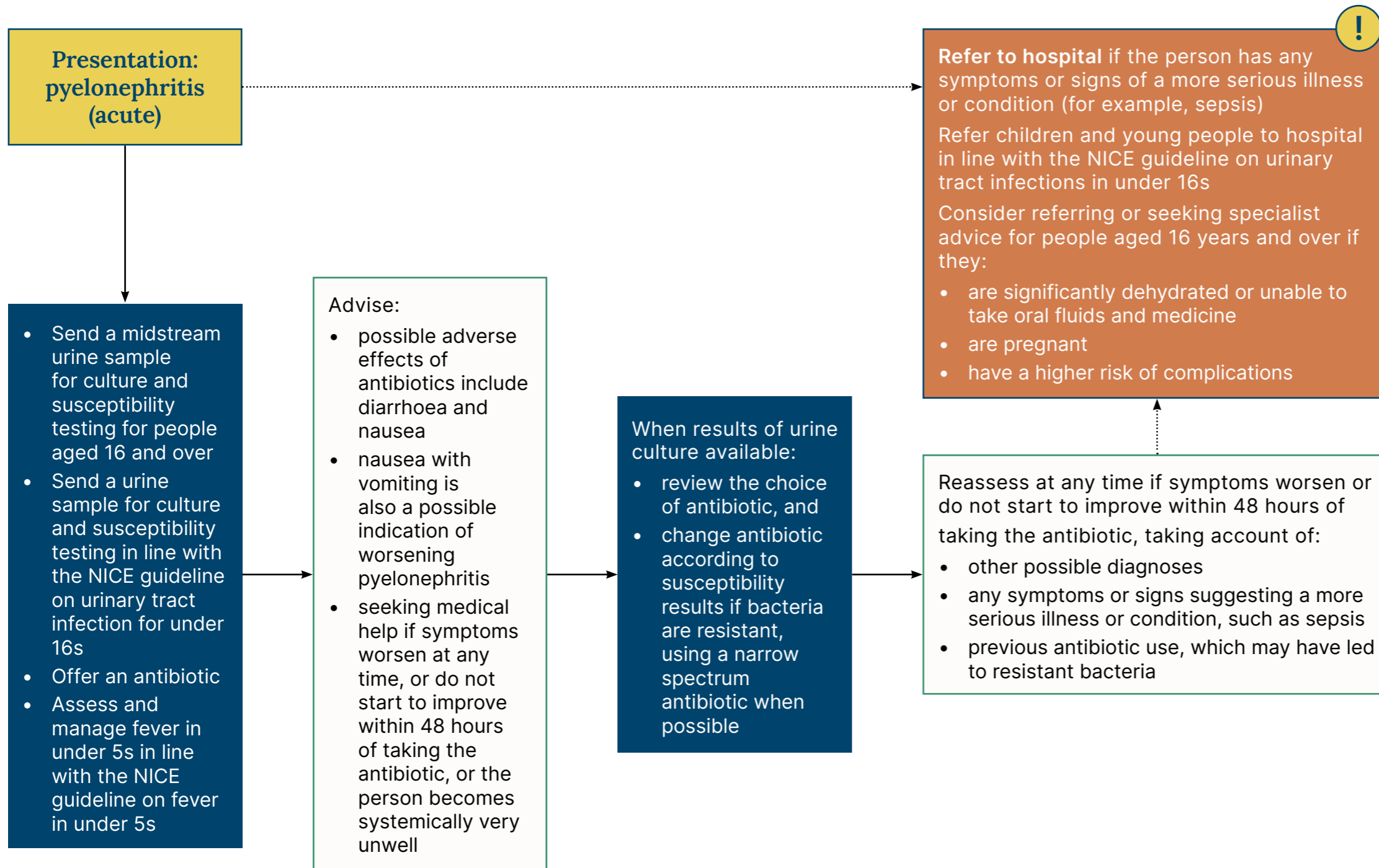


Pyelonephritis (acute): antimicrobial prescribing



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Background

- Pyelonephritis is an infection of one or both kidneys caused by bacteria travelling up from the bladder
- People at higher risk of complications include those with abnormalities of the genitourinary tract or underlying disease (such as diabetes or immunosuppression)

Self-care


- Advise paracetamol for pain, with possible addition of a low-dose weak opioid such as codeine for people over 12 years
- Advise drinking enough fluids to avoid dehydration

Antibiotics


- When prescribing antibiotics, take account of severity of symptoms, risk of complications, previous urine culture and susceptibility results, previous antibiotic use which may have led to resistant bacteria and local antimicrobial resistance data
- Give oral antibiotics first-line if people can take oral medicines, and the severity of their condition does not require intravenous antibiotics
- Review intravenous antibiotics by 48 hours and consider stepping down to oral antibiotics where possible

Pyelonephritis (acute): antimicrobial prescribing

Choice of antibiotic for non-pregnant women and men aged 16 years and over

Antibiotic	Dosage and course length
First-choice oral antibiotics	
Cefalexin	500 mg twice or three times a day (up to 1 to 1.5 g three or four times a day for severe infections) for 7 to 10 days
Co-amoxiclav (only if culture results available and susceptible)	500/125 mg three times a day for 7 to 10 days
Trimethoprim (only if culture results available and susceptible)	200 mg twice a day for 14 days
Ciprofloxacin (only if other first-choice antibiotics are unsuitable) 	500 mg twice a day for 7 days

First-choice intravenous antibiotics (if vomiting, unable to take oral antibiotics, or severely unwell). Antibiotics may be combined if susceptibility or sepsis is a concern

Co-amoxiclav (only in combination or if culture results available and susceptible)	1.2 g three times a day
Cefuroxime	750 mg to 1.5 g three or four times a day
Ceftriaxone	1 to 2 g once a day
Gentamicin	Initially 5 mg/kg to 7 mg/kg once a day, subsequent doses adjusted according to serum gentamicin concentration
Amikacin	Initially 15 mg/kg once a day (maximum per dose 1.5 g once a day), subsequent doses adjusted according to serum amikacin concentration (maximum 15 g per course)
Ciprofloxacin (only if other first-choice antibiotics are unsuitable) 	400 mg twice or three times a day


Second-choice intravenous antibiotics: consult local microbiologist

Choice of antibiotic for pregnant women aged 12 years and over

Antibiotic	Dosage and course length
First-choice oral antibiotic	
Cefalexin	500 mg twice or three times a day (up to 1 to 1.5 g three or four times a day for severe infections) for 7 to 10 days
First-choice intravenous antibiotic (if vomiting, unable to take oral antibiotics, or severely unwell)	
Cefuroxime	750 mg to 1.5 g three or four times a day
Second-choice antibiotics or combining antibiotics if susceptibility or sepsis a concern: consult local microbiologist	

Notes

For **all antibiotics**: see [BNF](#) for appropriate use and dosing in specific populations, for example, hepatic impairment, renal impairment, breastfeeding, and administering intravenous antibiotics. Check any previous urine culture and **susceptibility results** and antibiotic prescribing, and choose antibiotics accordingly.

 **Warning:** for **ciprofloxacin**, see the [MHRA January 2024 advice for restrictions and precautions for using fluoroquinolone antibiotics](#) because of the risk of disabling and potentially long-lasting or irreversible side effects. These fluoroquinolones must now only be prescribed when other commonly recommended antibiotics are inappropriate.

For **intravenous antibiotics**: review by 48 hours and consider stepping down to oral antibiotics where possible.

For **gentamicin** and **amikacin**: therapeutic drug monitoring and assessment of renal function is required for adjusting doses (see [BNF information on gentamicin](#) and [BNF information on amikacin](#)).

Pyelonephritis (acute): antimicrobial prescribing

Choice of antibiotic for children and young people under 16 years

Antibiotic	Dosage and course length
Refer children under 3 months to paediatric specialist and treat with intravenous antibiotics in line with the NICE guideline on fever in under 5s	
Children aged 3 months and over: first-choice oral antibiotics	
Cefalexin	3 to 11 months, 12.5 mg/kg or 125 mg twice a day for 7 to 10 days (25 mg/kg two to four times a day [maximum 1 g per dose four times a day] for severe infections) 1 to 4 years, 12.5 mg/kg twice a day or 125 mg three times a day for 7 to 10 days (25 mg/kg two to four times a day [maximum 1 g per dose four times a day] for severe infections) 5 to 11 years, 12.5 mg/kg twice a day or 250 mg three times a day for 7 to 10 days (25 mg/kg two to four times a day [maximum 1 g per dose four times a day] for severe infections) 12 to 15 years, 500 mg twice or three times a day (up to 1 to 1.5 g three or four times a day for severe infections) for 7 to 10 days
Co-amoxiclav (only if culture results available and susceptible)	3 to 11 months, 0.25 ml/kg of 125/31 suspension three times a day for 7 to 10 days (dose doubled in severe infection) 1 to 5 years, 0.25 ml/kg of 125/31 suspension or 5 ml of 125/31 suspension three times a day for 7 to 10 days (dose doubled in severe infection) 6 to 11 years, 0.15 ml/kg of 250/62 suspension or 5 ml of 250/62 suspension three times a day for 7 to 10 days (dose doubled in severe infection) 12 to 15 years, 250/125 mg or 500/125 mg three times a day for 7 to 10 days
Children aged 3 months and over: first-choice intravenous antibiotics (if vomiting, unable to take oral antibiotics or severely unwell). Antibiotics may be combined if susceptibility or sepsis a concern	
Co-amoxiclav (only in combination or if culture results available and susceptible)	3 months to 15 years, 30 mg/kg three times a day (maximum 1.2 g three times a day)
Cefuroxime	3 months to 15 years, 20 mg/kg three times a day (maximum 750 mg per dose), increased to 50 to 60 mg/kg three or four times a day (maximum 1.5 g per dose) for severe infections
Ceftriaxone	3 months to 11 years (up to 50 kg), 50 to 80 mg/kg once a day (maximum 4 g per day); 9 to 11 years (50 kg and above), 1 to 2 g once a day; 12 to 15 years, 1 to 2 g once a day
Gentamicin	Initially 7 mg/kg once a day, subsequent doses adjusted according to serum gentamicin concentration
Amikacin	Initially 15 mg/kg once a day, subsequent doses adjusted according to serum amikacin concentration

Children aged 3 months and over: for second-choice intravenous antibiotics, consult a local microbiologist

Notes

For **all antibiotics**: see [BNF for children](#) (BNFC) for appropriate use and dosing in specific populations, for example, hepatic impairment, renal impairment, and administering intravenous antibiotics. If a young woman is pregnant, refer to the prescribing table on choice of antibiotic for pregnant women aged 12 years and over. The age bands apply to children of average size and, in practice, the prescriber will use the age bands in conjunction with other factors such as the severity of the condition being treated and the child's size in relation to the average size of children of the same age. Check any previous urine culture and **susceptibility results** and antibiotic prescribing, and choose antibiotics accordingly.

For **intravenous antibiotics**: review by 48 hours and consider stepping down to oral antibiotics where possible for a total of 10 days. If intravenous treatment is not possible, consider intramuscular treatment, if suitable.

For **gentamicin** and **amikacin**: therapeutic drug monitoring and assessment of renal function is required for adjusting doses (see [BNFC information on gentamicin](#) and [BNFC information on amikacin](#)).