COPD (acute exacerbation): antimicrobial prescribing

Background
- An acute exacerbation of COPD is a sustained worsening of symptoms from a person's stable state
- A range of factors (including viral infections and smoking) can trigger an exacerbation
- Many exacerbations (including some severe exacerbations) are not caused by bacterial infections so will not respond to antibiotics

Prescribing considerations
When considering antibiotics, take into account:
- the severity of symptoms, particularly sputum colour changes and increases in volume or thickness beyond the person’s normal day-to-day variation
- whether they may need to go into hospital for treatment (see the NICE guideline on COPD)
- previous exacerbation and hospital admission history, and the risk of developing complications
- previous sputum culture and susceptibility results
- the risk of antimicrobial resistance with repeated courses of antibiotics

Give oral antibiotics first line if possible

Some people at risk of exacerbations may have antibiotics to keep at home as part of their exacerbation action plan (see the NICE guideline on COPD in over 16s)

Consider an antibiotic, but only after taking into account prescribing considerations

When no antibiotic given, advise:
- antibiotic is not currently needed
- seeking medical help without delay if symptoms worsen rapidly or significantly, do not improve in an agreed time, or the person is systemically very unwell

When an antibiotic is given, advise:
- possible adverse effects of antibiotics, particularly diarrhoea
- symptoms may not be fully resolved by completion of antibiotic course
- seeking medical help if symptoms worsen rapidly or significantly, or do not improve within 2 to 3 days (or other agreed time), or the person becomes systemically very unwell

If sputum sample sent for testing, when results available:
- review antibiotic choice
- only change antibiotic if bacteria resistant and symptoms not improving

Reassess at any time if symptoms worsen rapidly or significantly, taking account of:
- other possible diagnoses, such as pneumonia
- symptoms or signs of something more serious, such as cardiorespiratory failure or sepsis
- previous antibiotic use, which may have led to resistant bacteria
Send sputum sample for testing if symptoms have not improved after antibiotics

Refer to hospital if a severe systemic infection is present or in line with NICE’s guidelines on COPD and sepsis
Seek specialist advice if:
- symptoms do not improve with repeated courses of antibiotics, or
- bacteria are resistant to oral antibiotics, or
- the person cannot take oral medicines (to explore giving intravenous antibiotics at home or in the community if appropriate)

NICE uses ‘offer’ when there is more certainty of benefit and ‘consider’ when evidence of benefit is less clear.
### Choice of antibiotic for treating an acute exacerbation: adults aged 18 years and over

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Dosage and course length</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First choice oral antibiotics</strong></td>
<td></td>
</tr>
<tr>
<td>Amoxicillin</td>
<td>500 mg three times a day for 5 days (see BNF for dosage in severe infections)</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>200 mg on first day, then 100 mg once a day for 5-day course in total (see BNF for dosage in severe infections)</td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>500 mg twice a day for 5 days (see BNF for dosage in severe infections)</td>
</tr>
<tr>
<td><strong>Second choice oral antibiotics</strong></td>
<td></td>
</tr>
<tr>
<td>Use alternative first choice (from a different class)</td>
<td>As above</td>
</tr>
<tr>
<td>Alternative choice oral antibiotics (if person at higher risk of treatment failure; guided by susceptibilities when available)</td>
<td>Co-amoxiclav 500/125 mg three times a day for 5 days</td>
</tr>
<tr>
<td></td>
<td>Levofloxacin^4 500 mg once a day for 5 days</td>
</tr>
<tr>
<td></td>
<td>Co-trimoxazole^5 960 mg twice a day for 5 days</td>
</tr>
<tr>
<td><strong>First choice intravenous antibiotics</strong> (if unable to take oral antibiotics or severely unwell; guided by susceptibilities when available)</td>
<td>Amoxicillin 500 mg three times a day (see BNF for dosage in severe infections)</td>
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<tr>
<td></td>
<td>Co-amoxiclav 1.2 g three times a day</td>
</tr>
<tr>
<td></td>
<td>Clarithromycin 500 mg twice a day</td>
</tr>
<tr>
<td></td>
<td>Co-trimoxazole^5 960 mg twice a day (see BNF for dosage in severe infections)</td>
</tr>
<tr>
<td></td>
<td>Piperacillin with tazobactam 4.5 g three times a day (see BNF for dosage in severe infections)</td>
</tr>
<tr>
<td><strong>Second choice intravenous antibiotics</strong></td>
<td>Consult local microbiologist (guided by susceptibilities)</td>
</tr>
</tbody>
</table>

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^1See BNF for appropriate use and dosing in specific populations, for example, hepatic impairment, renal impairment, and for administering intravenous antibiotics.

^2Where a person is receiving antibiotic prophylaxis, treatment should be with an antibiotic from a different class.

^3People who may be at higher risk of treatment failure include people who have had repeated courses of antibiotics, a previous or current sputum culture with resistant bacteria, or people at higher risk of developing complications.

^4The European Medicines Agency’s Pharmacovigilance Risk Assessment Committee has recommended restricting the use of fluoroquinolone antibiotics following a review of disabling and potentially long-lasting side effects mainly involving muscles, tendons, bones and the nervous system. This includes a recommendation not to use them for mild or moderately severe infections unless other antibiotics cannot be used (press release October 2018).

^5Co-trimoxazole should only be considered for use in acute exacerbations of COPD when there is bacteriological evidence of sensitivity and good reason to prefer this combination to a single antibiotic (BNF, October 2018).

^6Review intravenous antibiotics by 48 hours and consider stepping down to oral antibiotics where possible.