Pneumonia (community-acquired): antimicrobial prescribing

NICE National Institute for Health and Care Excellence

Severity of pneumonia

In adults, severity is assessed by clinical judgement guided by mortality risk score (CRB65 or CURB65):

- **low severity - CRB65 score 0 or CURB65 score 0 or 1**
- **moderate severity - CRB65 score 1 or 2 or CURB65 score 2**
- **high severity - CRB65 score 3 or 4 or CURB65 score 3 to 5**

In children and young people, severity is assessed by clinical judgement.

Prescribing considerations

When choosing an antibiotic(s), take account of:

- **the severity assessment (adults), or the severity of symptoms or signs (children and young people); see above**
- **the risk of complications, for example, a relevant comorbidity (such as severe lung disease or immunosuppression)**
- **local antimicrobial resistance and surveillance data (such as flu and *Mycoplasma pneumoniae* infection rates)**
- **recent antibiotic use**
- **previous microbiological results, including colonisation with multi-drug resistant bacteria**

Give oral antibiotics first line if possible

Review intravenous antibiotics by 48 hours and consider switching to oral antibiotics if possible

September 2019

Pneumonia (community-acquired)

- Offer an antibiotic(s) within 4 hours of establishing a diagnosis
- For adults, follow the recommendations on microbiological tests in the NICE guideline on pneumonia
- For children and young people in hospital with severe symptoms or a comorbidity, consider sending a sample (for example, a sputum sample) for microbiological testing

Give advice about:

- **possible adverse effects of the antibiotic(s)**
- **how long symptoms are likely to last (see also the NICE guideline on pneumonia)**
- **seeking medical help if symptoms worsen rapidly or significantly, or do not start to improve within 3 days, or the person becomes systemically very unwell**

If a respiratory sample has been sent for microbiological testing:

- review the choice of antibiotic(s) when results available, and
- consider changing the antibiotic(s) according to results, using a narrower spectrum antibiotic if appropriate

- **Reassess if symptoms do not improve as expected, or worsen rapidly or significantly, taking account of possible non-bacterial causes such as flu**
- **If symptoms have not improved after antibiotics, send a sample (for example, a sputum sample) for microbiological testing, if not done already**

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Refer adults to hospital in line with NICE's guideline on pneumonia or if:

- symptoms or signs suggest a more serious illness such as sepsis, or
- symptoms are not improving as expected with antibiotics

Consider referring adults or seeking specialist advice if they have bacteria resistant to oral antibiotics or they cannot take oral medicines

Consider referring children and young people to hospital or seek specialist paediatric advice on further investigation and management

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Choice of antibiotic: adults aged 18 years and over

Antibiotic[1]	Dosage and course length[2]
First choice oral antibiotic if low severity (based on clinical judgement and guided by CRB65 score 0 or CURB65 score 0 or 1)[3]	
Amoxicillin	500 mg three times a day (higher doses can be used - see BNF) for 5 days[4]
Alternative oral antibiotics if low severity, for penicillin allergy or if amoxicillin unsuitable (for example, atypical pathogens suspected[5])[3]	
Doxycycline	200 mg on first day, then 100 mg once a day for 4 days (5-day course in total)[4]
Clarithromycin	500 mg twice a day for 5 days[4]
Erythromycin (in pregnancy)	500 mg four times a day for 5 days[4]
First choice oral antibiotics if moderate severity (based on clinical judgement and guided by CRB65 score 1 or 2, or CURB65 score 2); guided by microbiological results when available[3]	
Amoxicillin ***with (if atypical pathogens suspected[5]):***	500 mg three times a day (higher doses can be used – see BNF) for 5 days[4]
Clarithromycin[6] ***or***	500 mg twice a day for 5 days[4]
Erythromycin[6] (in pregnancy)	500 mg four times a day for 5 days[4]
Alternative oral antibiotics if moderate severity, for penicillin allergy; guided by microbiological results when available[3]	
Doxycycline	200 mg on first day, then 100 mg once a day for 4 days (5-day course in total)[4]
Clarithromycin	500 mg twice a day for 5 days[4]
First choice antibiotics if high severity (based on clinical judgement and guided by CRB65 score 3 or 4, or CURB65 score 3 to 5); guided by microbiological results when available[3]	
Co amoxiclav ***with:***	500/125 mg three times a day orally or 1.2 g three times a day IV[7] for 5 days[4]
Clarithromycin ***or***	500 mg twice a day orally or IV[7] for 5 days[4]
Erythromycin (in pregnancy)	500 mg four times a day orally for 5 days[4]
Alternative antibiotic if high severity, for penicillin allergy; guided by microbiological results when available[3]	
Levofloxacin[8] (consider safety issues)	500 mg twice a day orally or IV[7] for 5 days[4]
Consult local microbiologist if fluoroquinolone not appropriate	

[1]See BNF for appropriate use and dosing in specific populations, for example, hepatic impairment, renal impairment, pregnancy and breast-feeding, and administering intravenous (or, where appropriate, intramuscular) antibiotics.
[2]Oral doses are for immediate-release medicines.
[3]Give oral antibiotics first-line if the person can take oral medicines, and the severity of their condition does not require intravenous antibiotics.
[4]Stop antibiotic treatment after 5 days unless microbiological results suggest a longer course is needed or the person is not clinically stable (fever in the past 48 hours, or more than 1 sign of clinical instability [systolic BP <90 mm Hg, heart rate >100/min, respiratory rate >24/min, arterial oxygen saturation <90% or PaO_2 <60 mmHg in room air]).
[5]*Mycoplasma pneumoniae* infection occurs in outbreaks approximately every 4 years.
[6]Consider adding a macrolide to amoxicillin if atypical pathogens suspected. Review when microbiological results available.
[7]Review intravenous antibiotics by 48 hours and consider switching to oral antibiotics if possible.
[8]See MHRA advice for restrictions and precautions for using fluoroquinolones due to very rare reports of disabling and potentially long-lasting or irreversible side effects affecting musculo-skeletal and nervous systems. Warnings include stopping treatment at first signs of a serious adverse reaction (such as tendonitis), prescribing with special caution in people over 60 years and avoiding coadministration with a corticosteroid (March 2019).
C(U)RB65, confusion, (urea >7 mmol/l), respiratory rate ≥ 30/min, low systolic [<90 mm Hg] or diastolic [≤60 mm Hg] BP, age ≥65; IV, intravenous; PaO_2, partial pressure of oxygen

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Choice of antibiotic: children and young people over 1 month and under 18 years

Antibiotic[1]	Dosage and course length[2]
First choice oral antibiotic if non-severe symptoms or signs (based on clinical judgement)[3]	
Amoxicillin	1 to 11 months, 125 mg three times a day for 5 days[4] 1 to 4 years, 250 mg three times a day for 5 days[4] 5 to 17 years, 500 mg three times a day for 5 days (higher doses can be used for all ages - see BNFC)[4]
Alternative oral antibiotics if non-severe symptoms or signs (based on clinical judgement), for penicillin allergy or if amoxicillin unsuitable (for example, atypical pathogens suspected[5])[3]	
Clarithromycin	1 month to 11 years: Under 8 kg, 7.5 mg/kg twice a day for 5 days[4] 8 to 11 kg, 62.5 mg twice a day for 5 days[4] 12 to 19 kg, 125 mg twice a day for 5 days[4] 20 to 29 kg, 187.5 mg twice a day for 5 days[4] 30 to 40 kg, 250 mg twice a day for 5 days[4] 12 to 17 years: 250 mg to 500 mg twice a day for 5 days[4]
Erythromycin (in pregnancy)	8 to 17 years, 250 mg to 500 mg four times a day for 5 days[4]
Doxycycline[6]	12 to 17 years, 200 mg on first day, then 100 mg once a day for 4 days (5-day course in total)[4]
First choice antibiotic(s) if severe symptoms or signs (based on clinical judgement); guided by microbiological results when available[3]	
Co-amoxiclav	Oral doses: 1 to 11 months, 0.5 ml/kg of 125/31 suspension three times a day for 5 days[4] 1 to 5 years, 10 ml of 125/31 suspension three times a day or 0.5 ml/kg of 125/31 suspension three times a day for 5 days[4,7] 6 to 11 years, 10 ml of 250/62 suspension three times a day or 0.3 ml/kg of 250/62 suspension three times a day for 5 days[4] 12 to 17 years, 500/125 mg three times a day for 5 days[4] IV dose[8]: 1 to 2 months, 30 mg/kg two times a day[4] 3 months to 17 years, 30 mg/kg three times a day (maximum 1.2 g per dose three times a day)[4]
with (if atypical pathogen suspected[5]): Clarithromycin ***or***	Oral doses: see above for clarithromycin, for 5 days[4] IV doses[8]: 1 month to 11 years, 7.5 mg/kg twice a day (maximum 500 mg per dose)[4] 12 to 17 years, 500 mg twice a day[4]
Erythromycin (in pregnancy)	See oral doses for erythromycin; for 5 days[4]
Alternative antibiotics if severe symptoms or signs (based on clinical judgement), for penicillin allergy; guided by microbiological results when available[3] - consult local microbiologist	

[1]See BNFC for use and dosing in hepatic impairment, renal impairment, pregnancy and breast-feeding, and administering intravenous (or, where appropriate, intramuscular) antibiotics.
[2]Oral doses are for immediate-release medicines. 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.
[3]Give oral antibiotics first-line if the person can take oral medicines, and the severity of their condition does not require intravenous antibiotics.
[4]Stop antibiotic treatment after 5 days unless microbiological results suggest a longer course length is needed or the person is not clinically stable.
[5]*Mycoplasma pneumoniae* infection occurs in outbreaks approximately every 4 years and is more common in school-aged children.
[6]See BNFC for use of doxycycline in children under 12.
[7]Or 5 ml of 250/62 suspension.
[8]Review intravenous antibiotics by 48 hours and consider switching to oral antibiotics if possible.