CHRONIC UTI Australia Inc.

Understanding Chronic UTI

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Version 4

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Contents

Introduction

Do you have recurrent urinary tract infections (UTIs) or do you live with persistent UTI symptoms with negative tests?

Maybe you've been told you're prone to bladder infections. Or perhaps you've been through years of specialists' appointments and tests, only to be diagnosed with an incurable 'urinary syndrome' with no known cause.

Another explanation is you could have a chronic UTI.

What is a chronic UTI?

Chronic UTI is caused by the parasitisation of bladder wall cells by intracellular microbes and microbial biofilms. Put simply, a chronic UTI is an embedded bladder infection.

It is a debilitating condition that affects mostly women. It also affects babies, children and men, but far less commonly.

A chronic UTI is related to the common 'garden variety' UTI most women are familiar with, but because the bacteria have become embedded in the bladder wall, it is much more difficult to diagnose and treat.

Because chronic UTI is almost impossible to pick up using current diagnostic guidelines, we believe it is a grossly underdiagnosed and widespread cause of persistent pelvic pain.

You can learn more about chronic UTI on page 6.

Chronic UTI is a debilitating condition that affects mostly women.

About us

Chronic UTI Australia grew organically from the experiences of a small group of Australian women who met online. Through sharing their stories of chronic UTI, and their difficulties getting appropriate diagnosis and treatment, they realised the number of people suffering with undiagnosed chronic UTI was much greater than previously understood.

After several years of networking with chronic UTI sufferers and international advocacy groups, we decided to form an Australian patient advocacy organisation dedicated to achieving better UTI diagnosis and treatment in Australia. We are also focused on encouraging and supporting Australian and international chronic UTI research.

Chronic UTI Australia became incorporated in 2018.

Our mission

Our mission is to put urinary tract infection (UTI) on Australia's public health agenda by advocating for awareness, recognition, education, research, and improved testing and treatment for ALL forms of UTI. Ultimately, we want to stop the underdiagnosis and inadequate treatment of UTI so that chronic UTI does not develop, cause needless suffering and destroy lives.

Our primary contacts

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Background

Half of all women will experience at least one UTI in their lifetime. This makes UTIs a significant public health issue, yet it is rarely spoken about.

UTIs are a significant public health problem

UTI is the second most common human bacterial infection, affecting more than 400 million people worldwide each year.[1] Half of all women will experience at least one UTI in their lifetime.[2] This makes UTIs a significant women's health issue, yet it is rarely spoken about.

UTIs are indiscriminate. They strike women of all ages, with a third occurring before the age of 24.[2] After an initial UTI, a quarter of women will have a recurrence within six months.[3] Having a history of one or more UTIs drives the risk of recurrence to 70% within the year.[3]

Antimicrobial resistance (AMR) is growing among all bacterial infections, including those causing UTI. There is now strong evidence that hospital admissions for serious UTIs are increasing in Australia and other countries. Although it is not yet understood why some people go on to develop recurrent or chronic UTI, researchers say inadequate, inappropriate or even delayed treatment of UTI could contribute to the likelihood of an acute UTI becoming chronic.

Although it appears that adult women are the predominant sufferers of chronic UTI, the condition can affect men and even children. See our page on chronic UTI in children: www.chronicutiaustralia.org.au/chronic-uti-in-children/

UTI testing and treatment hasn't progressed in over half a century

Treatment

Over the past 60 years, there have been no significant advances in UTI treatment. An estimated 25–35% of people treated according to current clinical guidelines have infections that fail to respond to treatment.[4] Despite this, there are no Australian guidelines advising doctors how to treat the subgroup of patients whose infection fails to respond.[5 6]

Some of these patients go on to develop a chronic form of UTI that features constant or intermittent lower urinary tract symptoms (LUTS). For reasons we outline later, they often experience these symptoms in the absence of positive results using UTI tests. Alternatively, others whose infections fail standard treatment will experience recurrent 'culture-proven' UTIs that, over time, increase in frequency and severity, often becoming harder to treat.

Ironically, instead of finding better outcomes for patients, there is concern among leading UTI experts that current practices designed to minimise antibiotic use for UTI—such as very short antibiotic courses and low dose prophylaxis—are fuelling an epidemic of recurrent and chronic UTI. As discussed in the following article, it is believed that the trend towards shorter treatments is resulting in a failure to fully eradicate acute infections and, in turn, could be contributing to the rise in AMR: www.theguardian.com/society/2019/oct/04/rise-in-persistent-urinary-tract-infections-could-be-linked-to-antibiotics-crackdown

Testing

Advances in UTI diagnostic methods have been equally lacking. For the past 30 years, researchers throughout the world have highlighted fundamental flaws in **antiquated UTI tests developed in the 1950s**. Urinary dipsticks, used by clinicians as a basic first-line diagnostic tool, are grossly insensitive and miss up to 70% of infections.[7 8 9] Midstream specimen urinary cultures (MSUs) performed in clinical labs fare no better, missing an alarming 50-80% of infections.[9 10]

There are no evidence-based guidelines for diagnosing and treating chronic UTI

It is common for patients with appropriate UTI symptoms to be told they do not have an infection because unreliable dipstick and/or culture tests return negative findings. These patients are commonly misdiagnosed with one of many incurable urinary syndromes in an attempt to explain their ongoing UTI symptoms. These diagnoses include overactive bladder (OAB), painful bladder syndrome/bladder pain syndrome/interstitial cystitis (PBS/BPS/IC) and urinary urge incontinence (UUI).

Urinary dipsticks, used by clinicians as a basic first-line diagnostic tool, are grossly insensitive and miss up to 70% of infections.

These diagnoses persist despite extensive evidence of the inadequacies of commonly used UTI tests; media stories about chronic UTI patients failed by current tests and treatments; and public recognition by the Urological Society of Australia and New Zealand (USANZ) usanz.org.au/info-resources/position-statements-guidelines/chronic-urinary-tract-infections and several prominent health professionals of the need for changes in UTI information, diagnostics and treatment, and better recognition and understanding of chronic, embedded infections. The following 2024 article written by prominent Australian health professionals highlights this: insightplus.mja.com.au/2024/30/its-time-we-recognised-chronic-urinary-tract-infection/

Apart from Chronic UTI Australia's website, accurate information about chronic UTI diagnosis and treatment is not available to Australian patients and most doctors. The various UTI guidelines that exist in Australia ignore the current scientific evidence about the failures of dipstick and culture tests; fail to offer evidence-based advice for doctors treating recurrent UTI; and fail to mention chronic UTI at all. Nor are there any clear referral pathways to evidence-based specialist treatment for the significant number of people who are failed by standard primary care diagnosis and treatment for UTI, and who often go on to develop life-changing chronic infections.

Chronic UTI Australia continues to advocate for nationally consistent, evidence-based guidelines for diagnosing and treating all forms of UTI, including chronic UTI, and for specialist treatment clinics for people who develop chronic and other difficult-to-treat UTIs.

Frequently asked questions

1. Who is likely to get a UTI?

Women are the most common group afflicted by UTIs. However, UTIs also affect babies, children, men and especially the elderly.

UTIs are common in otherwise healthy adult women, but there are some medical conditions that can increase their likelihood. These include diabetes, conditions causing immunosuppression, kidney and bladder stones, physical injuries impacting the spine/pelvis and conditions requiring catheterisation.[11]

1 in 2 WOMEN will experience a UTI in their lifetime

1 in 10 GIRLS will experience a UTI before the age of 16

1 in 20 MEN will experience a UTI in their lifetime

1 in 30 BOYS will experience a UTI before the age of 16

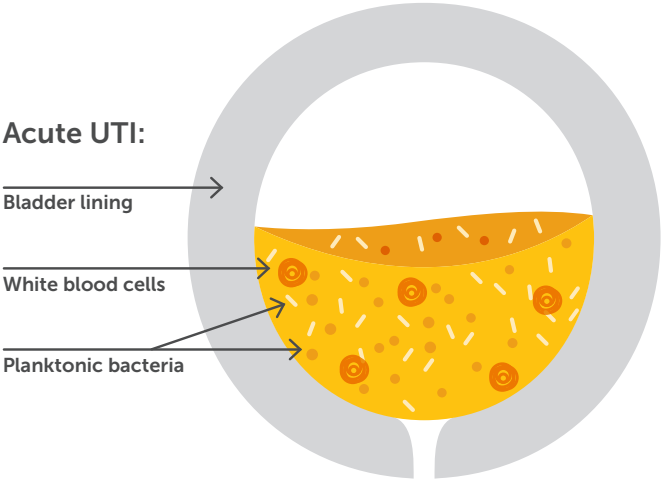
2. How is a chronic UTI different from an acute UTI?

An estimated 50% of all women will experience an acute UTI in their lifetime.[2] This means, even if you have not had a UTI yourself, someone close to you has. To explain the difference between an acute and chronic UTI, we need to delve into some science.

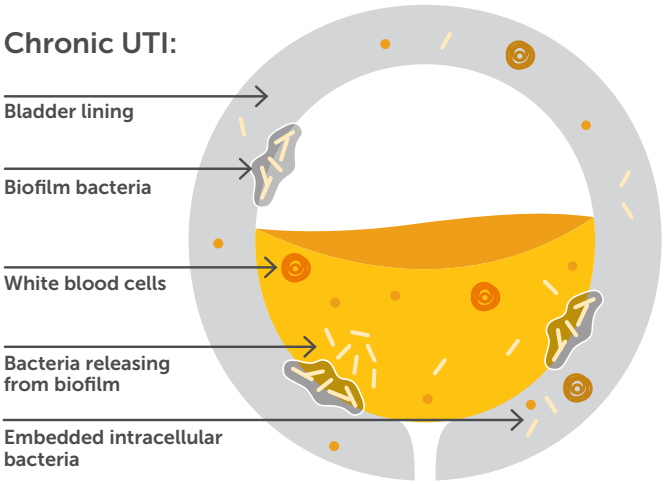
50%

of all women will experience an acute UTI in their lifetime

Acute UTI: During an acute UTI, pathogenic bacteria invade the urethra/bladder and multiply rapidly in the urine. This is known as a planktonic infection. An acute (planktonic) UTI will result in the sudden onset of one or more of the distressing UTI symptoms most Australian women are familiar with—painful urination (dysuria), urgency, extreme frequency, excruciating bladder/lower abdominal pain, lower back pain and, sometimes, cloudy, smelly or even blood in urine.



Chronic UTI: A chronic UTI often presents differently because the bacteria have become embedded within the lining of the bladder/urinary tract. Anyone who has an acute UTI is at risk of the infection becoming chronic. In fact, most people with a chronic UTI can clearly pinpoint the origins of their symptoms after an acute UTI did not fully resolve after treatment. This is because, in some circumstances when treating an acute UTI, bacteria can evade the host immunity or antibiotic attack. For safety, they cleverly burrow into the cells that form the bladder lining (known as the urothelium) and/or gather in tight clusters covered in a sticky substance called biofilm. Once embedded in the urothelium, the infection becomes increasingly difficult to diagnose using current testing tools and is challenging to treat.[12,13]



You can learn more about how chronic UTI develops here: www.chronicutiaustralia.org.au/chronic-uti/how-chronic-uti-forms/

3. What are the symptoms of chronic UTI?

Chronic UTI can present in several ways. It can occur as recurrent acute UTIs, often increasing in frequency and severity over time. Alternatively, chronic UTI can feature constant background urinary symptoms and acute attacks known as 'flares'. Chronic UTI symptoms can include some, or all, of the symptoms experienced during an acute UTI, along with persistent bladder/pelvic pain, urethral/vulval pain, overactive bladder, stress urinary incontinence, voiding problems and frequency symptoms. Typically, people with chronic UTI will suffer these painful, relentless and often debilitating symptoms for many years or even entire lifetimes.

You can see a list of the most common chronic UTI symptoms here: www.chronicutiaustralia.org.au/chronic-uti/chronic-uti-symptoms/

4. What tests are available to diagnose UTIs?

There are two tests currently used to diagnose UTIs that were developed and introduced in the 1950s—the urinary dipstick and the MSU culture.

Urinary dipsticks: The urinary dipstick is used by doctors as a basic first-line diagnostic tool. It is designed to pick up signs of an acute UTI, such as leukocyte esterase (signs of pus/white blood cells), nitrites (produced by some types of gram-negative bacteria) and blood. Urinary dipsticks have been widely discredited, with research showing they miss up to 70% of infections.[7 8 9] They can be useful in confirming a clearly positive acute infection, but dipsticks are ineffective at ruling out infection and should not ever be used for this purpose.

Midstream specimen urinary (MSU) culture: Urine cultures are performed in clinical labs to grow and identify the bacteria responsible for an infection. They are also used to determine any antibiotic resistance the identified bacteria may harbour.

The MSU culture was originally developed for research purposes to identify pyelonephritis (a kidney infection) —a much more severe and serious form of acute upper urinary tract infection— in a group of pregnant women.

Although the urine culture method, along with its set of arbitrary diagnostic thresholds, was never validated for diagnosing UTI, it somehow became adopted worldwide as the 'gold standard' tool for UTI diagnosis. For the past 30 years, researchers have been demonstrating that MSU culture tests are fundamentally flawed and miss 50–80% of UTIs.[10 11]

Traditionally, culture testing has been mostly satisfactory for the majority of uncomplicated, acute UTIs caused by Escherichia coli (E. coli), and several other known urinary pathogens. However, research shows this test fails to diagnose chronic UTI, complicated and polymicrobial UTIs, lower grade UTIs and infections caused by more recently recognised uropathogens.[14]

Molecular (DNA) testing: DNA-based molecular testing for diagnosing UTIs has generated interest in some circles because of its ability to identify all bacteria in a urine sample. There are now labs in Australia and around the world offering molecular testing for UTI.

The scientific community has not reached consensus on the value of DNA-based molecular testing in diagnosing UTIs. Some research experts are opposed to the commercial use of the test because of the existing lack of understanding of the urinary microbiome and the inability to describe the microbes truly responsible for health and disease (otherwise known as 'causation'). In Australia, anecdotal reports so far highlight difficulties for people finding practitioners who understand the test report and have specialist knowledge in treating chronic UTI.

Although it is still early days, it is hoped that molecular testing will one day allow the identification of a personalised healthy urinary microbiome and inform future treatment options.

Please visit: www.chronicutiaustralia.org.au for more information on UTI testing

Frequently asked questions

5. Why are there no tests to diagnose chronic UTI?

Compared with acute UTI, chronic UTI involves lower numbers of bacteria that invade the bladder lining and move in and out of a dormant (quiescent) state. These lower-level bacterial loads will most likely fall well below the thresholds set for diagnosing acute UTI and are interpreted as 'negative'.[12] Since chronic UTI is not a widely recognised condition, there has been no drive to introduce a suitable test to diagnose UTIs that fall outside the existing diagnostic criteria (which were originally developed for research to identify pyelonephritis in a group of pregnant women).

25–35% of people fail standard antibiotic treatment for acute UTI.

6. Is it true that urine is not sterile and what does this mean?

This is absolutely true. Urine is not sterile.[15] This discovery is proving to be one of the biggest myth busters of the 21st century when it comes to bladder health and disease. As recently as 2012, scientists in the United States discovered a residential microbial community within the bladders of healthy women—dubbed the female urinary microbiota (FUM). Using DNA testing, researchers were able to identify over 400 different bacterial species living in both healthy women and women with lower urinary tract symptoms. Some of these species are thought to be beneficial and perform a protective role within the bladder.

This discovery is important because the traditional understanding of urine infections, and the foundations UTI diagnostic methods are built on, assume healthy urine is sterile—and an isolated 'known' urinary pathogen cultured on a plate, is responsible for infection. This is no longer the case. The discovery of the urinary microbiota is forcing scientists, microbiologists and clinicians to re-think everything previously accepted about bladder health and disease, including what causes UTIs and other urinary disorders—such as interstitial cystitis/painful bladder syndrome/bladder pain syndrome (IC/PBS/BPS), overactive bladder syndrome (OAB) and urgency urinary incontinence (UUI)—and how these conditions are best diagnosed and treated.

7. Why do some people fail standard UTI treatment?

Scientists have not yet reached a consensus about why 25–35% of people with an acute UTI have infections that fail standard antibiotic therapy.[4] However, researchers have shown that bacteria, such as E. coli, are able to communicate between themselves via a process known as 'quorum sensing'. Such communication enables them to form biofilm-like intracellular bacterial communities early on during an acute infection (in as little as 12 hours), leaving behind a bacterial reservoir (also known as 'persisters') capable of seeding future acute attacks and/or ongoing lower urinary tract symptoms (LUTS).[16]

8. What treatment is available for chronic UTI?

Presently, full therapeutic dose antibiotic therapy for a protracted period is the only evidence-based and readily effective treatment for people diagnosed with chronic UTI.[17] Researchers are desperately searching for fast, effective, safe and affordable alternatives to traditional antibiotics.

Potential therapies to watch:

- Bacteriophage therapy (using viruses to attack pathogenic bacteria).
- Probiotics to return the urinary microbiota to a healthy state.
- New age vaccines with strategies that reprogramme the immune system to more effectively fight and fully clear invading bacteria in the urinary tract.
- Super-strength mannosides to stop bacteria from becoming embedded in the bladder wall.
- New nanoparticle technology that administers the antibiotic directly into the bladder where it can reach uropathogens protected by biofilm and/or hiding inside the cells that line the bladder.

9. What impact does chronic UTI have on people's lives?

Because chronic UTI is a poorly recognised condition that evades current tests, many people fail to achieve a proper diagnosis.

Commonly, people with chronic UTI are diagnosed with incurable urinary syndromes like interstitial cystitis/painful bladder syndrome/bladder pain syndrome (IC/PBS/BPS), overactive bladder syndrome (OAB) or urinary urge incontinence (UUI). Diagnosis of a urinary syndrome is usually made after patients have sought help from three to five different practitioners over a period of three to seven years.[18 19]

Chronic UTI is a debilitating condition. Many people with an untreated chronic UTI live with symptoms of distressing and incapacitating pain and constant urinary frequency and urgency —all of which significantly impact psychological and emotional health and wellbeing. If left untreated, chronic UTI ruins lives, relationships, self-confidence and the ability to work or study, be sexually intimate and manage families.

Our 2022/23 survey of more than 400 people with chronic UTI symptoms provides more information about the devastating impact of chronic UTI. The survey report can be accessed at www.chronicutiaustralia.org.au/survey/

10. What should you do if you think you have a chronic UTI?

In Australia, there are currently no tests or treatment guidelines for chronic UTI. Not all doctors recognise chronic UTI as a disease or know how to treat it, so practitioners often vary in their approach.

There are Australians being treated for chronic UTI who have proactively researched the disease and partner with their doctors to treat their embedded infection using antimicrobials, Traditional Chinese Medicine (TCM) or natural therapies.

You can talk to some of these people, and others who are researching and undergoing various therapies, in online support groups for chronic UTI. Please contact us for a current list.

You can read more from others who have cured their chronic UTI using a variety of approaches on the Chronic UTI Australia blog: www.chronicutiaustralia.org.au/blog/

We have also developed the Chronic UTI Worksheet to help you understand your chronic UTI symptoms and to prepare for an appointment with your doctor. You can download the worksheet here: www.chronicutiaustralia.org.au/new-chronic-uti-worksheet/

There is so much more to explore on our website. Visit us at www.chronicutiaustralia.org.au

And follow us on social media:

UTI research

Tarnished gold – the 'standard' urine culture: reassessing the characteristics of a criterion standard for detecting urinary microbes

July 2023

This article discusses the problems with current UTI testing and diagnosis and the importance of improving on techniques that have not changed in many decades. This outdated and simplistic approach to diagnosis is no longer appropriate, despite many continuing to argue that current UTI care is adequate.

www.frontiersin.org/journals/urology/articles/10.3389/fruro.2023.1206046/full

Alternative to prophylactic antibiotics for the treatment of recurrent urinary tract infections in women: multicentre, open label, randomised, non-inferiority trial

March 2022

This multicentre, randomised trial tested and compared the efficacy of methenamine hippurate (Hiprex) for prevention of recurrent UTI with the current standard prophylaxis of a daily low dose antibiotic. It was found that prophylactic treatment with methenamine hippurate could be appropriate for women with a history of recurrent episodes of UTI, given the demonstration of non-inferiority to daily antibiotic prophylaxis seen in this trial.

pmc.ncbi.nlm.nih.gov/articles/PMC8905684/

Cystitis Unmasked by James Malone-Lee

2021

Cystitis Unmasked is the first book of its kind to explain the history behind UTI diagnosis and treatment protocols and why this is causing harm to many. The book dispels age-old UTI myths and assumptions that are given, mostly unchallenged, in the form of facts, tips and advice by doctors, well-meaning friends and family and other trusted sources. It covers new ground-breaking research that has completely changed how the bladder and UTIs are understood. And most importantly, the book provides a practical path forward for clinicians to recognise and treat this neglected patient group. You can watch our 2021 interview with the late Professor Malone-Lee on our YouTube channel:
www.youtube.com/watch?v=5RmbLcXKMvI
www.tfmpublishing.com/cystitis-unmasked

Urine trouble: should we think differently about UTI?

February 2018

This opinion piece discusses how current standards for diagnosing UTIs have significant limitations since the discovery of the female urinary microbiota (FUM), and the new understanding that urine is not sterile. The paper discusses the four identified major limitations that need urgent revision as being: 1) the language of UTI; 2) UTI diagnostic testing; 3) the Escherichia coli-centric view of UTI; and 4) the colony-forming units (CFU) threshold-based diagnosis. The paper concludes by encouraging clinicians to learn new methods of interpretation of UTI testing, highlighting that clinical judgement will remain a valued tool in patient care and long-held clinical patterns need to be stopped to improve patient care.

www.ncbi.nlm.nih.gov/pubmed/29279968

Reassessment of routine midstream culture in diagnosis of urinary tract infection

March 2019

Midstream urine (MSU) culture remains the gold standard diagnostic test for confirming UTI. This study was conducted on urine specimens from 33 patients with LUTS attending their first clinical appointment, 30 LUTS patients on treatment whose symptoms had relapsed and 29 asymptomatic controls. The outcome shows that the routine MSU culture, adopting the UK interpretation criteria tailored to acute UTI, failed to detect a variety of bacterial species, including recognised uropathogens. Moreover, the diagnostic MSU culture was unable to discriminate between patients and controls and may be unsuitable for excluding UTI in patients with LUTS.

journals.asm.org/doi/10.1128/jcm.01452-18

Recalcitrant chronic bladder pain and recurrent cystitis but negative urinalysis: What should we do?

January 2018

This widely accessed study covers a large case series of 624 women, spanning data collected over 10 years. Patients in the study with chronic LUTS and pyuria (pus cells) experienced symptom regression (improvement) and a reduction in urinary tract inflammation (pus cells) after extended antimicrobial therapy. Disease regression was achieved with a low frequency of adverse effects and no increase in antibiotic resistance.

link.springer.com/article/10.1007/s00192-018-3569-7

Intracellular bacterial communities: a potential etiology for chronic lower urinary tract symptoms

July 2015

This review examines the emerging evidence of intracellular bacterial communities (IBC) in occult and recurrent UTI. The bacteria invade the cells in the bladder wall and form biofilm-like IBC in patients with chronic LUTS and negative cultures.

www.ncbi.nlm.nih.gov/pmc/articles/PMC4617679/

The female urinary microbiota, urinary health and common urinary disorders

January 2017

In this review, Dr Linda Brubaker and Prof Alan Wolfe provide clinical context and updated information regarding the female urinary microbiota (FUM). They describe the distinct characteristic of these microbial communities in health and dysbiosis, and the growing evidence that FUM may be useful to help advance prevention, diagnosis and treatment of common lower urinary tract disorders in women. The review suggests adopting enhanced culturing techniques in clinical labs to more accurately diagnose UTIs. Better understanding of the FUM will potentially allow clinicians and patients to appropriately modify and improve treatment for lower urinary tract disorders without antibiotic use in the future.

atm.amegroups.com/article/view/13209/13677

Importance of biofilms in urinary tract infections: new therapeutic approaches

March 2014

This review examines the role biofilm plays in persistent UTI and prostatitis. It discusses the difficulties in eradicating biofilm infections and looks at new therapeutic approaches, including nanoparticles, biofilm enzyme inhibitors, bacteriophages, low-energy surface acoustic waves and the urgent need for new antimicrobial drugs to inhibit bacterial virulence and biofilm formation.

www.hindawi.com/journals/ab/2014/543974/

Bad bugs and beleaguered bladders: Interplay between uropathogenic Escherichia coli and innate host defences

August 2000

This early study describes how strains of uropathogenic Escherichia coli (UPEC) can evade host defences in the urinary tract by attaching to the bladder epithelial cells. Here, they can replicate or persist in a quiescent state. The invasion of the cells can trigger immune responses such as cytokine production, inflammation and the exfoliation of infected bladder wall cells (urothelial cell shedding). Despite host defences and antibiotic treatment, these bacteria can persist within the bladder tissue and possibly serve as a reservoir for recurrent UTIs.

www.ncbi.nlm.nih.gov/pmc/articles/PMC34019/

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Glossary

Biofilm	*Cooperative communities of microorganisms that live together and are covered in a sticky substance protecting them from attack by the host's immune system and/or antibiotics.*
Chronic UTI	*Also known as **recalcitrant UTI**, **recurrent UTI (rUTI)**. A medical condition where bacteria have become embedded in the lining of the bladder/urinary tract (urothelium), with the ability to continue seeding infections that cause acute UTIs or constant lower-level urinary symptoms.*
Cystoscopy	*A medical procedure where a thin tube and a camera is inserted into the bladder through the urethra to look for abnormalities.*
Cytokine production	*Molecules that assist in the immune response by stimulating the movement of cells towards host-recognised inflammation, infection and trauma.*
Female urinary microbiota (FUM)	*A naturally occurring residential bacterial community found in the bladder which is thought to be connected to bladder health and disease.*
Dipsticks (urinary)	*A basic first-line diagnostic tool used by practitioners to determine pathological changes in urine.*
Intracellular bacterial communities (IBC)	*Complex bacterial communities that invade bladder wall cells, forming biofilm-like properties to withstand immune and antibiotic attack. IBCs act as reservoirs with an ability to reinfect the host.*
Leucocytes	*Also known as **white blood cells (WBC)**, **pus cells**, **pyuria**. Leucocytes are produced by the body's immune system to fight host-recognised infection.*
Lower urinary tract symptoms (LUTS)	*A term used to describe a collective of common symptoms related to problems of the lower urinary tract (bladder, prostate and urethra).*
Midstream specimen of urine (MSU) Test	*A gold standard test used by labs to diagnose UTI by detecting the growth of urinary bacteria on agar plates using specific growing conditions and thresholds.*
Shedding (epithelial cell)	*Also known as **exfoliation**, **sloughing**. A naturally occurring first-line defence mechanism to rid the bladder lining of low-grade infection by invading pathogens.*
Urinary dysbiosis	*A form of microbial imbalance within the natural female urinary microbiota (FUM), resulting in urinary symptoms.*
Urinary syndromes / Disorders	*A range of conditions featuring common urinary symptoms with an unknown cause or origin—such as interstitial cystitis/painful bladder syndrome (IC/PBS), overactive bladder (OAB), urinary urge incontinence (UUI), urethral syndrome.*
Urinary tract infection (UTI)	*Also known as **cystitis**, **bladder infection**, **acute UTI**, **kidney infection**, **pyelonephritis**. An infection of the urinary tract. Lower UTI involves the bladder/urethra/prostate. Upper UTI involves the ureters/kidneys (pyelonephritis).*
Uropathogens	*A microorganism that is known to be capable of causing disease of the urinary tract.*
Urothelial cells / Epithelial cells / Urothelium	*Microscopic cells that line the inside of the urinary tract, including the renal pelvis, ureters, bladder and parts of the urethra.*

Further information and important links

Chronic UTI information that can be shared with your doctor

Chronic UTI Australia website
www.chronicutiaustralia.org.au

Chronic UTI picture commentary developed by Professor James Malone-Lee www.chronicutiaustralia.org.au/wp-content/uploads/2018/08/00-Chronic-urinary-infection-Picture-Commentary-August-2018.pdf

Cystitis Unmasked by Professor James Malone-Lee (2021)
www.tfmpublishing.com/cystitis-unmasked

Confronting the urinalysis tyrant, BJGP Life (2021)
www.bjgplife.com/confronting-the-urinalysis-tyrant/

'Battler's disease': UTI sufferers' plight relegated by medicos, The Weekend Australian Magazine
www.chronicutiaustralia.org.au/wp-content/uploads/2024/04/The-Weekend-Australian.3Feb2024.pdf

Chronic UTIs and test flaws overlooked in 'archaic' guidelines: urologists, Australian Doctor News www.chronicutiaustralia.org.au/wp-content/uploads/2024/04/230224-AusDoc-cUTI.pdf

'Aussie women struggling to have chronic UTI treated', The Project (2024) www.youtube.com/watch?v=OGpGs6wpXMM

'Agony and the urge to pee: the growing evidence giving hope to chronic UTI sufferers' (2024) www.theguardian.com/australia-news/article/2024/jun/02/agony-and-the-urge-to-pee-the-growing-evidence-giving-hope-to-chronic-uti-sufferers

Professor James Malone-Lee's Australian interview on chronic urinary tract infection (2021) www.youtube.com/watch?v=5RmbLcXKMvI&t=166s

Urinary Tract Infections: 3 facts about UTIs you MUST know (2023) www.youtube.com/watch?v=OGOfF-2oYdU

'Hearing Patient Voices' chronic UTI quality-of-life survey report (2023) www.chronicutiaustralia.org.au/wp-content/uploads/2023/05/Hearing-Patient-Voices-Survey-Report.2023.pdf

Urinary Tract Infection factsheet (2024)
www.chronicutiaustralia.org.au/wp-content/uploads/2024/02/The-Urinary-Tract-Infection-UTI-Factsheet-February-2024.pdf

MJA Insight article (2024) insightplus.mja.com.au/2024/30/its-time-we-recognised-chronic-urinary-tract-infection/

Chronic UTI Worksheet (2024)
www.chronicutiaustralia.org.au/new-chronic-uti-worksheet/

More information

www.chronicutiaustralia.org.au

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Notes

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