Management of Acute Pyelonephritis in Adults in Primary Care

Covers all Non-pregnant Adults (over 16 years) - COMPLICATED UTI

Acute pyelonephritis is caused by infection within the renal pelvis, with or without active infection of the renal parenchyma. In most people, it is caused by bacteria ascending from the lower urinary tract.

- There are no clinical features or routine investigations that conclusively distinguish acute pyelonephritis from a lower UTI.
- Suspect pyelonephritis if patient has symptoms of UTI accompanied by loin pain and/or fever.
- Typical symptoms of a UTI include:
  - dysuria
  - urgency
  - frequency
  - polyuria
  - suprapubic tenderness
  - haematuria
- In the absence of more sensitive clinical features or practical clinical tests, experts recommend diagnosing acute pyelonephritis based on evidence of a UTI in a person with loin pain or a temperature over 38°C.
- Consider and exclude other causes of loin pain and/or fever including:
  - Pelvic inflammatory disease
  - Appendicitis
  - Renal calculi
- Maintain full hydration — advise sufficient fluid intake to ensure frequent passage of pale-coloured urine, although care should be taken with those on restricted fluid intakes.
- If no response to antibiotics after 24 hours and patient unwell consider admission.

### Antibiotic Dosage

<table>
<thead>
<tr>
<th>Acute pyelonephritis CKS</th>
<th>Antibiotic</th>
<th>Dosage</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ciprofloxacin</td>
<td>500 mg BD</td>
<td>7 days</td>
</tr>
<tr>
<td></td>
<td>or co-amoxiclav</td>
<td>500/125 mg TDS</td>
<td>7 days</td>
</tr>
<tr>
<td></td>
<td>trimethoprim 200 mg BD</td>
<td>14 days</td>
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A urine sample should be taken for culture before starting antibiotics.

Symptoms can be relieved with paracetamol or ibuprofen.

Empirical treatment should be as the table below — do not usually wait for culture result.

Review after 24 hours (or according to the clinical situation) to check response to treatment and the urine culture results. If no response consider admission.

If urine culture shows that the organism is resistant to the current antibiotic, change to an antibiotic to which the organism is sensitive, choosing the most suitable antibiotic with the lowest *Clostridium difficile* infection risk.

If symptoms then recur, treat with an antibiotic shown to cover the infecting organism choosing the most suitable antibiotic with the lowest *C. difficile* infection risk.

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Supporting Information—Pyelonephritis

Risks of Pyelonephritis
Complications of acute pyelonephritis include:
- Impaired renal function or renal failure, due to bacterial damage of the renal parenchyma.
- Septicaemia.

The risk of developing a complication is increased in people with:
- Severe illness, including hypotension, tachycardia, reduced levels of consciousness, or dehydration.
- People older than 65 years of age.
- Abnormalities of renal tract anatomy and function (such as vesico-ureteric reflux, polycystic kidney disease).
- Foreign body within the renal tract, including renal stones and urinary, ureteric, or nephrostomy catheters.
- Immune compromise, due to immunosuppressant drug use, cancer, cancer therapies, or AIDS.
- Diabetes.
- Persistent infection despite treatment.

Urine Sampling
- Antiseptic leads to false negatives.
- Refrigerate specimens to prevent bacterial overgrowth.

Males:
- A clean-catch, mid-stream urine (MSU) sample is ideal:
  - This requires the man to start urinating then, about half way through and without interrupting the flow, collecting a sample of approximately 10 mL urine into a sterile specimen container.
  - A fresh-voided specimen is probably adequate if an MSU is not practical.
- Uncircumcised men are usually advised to withdraw the prepuce and clean the glans penis before collecting the sample. However, if this is not done, the sample is probably adequate.

Females:
- The specimen should be mid-stream.
- Cleansing with water and holding the labia apart are not essential.

Catheterised patients
Also refer to guidance on the management of UTIs in catheterised adults for further information on sampling etc. However treatment for suspected pyelonephritis in a patient with a catheter should be as overleaf.

If catheter has been in situ more than 2 weeks—change catheter whilst taking antibiotics sensitive to organism. Patient should have received a minimum of 3 days treatment before catheter is changed.

Interpreting a culture result
The following usually indicates UTI in a patient with urinary symptoms. Higher counts have even higher positive predictive values:
- Single organisms ≥ 10^4 colony forming units (CFUs)/mL.
- Mixed growths' indicates perineal contamination which reduces the significance of the culture. If a culture is still required an MSU should be repeated.
- Culture results should be interpreted in the light of near patient dipstick testing.

Microscopy
Microscopy is not available for the diagnosis of UTI except in children <3years to comply with NICE guidelines.
- Use near patient testing with dipsticks to assess likelihood of UTI, they are as sensitive and specific as microscopy for predicting the presence of infection.
- Urine microscopy is only performed for ?glomerulonephritis, SLE, endocarditis, haematuria, casts, crystals, candiduria and schistosomiasis and must be specifically requested with the relevant clinical details.

Prevention and Maintaining Adequate Hydration
The urine colour chart to the right is a simple tool that can be used to assess if patients are drinking enough fluids throughout the day to stay hydrated.

Care should be taken for those patients for whom fluid restriction is required.

If urine matches the colours numbered 1, 2, or 3 they are hydrated.

If urine matches the colour numbered 4 through 8 they are dehydrated and need to drink far more fluid.

Some medicines and vitamins can discolour urine.

Whilst drinking more water may encourage patients to go to the toilet more often, achieving a healthy toilet function for patients can result in fewer soiling incidents, prevention of urinary tract infections, less need for time-consuming enemas and less need for laxative products.

Many older people are loath to drink during the evening to eliminate the need to go to the toilet during the night.

Evidence shows, however, that the restriction of overall fluid intake does not reduce urinary incontinence frequency or severity.