

PROSTATE

Inflammation

Inflammatory diseases of the prostate

Etiology · clinical patterns · diagnostic discrimination

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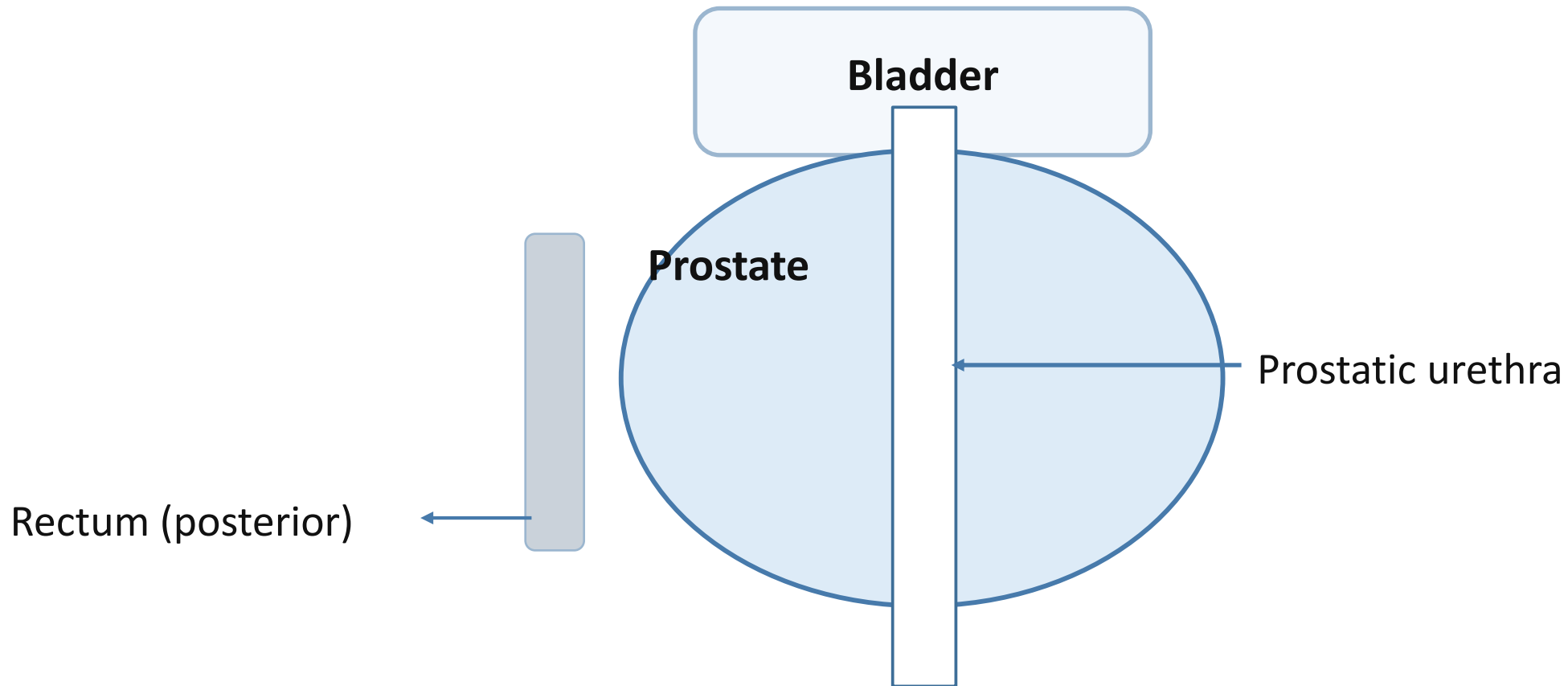
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Learning objectives

- Locate the prostate and distinguish its epithelial and stromal components.
- Differentiate acute bacterial, chronic bacterial, chronic abacterial, and granulomatous prostatitis.
- Connect urinary symptoms, cultures, and clinical histories to the categories.
- Recognize why biopsy is contraindicated when acute bacterial prostatitis is suspected.

The prostate surrounds the proximal urethra

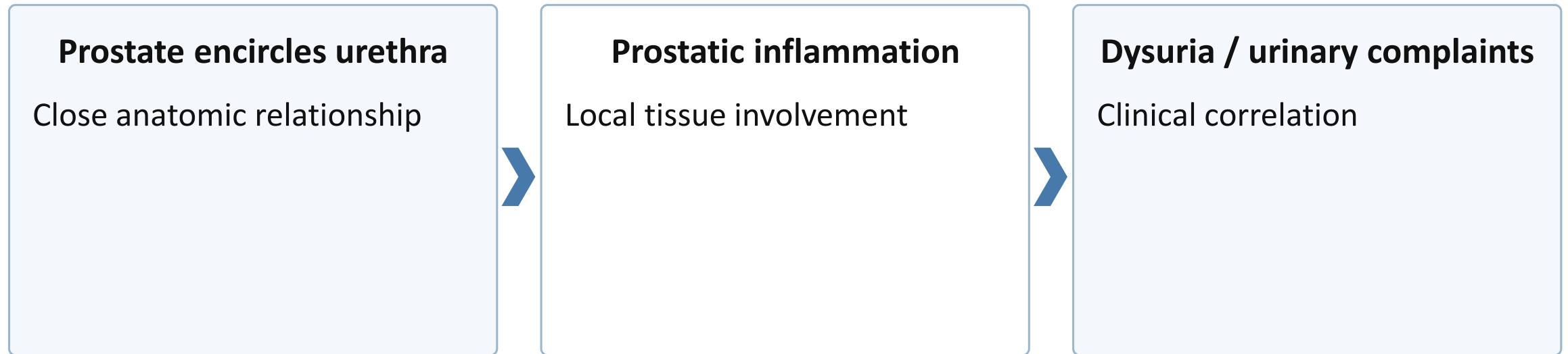


Encircles bladder neck and urethra; No distinct capsule.

Four anatomical regions provide the background

Region	Teaching significance
Peripheral zone	Anatomic zone; parent chapter identifies it as the common site of carcinoma.
Central zone	A distinct anatomic zone around ducts.
Transition zone	Parent chapter links this zone to most prostatic hyperplasia.
Periurethral zone	Situated close to the prostatic urethra.

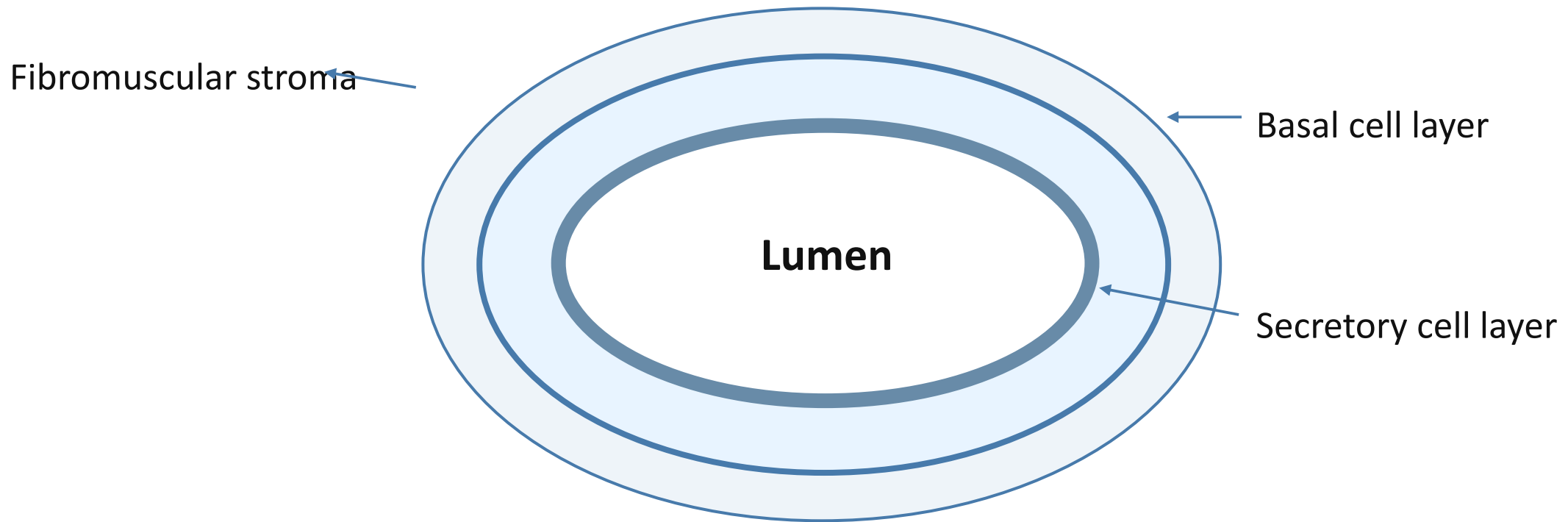
Anatomy makes urinary symptoms plausible



Conceptual clinicopathologic inference; Not an assertion that every case obstructs the urethra.

Normal prostate: Glands within fibromuscular stroma

Simplified original schematic — not histologic microscopy

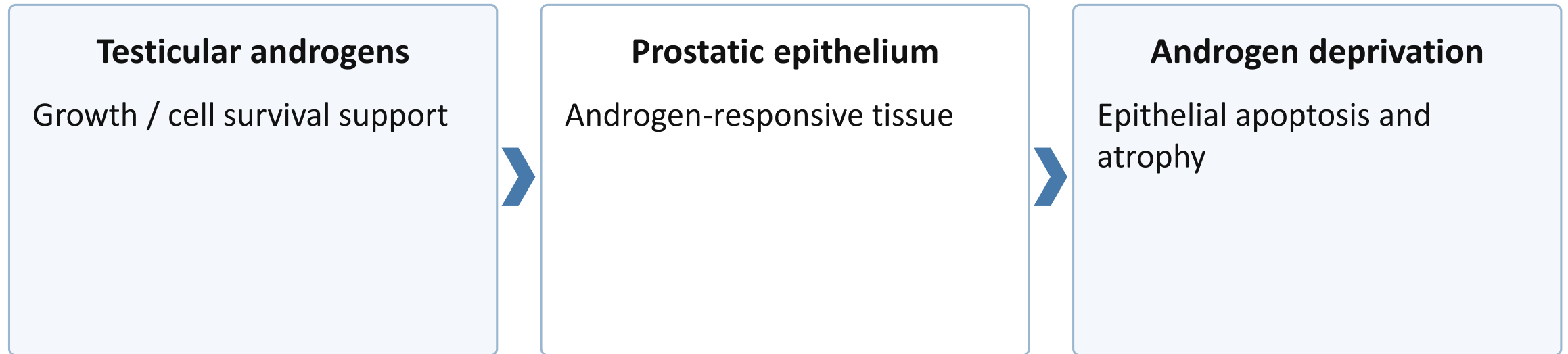


Two epithelial layers separate secretory lumen from stroma.

The prostatic epithelium has two layers

Component	Morphologic description	Role in the schematic
Basal cells	Low cuboidal epithelium	Outer epithelial layer
Secretory cells	Columnar epithelium	Faces glandular lumen
Glandular lumen	May show papillary infoldings	Space receiving glandular secretions

Androgens maintain prostatic epithelium



Physiologic context from the parent section; Not a proposed cause of prostatitis.

Three major groups of prostatic pathology

Inflammation

Prostatitis; Current teaching topic

Benign enlargement

Hyperplasia; Separately indexed topic

Neoplasia

Tumors; Separately indexed topic

Prostatitis is not one etiologic entity

Prostatitis

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graph TD; A[Prostatitis] --> B[Acute bacterial]; A --> C[Chronic bacterial]; A --> D[Chronic abacterial]; A --> E[Granulomatous];
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Acute bacterial

Acute symptomatic
infection

Chronic bacterial

Persistent bacterial
reservoir

Chronic abacterial

Pelvic pain; Negative
cultures

Granulomatous

Infectious or
noninfectious stimulus

Classification uses three distinct dimensions

Dimension	Question answered	Examples
Cause	Are microorganisms implicated?	Bacterial; nonbacterial
Tissue response	What pattern of inflammation occurs?	Granulomatous response
Course	How does the syndrome behave?	Acute; chronic

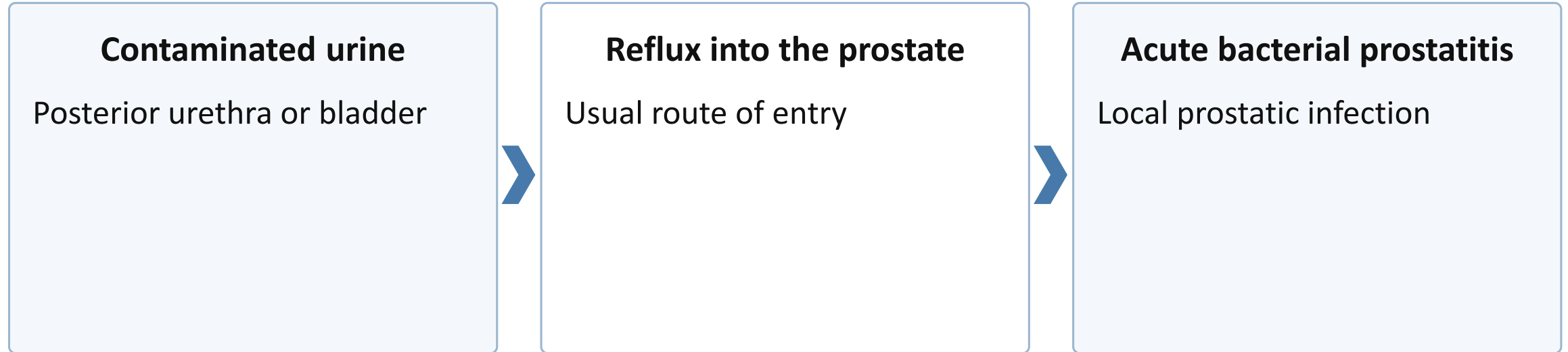
Acute bacterial prostatitis shares urinary pathogens

- The bacterial spectrum resembles that of ordinary urinary tract infection.
- *Escherichia coli* is explicitly identified among the leading organisms.
- Other gram-negative rods, enterococci, and staphylococci are also described.
- An organism list does not by itself establish an individual patient's diagnosis.

Acute pathogens: A practical grouping

Pathogen group	Examples described in Robbins
Gram-negative enteric bacteria	E. coli; other gram-negative rods
Gram-positive cocci	Enterococci
Additional gram-positive cocci	Staphylococci

Urinary reflux is the usual route to the prostate



Hematolymphatic spread is an alternative route

Distant infectious focus

Organisms outside urinary tract



Lymphohematogenous spread

Occasional dissemination



Prostatic seeding

Alternative to urine reflux

Instrumentation can precede acute infection

Catheterization

Example of preceding urethral manipulation

Cystoscopy

Endoscopic manipulation described in source

Urethral dilation

Further example of instrumentation

Acute infection: A clinicopathologic sequence

Bacterial access

Reflux, instrumentation, or distant focus



Inflamed prostate

Clinically tender and boggy



Acute syndrome

Fever, chills, dysuria

Systemic features signal the acute syndrome

- Fever and chills form part of the typical acute bacterial presentation.
- Their presence alongside dysuria supports a symptomatic infectious process.
- Absence of this exact triad cannot independently exclude all prostatic inflammation.
- The pattern must be interpreted with clinical assessment and culture.

Dysuria connects urinary tract and prostate

- Dysuria is included in the clinical presentation of acute bacterial prostatitis.
- Prostatic infection may follow contaminated urine reaching the gland.
- Urinary symptoms therefore do not localize infection to the bladder alone.
- Use associated systemic findings and examination to refine localization.

The acutely inflamed prostate is tender and boggy

Examination

- Digital rectal examination can reveal an exquisitely tender gland.
- Boggy consistency is part of the described examination pattern.

Interpretation

- The diagnosis is not based on the examination finding in isolation.
- Clinical features and urine culture establish the textbook diagnosis.

Acute bacterial diagnosis: Culture plus syndrome

Fever / chills / dysuria

Characteristic syndrome



Tender, boggy prostate

Supportive examination



Urine culture

Microbiologic support

Suspected acute prostatitis: Do not biopsy

Prostate biopsy is contraindicated when acute bacterial prostatitis is suspected.

- The acutely infected gland is vulnerable to procedure-associated dissemination.
- Robbins explicitly identifies sepsis as a possible consequence.
- Use the clinical presentation and urine culture rather than tissue sampling.

Case: Fever, dysuria, tender prostate

Clinical stem

An adult develops fever, chills, and dysuria. Examination identifies an exquisitely tender, boggy prostate.

Which prostatitis category is supported, and which examination should be avoided?

- Acute bacterial prostatitis is the leading Robbins category.
- Urine culture supports diagnosis.
- Avoid prostate biopsy because of sepsis risk.

Chronic bacterial prostatitis may be subtle

- Low back pain, dysuria, and perineal or suprapubic discomfort are described.
- Intensity and combination of symptoms may vary.
- Some patients have no overt symptoms despite bacterial prostatitis.
- A recurrent urinary infection history often supplies the decisive clue.

Pain distribution in chronic bacterial disease

Site / complaint	Clinical meaning
Lower back	One potential location of reported discomfort
Perineum	Pelvic pain may be localized here
Suprapubic region	Discomfort can be reported above the pubis
Dysuria	Lower urinary symptoms can coexist

Symptoms are not mandatory in chronic infection

Clinical spectrum

- Chronic bacterial prostatitis may be asymptomatic.
- Lack of dramatic symptoms does not erase a recurrent-infection history.

Diagnostic implication

- Interpret symptoms alongside cultures and episodes of urinary tract infection.
- Do not use pelvic discomfort alone to infer bacterial persistence.

Repeated infection by the same organism is a clue

Cystitis / urethritis

Repeated urinary tract episodes



Same organism recurs

Pattern highlighted by Robbins



Chronic bacterial prostatitis

Potential persistent prostatic source

The prostate can become a bacterial reservoir

Bacteria persist

Organisms remain in
parenchyma



Prostate serves as haven

Incomplete eradication



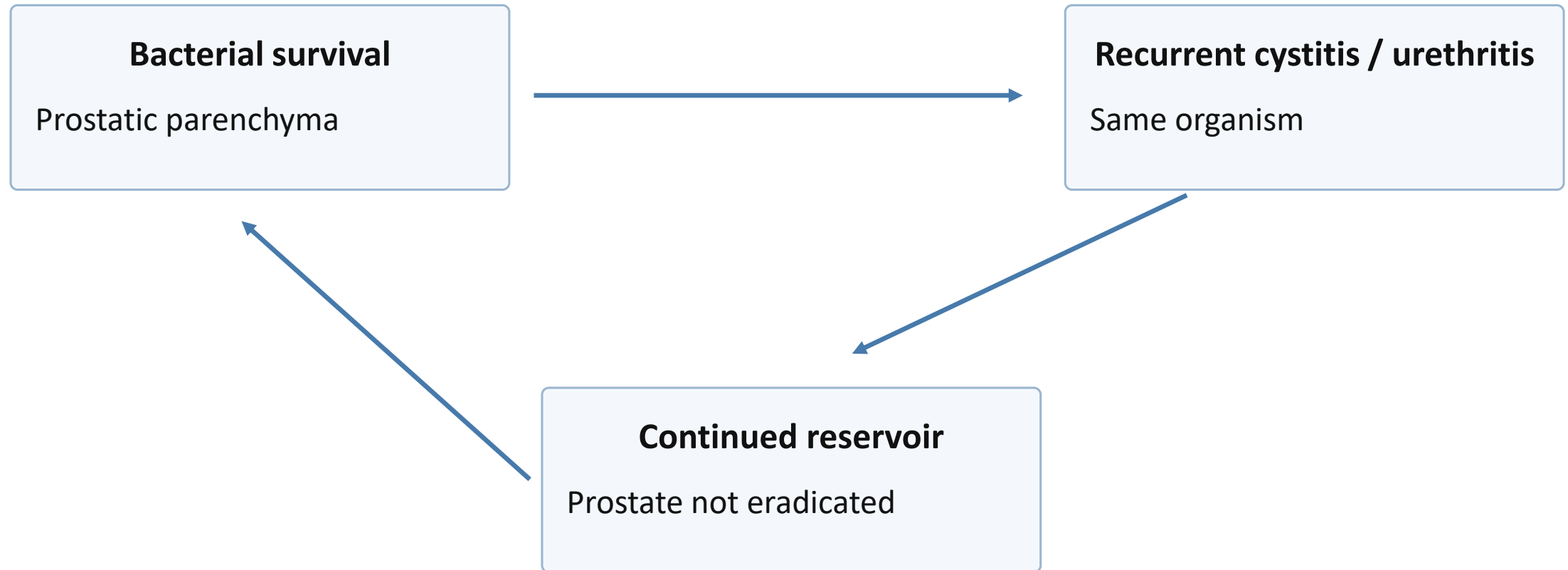
Urinary tract reseeded

Recurrent bacterial urinary
infections

Antibiotic penetration complicates eradication

- Most antibiotics penetrate prostatic tissue poorly.
- Persisting bacteria can therefore remain within the prostatic parenchyma.
- Persistent infection offers a mechanism for repeated urinary tract seeding.
- This is a pathogenesis point, not a treatment-regimen recommendation.

Prostatic persistence and recurrence form a loop



Schematic mechanism

Leukocytes are sought in prostatic secretions

- Diagnosis depends partly on demonstration of leukocytes in expressed prostatic secretions.
- Leukocytes establish an inflammatory component but not an organism's identity.
- Microbiologic culture is required for the bacterial distinction.
- The specimen source matters: These are prostatic secretions, not a generic tissue count.

Positive bacterial culture establishes the distinction

Evidence expected

- Expressed prostatic secretions contain leukocytes.
- Positive bacterial cultures support chronic bacterial prostatitis.

Why it matters

- Symptoms alone can resemble chronic abacterial prostatitis.
- The culture result gives a crucial etiologic distinction.

Chronic bacterial organisms overlap with acute disease

Category	Bacterial spectrum
Acute bacterial	E. coli, other gram-negative rods, enterococci, staphylococci
Chronic bacterial	The same implicated organisms are described
Diagnostic emphasis	Course, recurrence, prostatic secretions, and culture discriminate

Case: Repeated cystitis with matching cultures

Clinical stem

A patient reports recurrent episodes of cystitis caused by the same organism, with perineal discomfort between episodes.

What pathophysiologic process can explain recurrence?

- Chronic bacterial prostatitis may act as a persistent reservoir.
- Poor antibiotic penetration is the mechanism emphasized by Robbins.
- Leukocytes in secretions and positive bacterial cultures support the diagnosis.

Chronic abacterial prostatitis: Common phenotype

- Chronic abacterial prostatitis as the most common form of prostatitis.
- The condition is also called chronic pelvic pain syndrome in the source.
- Its symptoms can be indistinguishable from chronic bacterial prostatitis.
- An inflammatory secretions pattern may coexist with negative bacterial cultures.

Symptoms cannot reliably separate chronic categories

Finding	Chronic bacterial	Chronic abacterial
Low back / pelvic discomfort	May be present	Similar pattern
Dysuria	May be present	Similar pattern
Symptoms alone	Not sufficient	Not sufficient

No recurrent UTI history is a distinguishing clue

Bacterial history

- Chronic bacterial prostatitis often accompanies repeated urinary infections.
- Those episodes may yield the same causative organism.

Abacterial history

- The chronic abacterial category lacks a recurrent UTI history.
- Use history with cultures; Neither symptom profile alone settles etiology.

Textbook inflammatory secretions criterion

>10

Leukocytes / high-power field

This finding in expressed prostatic secretions of chronic abacterial prostatitis.

An edition-specific textbook description; Not asserted here as a universal modern criterion.

Cultures remain negative in the abacterial category

Pelvic / urinary symptoms

Resemble chronic bacterial prostatitis



Leukocytes in secretions

Inflammatory evidence



Bacterial culture negative

Defines abacterial distinction in source

Chronic bacterial versus abacterial prostatitis

Feature	Chronic bacterial	Chronic abacterial
Recurrent UTI	Often present	Not present in described syndrome
Symptoms	Pain / dysuria; may be silent	Similar pain / urinary symptoms
Prostatic leukocytes	Present	>10 / high-power field
Bacterial culture	Positive	Negative

Case: Pelvic pain with sterile cultures

Clinical stem

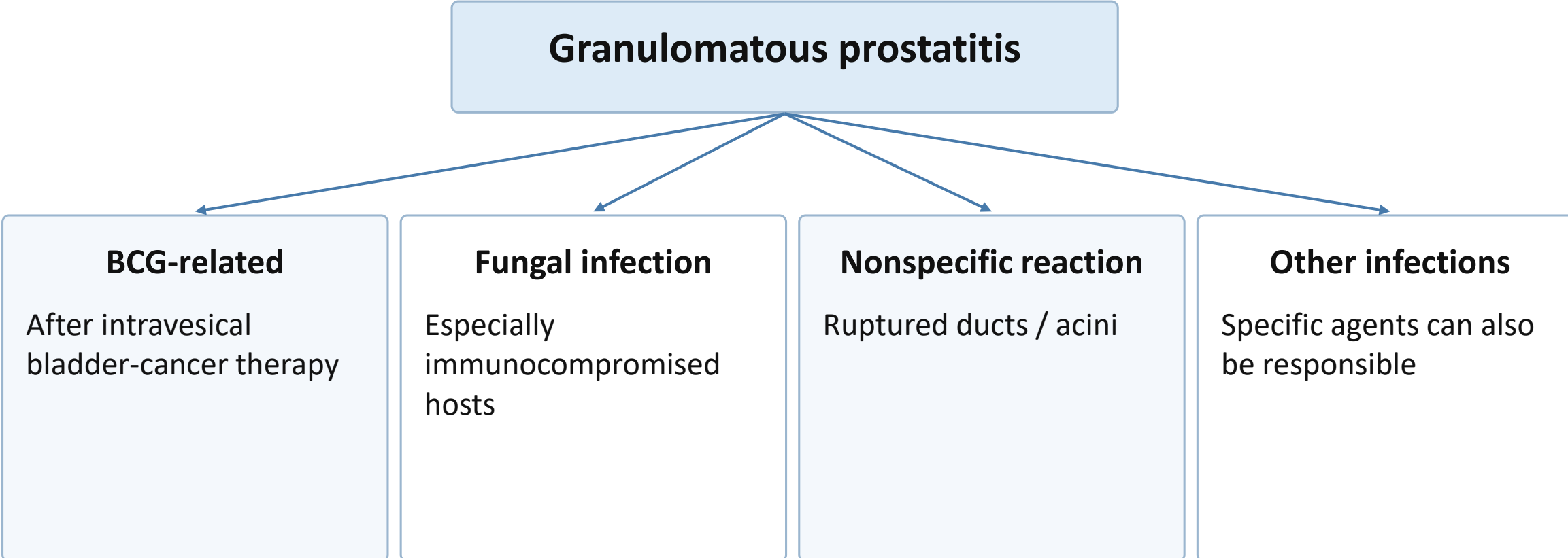
A patient has persistent pelvic discomfort resembling chronic bacterial prostatitis. There is no history of recurrent UTI; Expressed secretions contain leukocytes, and bacterial cultures are negative.

Which Robbins category fits the entire pattern?

- Chronic abacterial prostatitis / chronic pelvic pain syndrome.
- Symptoms overlap chronic bacterial disease.
- Negative cultures and absent recurrent UTI history are the discriminators.

Granulomatous inflammation has diverse triggers

Granulomatous prostatitis



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graph TD; A[Granulomatous prostatitis] --> B[BCG-related]; A --> C[Fungal infection]; A --> D[Nonspecific reaction]; A --> E[Other infections]; B --> B1[After intravesical bladder-cancer therapy]; C --> C1[Especially immunocompromised hosts]; D --> D1[Ruptured ducts / acini]; E --> E1[Specific agents can also be responsible];
```

The diagram is a hierarchical flowchart. At the top is a box labeled 'Granulomatous prostatitis'. Four arrows point downwards from this box to four separate boxes below it. Each of these four boxes contains a bold title and a descriptive sentence. The boxes are: 'BCG-related' (After intravesical bladder-cancer therapy), 'Fungal infection' (Especially immunocompromised hosts), 'Nonspecific reaction' (Ruptured ducts / acini), and 'Other infections' (Specific agents can also be responsible).

BCG-related

After intravesical
bladder-cancer therapy

Fungal infection

Especially
immunocompromised
hosts

Nonspecific reaction

Ruptured ducts / acini

Other infections

Specific agents can also
be responsible

BCG instillation is a recognized association

Bladder cancer treatment

Intravesical BCG instillation



Prostatic granulomas

Granulomatous tissue
response



Clinical context

Interpret pathology with
treatment history

BCG-associated granulomas: Context changes meaning

- In the United States, BCG instillation as the commonest granulomatous prostatitis cause.
- Prostatic granulomas in that setting are described as clinically insignificant.
- They require no treatment in that specific context.
- This conclusion must not be generalized to every cause of prostatic granulomas.

Fungal granulomatous disease: Host context matters

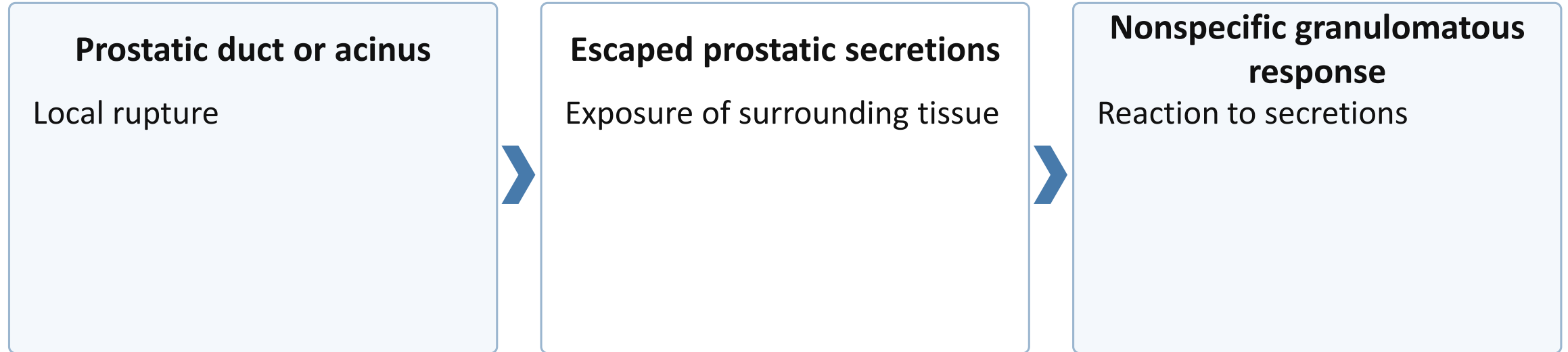
Documented association

- Fungal granulomatous prostatitis is typically seen in immunocompromised hosts.
- Here the granulomatous response is associated with an infectious agent.

Interpretive boundary

- A BCG-treatment history and host immune state suggest different etiologic contexts.
- The source does not provide a specific fungal organism list.

Duct and acinar rupture can initiate granulomas



The granuloma is a response, not a diagnosis of cause

Trigger	Meaning of the granulomatous pattern
BCG exposure	Treatment-associated response
Fungal infection	Infectious granulomatous prostatitis
Duct / acinar rupture	Nonspecific reaction to secretions
Other specified infection	Agent-related granulomatous process

Two clinical histories alter granuloma interpretation

Clinical stem

Patient A has prior intravesical BCG therapy. Patient B is immunocompromised. Both have prostatic granulomatous inflammation.

Why would a single etiologic label be inappropriate?

- BCG-associated granulomas are a recognized treatment-related pattern.
- Fungal prostatitis is especially associated with immunocompromised hosts.
- Granulomatous morphology alone does not specify the cause.

Adenoviral prostatitis is also described

- Adenoviral prostatitis among additional inflammatory entities.
- The supplied chapter excerpt does not provide diagnostic histologic or virologic criteria.
- Do not extrapolate the bacterial diagnostic algorithm to prove adenoviral disease.
- Its inclusion demonstrates that not all prostatic inflammation belongs to the four principal categories.

IgG4-associated prostatitis is another reported form

- IgG4-associated prostatitis is mentioned among other prostatitides.
- The text refers readers to its separate chapter on IgG4-associated disease.
- No quantitative tissue threshold or morphology rule is supplied in the prostate excerpt.
- An IgG4-associated label must not be inferred from generic inflammation alone.

All forms: A source-faithful comparison

Category	Hallmark context	Key discriminant
Acute bacterial	Fever, chills, dysuria	Tender boggy gland; urine culture
Chronic bacterial	Chronic / recurrent urinary issues	Same-organism UTIs; positive culture
Chronic abacterial	Chronic pelvic pain syndrome	Leukocytes; negative bacterial culture
Granulomatous	BCG, fungi, duct rupture	Etiologic history / granuloma context

Diagnostic reasoning checkpoints

Acute systemic syndrome?

Fever, chills, dysuria suggest an acute bacterial process

Clinical findings + urine culture

Support the diagnosis of acute bacterial prostatitis

Recurrent same-organism UTI?

Consider a persistent chronic bacterial prostatic reservoir

Pelvic pain + negative cultures?

Consider the chronic abacterial category

Granulomas or BCG exposure?

Interpret tissue response with treatment and immune history

Three categories with superficially similar dysuria

Patient scenario	Leading category	Why
Fever + chills + dysuria	Acute bacterial	Acute systemic presentation
Recurrent same-organism UTI	Chronic bacterial	Reservoir / recurrence
Pelvic symptoms; cultures negative	Chronic abacterial	No bacterial growth in described syndrome

Clinical reasoning: What cultures do—and do not—show

Positive culture

- Urine culture plus acute clinical features supports acute bacterial prostatitis.
- Positive bacterial culture is required in the chronic bacterial source definition.

Negative culture

- Negative bacterial cultures characterize chronic abacterial prostatitis in the excerpt.
- Culture negativity does not negate the documented leukocytic inflammation.

Diagnostic traps to avoid

Pathology interpretation depends on syndrome, culture, and exposure context.

- Do not biopsy a prostate when acute bacterial prostatitis is suspected.
- Do not equate chronic pelvic pain with culture-proven bacterial infection.
- Do not assume every granuloma is clinically significant or caused by BCG.

Integrated case review

Clinical stem

A patient with recurrent same-organism urinary infections later develops perineal discomfort. Another patient has pelvic pain, inflammatory expressed secretions and negative cultures.

What differentiates the two chronic syndromes?

- The first supports chronic bacterial prostatic persistence.
- The second matches chronic abacterial prostatitis.
- Bacterial culture and recurrent-infection history outrank symptom similarity.

Essential distinctions

Acute bacterial

Systemic syndrome + urine culture; Never biopsy acutely

Chronic syndromes

Recurrence and microbiology distinguish bacterial from abacterial

Granulomatous

Treatment history, immune state and duct rupture context matter

Primary reference and source boundaries

Core textbook source

Robbins, Cotran & Kumar: Pathologic Basis of Disease, 11th edition (2026).

Chapter 21, The Lower Urinary Tract and Male Genital System; Prostate — Inflammation, pp. 887–888.

Scope: prostate anatomy; acute and chronic bacterial prostatitis; chronic abacterial prostatitis; granulomatous, adenoviral and IgG4-associated forms.

Morphology drawings in this lecture are schematics, not patient specimens or textbook photomicrographs.