
- Contraception and condom use
- Sexual practices, including risk behaviours (for example, oral, anal or vaginal intercourse)
- Number of sexual partners in past 2 months; in past year
- Satisfaction with frequency and quality of sexual experiences
- Symptomatic sexual partner
- History of sexually transmitted infection
- Use of contraceptive creams, foam, condoms, etc.
- Use of bubble bath, douches (by women)
- Tight-fitting underwear or other clothing
- Disruption in sex life (from GU symptoms)
- Smoking (associated with risk of bladder cancer)
- Substance use (alcohol and drugs)
- Sex while under the influence of drugs or alcohol
- Missing work, school or social functions because of genitourinary symptoms (for example, incontinence)
- Victim of abuse (for example, sexual)
- Occupational exposure (for example, volatile hydrocarbons, benzene, aniline, heavy metals, ionizing radiation) – increased risk of kidney concerns
PHYSICAL EXAMINATION OF THE GENITOURINARY SYSTEM

GENERAL
- Apparent state of health
- Appearance of comfort or distress
- Colour (for example, flushed, pale)
- Hydration status
- Nutritional status (emaciated or obese)
- Match between appearance and stated age

VITAL SIGNS
- Temperature
- Heart rate
- Respiratory rate
- Blood pressure

URINARY SYSTEM (ABDOMINAL EXAMINATION)

Inspection
- Inguinal and femoral areas
- Abdominal contour looking for asymmetry or distention (a sign of ascites), pulsations, or masses
- Peripheral vascular irregularities
- Previous abdominal or flank surgical scars
- Edema (facial, peripheral)
- Ulcers, warts, nodules, scars, and inflammation
- Ask the client to bear down or cough while inspecting urethra for stress incontinence; repeat in females with pressure to lateral vaginal fornix
- Rectum looking for lesions, discharge, swelling, hemorrhoids, excoriations, masses, inflammation

Palpation
- Suprapubic tenderness
- Bladder distention
- Abdominal tenderness, induration, or masses
- Costovertebral angle tenderness
- Enlargement of kidney (normal kidneys are usually not palpable unless the client is thin)
- Inguinal nodes or swellings
- Femoral area (anterior thigh) for hernias
- Supraclavicular lymphadenopathy
- Rectum (digital rectal exam): hemorrhoids, masses, anal sphincter tone

Percussion
- Suprapubic or costovertebral angle tenderness
- Bladder distention

Remember to also examine the following areas as part of your assessment:

- Head, eyes, ears, nose, throat: assess for pharyngitis and conjunctivitis (chlamydia infection, gonorrhea)
- Skin: assess for skin lesions, rashes, polyarthralgias of systemic gonorrhea and hydration status

MALE GENITAL TRACT

Inspection
- Penis (including urethra, prepuce, glans, shaft, skin): inflammation, discharge (at urethral meatus before and after instructing the client to “milk” the penis from its base), lesions (ulcers, warts), nodules, scars, swelling, asymmetry, stenosis, ability to retract foreskin (if present), phimosis, paraphimosis, hydrocele
- Scrotum: inflammation, lesions, swelling, masses, asymmetry, rashes, warts, veins
- Pubic area: inflammation, lesions (warts, ulcers), nodules, scars, changes in hair distribution, nits
- Inguinal and femoral areas (for hernial bulges)

Palpation
- Penis: tenderness, induration, nodules, lesions
- Testes and scrotal contents (including epididymis, spermatic cord): size, position, shape, consistency, atrophy of testes, tenderness, swelling, warmth, masses, hydrocele
- Prostate (digital rectal exam): size, shape, contour, consistency, mobility, tenderness, or nodules
- Superficial inguinal ring (for hernia)
- Inguinal canal (while standing) and femoral areas (for hernia)
- Cremasteric reflex

FEMALE GENITAL TRACT

See Chapter 13, “Women’s Health and Gynecology”, for details of this examination.
LABORATORY EVALUATION

- Urine: colour, cloudy or clear
- Dipstick testing: blood, protein, white blood cells (WBC), nitrates, pH
- Microscopic urine (spun urine): white and red blood cells, bacteria or casts, epithelial cells
- Urine culture and sensitivity
- Culture and sensitivity of urethral discharge or prostatic secretions
- Prostate specific antigen (has limited specificity)
- Creatinine and blood urea nitrogen (for kidney function)

Consider additional diagnostic tests (for example, HIV, N. gonorrhoeae, hepatitis) for individuals with risk factors for sexually transmitted infections (STIs) (see Chapter 11, “Communicable Diseases”).

PROSTATE CANCER SCREENING

Prostate cancer is the leading non-skin cancer in men and causes more mortality for First Nations males than the rest of the Canadian population. Risk factors for prostate cancer are increasing age (most significant after age 40), genetics, and possibly diet.

Prostate cancer screening is controversial. Screening using a digital rectal exam (DRE) does not ensure early detection of the cancer. Serum prostate specific antigen (PSA) testing results may cause unnecessary stress if the client requires further testing.

Refer all asymptomatic men who are expected to live at least 10 years and who are over age 50 (40 in those with a family history of prostate cancer) to a physician or nurse practitioner to discuss the risks and benefits of prostate cancer screening with DRE and/or serum PSA testing. The decision to screen or not screen must be individualized to the client.

If an asymptomatic man has positive screening results from the DRE and/or serum PSA testing, refer the client to a physician or nurse practitioner to discuss the results.

If a client has symptoms that may signify prostate cancer (for example, genitourinary symptoms such as urgency or nocturia) a DRE should be done. Advanced prostate cancer may present with erectile dysfunction, hematuria and hematospermia in older men, and metastases (for example, bone pain). Any man with symptoms that may signify prostate cancer (with or without an abnormal DRE) should be referred urgently to a physician for further assessment and/or investigations (for example, serum PSA testing and/or a prostate biopsy). A diagnosis of prostate cancer requires a biopsy.

COMMON PROBLEMS OF THE GENITOURINARY SYSTEM

ASYMPTOMATIC BACTERIURIJA

Presence of bacteria in appropriately collected urine without the client experiencing symptoms or signs of a urinary tract infection, as demonstrated by more than 10^5 cfu/mL of a single bacterial species cultured on 2 successive midstream urine specimens for women and one specimen for men or those who are catheterized.

In the young and healthy this condition is transient, often only lasting a couple of weeks.

CAUSES

- Bacteria (for example, E. coli)
- Contamination of specimen

Risk Factors

- Diabetes (in particular women, those using insulin, those who have had diabetes for a longer time, and First Nations individuals)
- Older age
- Sexual activity
- Female anatomy (more common in women because the urethra is short and located close to the vagina)
- Males practising insertive anal intercourse
- Uncircumcised male
- Bladder outlet obstruction (for example, prostatic hyperplasia)
- Urinary tract instrumentation
- Indwelling catheters
HISTORY

- No urinary complaints
- Usually discovered on routine examination of urine
- The prevalence of asymptomatic bacteriuria among healthy women increases with advancing age
- Common in women 20–50 years of age, and in up to 30% of pregnant women
- Asymptomatic bacteriuria is rare among healthy young men
- Chronic low-grade prostatitis is often present in men > 50 years of age
- Common in elderly clients and those with an indwelling urinary catheter

PHYSICAL FINDINGS

Normal.

COMPLICATIONS

- Cystitis
- Pyelonephritis
- Preterm birth
- Low birth weight
- Perinatal mortality

DIAGNOSTIC TESTS

Pregnant clients (12–16 weeks’ gestation) and those pre-operative to invasive urologic procedures (for example, transurethral resection of the prostate) are the only ones who should be screened. All other clients should not have their urine screened for asymptomatic bacteriuria.

- Urine: clear
- Dipstick test: normal
- Microscopic examination: bacteria evident
- Culture: positive in 24–48 hours

Ensure that the specimen is a properly collected, midstream urine sample.

MANAGEMENT

Goals of Treatment

- Recognize the significance of asymptomatic bacteriuria in the various subgroups (prenatal, immunocompromised, elderly)
- Eradicate bacteria from genitourinary (GU) tract in pregnant women; it may progress to urinary tract infection, pyelonephritis, miscarriage, pre-eclampsia or sepsis
- Eradicate bacteria from genitourinary (GU) tract in clients undergoing invasive urologic procedures where mucosal bleeding is expected
- Avoid treating all other clients to decrease the potential for antibiotic resistance

Nonpharmacologic Interventions

Client Education

- Recommend adequate fluid intake to flush bacteria from the bladder and prevent stasis of urine (6–8 glasses of fluid per day)
- Instruct female client about proper hygiene (wiping from front to back)
- Teach client the signs and symptoms of acute infection and advise client to return to the clinic if these occur

Pharmacologic Interventions

Females require 2 consecutive positive cultures and males require one positive culture before treatment is warranted.

Pregnant Women

Treat all pregnant women with this condition to ensure resolution of the bacteriuria:

- amoxicillin 500 mg PO tid for 3–7 days

For clients with allergy to penicillin:

- nitrofurantoin (MacroBID), 100 mg PO bid for 3–7 days

Nitrofurantoin is contraindicated at term (after 35 weeks) and during labour in pregnant women. Contact a physician for help in choosing an antibiotic if the pregnant client is allergic to penicillin and is near term.

Pre-Operative to Invasive Urologic Procedures where Mucosal Bleeding is Expected

As per specific pre-operative recommendations.

Other Groups: Healthy Nonpregnant Women, Diabetics, Elderly, Clients with a Urethral Catheter

Antibiotic treatment is not needed.

If there have been no GU problems in the past and there are currently no symptoms, the problem is probably only contamination. Educate about Nonpharmacologic Interventions (see “Nonpharmacologic Interventions”).
**Follow-Up**

Pregnant Women:

Follow up with midstream urine for culture and sensitivity 1 week post-treatment. Repeat culture and sensitivity monthly. Retreat if necessary based on the susceptibility report with either a longer duration of the same antibiotic or a different one. Discuss persistent positive cultures with a physician.

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**CYSTITIS**

Infection of the bladder. It can occur alone or in conjunction with pyelonephritis. They are common throughout a female’s lifespan.

**Uncomplicated** if: nonpregnant female with no structural or functional genitourinary abnormalities (for example, chronic catheter, obstruction, spinal cord injury).

**Complicated:** all other individuals other than those listed as uncomplicated (for example, males, genitourinary tract abnormalities, pregnant); often is due to a mixed bacterial infection and is more likely to involve resistant organisms.

**Recurrent UTI** is defined as 2 uncomplicated UTIs in 6 months or, more traditionally, as 3 or more positive cultures within the preceding 12 months. It can be attributed to:

- Reinflection: cystitis caused by a different organism than the original infection OR the same organism if it occurs more than 2 weeks after end of treatment OR if there is documentation of a sterile urine culture after treatment ending before the onset of another infection
- Relapse: cystitis caused by the same organism as the original infection and occurring within 2 weeks of treatment ending

**CAUSES**

- E. coli (most common organism, in 80–90% of cases)
- Also Klebsiella, Staphylococcus saprophyticus, Pseudomonas, group B Streptococcus, Proteus mirabilis, fungi

**Risk Factors**

- Female
- Diabetes mellitus treated with insulin
- Urinary instrumentation (for example, catheter)
- Urinary retention (for example, due to multiple sclerosis)
- Congenital abnormality of GU tract
- Renal calculi
- Tumour
- Urethral stricture
- Pregnancy
- Related to sexual activity (in women)
- Use of spermicides (including condoms coated with them), diaphragm
- Bladder outlet obstruction (for example, prostatic hypertrophy)
- Immuno-compromised state (for example HIV infection)
- History of > 6 urinary tract infections
- Recent antimicrobial use
- Male performing insertive anal intercourse
- Uncircumcised male
- Sexual intercourse with a female partner with a urinary tract infection

**Risk Factors for Recurrent Cystitis**

- Genetic or biologic factors
- Frequent sexual intercourse
- Spermicide use within the last year
- New sexual partner within last year
- First cystitis at < 15 years of age
- Mother with a history of cystitis
- Shorter length from urethra to anus
- Urinary incontinence
- History of cystitis before menopause

**HISTORY**

- Dysuria
- Frequent urination, small amounts
- Hematuria
- Urgency
- Suprapubic discomfort
- No nausea or vomiting
- No vaginal discharge or irritation
- No urethral discharge
- Risk factors as described above (see “Risk factors”)

In women, note last menstrual period. In men, note symptoms suggestive of benign prostatic hyperplasia (see the section “Benign Prostatic Hyperplasia”). Often symptoms are more subtle in older adults.
In clients with an indwelling catheter, evaluate for cystitis if they develop a fever or other systemic symptoms (for example, malaise, confusion, hypotension).

**PHYSICAL FINDINGS**
- There may be no physical findings in cystitis
- Temperature may be elevated (usually only in upper urinary tract infections)
- Mild to moderate suprapubic tenderness
- Prostate may be enlarged
- No costovertebral angle tenderness or flank pain
- Pelvic examination if urethral or vaginal discharge is present, or vaginal irritation reported, sexually active male, or uncertain diagnosis. In pure cystitis one would not expect to see signs of vaginitis, urethral discharge, herpetic ulcerations, nor any signs of cervicitis

**DIFFERENTIAL DIAGNOSIS**
- Pyelonephritis
- Urethritis
- Vulvovaginitis
- Urinary calculi
- Sexually transmitted infection (STI)
- Pelvic inflammatory disease
- Benign prostatic hyperplasia
- Diabetes mellitus
- Chronic prostatitis (if recurrent cystitis)
- Renal tuberculosis (TB)

**COMPLICATIONS**
- Ascending infection (pyelonephritis)
- Sepsis
- Kidney failure
- Chronic cystitis

**DIAGNOSTIC TESTS**
- Obtain midstream urine for urine dipstick testing (leukocyte esterase and nitrites positive)
- Urine culture and sensitivity might be useful if:
  - Client is not responding to treatment
  - Client is known to have an abnormality of the GU tract
  - Client is suspected to have a complicated infection (for example, male), (see the section “Cystitis”)
- Diagnostic uncertainty exists (for example, atypical symptoms OR typical cystitis symptoms and negative leukocyte esterase dipstick)
- Client is pregnant
- Only one of the following or none of the following signs and symptoms are present: dysuria, more than trace amount of urine leukocytes, or positive nitrites on urine dipstick
- Client symptoms persist after empiric therapy
- A relapse occurs less than a month after therapy when no culture was done for the initial infection
- Obtain urine sample for culture and sensitivity in those with an indwelling catheter by removing the old one and inserting a new one
- Obtain a vaginal swab for analysis (routine and microscopy, culture and sensitivity) as required
- Obtain appropriate swabs or urine sample for Neisseria gonorrhoeae and Chlamydia trachomatis if an STI is suspected (for example, if dysuria and positive for leukocyte esterase, but negative urine culture and sensitivity) (see Chapter 11, “Communicable Diseases”)
- Consider additional diagnostic tests (for example, for HIV, hepatitis A, B and C, syphilis) for individuals with risk factors for sexually transmitted infections (STIs) (see Chapter 11, “Communicable Diseases”)
- Check the blood glucose level if symptoms suggest diabetes mellitus

**MANAGEMENT**

**Goals of Treatment**
- Relieve symptoms
- Eradicate bacteria from the bladder
- Prevent recurrent infection

**Appropriate Consultation**
Consult a physician if the client is suspected to have a relapse, as further testing may be required.
Nonpharmacologic Interventions

Client Education
Counsel client about appropriate use of medications (dose, frequency, side effects, need to complete entire course of treatment)

- Instruct client in proper perineal hygiene (wiping from front to back) to prevent recurrence
- Remove catheter if not required; if one is required use intermittent catheterization if possible, otherwise replace the catheter when beginning antibiotic treatment

Pharmacologic Interventions

If ≥ 2 of the following are present treat with antibiotics, without waiting for the urine culture and sensitivity result (if testing required):

- Dysuria (burning or pain on urination)
- More than trace amount of urine leukocytes
- Positive for nitrites

Uncomplicated Cystitis

- nitrofurantoin (MacroBID), 100 mg PO bid for 5 days
- sulfamethoxazole/trimethoprim (Septra DS, generics) 1 tab PO bid for 3 days (use sulfamethoxazole/trimethoprim as a first-line agent only if the level of resistance is ≤ 20% or the organism is susceptible to this agent)

Recurrent Cystitis

- sulfamethoxazole/trimethoprim (Septra DS, generics), 1 tab PO bid for 7–14 days
- ciprofloxacin 250 mg bid for 7–14 days

Cystitis in Pregnancy

- nitrofurantoin (MacroBID), 100 mg PO bid for 7 days

Nitrofurantoin is contraindicated at term (after 35 weeks) and during labour in pregnant women.

- amoxicillin 500 mg PO tid for 7 days; do not start unless the culture and sensitivity indicates the bacteria are susceptible

Contact a physician for help in choosing an antibiotic if the pregnant client is allergic to penicillin and is near term.

Complicated Cystitis

For those with no systemic symptoms (for example, high fever, vomiting)

- sulfamethoxazole/trimethoprim (Septra DS, generics), 1 tab PO bid for 7–10 days
- ciprofloxacin 250 mg PO bid for 7–10 days

Monitoring and Follow-Up

- Once culture and sensitivity results are received (if applicable), tailor treatment according to the susceptibility profile
- If symptoms do not begin to resolve within 48 hours or if symptoms progress despite treatment, client should return to the clinic for reassessment
- Arrange follow-up after the completion of therapy; assess for continuing symptoms; if the client is asymptomatic (except for pregnant clients) there is no need to repeat the urinalysis and culture to ensure resolution of cystitis
- For pregnant clients, follow up with midstream urine for culture and sensitivity 1–2 weeks post-treatment. Repeat culture and sensitivity monthly. Re-treat if necessary based on the susceptibility report with either a longer duration of the same antibiotic or a different one

Referral

Clients with chronic or recurrent cystitis should be referred to a physician. Men ≥ 50 years of age who present with a true (culture-positive) urinary tract infection for the first time should also be referred to a physician for further evaluation.

PREVENTION

To prevent recurrent cystitis:

- Do not use spermicide-containing products
- Void early after sexual intercourse
- Advise women with recurrent cystitis to drink cranberry juice or take cranberry tablets
- Antibiotic prophylaxis for women with > 2 episodes of symptomatic cystitis in 6 months OR >3 over 12 months OR pregnant female who has another condition (for example, diabetes) that increases their risk of cystitis after first infection. Consult a physician to discuss the need for a prescription
- Postmenopausal women may use intravaginal estrogen cream. Consult a physician to discuss the need for a prescription
PYELONEPHRITIS, ACUTE

Infection of the kidney that is characterized by infection within the renal pelvis, tubules, or interstitial tissue.

**Uncomplicated** if: non-pregnant female with no structural or functional genitourinary abnormalities (for example, chronic catheter, no obstruction), not immunocompromised (for example, diabetic), and with no vomiting and no fever or sepsis.

**Complicated**: all other individuals other than those listed as uncomplicated (for example, obstruction, males, genitourinary tract abnormalities, immunocompromised, pregnant, spinal cord injury); often is mixed bacterial and more resistant organisms; results from a progression to emphysematous pyelonephritis, renal corticomedullary or perinephric abscess, or papillary necrosis.

**CAUSES**

- E. coli (most common)
- Also Enterobacter, Klebsiella, S. saprophyticus, Pseudomonas and Proteus (among others)
- Fungi
- In unresolving pyelonephritis, suspect tuberculosis of the kidney

**Risk Factors**

- Genetic factors

Complicated:

- Urinary tract obstruction
- Urologic dysfunction
- Antimicrobial resistant pathogen
- Diabetes

Females (at highest risk due to proximity of urethra to anus and vagina)

- Increased sexual activity (> 3 times per week in past 30 days)
- New sexual partner in past year
- Recent spermicide use
- Pregnancy, in particular nulliparous women
- Urinary tract infection (upper or lower tract) in the past year
- Stress incontinence in the past 30 days
- Mother with history of urinary tract infection
- Anatomic abnormalities

**Males**

- Homosexuality
- Lack of circumcision
- Anatomic abnormality
- Obstruction of normal flow resulting from prostatic hypertrophy and urethral strictures

**HISTORY**

- Flank pain
- Fever (> 38°C), shaking chills
- Headache
- Malaise
- Nausea and vomiting
- Dysuria, frequency, urgency may be present
- Abdominal or flank pain may be present
- Complicated case may have weeks to months of malaise, fatigue, nausea, abdominal pain, hematuria

**PHYSICAL FINDINGS**

- Temperature elevated
- Heart rate may be elevated
- Blood pressure may be mildly elevated
- Client appears moderately to acutely ill
- Mild, generalized abdominal discomfort
- Marked or severe pain with deep abdominal palpation of kidney
- Marked or severe costovertebral angle tenderness with percussion over kidney

**DIFFERENTIAL DIAGNOSIS**

- Pneumonia
- Acute cholecystitis with fever
- Appendicitis
- Acute pancreatitis
- Pelvic inflammatory disease
- Renal colic
- Bladder obstruction
- Musculoskeletal pain
- Shingles
COMPLICATIONS
- Acute renal failure
- Chronic renal failure
- Renal abscess
- Sepsis
- Focal renal scarring
- Renal papillary necrosis
- Emphysematous pyelitis and/or cystitis
- Respiratory dysfunction

DIAGNOSTIC TESTS
- Obtain midstream urine for urine dipstick testing (leukocyte esterase positive [pyuria] in most clients with acute pyelonephritis)
- Obtain midstream urine for urinalysis (routine and microscopy, culture and sensitivity)
- Blood culture, if pregnant or suspected to be septic
- Pregnancy test to rule it out, if child-bearing-age female

MANAGEMENT
Early or mild infections may be treated on an outpatient basis.

Moderate or severe (complicated and uncomplicated) infections usually require inpatient treatment. This includes those with:
- Moderate to severe infection (high fevers, pain and are debilitated)
- Sepsis
- Nausea and/or vomiting with an inability to rehydrate or take medications orally
- Pregnancy
- Potential medication compliance concerns

Goals of Treatment
- Relieve symptoms
- Eradicate bacterial infection
- Prevent complications or reinfection

Appropriate Consultation
Moderate or Severe Infection
- Consult a physician regarding choice of intravenous (IV) antibiotics and need for medevac

Adjuvant Therapy
Moderate or Severe Infection
- Start IV therapy with normal saline
- Adjust IV rate according to hydration status (see the section “Dehydration” in Chapter 5, “Gastrointestinal System”), age and other medical problems (for example, diabetes mellitus, heart disease)

Nonpharmacologic Interventions
Mild Infection (Uncomplicated)
- Rest until symptoms improve

Client Education
- Counsel client about appropriate use of medications (dose, frequency, completion of entire course of antibiotics)
- Instruct client about proper hygiene to prevent recurrence of infection
- Ask client to report recurrence of symptoms immediately

Pharmacologic Interventions
Mild, Uncomplicated Infection (see “Management” above and the section “Pyelonephritis, Acute”)
Early or mild infections may be treated on an outpatient basis.

Analgesic and antipyretic:
acetaminophen (Tylenol), 325 mg, 1–2 tabs PO q4–6h prn (maximum 12 regular-strength tabs, 4 g/day)

Oral antibiotics:
sulfamethoxazole/trimethoprim (Septra DS, generics), 1 tab PO bid x 14 days if the pathogen is known to be susceptible to this agent
or
ciprofloxacin 500 mg po bid x 7 days
Consult a physician for choice of antibiotic if there is an allergy to the recommended agents.

Complicated Infections and Severe Uncomplicated Infection (see the section “Pyelonephritis, Acute”)

Analgesia and antipyretics for fever and pain:
acetaminophen (Tylenol), 325 mg, 1 or 2 tabs PO q4–6h prn (maximum 12 regular-strength tabs, 4 g/day)
Antiemetics to control severe nausea and vomiting:
  dimenhydrinate (Gravol), 50 or 75 mg IM or IV if line in place

For antibiotics, consult a physician.
Extra consideration is required in choosing drugs for a pregnant woman. Consult a physician.

**Monitoring and Follow-Up**

**Mild Infection (Uncomplicated and Complicated)**
- Follow up in 2–3 days to determine clinical response to therapy; if poor response after 72 hours of therapy (for example, no improvement or worsening), consult a physician as radiographic evaluation may be warranted
- Arrange follow-up after the completion of therapy; assess for continuing symptoms; if the client is asymptomatic (except for pregnant clients) there is no need to repeat the urinalysis and culture

**Moderate to Severe Infection (Complicated)**
- Monitor response to therapy, vital signs, and urinary output
- For pregnant clients, follow up with midstream urine for culture and sensitivity 1–2 weeks post-treatment. Repeat culture and sensitivity monthly for the rest of the pregnancy

**Referral**

**Moderate to Severe Infection (Complicated)**
- Medevac to hospital as soon as possible

Refer the following individuals to a physician, as they may require further investigation:
  - Poor response after 72 hours of antibiotics
  - Males with pyelonephritis
  - Infection with Pseudomonas
  - Individuals with diabetes
  - Recurrent pyelonephritis after a course of appropriate therapy
  - Immunocompromised
  - History of renal stones or another urologic concern
  - Prior urologic surgery

**URETHRITIS**

Infection of the urethra causing inflammation (dysuria and/or urethral discharge).

**CAUSES**
- Neisseria gonorrhoeae (often symptomatic in men, asymptomatic in women)
- Chlamydia trachomatis (often symptomatic in women, asymptomatic in men)
- Trichomonas vaginalis
- Herpes simplex virus
- Mycoplasma genitalium, Ureaplasma urealyticum
- Candida albicans
- Adenovirus
- Chemical irritation from products used and/or those inserted into vagina (for example, spermicides, condom, tampon, soaps)

**Risk Factors**
- Repeated sexual exposure
- Inadequate treatment for a previous sexually transmitted infection
- New, recent sexual partner
- Partner with urethral discharge and/or diagnosed sexually transmitted infection
- History of sexually transmitted infection (for example, gonorrhea)
- Multiple sexual partners
- Young age
- Inconsistent use of barrier contraception
- Low socioeconomic status

**HISTORY**
- Dysuria (pain, tingling or burning in perineal area with voiding or just after) may be present; in women may be on and off for a day or two (chlamydia); occurs prior to lesions developing (herpes simplex)
- Meatal discharge may be present (for example, for entire day, at first morning void, scanty); Gonorrhea often has acute onset and copious purulent discharge; often none for Chlamydia
- Pruritus at urethral meatus may be present
- Ulcer may be present
- Frequency, urgency may be present
- Fever, chills, inguinal lymphadenopathy, headache may be present (initial herpes simplex virus presentation)
- No hematuria
- Activity causing irritation precedes dysuria (if chemical irritant)
- Ask about risk factors (see “Risk factors”)
- Take a sexual history; see “Personal and Social History (Specific to Genitourinary System)”
PHYSICAL FINDINGS

- Client appears well
- Urethral meatus may be crusted or erythematous
- Mucoid, mucopurulent or purulent urethral discharge may be present (gonorrhea, chlamydia); in males must retract foreskin and milk the urethra from the base of the penis to the meatus; discharge may also be present at cervical os in females
- Lymph nodes (for example, inguinal) may be present and/or tender (in syphilis)
- Perineal area lesions or ulcer(s) may be present (syphilitic chancre or herpes simplex virus)
- Abdominal (including costovertebral angle tenderness) and digital rectal (males only) exams have no acute findings
- Temperature not elevated
- No testicular or epididymal swelling, masses or tenderness

DIFFERENTIAL DIAGNOSIS

- Epididymitis
- Prostatitis (acute or chronic)
- Cystitis
- Pyelonephritis
- Reactive arthritis
- Chemical irritation
- Endourethral chancre (syphilis)
- Chronic pelvic pain disorder

COMPLICATIONS

- Pelvic inflammatory disease
- Tubo-ovarian abscess
- Infertility
- Cervicitis
- Vaginitis
- Urinary tract infection (cystitis or pyelonephritis)
- Epididymitis
- Prostatitis
- Urethral stricture or stenosis
- Abscess

DIAGNOSTIC TESTS

- Obtain midstream urine for dipstick testing (positive leukocyte esterase, no hematuria for Chlamydia, N. Gonorrhoeae, and Trichomonas)
- Obtain midstream urine for urinalysis (routine and microscopy, culture and sensitivity); culture has no growth in Chlamydia
- Take endourethral swabs for culture or first 20 mL of first morning void or after > 2 hours of not voiding for nucleic acid amplification testing for N. gonorrhoeae and Chlamydia; swabs are the best route to diagnose N. gonorrhoeae
- Offer urethral swabs for trichomoniasis in men
- Consider offering additional diagnostic tests (for example, for HIV, hepatitis A, B, and C virus) for individuals with risk factors for sexually transmitted infections (STIs), (see Chapter 11, “Communicable Diseases”)
- Offer Venereal Disease Research Laboratory (VDRL) or Rapid Plasma Reagin (RPR) testing for syphilis (perform it if an ulcer is present)
- If a genital ulcer is present, take a culture for herpes simplex virus

MANAGEMENT

Treatment depends on suspected cause, based on signs, symptoms, risk factors and diagnostic test results.

Goals of Treatment

- Relieve symptoms
- Prevent complications of infection
- Prevent recurrence

Appropriate Consultation

Consult a physician if urethritis has recurred or if it has not resolved after the course of treatment.

Nonpharmacologic Interventions

- Advise client to return to the clinic for reassessment if symptoms worsen
- If sexually transmitted infection is suspected or is the cause, educate client about the importance of their partner being tested and treated
Client Education
- Educate to avoid chemical irritants (for example, spermicide), if it is a potential cause
- Explain disease process and expected course (for example, symptoms may be present for up to 7 days after treatment is completed)
- Counsel client about appropriate use of medication (dose, frequency, side effects, completion of entire course prescribed)
- Counsel client about preventing spread of STIs to sexual partners (for example, abstain from sex for 1 week after treatment begins for last partner treated, consistent condom use, explore barriers to safe sexual practices)

Pharmacologic Interventions
Urethral discharge present OR lab results indicate N. gonorrhoeae infection:
- cefixime (Suprax), 400 mg PO single dose
  and either
  - doxycycline, 100 mg PO bid for 7 days (if not pregnant)
  or
  - azithromycin 1 g PO single dose (if poor compliance is expected)

Lab results indicate Chlamydia OR if nongonococcal infection:
- doxycycline (Vibramycin), 100 mg PO bid for 7 days (if not pregnant)
  or
  - azithromycin 1 g PO single dose (if poor compliance is expected)

Lab results indicate Trichomonas or recurrence of urethritis with no new partner or re-exposure and good compliance with medication:
- metronidazole 2 g PO single dose

Monitoring and Follow-Up
- Follow up in 7 days, when the course of antibiotics is completed to ensure symptom resolution, good compliance with medication, no re-exposure to partner and no new partners
- If N. gonorrhoeae or Chlamydia are confirmed as the causative organism, ensure contact tracing and a report to Public Health is made according to the procedures in your region
- Treat current sexual partner(s) and those within the past 60 days, even if asymptomatic
- Do a test of cure (repeat sexually transmitted infection testing) 3 weeks after treatment only for pregnant women
- If N. gonorrhoeae or Chlamydia are confirmed as the causative organism, repeat STI testing in 6 months

Referral
Refer to a physician if the client presents with recurrent urethritis.

URINARY INCONTINENCE
Involuntary loss of urine. Incontinence is so frequent in women that many consider it normal, although it is not, nor is it age related. In men, dribbling is usually associated with other symptoms of bladder-outlet obstruction (see the section “Benign Prostatic Hyperplasia”).

One should routinely screen for incontinence in those who are at risk, as more than half of clients do not report it. It has a large adverse impact on quality of life.

CAUSES
See Table 1, “Incontinence Types and Causes”.
Table 1 – Incontinence Types and Causes

<table>
<thead>
<tr>
<th>Type</th>
<th>Description and Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress Incontinence</td>
<td>Leakage of urine due to an increase in intra-abdominal pressure (for example, cough, exercise, climbing stairs, sneeze) leading to impaired urethral sphincter functioning or hypermobility. Most common type in younger women. Poor pelvic support (for example, multiple vaginal deliveries, postmenopausal estrogen deficiency, prostate surgery) is the primary cause.</td>
</tr>
<tr>
<td>Urge Incontinence (overactive bladder syndrome)</td>
<td>Leakage of urine due to inability to delay voiding when an urge is perceived. Causes include detrusor hyperactivity (contractions) or instability of the bladder wall, disorders of the central nervous system (for example, Parkinson’s disease), and bladder irritability from infection, stones, diverticula or tumour.</td>
</tr>
<tr>
<td>Functional Incontinence (potentially reversible)</td>
<td>Leakage of urine due to inability to get to the toilet. Causes include age-related problems (for example, decreased mobility and manual dexterity, cognitive disability), alcohol intoxication, environmental factors, medications (for example, diuretics, sedatives) and diabetes mellitus (neurogenic bladder). Can affect other types of incontinence and/or be a cause by itself.</td>
</tr>
<tr>
<td>Mixed Incontinence</td>
<td>Combination of urge and stress incontinence. Most common type in women.</td>
</tr>
<tr>
<td>Overflow Incontinence</td>
<td>Constant leakage of urine due to overdistention of the bladder (incomplete bladder emptying resulting in high post-void residual volume) or fullness of the bladder. Commonly caused by obstruction of the bladder outlet (for example, prostatic enlargement, fecal impaction), impaired detrusor contractility and/or neurologic disease (for example, multiple sclerosis). Often associated with weak stream, hesitancy, frequency, and nocturia.</td>
</tr>
</tbody>
</table>

**Risk Factors**

- Childbearing (including vaginal delivery)
- Obesity
- Increasing age
- Functional impairment (for example, lower and upper extremity weakness, sensory or cognitive impairment)
- Other urinary symptoms (for example, dysuria)
- Childhood enuresis
- Diabetes
- Menopause
- Stroke
- Spinal cord injury
- Depression
- Lower estrogen
- Genitourinary surgery (for example, hysterectomy, prostate surgery)
- Medications that may cause or worsen urinary incontinence are shown in Table 2 (see “Table 2”).

Anticholinergic agents impair emptying and can cause retention of urine. Some drugs can cause pedal edema, which is associated with nocturia and nighttime incontinence. Examples include gabapentin and pregabalin, thiazolidinediones and calcium channel blockers. ACE inhibitors can cause cough in some clients, which worsens stress incontinence

Table 2 – Selected Drugs Related to Incontinence

<table>
<thead>
<tr>
<th>Drug class</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drugs with anticholinergic effects</td>
<td></td>
</tr>
<tr>
<td>Antipsychotic agents</td>
<td>prochlorperazine (Stemetil)(^{a})</td>
</tr>
<tr>
<td>Tricyclic antidepressants</td>
<td>amitriptyline</td>
</tr>
<tr>
<td>Antihistamines(^{b})</td>
<td>diphenhydramine (Benadryl)</td>
</tr>
<tr>
<td>Hormones</td>
<td>estrogen, oral contraceptives</td>
</tr>
<tr>
<td>Antihypertensives</td>
<td></td>
</tr>
<tr>
<td>Calcium channel blockers</td>
<td>amlodipine, nifedipine</td>
</tr>
<tr>
<td>ACE inhibitors</td>
<td>enalapril</td>
</tr>
<tr>
<td>Loop diuretics</td>
<td>furosemide</td>
</tr>
</tbody>
</table>

\(^{a}\) Often used as an antinauseant
\(^{b}\) It is the older histamine H1 receptor antagonists that are a problem in this regard

Urge Incontinence
- Increasing age
- Prostate disorder and/or radiation
- History of urinary tract infections (in men)
- Constipation

Stress Incontinence
- Pelvic trauma
- High impact physical activities
- Smoking
Overflow Incontinence
- Previous anti-incontinence surgery
- Pelvic organ prolapse
- Older adult
- Peripheral neuropathy

HISTORY
- Loss of bladder control
- Onset and course (for example, sudden onset may indicate neurologic or neoplastic cause)
- How often, how much and when leakage occurs (severity)
- Qualify degree of difficulty in maintaining continence
- Urgency (strong and sudden, so lose control before getting to the toilet)
- Precipitating factors (for example, medications, caffeinated beverages, alcohol, amount of fluid consumed, physical activity, coughing, laughing, sneezing, sound of water, placing hands in water) and what caused loss of bladder control most often
- Associated symptoms (for example, frequency, nocturia, hesitancy, interrupted voiding, dribbling, continuous leakage, weak urinary stream, incomplete emptying, straining to empty)
- Assess bowel habits, sexual function, history of prostate disease and/or treatment, number of pregnancies and vaginal deliveries, postmenopausal symptoms, neurologic deficits
- Impact on quality of life of client and caregiver, if applicable (for example, restrictions to work, exercise, social activities); most bothersome part of incontinence
- Previous continence therapy, in particular, surgeries
- In females, feeling of prolapse
- Comorbid conditions
- Risk factors, as listed above and the timing of them compared to the onset of incontinence (see “Risk factors”)

- Bladder diary is helpful if it is difficult to determine the severity of incontinence, if nocturia is present and/or if there is frequency. It can also help establish efficacy of treatment if done before and after treatment. Ask the client or caregiver to keep track of the time, volume (amount or drop, small, medium, soaking), and circumstances of all continence and incontinence episodes for 3 days. Also have them record associated activities (for example, time, type and amount of fluid intake, exercise, hours of sleep). A sample bladder diary is available from the Institute for Clinical Evaluative Sciences at: http://www.ices.on.ca/informed/periodical/subissue/21-ip5311.PDF

Previously “dry” elderly clients who suddenly become incontinent may have an early urinary tract infection or an intercurrent illness or infection elsewhere.

If infection is present, there will be symptoms of cystitis.

If diabetes is suspected, ask about polyuria, polydipsia, polyphagia, weight loss, recurrent cystitis or vaginitis.

PHYSICAL FINDINGS
The findings will depend upon the specific cause.
- Distention of the bladder may be present
- Cardiovascular examination to rule out volume overload (for example, peripheral edema)
- Palpate abdomen for masses and tenderness (for example, bladder distention, costovertebral angle tenderness)
- Examine the extremities for joint mobility, function, and venous stasis
- Assess prostate, anal-sphincter tone, rectal wall (masses), amount of stool present in rectum
- Note atrophic urethral and vaginal changes (for example, pallor, thinning, loss of rugae), relaxation of pelvic floor (for example, cystocele, uterine prolapse), pelvic masses (for example, fibroids) and tenderness, inflammation (for example, erythema, friability)
- Assess penis, scrotal contents and pelvic area for infection, masses, hernia, position of urethral meatus
- Assess for stress incontinence by asking client to cough or bear down while observing their urethral meatus
- Assess deep tendon reflexes and perineal sensation
– Neurologic examination if sudden onset, known neurologic disease, or new onset of neurologic symptoms (for example, perineal sensation, anal sphincter tone, anal wink, vibration and sensation testing)
– Older adults: assess cognitive and functional status (for example, mobility, ability to transfer, manual dexterity, ability to toilet)
– Screen for depression

**DIFFERENTIAL DIAGNOSIS**

– Cauda equina syndrome
– Spinal cord compression or trauma
– Uterine prolapse
– Renal calculi
– Multiple sclerosis
– Brain or spinal cord tumour
– Cystitis or pyelonephritis
– Pelvic inflammatory disease
– Prostatitis
– Vaginitis

**COMPLICATIONS**

– Irritation
– Breakdown and ulceration of skin in the genital area
– Social embarrassment
– Social and psychological problems

**DIAGNOSTIC TESTS**

– Obtain urine for urinalysis (routine and microscopy)
– Obtain midstream urine for culture and sensitivity if infection is suspected (to identify cystitis)
– Post-void in and out catheterization to measure amount of residual urine only if requested by a physician (for example, when the diagnosis is not clear or the client fails to improve after nonpharmacologic treatment)
– Perform complete blood count, and measure creatinine, blood urea nitrogen (BUN), and electrolytes to check renal function
– Measure blood sugar to rule out diabetes
– Serum calcium if frequency and/or increased urine volume
– In men, prostate surface antigen (PSA): optional and controversial but is generally recommended when a diagnosis of prostate cancer would alter treatment in a healthy man between 50 and 70 years of age and who is expected to live at least 10 years

PSA levels should not be drawn if a digital prostate exam has been done in the previous 3 days because levels may be falsely elevated.

**MANAGEMENT**

Management is based on identifying and treating the underlying cause. Treatment is focused on the most troublesome aspects for the client, so the client’s goals are consistent with the care provider’s and should start with the least invasive (nonpharmacologic) measures first, as they carry the least risk.

**Goals of Treatment**

– Achieve relief of urinary symptoms (reduction in incontinent episodes, urinary frequency, urinary urgency)
– Increase functional capacity of the bladder
– Improve quality of life

**Appropriate Consultation**

Consult a physician if the incontinence is associated with abdominal or pelvic pain, hematuria (and not cystitis), elevated prostate specific antigen, abnormal prostate examination, a fistula is suspected, there are neurologic abnormalities, medication is a suspected cause, or there is a pelvic mass or prolapse.

**Nonpharmacologic Interventions**

The following simple measures should be tried.

**All Types of Incontinence**

– Manage fluid intake (maximum of 1.5–2 L per day)
– Avoid caffeinated, carbonated, and alcoholic beverages
– Avoid constipation (for example, eat more fibre, avoid straining while having a bowel movement)
– Treat cough
– Advise smoking cessation if the client is a smoker
– Avoid straining while urinating
– Avoid voiding > 2 times a night, if possible
– Bladder training (if cognitively intact) to gradually lengthen the time between voids by timed voiding (start voiding at the shortest time between voids from a bladder diary) or every 2 hours while the client is awake and then increase by 30–60 minute intervals after 2 days without leaking, until it is a period that works for the client, or every 3–4 hours without incontinence (for urge and mixed incontinence); reassure clients that this takes weeks to achieve
− Urgency suppression using relaxation techniques; stand still or sit down when urgency occurs then take a deep breath and let it out slowly while contracting pelvic muscles; after feel in control walk slowly to a bathroom (for urge and mixed incontinence); reassure clients that this takes weeks to achieve
− Kegel exercises to strengthen pelvic floor and perineal muscles; advise client to do 10–15 repetitions of slow velocity contractions, held for 6–8 seconds, three times a day for at least 15–20 weeks (for urge, stress, mixed incontinence, prevention); confirm that the client is doing them properly by digital vaginal examination (for example, vaginal muscles squeeze, but not buttock or abdominal ones). Educate that it takes 6–8 weeks to start to see results. A client education sheet on Kegel exercises is available from The Canadian Continence Foundation at: http://www.canadiancontinence.ca/pdf/pelvicmuscleexercises.pdf
− Suggest sanitary napkins or adult diapers specifically designed for urinary incontinence or a condom catheter to help maintain dryness
− Explain disease process and expected course
− Counsel client about appropriate use of medication (dose, frequency, side effects, completion of entire course prescribed)
− Client education sheets on incontinence are available to download from The Canadian Continence Foundation at: http://www.continence-fdn.ca/english/documents.html

Stress Incontinence
− Encourage weight loss and increased physical activity, if appropriate, to reduce symptoms
− Encourage frequent toileting, complete emptying of the bladder, voiding before strenuous activities and use of sanitary napkins to maintain dryness

Urinary stress incontinence of some small degree may be physiological and may not be abnormal.

Nighttime Incontinence
− Advise client to reduce fluid intake in the evening (especially caffeine products)
− Advise client to take diuretic drugs earlier in the evening or day
− Suggest a bedside commode or urinal, if available, or a condom catheter

Chronic Day and Nocturnal Incontinence
− Advise client to toilet regularly at a bedside commode or urinal to train the bladder
− Instruct client and family members about good skin care to prevent skin breakdown and infection

In the elderly client, assess life situation and any recent life changes, cognitive status (to detect recent changes, depression or confusion), general medical status (to identify concurrent illness, medications and whether client has physical difficulty getting to the toilet). Correcting these factors should be the focus, to start. Discuss medications, cognitive changes and uncontrolled comorbid conditions with a physician. Prompted voiding (like bladder training, but timed by a caregiver) can help cognitively impaired clients.

If client has a distended bladder, see “Acute Urinary Retention”.

Pharmacologic Interventions
Medications are sometimes used as an adjuvant therapeutic intervention to these nonpharmacologic measures. They would be used only after clear diagnosis of the type of incontinence (see “Causes”) and would be prescribed only by a physician. Examples of medications used to treat urinary incontinence include anticholinergic agents such as oxybutynin, flavoxate, tolterodine, trosplium, solifenacin, and darifenacin; alpha-adrenergic antagonists such as terazosin, doxazosin, tamsulosin, alfuzosin; and the antidepressant duloxetine. Injection of botulinum toxin type A by a specialist into the detrusor muscle may also be used in selected clients.

Relieve fecal impaction with gentle disimpaction or water enemas (see “Constipation,” in Chapter 5, “Gastrointestinal System”).

Monitoring and Follow-Up
Follow up in 1 month and in 4 months to ensure client is continuing their Kegel exercises and other nonpharmacologic interventions, and to provide positive reinforcement. If no difference is noted in 4 months and the client wants to pursue further treatment, refer to a physician.

Referral
Men with pelvic pain, severe incontinence or lower urinary tract symptoms, and frequent urologic infections should be referred to a physician upon presentation.
Refer to a physician for evaluation if conservative measures fail to improve symptoms, the diagnosis is uncertain, client has had prior pelvic surgery or irradiation, and/or the client would like further options (for example, pessary, medication, surgery).

**Prevention**
- Manage fluid intake (maximum of 2 L per day)
- Avoid caffeinated, carbonated, and alcoholic beverages
- Regular bowel movements
- Kegel exercises to strengthen pelvic floor and perineal muscles; advise client to do 10–15 repetitions of slow velocity contractions, held for 6–8 seconds, three times a day for at least 15–20 weeks (for first year after vaginal delivery, after pelvic or prostate surgery, older women). A client education sheet on Kegel exercises is available from The Canadian Continence Foundation at: http://www.canadiancontinence.ca/pdf/pelvicmuscleexercises.pdf
- Encourage weight loss (if obese)
- Increase physical activity
- Smoking cessation
- Improve diet
- Manage conditions associated with incontinence (for example, diabetes, neurologic conditions)

**Risk Factors**
- Hypertension
- Age 20–49
- Family history of urolithiasis
- Personal history of urolithiasis
- Recurrent upper urinary tract infections
- Bone resorption
- Low fluid intake
- Possible risk factors include diabetes, obesity, gout, excessive physical exercise
- Asian or Caucasian race

Calcium stones (are most common):
- Hypercalciuria
- Hypocitraturia
- Hyperoxaluria
- Low urine volume
- Alkaline urine
- Dietary factors (for example, low calcium, high oxalate (for example, spinach), high animal protein, high sodium, low fluid, high vitamin C or D supplementation)
- Primary hyperparathyroidism

Uric acid stones:
- Acidic urine (for example, due to chronic diarrhea, gout, diabetes, obesity, metabolic syndrome)
- High serum uric acid

Struvite stones:
- Upper urinary tract infection due to Proteus or Klebsiella
- Recurrent urinary tract infections

**HISTORY**
- Sudden onset of mild ache to severe, colicky pain in one flank that often increases and decreases in severity
- Pain may radiate to lower abdomen, flank, groin, labia or testicle
- Exact location of pain depends on location of stone and level of obstruction (may be vague or acute, abdominal or flank, may change location as the stone moves)
- Gross hematuria present in most clients
- Dysuria, urgency, frequency may develop
- Nausea and vomiting are often present
- May be penile or testicular pain
- Stone or “gravel” in urine may be present
- May have low fluid intake
- Risk factors, as listed above (see “Risk factors”)
PHYSICAL FINDINGS
- Temperature may be elevated (unusual unless infection is also present)
- Heart rate may be elevated
- Blood pressure may be elevated
- Client appears in acute distress
- Client pale, cool and sweaty
- Client restless, tossing about, unable to find a comfortable position
- Abdomen may be distended (uncommon)
- Costovertebral angle and/or abdominal tenderness
- Bowel sounds may be decreased (because of reactive ileus)

DIFFERENTIAL DIAGNOSIS
- Abdominal aortic aneurysm (the most important differential diagnosis to rule out, often mimics urinary colic)
- Ectopic pregnancy (important to rule out in any woman of child-bearing age with abdominal pain)
- Acute abdomen (cholecystitis, appendicitis, gastroenteritis, diverticulitis, peritonitis)
- Acute pyelonephritis
- Peptic ulcer disease
- Biliary colic
- Salpingitis, tubo-ovarian abscess
- Ovarian cysts
- Herpes zoster prodromal pain (shingles)
- Pancreatitis
- Low back pain
- Renal carcinoma
- Attention- or drug-seeking client

COMPLICATIONS
- Renal abscess
- Ureteral perforation
- Ureteral stenosis and scarring
- Urinary fistula formation
- Recurrent stones
- Chronic renal failure secondary to obstruction
- Recurrent infection of the lower urinary tract
- Hydronephrosis (asymptomatic obstruction of the kidney leading to decreased renal function or renal failure)
- Pyelonephritis
- Sepsis

DIAGNOSTIC TESTS
- Obtain urine for urinalysis (routine and microscopic and for culture); often hematuria is present
- Strain all urine for stones and send for pathology
- Pregnancy test to rule out pregnancy, if child-bearing age
- Consider imaging in consultation with a physician

MANAGEMENT
If symptoms are mild, client is afebrile and able to tolerate oral fluids and medication, and diagnosis is clear, treat on outpatient basis.

If symptoms are uncontrollable or severe, client is unable to tolerate oral fluids, or the diagnosis is questionable, consultation with a physician and inpatient treatment will be needed.

Goals of Treatment
- Control pain
- Maintain hydration
- Identify complications

Appropriate Consultation
Severe Condition or Questionable Diagnosis
Consult a physician as soon as possible.

Adjuvant Therapy
Severe Condition or Questionable Diagnosis
- Start IV therapy with normal saline
- Adjust rate according to severity of vomiting and dehydration, client’s age and underlying medical problems

Nonpharmacologic Interventions
Mild Condition
- Encourage increase in fluid intake (to produce 2 L of urine daily)
- Strain urine to collect stones for several days and send stones for pathology

Severe Condition or Questionable Diagnosis
- Bed rest
- Nothing by mouth if vomiting
- Strain urine to collect stones for several days and send stones for pathology
**Pharmacologic Interventions**

**Mild Condition**
To control pain:
- ibuprofen 600–800 mg PO tid prn
- or
- naproxen 500 mg, then 250–500 mg PO tid prn (maximum 1500 mg/day)
- or
- ketorolac 30 mg IM/IV q6h prn (maximum 120 mg/day)

For pain unresponsive to NSAIDs or in clients unable to take NSAIDs because of a contraindication (allergy, history of ulcers, renal disease):
- morphine 5 mg IM or IV or SC once; upon consultation with a physician

**Antiemetics for nausea and vomiting:**
- dimenhydrinate (Gravol), 50–75 mg IM/IV q4–6h as required

**Monitoring and Follow-Up**

**Mild Condition**
- Client may be discharged home once pain and nausea are controlled
- Instruct client to collect and strain all urine for stones and save any stones that are passed and then bring them to the clinic so they can be sent for analysis
- Follow up 48 hours after discharge; sooner if pain is uncontrollable

**Severe Condition or Questionable Diagnosis**
- Monitor urine output
- Strain all urine for stones
- Send all stones for laboratory analysis
- Client may be discharged home once pain and nausea are controlled (and if they are not being medevaced)
- Instruct client to collect and strain all urine for stones and save any stones that are passed and then bring them to the clinic so they can be sent for analysis
- Encourage fluid intake to produce 2 L of urine daily
- Follow up 12–24 hours after discharge

**Referral**

**Mild Condition**
Refer to a physician if client fails to pass stone (as the stone may have to be removed by some other means) or if pain is uncontrollable. Physician may order medication such as tamsulosin (which can be obtained through an NIHB pharmacy provider) to help with stone passage.

**Severe Condition or Questionable Diagnosis**
Medevac to hospital upon recommendation of a physician if:
- pain, nausea, vomiting or fever persist or are not controlled; urosepsis;
- acute renal failure;
- anuria

Imaging studies or urgent urology consultation may be warranted.

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**COMMON PROBLEMS OF THE MALE GENITOURINARY SYSTEM**

**ACUTE PROSTATITIS**

Acute infection of the prostate gland. The diagnosis is presumed with clinical symptoms and a swollen and tender prostate on exam.

**CAUSES**
The same organisms that cause cystitis (E. coli, Proteus spp, Klebsiella spp).

**Risk Factors**
- Urinary tract infection
- Prostatic calculi

- Young and middle-aged male
- Trauma (for example, bicycle or horseback riding)
- Dehydration
- Sexual abstinence
- Chronic indwelling urinary catheter
- Urethral stricture
- Intraprostatic ductal reflux
- Phimosis
- Unprotected anal intercourse
- Acute epididymitis
- Transurethral surgery
HISTORY

- Abrupt onset of fever and chills
- Genital pain
- Lower abdominal pain
- Pain in sacrum and low back may be present
- Perineal and/or rectal pain
- Pain with ejaculation
- Dysuria, frequency, urgency (all symptoms of cystitis), nocturia
- Symptoms of bladder-neck obstruction may be present
- Cloudy urine
- Flow and stream may be abnormal (for example, dribbling, hesitancy, urinary retention)
- Pain with bowel movements
- May be blood in semen
- Malaise, myalgia

PHYSICAL FINDINGS

- May be a fever
- May be tachycardia
- Client may be in moderate to severe distress and appear acutely ill (for example, septic shock)
- Client walks slowly, with legs apart
- Bladder may be visibly distended on abdominal inspection
- Prostate gland enlarged, acutely tender, warm, with soft-firm consistency
- Small amounts of pus may be expressed from urethra
- Avoid massage of prostate (may cause bacteremia)

DIFFERENTIAL DIAGNOSIS

- Benign prostatic hyperplasia with urinary tract infection
- Epididymitis
- Urethritis
- Cystitis
- Pyelonephritis
- Malignancy

COMPLICATIONS

- Epididymitis
- Pyelonephritis
- Acute urinary retention
- Sepsis
- Chronic prostatitis
- Prostatic abscess

DIAGNOSTIC TESTS

- Obtain urine for urinalysis (routine and microscopy, culture and sensitivity):
  - Urine cloudy or clear
  - Dipstick test: blood and protein may be present
  - Microscopic examination of urine: bacteria, WBC and a few red blood cells (RBC) may be present
- Take urethral swabs for culture (N. gonorrhoeae and Chlamydia) if an STI is suspected (because of history) or urethral discharge is detected
- Offer HIV testing
- Perform Venereal Disease Research Laboratory (VDRL) or Rapid Plasma Reagin (RPR) testing for syphilis

MANAGEMENT

If the symptoms are mild to moderate, treat on an outpatient basis. If the symptoms are severe and the client appears acutely ill, inpatient care is required.

Goals of Treatment

- Relieve symptoms
- Prevent complications
- Eradicate infection (if present)

Appropriate Consultation

Consult a physician, especially if the symptoms are severe or the client appears systemically unwell.

Nonpharmacologic Interventions

Educate the client that fever and dysuria usually resolve after 2–6 days of treatment.

Encourage intake of fluids (in particular if mucous membranes are dry).

Severe Symptoms

Bed rest.

Pharmacologic Interventions

Mild to Moderate Symptoms

Consider treating clients < 35 years for sexually transmitted infections as well.

Antibiotics vary in their ability to penetrate prostate tissue. Prolonged antibiotic therapy is often required to eradicate the causative organism. Because of the prolonged duration of therapy ensure that the dose is adjusted in clients with the potential for renal
dysfunction (for example, elderly clients, clients with renal disease and/or diabetes mellitus). Discuss dosing with a physician.

sulfamethoxazole/trimethoprim (Septra DS), 1 tab PO bid for 4 weeks

For clients with an allergy to Septra or sulfa drugs, a fluoroquinolone can be prescribed:

ciprofloxacin 500 mg PO bid for 4 weeks

**Severe Symptoms**

For symptoms such as sepsis, hypotension, urinary retention, inability to tolerate oral medication, and immunodeficiency, start IV therapy with normal saline for fluids and IV antibiotics, after consultation with a physician.

Manage fever and pain:

acetaminophen (Tylenol), 325 mg, 1–2 tabs PO q4h prn (maximum 12 regular-strength tabs/day [4 g])

or

ibuprofen (Advil, Motrin, generics), 200 mg, 1–2 tabs PO tid-qid prn

or

naproxen (Naprosyn, generics), 250 mg, 1–2 tabs PO bid-tid prn

Avoid NSAIDs in clients with renal dysfunction and do not use if there are contraindications such as a history of allergy to aspirin or NSAIDs or peptic ulcer disease.

Discuss the need for IV antibiotics with physician. Antibiotic selection will vary according to circumstances. The dose of some agents (for example, gentamicin) will need to be tailored to the client’s renal function.

**Monitoring and Follow-Up**

Be sure to review the results of the urine culture and sensitivities and adjust the antibiotic accordingly if the organism is not sensitive to the empiric antibiotic prescribed.

**Mild to Moderate Symptoms**

- Follow up at days 2 and 7 of therapy, sooner if the client’s symptoms are not improving or are worsening. Asses compliance with the medication regimen
- Repeat urine culture on day 7 of treatment; a negative culture at this time predicts that the client will be cured after 4–6 weeks of therapy; a positive culture suggests that an alternative antibiotic should be considered in consultation with a physician
- Educate about the importance of finishing the course of antibiotics

**Severe Symptoms**

- Watch for distended bladder and/or signs of sepsis
- If the client is unable to void and has a distended bladder, have him sit in a tub filled with warm water and attempt to void into the water
- Do not catheterize, as it is contraindicated in acute prostatitis
- See “Acute Urinary Retention” if treatment as described here is not successful

**Referral**

**Severe Symptoms**

Medevac as soon as possible for continued inpatient IV therapy.

**Balanitis**

Inflammation of glans penis.

**CAUSES AND/OR RISK FACTORS**

- Allergic or irritant reaction (for example, after use of latex condoms, contraceptive jelly, soaps)
- Infection: Fungal (for example, Candida albicans), viral (for example, herpes simplex), or bacterial (for example, Streptococcus spp or Staphylococcus spp)
- Skin disorders (for example, circinate balanitis, psoriasis)
- Poor personal hygiene in uncircumcised males
- Trauma (for example, zippers)
- Reactive arthritis
- Medication reaction (for example, tetracycline, salicylates); causing fixed drug eruption
- Presence of foreskin
- Diabetes
- Morbid obesity
**HISTORY**
- Symptoms appear over 3–7 days
- Penile pain
- Tenderness
- Pruritus associated with small erythematous lesions on the glans or prepuce
- Thick, foul smelling, purulent discharge is often present
- Dysuria
- Drainage at site of infection
- Erythema of glans
- Swelling of prepuce
- Ulceration or scaly lesions
- Plaques
- Symptoms may be worse after sexual intercourse
- Systemic symptoms may be present, such as painful joints or erections, mouth sores, swollen or painful glands, painful voiding, and malaise or fatigue

**PHYSICAL FINDINGS**
- Redness, swelling of the glans penis
- Discharge around glans
- Examine genitals (in particular for paraphimosis), oral mucosa, joints, skin

**DIFFERENTIAL DIAGNOSIS**
- Leukoplakia
- Lichen planus
- Psoriasis
- Reactive arthritis
- Nummular eczema
- Scabies
- Human papillomavirus

**COMPLICATIONS**
- Urinary meatal stenosis
- Premalignant changes resulting from chronic irritation
- Urinary tract infection
- Ulcerative lesions of the glans/prepuce
- Phimosis, paraphimosis

**DIAGNOSTIC TESTS**
- Sample any discharge for culture and sensitivity, KOH testing (for fungi)
- Take urethral swabs for culture (N. gonorrhoeae and Chlamydia) if an STI is suspected (because of history) or urethral discharge is detected
- Serum glucose, after consultation with a physician (if candidal infection is suspected – for example, young client)

**MANAGEMENT**

**Goals of Treatment**
- Relieve symptoms
- Prevent recurrence

**Appropriate Consultation**
Consult a physician if the lesion is well circumscribed, red and velvety, or if there is induration and white patches. They may be indicative of carcinoma in situ. Additionally, consult a physician if there are systemic signs and symptoms.

**Nonpharmacologic Interventions**
- Warm compresses or sitz baths
- Local hygiene: retract foreskin and wash with saline BID; ensure adequate drying of tissues after cleansing and voiding; continue daily after inflammation resolves
- Ensure foreskin is easily retractable
- Avoid chemical and soap irritants or allergens

**Pharmacologic Interventions**
Start topical therapy. The choice of agent depends on whether you think it is a fungal infection (40% are) or dermatitis.

Fungal:
- clotrimazole 1% cream (Canesten, generic), bid to affected area for 1–3 weeks

Dermatitis:
- hydrocortisone 1% cream (Cortate), bid to affected area for 1 week

**Monitoring and Follow-Up**
Reassess client in 1 week and then weekly if signs and symptoms have not resolved.

**Referral**
Refer to a physician if symptoms have not improved within 1 week or if signs and symptoms have not resolved within 3 weeks. A referral for allergy testing or biopsy may be warranted.
**BENIGN PROSTATIC HYPERPLASIA**\(^{18,19,20,21,22}\)

Benign enlargement of prostate gland which may result in obstruction of the bladder outlet.

**CAUSES**
- Unknown
- Possible link with hormonal activity

**Risk Factors**
- Age > 50 years
- Higher free prostate specific antigen, testosterone and/or estradiol levels
- Heart disease
- Beta-blocker use
- Obesity
- Diabetes
- Genetic susceptibility (for example, family history)
- Lack of physical exercise

Drugs do not cause BPH, although treatment with some classes of drugs can exacerbate symptoms and thus should be avoided if possible; see Table 3 below.

Table 3 – Selected Drugs Associated with Urinary Retention that have the Potential to Exacerbate the Symptoms of BPH\(^{23,24,25}\)

<table>
<thead>
<tr>
<th>Drug class</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drugs with anticholinergic effects</td>
<td></td>
</tr>
<tr>
<td>Antipsychotic agents</td>
<td>Prochlorperazine (Stemetil)(^a)</td>
</tr>
<tr>
<td>Tricyclic antidepressants</td>
<td>Amitriptyline</td>
</tr>
<tr>
<td>Antispasmodic agents</td>
<td>Hyoscine butylbromide (Buscopan)</td>
</tr>
<tr>
<td>Antiparkinsonian agents</td>
<td>Benztropine (Cogentin)</td>
</tr>
<tr>
<td>Antihistamines(^b)</td>
<td>Diphenhydramine (Benadryl)</td>
</tr>
<tr>
<td>Inhaled anticholinergic agents (for COPD)</td>
<td>Ipratropium, tiotropium(^26)</td>
</tr>
<tr>
<td>Sympathomimetics</td>
<td></td>
</tr>
<tr>
<td>Alpha-adrenergic agonists (in cold remedies)</td>
<td>Phenylephrine, pseudoephedrine</td>
</tr>
<tr>
<td>Hormones</td>
<td>Testosterone</td>
</tr>
<tr>
<td>Antihypertensive agents</td>
<td>Hydralazine, nifedipine</td>
</tr>
<tr>
<td>Skeletal muscle relaxants</td>
<td>Cyclobenzaprine (Flexeril), diazepam, baclofen</td>
</tr>
</tbody>
</table>

\(a\). Often used as an antinauseant  
\(b\). It is the older histamine H\(_1\) receptor antagonists that are a problem in this regard

**HISTORY**

Urinary symptoms occur when the prostate gland has enlarged to a size that produces partial obstruction of the bladder outlet. Usually symptoms start slowly and progress.

- Hesitancy
- Overflow incontinence
- Straining to start flow
- Loss of stream force
- Frequent urination in small amounts
- Sense of urgency
- Post-void dribbling
- Nocturia
- Hematuria

- Continued sense of bladder fullness even after voiding
- Sexual dysfunction
- Risk factors as listed above (see “Risk factors”)
- 24-hour voiding chart to assess frequency, volume, nocturia

Urinary tract infection or urinary retention may be the presenting complaint. Hematuria may be an early symptom.
To rule out other conditions, assess for:
- Neurologic disease symptoms (neurogenic bladder)
- Gross hematuria or bladder pain (bladder cancer or calculi)
- History of urethral trauma, urethritis, and/or urethral instrumentation (urethral stricture)
- Family history of prostate cancer
- Medications that can impair the bladder (for example, anticholinergics) or increase outflow resistance (for example, sympathomimetics)

PHYSICAL FINDINGS
- Abdomen: bladder may be enlarged if acute urinary retention present; enlarged bladder may be noted on percussion
- Rectal exam: prostate gland enlarged, rectal sphincter tone strong
- Prostate: normal consistency, top or margins may not be palpable, median sulcus may be indistinct, no nodules, induration or asymmetry
- Neurologic examination: within normal limits

The clinical size of the prostate gland correlates poorly with the severity of symptoms. A client with mild clinical enlargement may present with very troublesome symptoms.

DIFFERENTIAL DIAGNOSIS
- Cystitis
- Cancer of the prostate
- Bladder tumour
- Bladder calculi
- Prostatitis (chronic)
- Urethral stricture
- Bladder neck contracture
- Neurogenic bladder

DIAGNOSTIC TESTS
- Urine for urinalysis (routine and microscopy, culture and sensitivity)
- Rule out infection, hematuria and glycosuria
- Creatinine level
- Prostate specific antigen (PSA): optional and controversial but is generally recommended when a diagnosis of prostate cancer would alter treatment in a healthy man between 50 and 70 years of age and who is expected to live at least 10 years

PSA levels should not be drawn if a digital prostate exam has been done in the previous 3 days because levels may be falsely elevated.

MANAGEMENT

Goals of Treatment
- Improve or eliminate symptoms
- Prevent the complications of long-term obstruction of bladder outlet (for example, urinary tract infections, bladder stones, hydronephrosis)

Appropriate Consultation
Consult a physician if client’s symptoms are severe or bothersome enough that he wants immediate treatment (low quality of life), if there is hematuria, nodularity or induration or asymmetry of the prostate, unexpected back pain, or if there is acute bladder obstruction (see “Nonpharmacologic Interventions”).

Prostatic carcinoma with metastasis to bone must be ruled out in men > 35 years of age who have symptoms of bladder-neck obstruction and new onset of back pain.

Nonpharmacologic Interventions
Assess the severity of symptoms once a client has been diagnosed with benign prostatic hyperplasia using the International Prostate Symptom Score (available at: http://www.usli.net/uro/Forms/ipss.pdf).
- Educate that many men have symptoms improve or stabilize, even without treatment
- Instruct client to avoid fluids – especially tea, coffee and alcohol – before bedtime or leaving the house, as they tend to cause diuresis
- Double void to help empty the bladder
– Review all medications that the client is taking; discontinue if possible after consultation with a physician
– Cold remedies with decongestants, antihistamines, anticholinergics, antipsychotics, antidepressants and anxiolytics can cause poor bladder emptying and increase obstruction of the bladder outlet (see Table 3)
– Advise client to report any sudden change in symptoms for re-evaluation
– Counsel client about appropriate use of medications (dose, frequency, side effects, adherence to regimen between attacks to prevent future attacks)
– Surgery to reduce the size of the prostate may be warranted: transurethral prostatectomy, transurethral incision prostatectomy or laser prostatectomy
– If surgery was performed, avoid lifting, performing strenuous exercises or remaining seated for prolonged periods of time, for up to 1 month post-surgery
– No sexual intercourse for several weeks post-surgery

**Pharmacologic Interventions**

To improve symptoms, 5-α-reductase inhibitors such as finasteride (Proscar) or dutasteride (Avodart) and α
1-adrenergic blockers such as terazosin (Hytrin) or tamsulosin (Flomax) may be prescribed. Clients prescribed a 5-α-reductase inhibitor should be advised that 6–12 months of continuous treatment is required before the prostate volume decreases to an extent sufficient to improve symptoms. In contrast, the onset of effect of the α
1-adrenergic blockers is more rapid. Symptomatic improvement may be noted within 1 month of initiating treatment. These must be prescribed by a physician and the client usually remains on them for the rest of his life.

**Monitoring and Follow-Up**

If symptoms are mild, arrange elective follow-up with a physician. Client’s symptoms should be monitored every 6 months, and a digital rectal exam performed annually. If symptoms are moderate to severe, refer to a physician. If a client is on pharmacologic therapy, they should be reassessed every 3–6 months.

**Referral**

Refer to a physician for assessment. Urological consultation may be necessary if symptoms are moderate to severe, causing inconvenience to the client, or if there are complications.

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**EPIDIDYMIS**

Bacterial infection of epididymis leading to inflammation. Epididymitis is one of the most common infections of the male reproductive tract.

**CAUSES AND RISK FACTORS**

*Sexually transmitted infections:* usually a sexually transmitted infection (for example, *Neisseria gonorrhoeae*, *Chlamydia*).

– Risk factors: client < 35 years of age, sexually active, multiple sexual partners

*Other infectious causes* (for example, not an STI) include urinary tract pathogens (*Escherichia coli*, *Klebsiella*, *Proteus*) most often, and more rarely, tuberculosis or a fungus.

– Risk factors: client > 35 years of age, urinary tract infection, outflow obstruction, acute prostatitis, urinary tract surgery, instrumentation of the lower genitourinary (GU) tract (for example, catheterization), men who engage in anal intercourse (insertive), and urethral stricture

*Non-infectious cause:* reflux of urine through ejaculatory ducts causing inflammation.

– Risk factors: prolonged sitting, heavy physical exertion or exercise, bicycle or motorcycle riding

**HISTORY**

– Gradual onset of unilateral testicular pain and swelling
– Elevation of scrotum provides relief of pain
– Fever, chills, rigors, malaise may be present
– Symptoms of cystitis or urethritis may be present (frequency, urgency, dysuria, pruritus or meatal discharge)
– Take a sexual history; see “Personal and Social History (Specific to Genitourinary System)” above
– Risk factors as listed above (see “Risk factors”)

**PHYSICAL FINDINGS**

– Temperature may be elevated (in acute epididymitis)
– Moderate distress
– Client walks slowly and carefully, often holding scrotum
– Unilateral testicular swelling, pain and redness, if advanced
- Urethral discharge may be present after retracting foreskin and/or after milking the urethra from the base to the meatus (related to sexually transmitted infection)
- Testicle tender and warm to touch
- Epididymis enlarged (may not be if subacute), cord-like (indurated) and acutely tender
- Hydrocele may be present
- Abdominal (including costovertebral angle tenderness), digital rectal, lymph node, groin, pubic area skin, and inguinal exams have no acute findings

**DIFFERENTIAL DIAGNOSIS**
- Testicular torsion (surgical emergency)
- Scrotal abscess
- Infected sebaceous cyst, folliculitis, insect bites
- Trauma
- Mumps orchitis
- Testicular tumour
- Spermatocele
- Hydrocele
- Varicocele
- Testicular appendix torsion
- Inguinal hernia

**COMPLICATIONS**
- Spread of infection to testis
- Abscess
- Orchitis
- Atrophy
- Infarction
- Sepsis
- Trauma

**DIAGNOSTIC TESTS**
- Obtain midstream urine for urinalysis (routine and microscopy, culture and sensitivity)
- Take urethral swabs for culture or first 20 mL of first morning (or at least 2 hours after previous) void for nucleic acid amplification testing for N. gonorrhoeae and Chlamydia
- Offer HIV, hepatitis A, B, and C virus testing for individual with risk factors for sexually transmitted infections (STIs) (see adult Chapter 11, “Communicable Diseases”)
- Perform Venereal Disease Research Laboratory (VDRL) or Rapid Plasma Reagin (RPR) testing for syphilis

**MANAGEMENT**

Treatment depends on suspected cause and severity of symptoms. In general, **mild infections** are treated on an outpatient basis; more **severe infections**, which are associated with fever and chills, require inpatient care.

**Goals of Treatment**
- Relieve symptoms
- Eradicate infection (if present)
- Prevent complications of infection
- Prevent recurrence
- Prevent transmission (if STI)

**Appropriate Consultation**

**Mild Infection**
Consult a physician if there is concern about underlying non-infectious pathology, especially in a client > 35 years of age.

**Severe Infection** (for example, high fever, sepsis)
Consult a physician regarding choice of intravenous (IV) antibiotics and/or need for medevac.

**Adjunct Therapy**

**Severe Infection**
Start IV therapy with normal saline to keep vein open.

**Nonpharmacologic Interventions**
- Bed rest during acute phase (1–2 days)
- Elevation of scrotum to relieve pain
- Client should use a scrotal support when ambulatory
- Ice should be applied to scrotum for 20 minutes q4–6h to relieve pain
- Client should avoid heavy lifting, straining with stool and sexual intercourse during acute phase
- Advise client to return to the clinic for reassessment if symptoms worsen
- If sexually transmitted infection is suspected or is the cause, educate client about the importance of their partner being tested and treated
Client Education
- Explain disease process and expected course
- Counsel client about appropriate use of medication (dose, frequency, side effects, completion of entire course prescribed)
- Counsel client about preventing spread of STIs to sexual partners (for example, abstain from sex until 7 days after both partners started treatment for a sexually transmitted infection)

Pharmacologic Interventions
Mild Infection
Analgesia and antipyretics:31
ibuprofen (Advil, Motrin, generics), 200 mg, 1–2 tabs PO tid-qid prn
or
naproxen (Naprosyn, generics), 250 mg, 1–2 tabs PO bid-tid prn
Avoid NSAIDs in clients with renal dysfunction and do not use if there are contraindications such as a history of allergy to aspirin or NSAIDs, or peptic ulcer disease. If NSAIDs are not well tolerated or are contraindicated use:
acetaminophen (Tylenol), 325 mg, 1–2 tabs PO q4–6h prn
Antibiotics for treatment of acute epididymitis most likely caused by chlamydial or gonococcal infection (for example, client < 35 years or client with multiple sexual partners):34
ceftriaxone 250 mg IM single dose
and
doxycycline 100 mg PO bid for 10 days
Consult physician for choice of antibiotics for clients with severe infection, clients > 35 years with nonsexually transmitted infection (for example, enteric organism; sulfamethoxazole/trimethoprim [Septra DS] or ciprofloxacin [Cipro] are commonly used) or if a non-infectious cause is suspected.

Monitoring and Follow-Up
Mild Infection
- Follow up in 48–72 hours and note response to therapy
- Follow up again in 10–14 days, when the course of antibiotics is completed, to ensure medications were taken properly, symptoms have disappeared, and there was no re-exposure to an infected partner
- If N. gonorrhoeae or Chlamydia are confirmed as the causative organism, ensure contact tracing (for the 60 days prior to symptoms or the last partner if before that time) and a report to Public Health is made according to the procedures in your region

Referral
Mild Infection
If no response to pharmacologic treatment within 3 days consult a physician.
Severe Infection
Medevac as soon as possible for ongoing inpatient intravenous drug and hydration therapy.

ERECTILE DYSFUNCTION35,36,37,38,39,40
The inability to achieve or maintain an erection sufficient for satisfactory sexual performance.41 Impotence affects males of all age groups, but incidence increases with age. Can signal serious disease.

CAUSES
- 80% of cases believed to have an organic cause (for example, pelvic trauma, medications, hormonal abnormalities, neurologic or vascular concerns)
- Others believed to be psychogenic in origin (for example, performance anxiety, no affection for sexual partner, emotional concern)

Risk Factors
Reversible:
- Smoking
- Medication use (for example, antidepressants, spironolactone, thiazide diuretics, cimetidine, ketoconazole)
- Psychosocial factors (for example, depression, stress)
- Serious disruption of marital or other sexual relationships
- Decreased testosterone levels
- Obesity
- Physical inactivity
- Intercourse less than once per week
- Bicycling (in those doing > 3 hours/week)
- Alcohol and drug use (for example, marijuana, cocaine)
Irreversible:

- Pelvic trauma
- Prostate surgery (for example, radical prostatectomy)
- Increasing age
- Diabetes mellitus
- Cardiovascular disease (for example, hypertension, vascular insufficiency, dyslipidemia)
- Scleroderma
- Peyronie’s disease
- Neurologic disease (for example, stroke, multiple sclerosis, spinal cord injury)

**HISTORY**

A nonjudgmental attitude and empathy in a confidential environment helps clients feel safer and more comfortable disclosing their sexual concerns. Be direct with open-ended and specific questions to allow candid responses. Acknowledge that these discussions may be difficult and/or embarrassing.

Assess the impact on the partner as well, whenever possible and if the client agrees, as it impacts both partners. Often, sexual arousal and desire play a factor in erectile dysfunction.

- Inability to achieve erection
- Inability to sustain erection after penetration (often due to anxiety or vascular steal syndrome)
- Sudden loss of erectile function – usually psychogenic in origin, unless genital tract trauma is present (for example, after radical prostatectomy)
- Gradual decline in sexual function (for example, sporadic at first then more consistent)
- Erectile reserve (ability or inability to have spontaneous erections; for example, during night or early morning); ask client and partner, if client agrees
- Flaccidity of penis during foreplay, attempting intercourse, wakening from sleep, and when self-stimulated
- Excitement (in mind) and arousal during sexual activity may be reduced
- Negative thoughts during sexual activity may be present (for example, fear of losing erection)
- Sexual thoughts, fantasies, and desire to self-stimulate may be reduced
- Desire for sexual intimacy and activity (libido)
- Ability to ejaculate
- Interpersonal conflict, often unexpressed

- Assess for risk factors noted above (see “Risk factors”), including a full assessment for depression and anxiety (see Chapter 15, “Mental Health”)
- Take a sexual history; see “Personal and Social History (Specific to Genitourinary System)” above
- The “Sexual Health Inventory for Men” is a questionnaire that can be used to cover some of the areas that need to be assessed. It is available on page 9 of the Towards Optimized Practice Program guideline (available at: http://www.topalbertadoctors.org/cpgs.php?sid=13&cpg_cats=43&cpg_info=20)

**PHYSICAL FINDINGS**

- Occasionally, client will present with:
  - Anxious appearance
  - Signs of depression (see Chapter 15, “Mental Health”)
- Rule out other causes with an assessment:
  - Palpate femoral and peripheral pulses
  - Abdominal or femoral bruits (occlusion of pelvic blood flow)
  - Ankle brachial index
  - Hypertension
  - Heart sounds and size
  - Visual field defects (hypogonadism with pituitary tumours)
  - Gynecomastia (Klinefelter’s syndrome)
  - Penile plaques (Peyronie’s disease)
  - Cremasteric reflex
  - Testicular atrophy, fine body hair, hepatomegaly (hypotestosteronism)
  - Testicular asymmetry or masses
  - Prostate enlargement (digital rectal exam)
  - Neurologic causes (pelvic sensation and anal sphincter tone)

**DIFFERENTIAL DIAGNOSIS**

- Vascular disease
- Hypogonadism
- Hyperprolactinemia
- Hypo / hyperthyroidism
- Peyronie’s disease
- Klinefelter’s syndrome
COMPLICATIONS
– Marital concerns
– Quality of life decline
– May be an indication of comorbid disease (for example, diabetes, atherosclerosis)

DIAGNOSTIC TESTS
In consultation with a physician, try to rule out conditions that may cause erectile dysfunction:
– Morning free and bioavailable testosterone levels – may be decreased (for example, due to hypogonadism)
– Prolactin
– Thyroid-stimulating hormone
– Fasting blood glucose
– Fasting lipid profile
– Nocturnal penile tumescence test

MANAGEMENT42

Goals of Treatment
– Address underlying medical conditions that present with erectile dysfunction
– Improve or restore erectile function
– Correct reversible erectile dysfunction
– Prevent complications

Treatment depends on cause, severity of the problem, and client preference.

Appropriate Consultation
Consult and refer client to a physician, as further tests (for example, to rule out cardiovascular disease) and/or a referral may be warranted.

Nonpharmacologic Interventions
– Encourage sexual intimacy (for example, making time, using sexual comments)
– Avoidance of alcohol
– Smoking cessation
– Healthy diet and weight loss (if obese)
– Increased physical activity
– Decrease stress
– Remove television from bedroom (to decrease fatigue)

Client Education
– Educate about importance of controlling diseases (for example, compliance with medications for disorders that have a high prevalence of erectile dysfunction)
– Educate that specific sexual activities (for example, oral sex) are engaged in by many couples
– Explain causes (see “Causes”) and risk factors (see “Risk factors”) and that many men are affected as they age
– Explain importance of foreplay
– Counsel client about appropriate use of medication (dose, frequency, side effects, reinforce contraindications while taking medication)
– Priapism (erection lasting longer than 4 hours) requires one to get immediate help

Pharmacologic Interventions
Cessation of medications that may cause erectile dysfunction should be guided by a physician.

Treatment options to be prescribed by a physician include:
– Phosphodiesterase-5 inhibitors (for example, sildenafil, tadalafil, vardenafil)
– Alprostadil, administration intraurethrally or by intercavernosal injection
– Vacuum erection devices
– Surgical interventions

Monitoring and Follow-Up
Follow up after 1 month of treatment, as there may be more than one “cause” that can contribute to treatment failure (for example, sexual arousal, low desire).

Referral
Refer to a physician for assessment, treatment, and possibly referral (for example, for surgery, psychotherapy, certified sexual therapist). Psychological counselling has benefits if mainly a psychogenic cause (for example, depression, anxiety). Couples counselling can help if the concern is likely due to interpersonal conflict (helps in 25% of cases).
EMERGENCIES OF THE MALE GENITOURINARY SYSTEM

ACUTE URINARY RETENTION

An accumulation of urine in the bladder due to an abrupt inability to empty the bladder. It occurs most often in men over age 60, and is often the result of benign prostatic hyperplasia. It is the most common urologic emergency.

CAUSES

Usually related to obstruction, but may also be due to trauma, neurologic disease, infection, or psychologic concerns.

- Any process that causes increased bladder-outlet resistance or decreases bladder contractility
- Benign prostatic hyperplasia
- Side effects of drugs, both prescription and nonprescription (for example, decongestants, amitriptyline, oxybutynin, estrogen, haloperidol, diphenhydramine), see “Table 3”
- Constipation
- Prostate cancer
- Genitourinary infection (for example, acute prostatitis, urethritis, cystitis, vulvovaginitis, genital herpes simplex virus)
- Neurogenic bladder
- Urethral stricture or stone
- Postoperative
- Neurologic condition (for example, spinal cord injury, diabetic neuropathy, stroke, epidural mass compressing the spinal cord)
- Impingement on sacral nerves by protruding intervertebral disk or epidural mass
- Malignancy – bladder neoplasm, tumour causing spinal cord compression
- Phimosis or paraphimosis
- Pelvic mass
- Poorly positioned indwelling catheter
- Pelvic organ prolapse in women (for example, cystocele, rectocele)

Risk Factors

Established for men with benign prostatic hyperplasia:

- Age over 70
- International Prostate Symptom Score >7
  (available at: http://www.usli.net/uro/Forms/ipss.pdf)
- Prostate volume > 30 mL
- Urinary flow rate < 12 mL/sec

HISTORY

- Strong urge to void but inability to do so for hours
- Suprapubic and/or lower abdominal fullness and pain
- Voiding habits before retention (hematuria, dysuria, hesitancy, dribbling, daytime frequency, nocturia)
- Bowel habits, last bowel movement and its consistency
- History of fever, low back pain, neurologic symptoms, rash, intravenous drug use, low back pain (may be due to spinal cord compression)
- Previous history of retention, surgery, radiation, pelvic trauma, cancer
- Causes (see “Causes”) and risk factors (see “Risk factors”), as listed above
- Review medications, noting any drugs that might predispose to acute urinary retention (excessive alcohol intake, sedatives, decongestants in over-the-counter cold remedies, anticholinergics, antipsychotics, and antidepressants)

With a neurogenic bladder, symptoms of pain, fullness and urgency may be absent. However, dribbling of small amounts of urine (overflow dribbling) may be present.

PHYSICAL FINDINGS

- Pulse may be elevated
- Client may appear in moderate to acute distress (but there may be no evidence of distress with a neurogenic bladder)
- Client may be restless and sweaty
- Bladder distention may be noted on abdominal inspection
- Weak flow of urine
- Tender, distended bladder may be felt above symphysis, often reaching umbilicus (neurogenic bladder is distended but nontender)
- Rectal examination (in men and women): masses, fecal impaction, enlargement of prostate, nodular or rocky hard prostate, decreased anal tone, rectal sphincter tone or absent perineal sensation may be present, bladder may be palpable
- Pelvic examination for women with acute retention to examine for anatomic distortions (for example, fibroids, tumours of the pelvis, urethra or vagina, vulvar edema, labial fusion, imperforate hymen)
- Neurologic examination
DIFFERENTIAL DIAGNOSIS
See “Causes.”

COMPLICATIONS
– Decreased renal function
– Post-obstructive diuresis
– Renal failure
– Infection of stagnant urine

DIAGNOSTIC TESTS
– Obtain midstream or catheterized urine for urinalysis (routine and microscopy) and for culture and sensitivity
– Perform complete blood count if suspected infection
– Measure creatinine and electrolytes to check renal function if the obstruction is prolonged
– Imaging studies may be indicated: consult with physician

MANAGEMENT
Definitive management depends on the underlying cause and usually involves surgical or medical treatment.

Goals of Treatment
– Identify underlying cause
– Relieve bladder distention

Appropriate Consultation
Consult a physician for all clients. Most clients do not require emergency surgery, however, some do and/or require hospitalization.

Nonpharmacologic Interventions
Encourage client to sit in a tub full of warm water and to try voiding into the water. If the client is able to do so, reassess the bladder for residual distention.

If the bladder is severely distended, the client is in pain or it is still distended after trying to void in the tub, prompt catheterization is required (unless there are contraindications). Use the following technique:

– Use a Foley catheter (18 French in a male, 16 French in a female)

– If the client is known to have benign prostatic hyperplasia, a 14–16 French catheter may be tried if catheterization is unsuccessful with the larger size of catheter; one may go down to a 10 French if the client has had a previous transurethral procedure (for example, transurethral resection of the prostate) that may have left a scar; if there has not been previous transurethral instrumentation try a 20 or 22 gauge Coude (firm tip) catheter if an enlarged prostate is suspected

– Insert catheter and decompress the bladder by removing all of the urine at once until the bladder is empty

– Leave catheter in place after decompression
– Monitor clients during this procedure, in particular elderly ones
– Hematuria, transient hypotension and diuresis are common, but not usually significant during this procedure

If retention is due to acute prostatitis, do not insert catheter unless absolutely necessary, as this may cause bacteremia. Likewise, do not insert catheter if the pelvis is fractured or if there was recent urologic surgery. Do not attempt catheterization more than three consecutive times.

Client Education
Educate clients who will be going home about catheter care (for example, emptying the bag, cleansing) and monitoring urinary output once the bladder is decompressed.

Pharmacologic Interventions
Medications are sometimes used in combination with catheterization. They would be used if benign prostatic hyperplasia is the most likely cause and would be prescribed only by a physician. Ideally, they should be started when the catheter is inserted and continued after its removal: alpha adrenergic antagonists such as terazosin, doxazosin, tamsulosin or alfuzosin may be prescribed by a physician to relax bladder neck and prostatic capsule.

Monitoring and Follow-Up
Monitor hourly urine output carefully for the development of post-obstruction diuresis, a complication that occurs after the release of the obstruction, because of temporary impairment of renal function.
Diuresis is generally self-limiting and can be managed with oral fluid intake based on thirst, but a client may require IV fluid therapy to prevent dehydration.

If a client was initially sent home with a catheter:

- Follow-up in 3 days, or sooner if the catheter stops draining or volume declines or if the client has concerns
- At day 3, if output remains acceptable, try removing the catheter and then seeing if the client can void independently. If they cannot void insert another catheter and have another trial without the catheter (to see if the client can void by themselves) at 7 days. If they cannot void this time insert a catheter and leave it in place
- Educate men that a recurrence after the catheter is removed is likely, so they should return if it occurs prior to their referral to a physician for definitive treatment

**Referral**

Medevac to hospital, if after consultation with a physician, they agree. Hospitalization is necessary for clients who could not have their bladder decompressed, clients with urosepsis or those with obstruction from malignancy or spinal cord compression. Emergency surgery is rarely required any more due to its increased risks.

All clients who are not seen by a physician initially will require a referral to a physician, urologist, and/ or gynecologist to correct the cause, if possible. All referrals should be done after consultation with a physician. Surgery for those with benign prostatic hyperplasia usually takes place 30 days or more from the acute urinary retention episode, to decrease the risk of complications.

**TESTICULAR TORSION**

Abnormal twisting of spermatic cord and testis, which compromises blood supply to these structures and results in ischemic injury and pain. Testicular torsion is an acute, severely painful condition.

Testicular torsion is a medical emergency. If the blood supply to the testis is cut off for more than about six hours permanent damage to the testis is likely to occur.

Torsion can occur at any age; however, it is most common in adolescence, with a peak at 14 years of age.

**PARTIAL OR INTERMITTENT TESTICULAR TORSION**

Torsion is not an all-or-nothing phenomenon. It can be complete (usually twisting ≥ 360°), incomplete, or intermittent.

Some boys and men have warning pains in a testis every now and then, before a full-blown torsion. These occur suddenly, last a few minutes, then ease just as suddenly. These pains occur if a testis twists a little, and then returns back to its normal place on its own.

An incomplete or partial testicular torsion is difficult to diagnose because of its subacute presentation with nonspecific symptoms and signs.

**CAUSES**

- Usually spontaneous and idiopathic (often occurs during sleep)
- Predisposing structural (genetic) defect (for example, inadequate fixation of testis to tunica vaginalis, bell clapper deformity)
- Occasionally caused by minor trauma to the groin
- Strenuous physical activity
- Sexual activity or arousal
- Undescended testicle
- Testicular tumour

**HISTORY**

- Sudden onset of severe, constant, unilateral pain in scrotum or testicle, usually for < 12–24 hours
- Prior episode(s) of intermittent testicular pain may be reported (torsion and then detorsion)
- May be described as abdominal or inguinal pain
- Pain may radiate to lower abdomen
- Pain made worse by elevation of scrotum
- Pain not relieved by lying down
- Decreased appetite, nausea and vomiting may be present
- Urinary frequency may uncommonly occur
- Assess for causes as listed above (see “Causes”)

For intermittent torsion:

- Intermittent sharp testicular pain (resolves within seconds to minutes)
- Long periods without symptoms
- Number of occasions it occurred
PHYSICAL FINDINGS
- Temperature usually normal (rarely elevated)
- Heart rate elevated
- Blood pressure mildly elevated (because of pain)
- Client in acute distress
- Client bent over or unable to walk
- Unilateral scrotal swelling
- Testis acutely tender, may be warm
- Testis swollen and found higher up (retracted) in the scrotal sac than expected on the affected side
- Affected testis might be lying horizontally (epididymis not posterolateral)
- Hydrocele and scrotal skin erythema may be present (often a later finding)
- Slight elevation of the testis increases or has no effect on pain (negative Prehn’s sign – used to differentiate torsion from epididymitis)
- Cremasteric reflex (elevation of testis after stroking the upper, inner thigh on the same side) almost always not present
- Perform a complete assessment of the abdomen, testes, epididymis, spermatic cord, scrotal skin and inguinal area

For intermittent torsion, in addition to the above, the following may also be present:
- Very mobile testes
- Bulky spermatic cord
- Normal examination

DIFFERENTIAL DIAGNOSIS
- Epididymitis
- Orchitis
- Trauma
- Hydrocele
- Incarcerated or strangulated inguinal hernia
- Torsion of testicular appendage
- Acute varicocele
- Testicular tumour
- Scrotal abscess
- Testicular infarction
- Henoch-Schonlein purpura
- Appendicitis

COMPLICATIONS
- Testicular atrophy or loss
- Abnormal spermatogenesis
- Infertility
- Infarction of testicle
- Infection

DIAGNOSTIC TESTS
None.

MANAGEMENT

Goals of Treatment
- Relieve pain
- Prevent complications

Appropriate Consultation
If you suspect testicular torsion at all, consult a physician without delay. This is a surgical emergency; prompt diagnosis and surgical referral is critical to a satisfactory outcome.

If intermittent torsion is suspected consult a physician.

Adjuvant Therapy
- Start intravenous (IV) therapy with normal saline
- Adjust IV rate according to age and state of hydration

Nonpharmacologic Interventions
- Nothing by mouth before surgery
- Bed rest
- Promote the client’s comfort

Pharmacologic Interventions
Analgesia as needed with either an NSAID such as ibuprofen or naproxen or acetaminophen. If simple analgesics are ineffective then morphine could be used to relieve severe pain.

ibuprofen 200 mg, 1–2 tabs PO tid-qid prn
or
naproxen 250 mg, 1–2 tabs PO bid-tid prn

Avoid NSAIDs in clients with renal dysfunction and do not use if there are contraindications such as a history of allergy to aspirin or NSAIDs or peptic ulcer disease.

For severe pain:
morphine 5 mg IV or IM or SC once; upon consultation with a physician
Genitourinary System

Antiemetic for nausea and vomiting:

dimenhydrinate (Gravol), 50–75 mg IM/IV q4–6h as required

**Referral**

Medevac as soon as possible. This is a surgical emergency.

For those with suspected intermittent testicular torsion refer to a physician as a urology referral is often warranted.

**Monitoring and Follow-Up**

If intermittent testicular torsion is suspected and the examination was normal, follow up in 7 days (sooner if the pain recurs) and do another complete physical examination.

**SOURCES**

Internet addresses are valid as of March 2012.

**BOOKS AND MONOGRAPHS**


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