



PRACTICE

10-MINUTE CONSULTATION

A likely urinary tract infection in a pregnant woman

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A 27 year old pregnant woman of 28 weeks' gestation complains that she is urinating more often and that it is painful. She is worried that she might have an infection. A urine dipstick test indicates the presence of nitrites, leucocytes, and microscopic haematuria.

Urinary tract infection (UTI) in pregnancy is the most common non-obstetric indication for antenatal admission.¹ UTIs can cause morbidity such as preterm labour, sepsis, and adult respiratory distress syndrome, and can cause mortality if left untreated.^{2,3} Lower urinary tract infection occurs in approximately 1-4% of pregnancies, while upper tract infection (pyelonephritis) occurs in 0.5-2% of pregnant women.⁴

What you should cover

Find out how the woman's pregnancy is progressing and whether there is anything that she is particularly worried about.

- **Fetal wellbeing**—Ask about fetal health and movements. Maternal systemic illness can affect fetal wellbeing.
- **Current urinary symptoms**—Ask about symptoms such as dysuria, urinary frequency, urgency and abdominal pain. These symptoms may also be present in pregnant women without a UTI and are difficult to differentiate in the absence of urine analysis.
- **Associated urinary features**—Ask about suprapubic pain and haematuria, which may indicate urinary retention or calculi.
- **History of previous UTIs**—Women with a history of a previous UTI are more likely to have a recurrence, especially during pregnancy.
- **Coexisting vaginal discharge**—This may suggest an alternative or coexisting diagnosis. For example, some women with bacterial vaginosis or sexually transmitted infections such as chlamydia may have similar symptoms

to a UTI (such as dysuria), so a brief sexual history should be taken.

- **Associated systemic symptoms**—Ask about fever, rigors, flank tenderness, nausea and vomiting, anorexia, or altered mental status which may indicate sepsis.
- **Relevant medical history**—Ask about conditions likely to lead to recurrent infection (neurological such as spinal injury, metabolic such as diabetes, gynaecological disease, or immunosuppression).⁵

What you should do

Examination

Look for signs associated with sepsis:

- Record temperature, pulse, respiratory rate, oxygen saturations if available, and blood pressure.
- Perform an abdominal examination to elicit loin, groin, or suprapubic tenderness, which may indicate urinary tract calculi or upper tract infection.
- Auscultate the fetal heart rate and refer for formal cardiotocography and assessment in secondary care if abnormal (normal range 100-160 bpm) because maternal systemic infection can cause fetal tachycardia. The fetal heart can be auscultated from the 12th week of gestation with a sensitivity of 80%.

Investigations and management

Figure 1⇓ suggests an approach to the management of UTI in pregnancy.

- If the patient has signs of sepsis or systemic illness, she should be referred urgently to secondary care for intravenous antibiotics. Figure 2⇓ lists antibiotics

What you need to know

- Pregnant women with lower urinary tract infections are at increased risk of pyelonephritis, resulting in preterm delivery and low fetal birth weight
- Antibiotic treatment taken for at least seven days reduces these risks
- Pregnant women with sepsis or recurrent urinary tract infection should be referred to secondary care

commonly used for UTIs and their safety profile in pregnancy.⁷

- Send a urine culture in all women.
- For pregnant women with suspected UTI who do not have signs of systemic illness, start treatment with a seven day course of an appropriate antibiotic (shorter courses may be ineffective).^{8,9} When initiating treatment, follow local antibiotic guidelines, which take into account common pathogens and resistance patterns (figs 2 and 3⇓).
- If treatment for infection is commenced in the absence of a microbiological diagnosis, follow up the results in case resistant pathogens are found to be the cause. For lower urinary tract infections in women before 36 weeks' gestation, a seven-day course of nitrofurantoin is a reasonable first choice.^{12,13}
- *Escherichia coli* is the most common organism responsible for causing UTI in pregnancy
- If pain is the predominant symptom or subsequent culture reveals an atypical bacteria such as *Proteus* or *Klebsiella* species then consider the presence of urinary tract calculi.¹⁴ The first line investigation in this scenario is an ultrasound scan of the urinary tract.¹⁵
- Encourage pregnant women to re-attend if initial treatment is not successful.
- Treatment of patients with asymptomatic bacteriuria (a positive culture without symptoms) is controversial as these women may be managed differently (see box 1).
- An issue relevant to primary care is group B streptococcal infection in pregnancy, which is associated with chorioamnionitis and neonatal disease.¹⁹ Women with group B streptococcal bacteriuria should receive a treatment course of antibiotics for seven days at the time of diagnosis and intrapartum antibiotic prophylaxis consisting of a loading dose of benzylpenicillin followed by four-hourly doses for the duration of labour.²⁰

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Box 1: Controversies in managing pregnant women with asymptomatic bacteriuria

- Asymptomatic bacteriuria is defined as a positive urine culture in the absence of urinary symptoms
- The National Institute for Health and Care Excellence (NICE) recommends screening at the initial antenatal appointment in the form of urine analysis and culture,¹⁶ but this has been questioned on grounds of efficacy¹⁷ and cost¹⁸
- The evidence that NICE used to recommend this policy is limited and of poor quality¹²
- Current guidelines recommend a repeat culture if the first is positive and then use this to decide on treatment,⁸ but adherence to such guidance is low¹⁸
- Length of treatment is also controversial; both 4 and 7 day courses are considered efficacious¹⁵

Implications for resource poor settings

- It may be prudent to treat patients based on dipstick tests or clinical suspicion when patients have travelled from afar and are not able to return for test results
- The recommendation⁸ that treatment should be delayed in favour of a second urine culture may not be feasible

Education into practice

Audit—In what proportion of women with symptomatic UTI in pregnancy have you or your organisation prescribed a seven day course of antibiotics?

Practice—Do you routinely send away an urine culture for pregnant women with symptoms suggestive of UTI?

How patients were involved in the creation of this article

No patients were involved in the creation of this article.

Figures

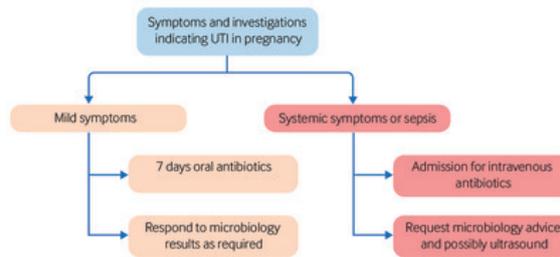


Fig 1 Suggested approach to the management of urinary tract infection (UTI) in pregnancy in women who have no signs of fetal compromise⁶

Antibiotic (group)*	Trimester 1	Trimester 2	Trimester 3	Term	Breast feeding
Trimethoprim	Avoid Teratogenic	Safe	Safe	Safe	Safe in short term
Nitrofurantoin	Safe	Safe	Safe	Avoid Risk of haemolysis	Avoid Risk of haemolysis
Cefalexin (cephalosporin)	Safe	Safe	Safe	Safe	Safe
Amoxicillin (penicillin)	Safe	Safe	Safe	Safe	Safe
Gentamicin (aminoglycoside)†	Avoid Nerve damage	Avoid Nerve damage	Avoid Nerve damage	Avoid Nerve damage	No data
Ciprofloxacin (quinolone)	Avoid Arthropathy	Avoid Arthropathy	Avoid Arthropathy	Avoid Arthropathy	Avoid Manufacturer advice
Meropenem (carbapenem)	No data	No data	No data	No data	Avoid Manufacturer advice
Fosfomycin	Caution Manufacturer advice				

*Safety advice from *British National Formulary (BNF)*.

†Gentamicin should be avoided unless essential according to *BNF* but has been used in pregnancy without ototoxicity. A multi-dose regimen and rigorous monitoring of serum levels is required.

Fig 2 Safety profile of antimicrobials used in pregnancy

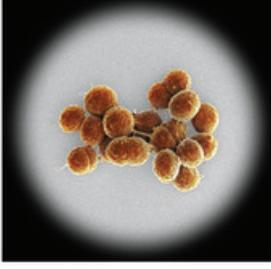
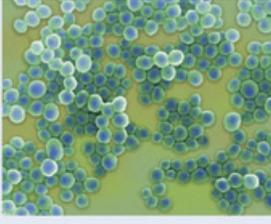
Organism		Gram stain
<i>Escherichia coli</i>		Negative
<i>Klebsiella pneumoniae</i>		Negative
<i>Proteus mirabilis</i>		Negative
<i>Enterococcus</i>		Positive
<i>Staphylococcus saprophyticus</i>		Positive
<i>Group B streptococcus</i>		Positive

Fig 3 Common pathogens in community acquired urinary tract infection (UTI) and their Gram stain status^{10 11}