# Approach to infectious causes of dysuria in the adult man

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## INTRODUCTION

Dysuria is a common complaint in men and a presenting symptom of various conditions. Most frequently, the presence of dysuria reflects a urogenital infection such as urethritis, prostatitis, epididymitis, or urinary tract infection. The approach to the workup and treatment of dysuria depends on other features of the patient history and certain clinical findings that may suggest one etiology over another.

The initial evaluation of the man who presents with dysuria, with a focus on infectious etiologies, is discussed here. Details of the infectious conditions that are associated with this symptom are discussed elsewhere:

- (See "Urethritis in adult males".)
- (See "Acute bacterial prostatitis".)
- (See "Chronic prostatitis and chronic pelvic pain syndrome".)
- (See "Acute scrotal pain in adults", section on 'Acute epididymitis or epididymo-orchitis'.)
- (See "Acute simple cystitis in adult males".)

Common non-infectious conditions that can also be associated with dysuria, often in association with other symptoms, are also discussed in detail elsewhere. (See "Lower urinary tract symptoms in males".)

## INFECTIOUS SYNDROMES

Urethritis is more commonly seen in sexually active men, whereas urinary tract infections occur in older men with prostatic hypertrophy, history of prior catheterization, or men with urologic anatomic abnormalities. Dysuria is reported in the majority of men with symptomatic gonorrhea and over half of patients with nongonococcal urethritis (NGU). Dysuria was reported by 59 percent of men with urethritis who presented to a sexually transmitted infection clinic and was the second most prevalent symptom [1]. (See "Urethritis in adult males", section on 'Epidemiology and microbiology'.)

Both acute and chronic prostatitis can occur in men of any age. Chronic prostatitis can occur as a complication of acute prostatitis or without any recognized initial infection. Urethral instrumentation and prostatic surgery are known causes of prostatitis, but many patients have no history of a precipitating event. (See "Acute bacterial prostatitis", section on 'Epidemiology' and "Chronic bacterial prostatitis", section on 'Epidemiology'.)

Isolated acute cystitis does not commonly occur in otherwise healthy men. The much lower incidence of cystitis in men, compared to women, has been attributed to less frequent bacterial colonization around the urethra due to the drier periurethral environment, increased length of the urethra, and antibacterial substances in prostatic fluid. Most men with acute cystitis have a functional or anatomic abnormality. (See "Acute simple cystitis in adult males".)

Acute bacterial epididymitis is a relatively rare disease, but can cause serious illness. It can be seen in conjunction with acute prostatitis, particularly in older men who may have underlying prostatic obstruction or recent instrumentation as a risk factor. Acute epididymitis can also be due to a sexually acquired infection. (See "Acute scrotal pain in adults".)

## MICROBIOLOGY

The microbiologic etiologies differ by syndrome and risk of sexually transmitted infection.

- **Urethritis** – Urethritis is generally caused by a sexually transmitted infection, most commonly *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, and *Mycoplasma genitalium*. *Trichomonas vaginalis*, and herpes simplex virus are also recognized causative pathogens. Herpes simplex virus can be a cause of acute urethritis without causing visible herpetic lesions [2]. *Neisseria meningitidis* and adenovirus have also been recognized as causes of urethritis [3]. (See "Urethritis in adult males", section on 'Epidemiology and microbiology'.)

- **Acute bacterial prostatitis** – Acute prostatitis is most commonly bacterial in origin and caused by gram-negative rods (eg, Enterobacteriaceae, *Pseudomonas aeruginosa*, *Proteus* species) and gram-positive organisms (*Enterococci*, Staphylococcus aureus). Gonorrhea and

chlamydia can also cause acute prostatitis in sexually active men. (See "Acute bacterial prostatitis", section on 'Microbiology'.)

- **Chronic bacterial prostatitis** – Gram-negative rods, particularly *Escherichia coli*, are also the most common cause of chronic bacterial prostatitis. Enterococci, *S. aureus*, and streptococcal species have also been associated with chronic bacterial prostatitis. (See "Chronic bacterial prostatitis", section on 'Microbiology'.)

- **Epididymitis** – In men younger than 35 years, *C. trachomatis* is the most common organism responsible for bacterial epididymitis, although gonococcal infection can also contribute to some cases. Sexually transmitted organisms may also be responsible for epididymitis in older men, but bacteriuria secondary to obstructive urinary disease (eg, prostatic hyperplasia) is more common, involving organisms such as *E. coli* and other coliforms. Men who engage in insertive anal intercourse are at increased risk for epididymitis due to coliform bacteria. (See "Acute scrotal pain in adults".)

- **Urinary tract infection** – As in women, the most common causes of urinary tract infection in men are enteric gram-negative pathogens, such as *E. coli*. (See "Acute simple cystitis in adult males".)

## HISTORY

A thorough sexual history should be obtained from all patients with dysuria. (See "Screening for sexually transmitted infections", section on 'Assessing risk'.)

Painful urination is usually the chief complaint in men with urethritis. They may also complain of pruritus or discharge at the urethral meatus. Discharge may be present throughout the day or may be scanty and only present on the first morning void. Men may note the ability to express discharge from the urethra. (See "Urethritis in adult males", section on 'Clinical manifestations'.)

The typical signs and symptoms of acute bacterial prostatitis are similar to upper urinary tract infection and include fever, chills, malaise, myalgia, dysuria, and cloudy urine. Prostatitis can also cause pelvic or perineal pain. In addition, swelling of the acutely inflamed prostate can cause obstructive symptoms, ranging from dribbling and hesitancy to anuria. (See "Acute bacterial prostatitis", section on 'Clinical manifestations'.)

Patients with chronic prostatitis may have complaints of typical cystitis such as frequency, dysuria, and urgency. However, other subtle symptoms may include perineal discomfort, discomfort during ejaculation, deep pelvic pain, or pain radiating to the back. The diagnosis of

prostatitis should be considered in men who have a history of recurrent UTIs in the absence of risk factors, such as bladder catheterization. (See "Chronic bacterial prostatitis", section on 'Clinical presentation'.)

Patients with acute epididymitis often complain of irritative voiding symptoms (dysuria, frequency, urgency) and pain in one testicle. These localizing symptoms are often accompanied by a history of high fever and rigors. (See "Acute scrotal pain in adults", section on 'Clinical features and diagnosis'.)

Acute cystitis is indicated by dysuria and other complaints of urinary frequency, urgency, suprapubic pain, and cloudy or bloody urine; fever is generally absent in isolated acute cystitis. The presence of upper tract infection is suggested by systemic symptoms such as fever, chills, and malaise. (See "Acute simple cystitis in adult males", section on 'Clinical manifestations'.)

## PHYSICAL EXAMINATION

The physical examination should include measurement of temperature and assessment of the general well-being of the patient. Specific attention should be given to a full genital and rectal examination and assessment of tenderness in the costovertebral region.

The physical examination should include lymph node palpation and inspection and palpation of the testicles and penis. The skin of the entire pubic area, scrotum, groin, and penis should be examined for lesions or genital ulcers. The testes, epididymides, and spermatic cords should be palpated for masses or tenderness. The foreskin should be completely retracted and the urethral meatus should be inspected for crusting, redness, or discharge.

In patients with suspected urethritis, penile discharge may be mucoid, mucopurulent, or purulent in appearance. If there is no apparent urethral discharge noted on physical examination, the urethra can be milked from the base to the meatus by placing the gloved thumb along the ventral surface of the base of the penis and the forefinger on the dorsum and applying gentle pressure. The hand is moved slowly toward the meatus to expel any discharge for specimen collection [4]. (See "Urethritis in adult males", section on 'Clinical manifestations'.)

The typical signs of acute prostatitis notable upon examination include an edematous and tender prostate on physical examination, often accompanied by fever. The digital rectal examination should be performed in a gentle fashion when acute prostatitis is suspected since vigorous examination can induce bacteremia. The physical exam in patients with chronic prostatitis may be unremarkable. (See "Acute bacterial prostatitis", section on 'Clinical manifestations' and "Chronic bacterial prostatitis", section on 'Clinical presentation'.)

In patients with epididymitis, physical examination is usually notable for induration and swelling of the involved epididymis in association with exquisite tenderness. Urologic consultation for possible torsion might be necessary if the onset of pain was sudden and severe [5]. Rarely, Fournier's gangrene can present with vague scrotal discomfort and malaise with rapid progression to necrosis. This requires prompt surgical evaluation. (See "Acute scrotal pain in adults".)

Patients with an upper urinary tract infection are often febrile and uncomfortable in appearance; in severe cases, physical examination may be notable for hypotension and flank pain. (See "Acute simple cystitis in adult males", section on 'Clinical manifestations'.)

## DIAGNOSIS

The diagnoses of urethritis, urinary tract infections, bacterial prostatitis, and epididymitis are generally made presumptively on the basis of risk factors, clinical presentations, and physical findings. Additional testing, typically of urine, is required to confirm the clinical diagnoses and determine the microbial etiologies.

For men with suspected urethritis or epididymitis secondary to a sexually transmitted infection, first-catch urine should be collected for nucleic acid amplification testing (NAAT) of urine for *N. gonorrhoeae* and *C. trachomatis*. NAAT for *M. genitalium* [6] and *T. vaginalis* [7] are also available for testing in men. If Gram staining and microscopy are readily available, identification of ≥2 to 5 white blood cells (WBC) per oil immersion field with or without gram-negative intracellular diplococci on the Gram stain (or methylene blue/gentian violet stain) of a urethral swab can confirm the diagnosis of urethritis at the point of care [5]. Urethral swabs perform better than meatal swabs in the absence of discharge [8]. Persistent symptoms of urethritis despite empiric treatment for gonorrhea and chlamydia suggest re-infection or infection with a nongonococcal, nonchlamydial cause of sexually transmitted urethritis (in order of prevalence, *M. genitalium and T. vaginalis*) [9-11]. In such cases, specific NAATs for these organisms may be warranted but may not be widely available for use in men. Further, men who engage in receptive anal intercourse should have a rectal swab obtained for NAAT for *N. gonorrhoeae* and *C. trachomatis*.

In men with suspected prostatitis or urinary tract infection, a urinalysis and a midstream urine culture should be collected to confirm the diagnosis. A urine culture should also be obtained in all men suspected of having acute epididymitis. Blood cultures may be helpful in the patient with systemic signs and symptoms of infection. Details on the diagnoses of these different syndromes are found elsewhere:

- (See "Urethritis in adult males", section on 'Diagnosis' and "Urethritis in adult males", section on 'Determining the microbial etiology'.)
- (See "Acute bacterial prostatitis", section on 'Diagnosis'.)
- (See "Chronic bacterial prostatitis", section on 'Diagnosis'.)
- (See "Acute scrotal pain in adults", section on 'Clinical features and diagnosis'.)
- (See "Acute simple cystitis in adult males", section on 'Diagnostic approach'.)

## DIFFERENTIAL DIAGNOSIS

Non-infectious causes of dysuria that should also be considered include chemical irritation from lubricants, spermicides, or soaps. Other non-infectious conditions that can cause dysuria, often in association with other symptoms, are also discussed in detail elsewhere. (See "Lower urinary tract symptoms in males" and "Chronic prostatitis and chronic pelvic pain syndrome".)

## TREATMENT

Initial treatment for dysuria is usually empiric, and the choice of therapy will depend on the suspected diagnosis based on presenting signs, symptoms, and risk factors.

For men with an initial presentation of suspected urethritis, the recommended regimen depends on the clinical evidence for gonococcal and/or nongonococcal urethritis. For men with symptoms of persistent or recurrent urethritis despite standard treatment for *N. gonorrhoeae* and *C. trachomatis,* empiric treatment for *M. genitalium* and *T. vaginalis* is recommended, especially if NAAT testing for these organisms is not available. (See "Urethritis in adult males", section on 'Initial therapy' and "Urethritis in adult males", section on 'Recurrent or persistent symptoms'.)

Men with suspected acute bacterial prostatitis should be treated presumptively for gram-negative pathogens, unless a urine Gram stain is available and suggests an alternate bacterial cause. A delay in therapy for acute prostatitis can lead to gram-negative sepsis, prostatic abscess, or metastatic infection. Men with acute prostatitis should also be instructed to increase their hydration and rest. (See "Acute bacterial prostatitis", section on 'Management'.)

Antimicrobial therapy can generally be tailored to microbiological results among men with chronic bacterial prostatitis. A prolonged course of therapy may be necessary for adequate treatment of the infection. (See "Chronic bacterial prostatitis", section on 'Management'.)

Medical management for epididymitis secondary to suspected STIs includes treatment for both gonorrhea and chlamydia. Bacterial epididymitis in men >35 years of age and men who engage in anal insertive intercourse should also be directed towards gram-negative rods. As an adjunct to therapy, bed rest, scrotal elevation, and analgesics are recommended until fever and local inflammation have subsided. (See "Acute scrotal pain in adults", section on 'Management'.)

Men with suspected UTI should be treated presumptively for gram-negative pathogens until the culture results are available. Men with acute cystitis should also undergo further evaluation for underlying urologic abnormalities. (See "Acute simple cystitis in adult males", section on 'Treatment'.)

## SUMMARY AND RECOMMENDATIONS

- Dysuria in men (pain, tingling, or burning during or just after urination) may be a presenting complaint of urethritis, prostatitis, epididymitis, or urinary tract infections. Distinction between the syndromes should be attempted in order to guide diagnosis and management. (See 'Introduction' above.)

- Specific details on the epidemiology, microbiology, clinical manifestations, diagnosis, and management of the various infectious etiologies that are associated with dysuria in men can be found elsewhere:

  - (See "Urethritis in adult males".)
  - (See "Acute bacterial prostatitis".)
  - (See "Chronic bacterial prostatitis".)
  - (See "Acute scrotal pain in adults", section on 'Acute epididymitis or epididymo-orchitis'.)
  - (See "Acute simple cystitis in adult males".)

- Obtaining a sexual history is important for determining the likelihood of certain sexually transmitted infections. Additionally, a careful history must determine the presence of irritative voiding symptoms, systemic manifestations, such as fever and chills, or subtle complaints, such as back pain. The presence of sexual risk factors and constellation of symptoms will suggest different diagnoses and management. (See 'History' above.)

- Men with dysuria should undergo a general physical examination with specific attention to the genital and rectal examination. (See 'Physical examination' above.)

- The diagnoses of urethritis, urinary tract infections, bacterial prostatitis, and epididymitis are generally made presumptively on the basis of risk factors, clinical presentations, and physical findings. Additional testing, typically of urine, is required to confirm the clinical diagnoses and determine the microbial etiologies. (See 'Diagnosis' above.)

- Urethritis is most commonly associated with *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, and *Mycoplasma genitalium* infections. Bacterial prostatitis and urinary tract infections are usually due to gram-negative pathogens, such as *Escherichia coli*. Epididymitis in men younger than 35 years of age is most frequently due to *C. trachomatis*; in older men, *E. coli*, other coliforms, or *Pseudomonas* species are the likely pathogens. The choice of therapy for dysuria depends on the likely diagnosis based on presenting signs, symptoms, and risk factors, and suspected or confirmed pathogens. (See 'Microbiology' above and 'Treatment' above.)

- Patients with risk factors for a sexually transmitted infection should be offered screening for syphilis and HIV infection. (See "Screening for sexually transmitted infections".)



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