

Managing PROSTATE Enlargement: A Comprehensive Guide

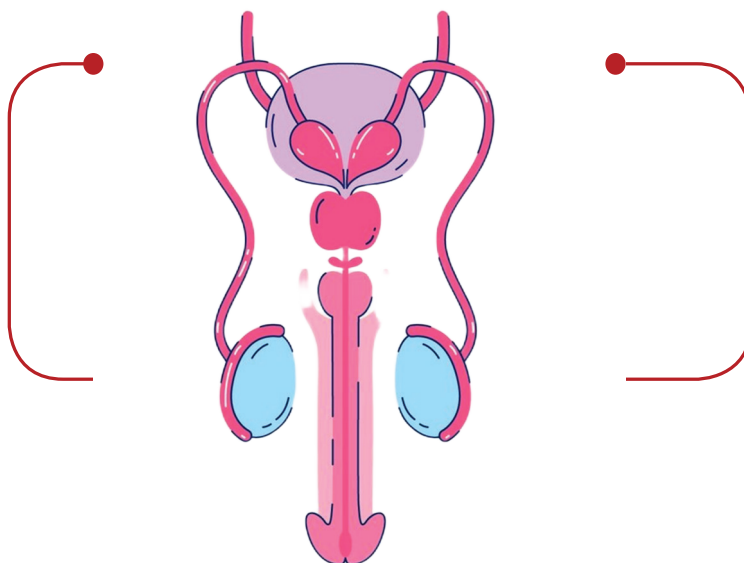
A portrait of Dr. Amit Gala, a man with dark hair, smiling, wearing a light grey blazer over a dark blue shirt. The portrait is positioned on the right side of the page, partially overlapping the red background of the title.

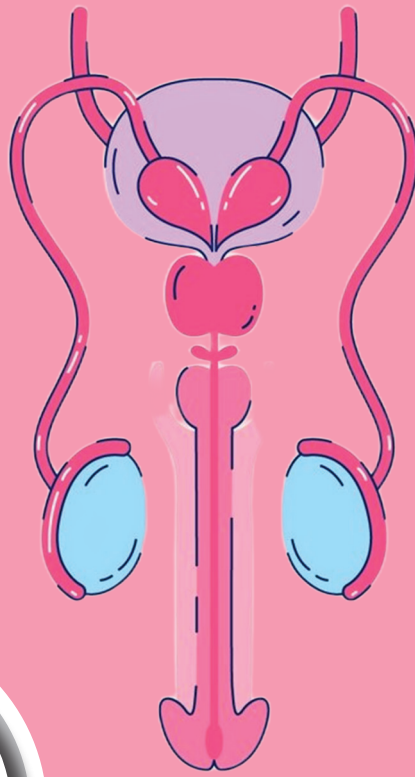
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Managing Prostate Enlargement: A Comprehensive Guide



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My name is Dr. Amit Gala, and I am a urologist. I practice in Kandivali, Mumbai, and I have nearly nine years of experience in this field. Today, I will discuss the treatment of prostate enlargement. Prostate enlargement is a condition exclusive to men and tends to increase with age. Globally, approximately 30 to 40 million men experience this issue every year, but it presents certain challenges.

As I mentioned, this problem generally becomes more noticeable after the age of 50 to 55. Why does this happen? In men, a hormone called testosterone, produced by the testes, enters the bloodstream and gets converted into its active form, dihydrotestosterone. This dihydrotestosterone causes the prostate to enlarge.

The prostate is located just below the urinary bladder. As it enlarges, it obstructs the flow of urine, leading to symptoms like frequent urination at night, difficulty starting urination, intermittent urine flow, and a feeling of incomplete bladder emptying. Patients may also feel an urgent need to urinate, sometimes leading to incontinence if they cannot reach the bathroom in time.

These are common symptoms of prostate enlargement. Recognizing them is crucial for diagnosis. When patients visit urologists, we take a detailed history to understand their symptoms better. For example, do they struggle more with starting urination or stopping it? Are they experiencing urinary retention, where the bladder doesn't empty completely, or frequent nighttime urination that disrupts sleep?

We assess how long the patient has had these symptoms, their severity, and whether they are worsening. We also evaluate factors like diabetes, constipation, daily water intake, and overall lifestyle. Tests such as urinalysis, blood tests, and PSA (Prostate-Specific Antigen) are performed. During the physical examination, we may conduct a digital rectal exam to assess the size of the prostate.

Imaging studies, such as ultrasound, help determine how much urine remains in the bladder after urination. Based on these findings, we recommend appropriate treatments. There are two or three main types of medications for managing prostate enlargement. Alpha-blockers like Tamsulosin and Silodosin relax the muscles around the prostate and

bladder neck, improving urine flow and reducing symptoms. However, these medications do not reduce the size of the prostate.

To shrink the prostate, we use 5-alpha reductase inhibitors, such as dutasteride or finasteride. These medications gradually decrease the size of the prostate over six months or more, reducing the likelihood of needing surgery in the future. However, it is important to note that these medications can have side effects, including reduced libido, erectile dysfunction, and changes in ejaculation.

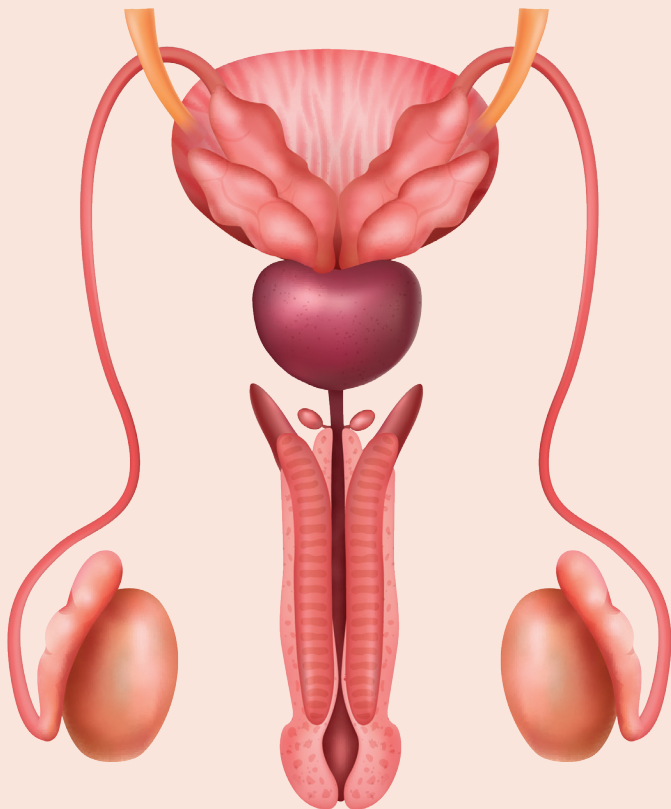
For patients who do not respond well to medications or have severe symptoms, surgical options are available. Common procedures include TURP (Transurethral Resection of the Prostate) and laser surgeries, which remove part of the prostate through the urinary tract without external incisions. More advanced techniques, such as robotic or laparoscopic surgery, involve making small incisions in the abdomen to remove the prostate. These surgeries are effective and significantly improve the patient's quality of life by alleviating symptoms.

It is essential to address prostate enlargement early to prevent complications such as urinary tract infections, blood in the urine, kidney swelling, or elevated creatinine levels. In severe cases, untreated prostate enlargement can lead to kidney damage or the need for dialysis.

Lifestyle modifications play a significant role in managing this condition. Regular physical activity, such as walking, cycling, or swimming, helps improve overall health. Maintaining a healthy diet, staying hydrated, and managing conditions like diabetes and constipation are also crucial.

While prostate enlargement is a common condition, its treatment can greatly improve a patient's quality of life. Proper diagnosis and timely intervention help patients regain restful sleep, improve mood and social interactions, and prevent complications. If you experience symptoms of prostate enlargement, consult a urologist to determine the best course of treatment.

Thank you.



Benign Prostatic Hyperplasia

Benign prostatic hyperplasia (BPH), commonly known as an enlarged prostate, is a significant health concern in aging men. The condition affects the prostate gland, leading to urinary symptoms that can severely impact quality of life (QoL). Though BPH is not life-threatening, it can cause significant discomfort and complications if left untreated.

Epidemiology

BPH is highly prevalent among older men – the prevalence rises significantly with age. Globally, the prevalence of BPH is the highest in men older than 50 years; this condition affects 5-6% of men aged 40-64 years and 29-33% of those above 65.

This condition is rarely detected in men under 40.¹ In India, the situation mirrors global trends, but there are unique challenges. Studies suggest that approximately BPH prevalence is estimated as 25% for the age-range 40-49 years; 37% for 50-69; and 50% for 70-79 years.² This prevalence rises to over 90% in men above 70 years, primarily due to the increasing lifespan and lifestyle changes, such as reduced physical activity and dietary shifts.³

Causes and Risk Factors

The exact cause of BPH remains unknown. Hormonal changes play a critical role—when compounded with aging. As men age, testosterone levels decrease, while dihydrotestosterone (DHT) levels remain relatively stable, leading to prostate cell proliferation and enlargement.⁴

Additional Factors Contribute to BPH Development

Genetics	Family history of BPH
Obesity	Associated with increased inflammation and hormonal imbalance.
Sedentary lifestyle	Increases predisposition to BPH.
Diet	High-fat and high-meat diets.
Ethnicity	Asian men, including Indians, may have a slightly lower risk. ⁴

Pathophysiology

BPH occurs due to hyperplasia of both stromal and epithelial cells within the prostate gland, leading to prostate enlargement. This increased size can compress the urethra, which passes through the prostate, resulting in obstructive and irritative lower urinary tract symptoms (LUTS). As the prostate enlarges, the bladder works harder to overcome the obstruction, often leading to bladder muscle hypertrophy, detrusor overactivity, and, eventually, bladder decompensation.⁵

Classification

The International Prostate Symptom Score (IPSS) is widely used to classify the condition into mild, moderate, and severe categories.

BPH can also be categorized as complicated – associated with complications such as acute urinary retention, urinary tract infections, bladder stones, or kidney dysfunction, and uncomplicated – when symptoms are bothersome but without severe complications.⁵

Symptomatic Classification	
Obstructive symptoms	Weak urinary stream, straining, prolonged urination, and incomplete bladder emptying.
Irritative symptoms	Urinary frequency, urgency, nocturia, and dysuria. ⁵

Evaluation

Evaluation of BPH begins with a detailed medical history and physical examination, including a digital rectal examination (DRE) to assess the size and texture of the prostate. Patients are typically asked about urinary symptoms, their duration, and any associated complications like hematuria or infections.⁵

Assessment tool	IPSS questionnaire – quantify symptom severity and QoL.
Laboratory tests	Prostate-specific antigen (PSA) - rule out prostate cancer Urinalysis – rule out infections ⁵

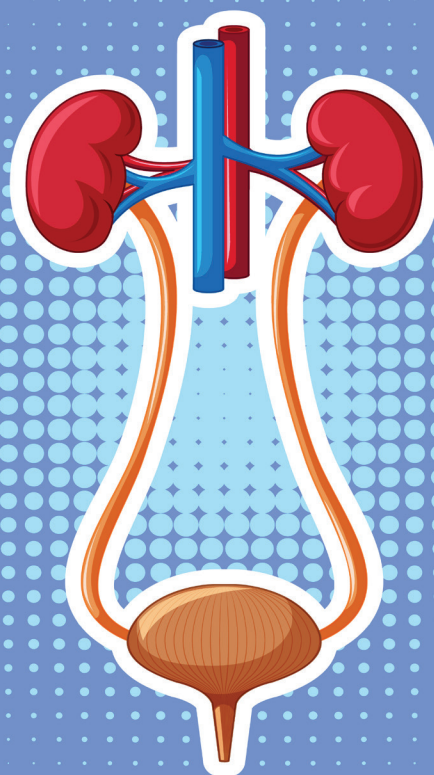
Diagnosis and Management

Evaluation	Treatment
BPH is diagnosed primarily through clinical assessment, supported by diagnostic tests such as: Urine flow rate – reduced flow rate suggests urethral obstruction. Post-void residual (PVR) – ultrasound helps determine the extent of obstruction. Imaging – Ultrasound or MRI. Urodynamic studies – assess bladder function.	Lifestyle changes: Increased physical activity, reduced fluid intake before bed, and avoiding caffeine or alcohol. Medications: First-line drug therapies include alpha-blockers and 5-alpha-reductase inhibitors. Combination therapy may be prescribed in more severe cases. Minimally invasive treatments: Transurethral microwave thermotherapy (TUMT) and transurethral needle ablation (TUNA). Surgical interventions: For patients with severe symptoms or complications – Transurethral resection of the prostate (TURP).⁵

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Lower Urinary Tract Symptoms



Lower urinary tract symptoms (LUTS) – a group of clinical symptoms involving the bladder, urethra, and prostate, affect both men and women. However, the prevalence and impact of LUTS are particularly significant in men, especially with increasing age. These symptoms can include difficulties in storing or voiding urine and are often associated with conditions like benign prostatic hyperplasia (BPH).

Epidemiology

LUTS is a prevalent issue globally, with its incidence rising with age. In India, the situation is similar, where a significant portion of older men suffer from LUTS, primarily due to BPH. A study conducted in India reported that 85% of men older than 50 years experience LUTS – with a greater predilection among diabetics and those who take >2 cups of tea daily.¹ Women may also be affected by LUTS, especially in older age groups and those who underwent vaginal delivery.² In India, the increasing aging population, coupled with the rising incidence of conditions such as obesity and diabetes, contribute to the growing burden of LUTS.

Causes and Risk Factors

Several factors contribute to LUTS development. Age is a major factor that heightens the incidence of symptoms. Hormonal changes, especially in men, play a role – as testosterone levels decrease with age.³

Other Causes and Risk Factors Include

Benign prostatic hyperplasia (BPH)	One of the most common causes of LUTS in older men.
Bladder dysfunction	Overactive bladder syndrome.
Neurological disorders	Conditions like multiple sclerosis, stroke, and Parkinson's disease.
Obesity and sedentary lifestyle	Excess weight and a lack of physical activity increase LUTS risk.
Diabetes	Diabetic neuropathy can impair bladder sensation and function.
Smoking	Smoking has been linked to an increased risk of LUTS. ³

Pathophysiology

The pathophysiology of LUTS is multifactorial, involving urinary bladder dysfunction, urethra, and prostate. In men, the most common cause is BPH, resulting in prostatic enlargement that obstructs urinary flow. This obstruction leads to compensatory changes in bladder function, including – detrusor overactivity or underactivity.

In women, LUTS is often associated with bladder dysfunction, such as overactive bladder syndrome or pelvic floor muscle weakness. Both men and women can experience neurogenic bladder, where neurological conditions impair the bladder's ability to store and expel urine properly.⁴

Classification^{4,5}

LUTS can be Classified Based on Symptoms	
Storage symptoms	Increased urinary frequency, nocturia, urgency, and incontinence. Overactive bladder syndrome is a common cause.
Voiding symptoms	Relate to difficulty in emptying the bladder like – hesitancy, weak urinary stream, straining to urinate, and a sense of incomplete bladder emptying. Prostate enlargement is a common cause in men.
Post-micturition symptoms	Involve dribbling of urine after voiding or a feeling of incomplete voiding. These symptoms often occur due to residual urine in the bladder after urination.

Evaluation	Diagnosis
A detailed medical history: Inquire about the duration and severity of symptoms, the impact on the patient's quality of life (QoL), and any associated complications, such as urinary tract infections or hematuria.	The diagnosis of LUTS is primarily clinical, based on patient-reported symptoms and the results of physical examinations and laboratory tests. Additional diagnostic tools include:
Physical examination: Digital rectal exam (DRE) for men.	Post-void residual (PVR) – helps assess bladder emptying efficiency.
Validated symptom scoring tools: Like the International Prostate Symptom Score (IPSS).	Uroflowmetry – helps detect obstructions in the urinary tract.
Laboratory investigations: Urinalysis; serum prostate-specific antigen (PSA) test.	Imaging – Ultrasound of the bladder and prostate may be used to evaluate structural abnormalities and rule out bladder stones or tumors.

Management

The treatment strategy depends on the severity of symptoms and their impact on the patient's QoL.

- ♦ **Lifestyle Modifications:** Dietary and lifestyle changes, include – reducing fluid intake before bedtime, avoiding caffeine and alcohol, and engaging in regular physical activity.
- ♦ **Medications:**
 - Alpha-blockers
 - 5-alpha-reductase inhibitors
 - Antimuscarinics
- ♦ **Surgical Treatment:** For patients with severe symptoms or complications, such as urinary retention, surgery may be required. Transurethral resection of the prostate (TURP) is the most common procedure for men with BPH and LUTS. Other minimally invasive surgical options, such as laser therapy, may also be considered.^{4,5}

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Male Infertility

Infertility is a growing concern, with male factors contributing significantly to the issue. Infertility in men is suspected when a couple fails to conceive after 1 year of unprotected sexual intercourse despite the female partner being fertile. Globally, male infertility is on the rise due to multiple factors, including – genetic, environmental, and lifestyle influences. In India, male infertility has seen a surge, with environmental and lifestyle changes playing a substantial role.

Epidemiology of Male Infertility

India ranks among the countries with the highest prevalence of infertility. Recent studies estimate that 8-12%¹ of couples worldwide experience fertility issues, with male factors accounting for 50% of these cases.² India stands second to China in terms of the highest number of male infertility cases worldwide,³ and research suggests infertility rates as high as 45% in certain regions of the subcontinent.⁴ Regional variations exist – for instance, infertility rates are higher in states like Kashmir (15%) compared to Uttar Pradesh and Maharashtra (3.7%).⁵

Causes and Risk Factors

The causes of male infertility are diverse, ranging from hormonal disorders, physiological abnormalities, and lifestyle factors to environmental and genetic issues. Key risk factors include varicocele (enlarged veins in the scrotum), testicular cancer, cryptorchidism (undescended testicles), and genetic defects. Lifestyle factors such as smoking, obesity, and exposure to environmental pollutants have a significant impact. Occupational risks, particularly exposure to chemicals, high temperatures, and radiation, also play a role. Notably, urban populations are more vulnerable due to environmental pollution and sedentary lifestyles. Additionally, infections such as sexually transmitted diseases (STDs), particularly the Human Papillomavirus (HPV) and genitourinary infections, can impair fertility. Psychological factors like stress and anxiety further exacerbate the issue.⁶

Pathophysiology

Male infertility primarily arises from abnormalities in sperm production, function, or delivery. It is often





associated with lower sperm counts, abnormal sperm morphology, and motility issues, affecting the sperm’s ability to fertilize the egg. Sperm abnormalities, such as defects in the sperm head or tail, are critical contributors to male infertility.⁶

Classification and Types of Male Infertility

Male infertility is broadly categorized into primary and secondary infertility. Primary infertility refers to cases where the man has never induced a pregnancy, while secondary infertility applies to men who have previously fathered a child but are now unable to do so.⁶

Classification Based on Sperm Abnormalities	
Azoospermia	Absence of sperm in the semen.
Oligozoospermia	Low sperm count.
Asthenozoospermia	Reduced sperm motility.
Teratozoospermia	Abnormal sperm morphology.

Evaluation and Diagnosis

Male infertility is often diagnosed through a detailed medical history and semen analysis, which assesses sperm concentration, morphology, motility, and volume. Hormonal evaluations, including testosterone and follicle-stimulating hormone (FSH) levels, are also conducted in cases of abnormal semen analysis.⁷

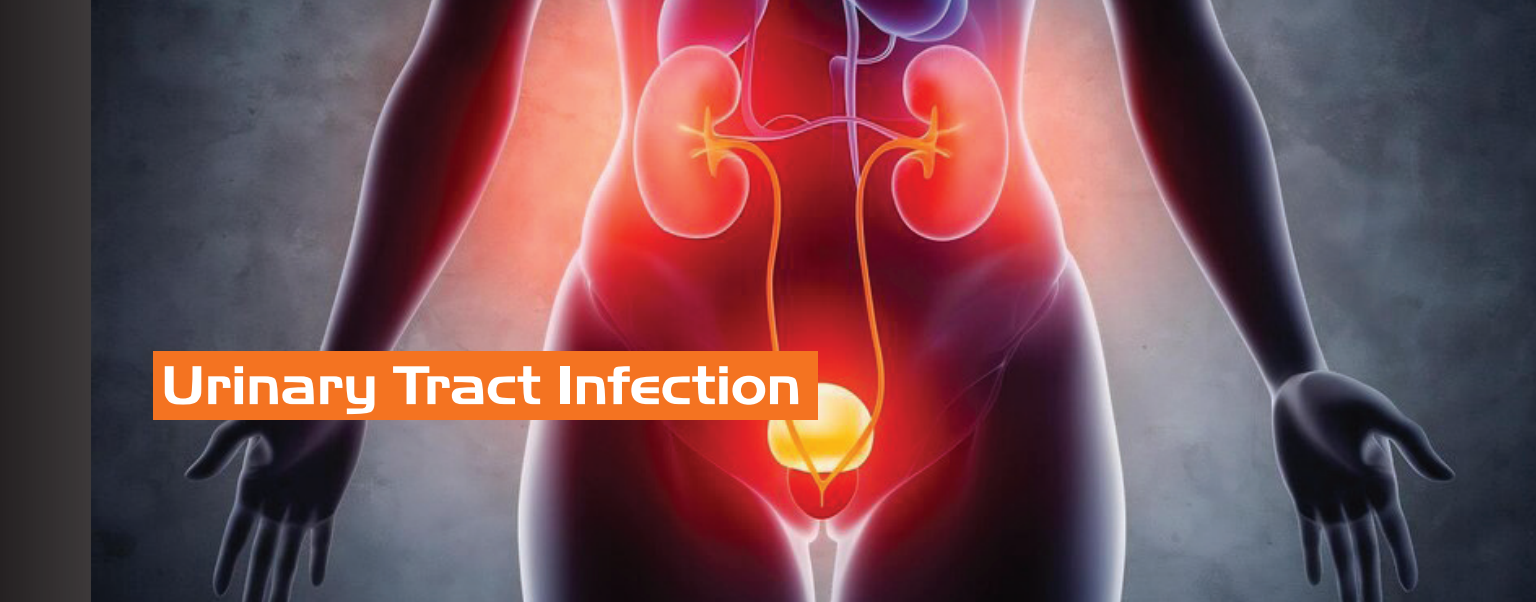
Other Relevant Tests	
Genetic testing	In men with suspected chromosomal abnormalities or Y chromosome microdeletions.
Imaging techniques	Ultrasound – to detect physical abnormalities.
Advanced tests	DNA fragmentation analysis – to check sperm quality.

Management^{8,9}

Treatment	Future Trends
Lifestyle modifications – diet, body weight optimization, alcohol modulation and smoking cessation. Eradication of environmental pollutant exposure.	Advances in ART, coupled with genetic and epigenetic therapies, hold promise.
Medical treatments – antioxidant supplementation and hormonal therapies.	DNA fragmentation analysis – to check sperm quality.
Surgical interventions – to address structural abnormalities.	Multifaceted approach.
Assisted reproductive technologies (ART) – <i>in vitro</i> fertilization (IVF) and intracytoplasmic sperm injection (ICSI).	
Sperm retrieval techniques – testicular sperm extraction (TESE) in cases with azoospermia.	

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Urinary Tract Infection

Urinary tract infections (UTIs) – one of the most common bacterial infections globally, can occur in both men and women but are particularly prevalent in women due to their anatomical features. The term describes infections occurring at any part of the urinary tract, and in a majority of the cases, empirical treatment is employed. Infection in the urinary tract can occur at any age; the risk factors include pregnancy, urinary diversion, immunosuppression, diabetes, and neurological pathologies. The disease is associated with reduced quality of life (QoL) and significant clinical and economic burden.

Epidemiology

UTIs are a major global health concern, accounting for about 15-30% of all infections among the elderly, and impose significant morbidity and mortality. Women show a higher preponderance of acquiring UTIs – owing to their physiology. Statistics suggest that 40% of all females develop a UTI at some point in their lifetime, while adult women show a 30 times greater predilection than their male counterparts.¹ with a rising trend among both sexes at sexually active pubertal age. UTI is the most common cause of antimicrobial prescriptions in people admitted to nursing homes. The risk increases with factors such as age, puberty, pregnancy, and menopause. Its incidence during pregnancy is 50-60%.² Men are less frequently affected but are at a higher risk in older age groups – due to comorbid conditions such as benign prostatic hyperplasia (BPH) or catheter use.³

In the Indian context, UTIs remain a significant health issue, particularly among women and in rural areas where access to health care may be limited. Research indicates that UTIs contribute substantially to the morbidity burden, with prevalence rates varying between 12-30% among adult women. The prevalence of community-acquired UTIs was found

to be 10.1% - of which 12.8% were diagnosed in children and 86.8% among adults. The Enterobacterales species was found to be the most predominant causative organism (>85%). Hyperglycemia was another notable risk factor.⁴

Causes and Risk Factors

Most UTIs are caused by bacteria, with *Escherichia coli* (*E. coli*) being the leading pathogen. Other bacteria, such as *Klebsiella pneumoniae*, *Proteus mirabilis*, and *Enterococcus faecalis*, are less common pathogens.⁵

Common Risk Factors for UTIs in Both Genders

Aging
Diabetes
Immunosuppression
Poor personal hygiene
Urinary diversion
Neurological pathologies ¹

Several risk factors contribute to the development of UTIs. In women, the shorter urethra facilitates bacterial entry. Pregnancy and sexual intercourse are significant risk factors due to the potential for bacteria to enter the urinary tract. The use of spermicides, diaphragms, and a history of previous infections also increase the risk. Men are more likely to develop UTIs if they have conditions that obstruct the urinary tract, such as BPH, kidney stones, or urinary catheter use.

Pathophysiology

UTIs can occur in the urethra – urethritis; bladder – cystitis; or kidneys – pyelonephritis. UTIs commence when uropathogens colonize the urethra and ascend into the bladder. In some cases, the infection may

travel further up the urinary tract, reaching the kidneys and leading to pyelonephritis.

Bacterial adherence to the urothelial cells is critical for infection establishment, and *E. coli* has specialized fimbriae that enable it to attach to the bladder wall and evade the host's immune system. Once inside the bladder, bacteria can multiply rapidly, causing inflammation and the hallmark symptoms of UTIs—dysuria, increased urinary frequency, urgency, and suprapubic pain.⁵

Classification

UTIs can be classified based on the site of infection. Cystitis refers to bladder infections, while pyelonephritis refers to kidney infections.

Asymptomatic bacteriuria is a condition where bacteria are present in the urine without symptoms, and this typically does not require treatment unless in specific populations, such as pregnant women.¹

Clinical Classification

Uncomplicated UTI	Responds very well to oral antibiotics
Complicated UTI	Requires early imaging and referral to the emergency department or hospitalization. ¹

Treatment Recommendations^{5,6}

Acute uncomplicated cystitis	Acetaminophen or ibuprofen for pain; phenazopyridine for symptomatic relief First-line: Nitrofurantoin Second-line: Trimethoprim/sulfamethoxazole (TMP/SMX), Cephalexin, and Fosfomycin
Asymptomatic UTI	Do not treat; except in pregnancy
Mild cystitis	Acetaminophen or ibuprofen may be used for symptom relief Close monitoring Delayed antibiotic use Phenazopyridine – dysuria
Complicated cystitis	First-line: Nitrofurantoin for 7 days Second-line: TMP/SMX for 7 days, or oral cephalexin for 7 days, or fosfomycin every 48 hours for 3 doses
Pyelonephritis	Ceftriaxone 1 g IM or IV × 1 dose, followed by an oral antibiotic: First line: TMP/SMX for 7-14 days Second line: Ciprofloxacin for 7 days, or levofloxacin for 5 days Third Line: amoxicillin/clavulanate for 10-14 days
Complicated obstructive pyelonephritis	Intravenous antibiotic treatment: Ceftolozane/tazobactam or ceftazidime-avibactam
Prostatitis	TMP/SMX, ciprofloxacin, or levofloxacin
Recurrent UTI	Recommended antibiotic regimens for acute cystitis, based on the culture and sensitivity results Postmenopausal women – intravaginal estrogen Habit modification Single-dose postcoital or daily antibiotic prophylaxis Assess urinary retention in men

Diagnosis

Clinical diagnosis is based on symptoms – dysuria, urinary urgency/frequency, new-onset hematuria, and suprapubic pain. In males – incomplete urinary emptying, penile discharge, suprapubic/groin pain, and testicular pain.

In women with dysuria and urinary frequency, in the absence of vaginitis – acute cystitis.⁶

Evaluation

History	Assess symptoms
Physical examination	Generally, not necessary – unless symptoms suggest pyelonephritis
Laboratory tests	Urine dipstick Microscopy Urine culture and antibiotic sensitivity

In recurrent or complicated cases, imaging studies such as ultrasound or CT scans may be necessary to identify any underlying anatomical abnormalities.⁶

Management

Treatment is planned based on the pathogenic organism causing the infection and the infection severity.

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Ureteric Calculi

Ureteric calculi – stones in the ureter, are a common urological problem that affects millions of people globally, leading to significant morbidity. The condition results from the formation of crystals, primarily composed of calcium – that migrate from the kidneys and lodge in the ureter, causing pain, obstruction, and potential kidney damage if untreated.

Epidemiology

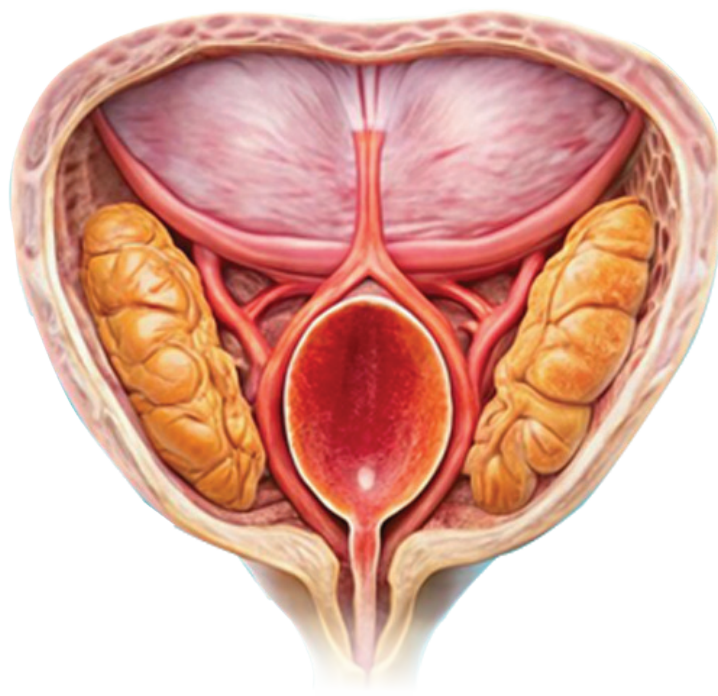
In India, ureteric calculi incidence has been on the rise due to changing dietary habits, climate, and an increasing prevalence of metabolic disorders like diabetes and obesity.¹ India lies in the so-called “stone belt,” which stretches across the northern and western regions, including states like Punjab, Rajasthan and Gujarat, where stone disease is particularly prevalent.² Studies suggest that approximately 12% of the Indian population will experience a kidney stone in their lifetime,³ and many of these stones will descend into the ureter.

Causes and Risk Factors

The formation of ureteric calculi is multifactorial, with both intrinsic and extrinsic factors playing a role.⁴

Some of the Major Causes and Risk Factors Include

Dehydration	Inadequate water intake
Diet	Sodium, protein, and oxalate rich foods like spinach, nuts, chocolates and refined sugars increase the risk
Climate	High temperatures
Genetic predisposition	Family history of stone
Comorbidities	Conditions like – hyperparathyroidism, gout, renal tubular acidosis and obesity ⁴
Medications	Certain medications, such as – loop diuretics, antacids and excessive vitamin D supplements



Pathophysiology

The formation of ureteric calculi is a complex process involving supersaturation of the urine with stone-forming substances such as calcium, oxalate, uric acid, and cystine. These substances precipitate to form crystals, which aggregate to form stones.

Migration of these stones from the kidney into the ureter can obstruct urinary flow, causing severe pain and hydronephrosis (swelling of the kidney due to urine buildup). Obstruction can also lead to infection or permanent kidney damage if left untreated. The location of the stone within the ureter influences the severity of symptoms and the potential for spontaneous passage.⁵

Management

The management of ureteric calculi depends on the size, location, and composition of the stone, as well as the severity of symptoms. Treatment options range from conservative management to more invasive surgical procedures:

- ♦ **Conservative Management:**
 - **Hydration**
 - **Pain management:** Nonsteroidal anti-inflammatory drugs (NSAIDs) and opioids.
 - **Medical expulsive therapy:** Alpha-blockers such as tamsulosin may be prescribed to relax the ureter, facilitating stone passage.
- ♦ **Surgical intervention:** Stones that are larger than 5-7 mm, cause persistent obstruction, or lead to complications like infection may require surgical intervention.
 - **Ureteroscopy**
 - **Shock wave lithotripsy (SWL)**
 - **Percutaneous nephrolithotomy (PCNL)**⁵

Classification	Evaluation
Ureteric stones are classified based on their composition, size and location within the ureter. The main types of stones include:	History of symptoms: Flank pain, hematuria, nausea, vomiting, and fever (in cases with infection). The pain may radiate to the groin or genitals, depending on the stone's location.
Calcium oxalate stones – 70-80% of all stones. These form when calcium combines with oxalate in the urine.	Physical examination: Flank tenderness and signs of systemic infection (fever or chills) – require urgent attention.
Uric acid stones – persistently acidic urine; more common in individuals with gout or consuming high-protein diets.	Laboratory tests: Urinalysis is essential for detecting hematuria, crystalluria, and signs of infection. Blood tests – to assess kidney function, calcium levels, uric acid, and other relevant biochemical markers.
Struvite stones – associated with recurrent urinary tract infections; composed of magnesium, ammonium, and phosphate.	Diagnosis The definitive diagnosis of ureteric calculi is made using imaging studies. The primary diagnostic tools include:
Cystine stones – a rare type of stone that occurs in cystinuria.	• Non-contrast CT-scan: The gold standard. • Ultrasound: In pregnant women or children. • X-ray (KUB): Plain radiograph of the kidneys, ureters, and bladder (KUB) can detect radiopaque stones.

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