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<td><em>Pseudomonas</em> spp.</td>
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<td><em>Stenotrophomonas maltophilia</em></td>
<td>13</td>
<td>[Link to guidance document on <em>Stenotrophomonas maltophilia</em>]</td>
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<tr>
<td><em>Burkholderia cepacia</em></td>
<td>-</td>
<td>[Link to guidance document on <em>Burkholderia cepacia group</em>]</td>
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<tr>
<td><em>Acinetobacter</em> spp.</td>
<td>14</td>
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<tr>
<td><em>Staphylococcus</em> spp.</td>
<td>18</td>
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<tr>
<td><em>Enterococcus</em> spp.</td>
<td>23</td>
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<td>Streptococcus groups A, B, C and G</td>
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<td><em>Streptococcus pneumoniae</em></td>
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<tr>
<td>Viridans group streptococci</td>
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<td><em>Haemophilus influenzae</em></td>
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<td><em>Moraxella catarrhalis</em></td>
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<td><em>Neisseria meningitidis</em></td>
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<td>Gram-positive anaerobes</td>
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<td><em>Clostridium difficile</em></td>
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<td>Gram-negative anaerobes</td>
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<td><em>Helicobacter pylori</em></td>
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<td><em>Listeria monocytogenes</em></td>
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<td><em>Pasteurella multocida</em></td>
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<td><em>Campylobacter jejuni and coli</em></td>
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<td><em>Corynebacterium</em> spp.</td>
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<td>PK/PD (Non-species related) breakpoints</td>
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<tr>
<td>Expert Rules</td>
<td>-</td>
<td>[Link to EUCAST Guidelines on Detection of Resistance Mechanisms]</td>
</tr>
<tr>
<td>Detection of Resistance Mechanisms</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
# Breakpoint tables for interpretation of MICs and zone diameters

## Version 4.0, valid from 2014-01-01

### Notes

1. The EUCAST tables of clinical breakpoints contain clinical MIC breakpoints (determined or revised during 2002-2013) and their inhibition zone diameter correlates. The EUCAST breakpoint table version 4.0 includes corrected typographical errors, clarifications, breakpoints for new organisms, revised MIC breakpoints and revised and new zone diameter breakpoints. Changes are best seen on screen or on a colour printout since cells containing a change are yellow.

2. PK/PD (Non-species-related) breakpoints are listed separately on the last page.

3. Numbered footnotes relate to MIC breakpoints. Lettered footnotes relate to zone diameter breakpoints.

4. Highlighted antimicrobial names link to EUCAST rationale documents. Highlighted MIC breakpoints and zone diameter breakpoints link to EUCAST MIC and zone diameter distributions, respectively.

5. One version of the document is released as an unprotected Excel file to enable users to alter the list of agents to suit the range of agents tested locally. The content of single cells cannot be changed. Hide lines by right-clicking on the line number and choosing "hide". Hide columns by right-clicking on the column letter and choosing "hide".

6. A zone diameter breakpoint of "S ≥ 50 mm" is an arbitrary "off scale" zone diameter breakpoint corresponding to MIC breakpoint situations where wild type isolates are categorised as intermediate (i.e. no fully susceptible isolates exist).

7. In order to simplify the EUCAST tables, the intermediate category is not listed. It is interpreted as values between the S and the R breakpoints. For example, for MIC breakpoints listed as S ≤ 1 mg/L and R > 8 mg/L, the intermediate category is 2-8 (technically >1-8) mg/L, and for zone diameter breakpoints listed as S ≥ 22 mm and R < 18 mm, the intermediate category is 18-21 mm.

8. For *Stenotrophomonas maltophilia* with trimethoprim-sulfamethoxazole, *S. aureus* with benzylpenicillin and enterococci with vancomycin, it is crucial to follow specific reading instructions for correct interpretation of the disk diffusion test. For these, pictures with reading examples are included at the end of the corresponding breakpoint table. For general and other specific reading instructions, please refer to the EUCAST Reading Guide.

9. For cefuroxime and fosfomycin there are breakpoints for intravenous and oral administration.

10. By international convention MIC dilution series are based on twofold dilutions up and down from 1 mg/L. At dilutions below 0.25 mg/L, this leads to concentrations with multiple decimal places. To avoid having to use these in tables and documents, EUCAST has decided to use the following abbreviations (in bold): 0.125→0.12, 0.0625→0.06, 0.03125→0.03, 0.015625→0.015, 0.0078125→0.008, 0.00390625→0.004 and 0.001953125→0.002 mg/L. Note, that with an MIC of 0.125 mg/L, the organism is within the susceptible category when the breakpoint is listed as S≤0.12 mg/L.

"-" indicates that susceptibility testing is not recommended as the species is a poor target for therapy with the drug. Isolates may be reported as R without prior testing.

"IE" indicates that there is insufficient evidence that the species in question is a good target for therapy with the drug. An MIC with a comment but without an accompanying S, I or R categorisation may be reported.

NA = Not Applicable

IP = In Preparation
**Guidance on reading EUCAST Breakpoint Tables**

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

**Disk diffusion (EUCAST standardised disk diffusion method)**
- **Medium:**
- **Inoculum:**
- **Incubation:**
- **Reading:**
- **Quality control:**

**EUCAST method for antimicrobial susceptibility testing by disk diffusion and recommendations for quality control**

---

### The intermediate category is not listed but is inferred as the values between the S and the R breakpoints. If the S and R breakpoints are the same value there is no intermediate category.

Agent A: No intermediate category
Agent B: Intermediate category: 4 mg/L, 23-25 mm
Agent G: Intermediate category: 1-2 mg/L, 24-29 mm

---

<table>
<thead>
<tr>
<th>Antimicrobial agent</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
</tr>
</tbody>
</table>
| **Antimicrobial agent A** |                       | 1    | 1    | X   | 20<sup>a</sup> | 20<sup>a</sup> | 1. Comment on MIC breakpoints  
|                      |                       |      |     |     |     | A. Comment on disk diffusion |
| **Antimicrobial agent B, S. aureus** |                   | 2    | 4    | Y   | 26   | 23 |
| **Antimicrobial agent C** |                       | IE   | IE   | IE   | IE   | |
| **Antimicrobial agent D** |                       | -    | -    | -    | -    | |
| **Antimicrobial agent E** |                       | IP   | IP   | IP   | IP   | |
| **Antimicrobial agent F (screen)** |             | NA   | NA   | 25   | 25   | |
| **Antimicrobial agent G** |                       | 0.5  | 2    | Z    | 30   | 24 |

---

**Screening breakpoint to differentiate between isolates without and with resistance mechanisms**

**Not Applicable**

**In Preparation**

**Link to MIC distribution if highlighted in blue**

**Link to zone diameter distribution if highlighted in blue**

**Changes from previous version highlighted in yellow**

---

**No breakpoints. Susceptibility testing is not recommended**

---

**Insufficient evidence that the species in question are a good target for therapy with the drug**

---

**Link to rationale document if highlighted in blue**

---

**Link to MIC distribution if highlighted in blue**

---

**EUCAST method for antimicrobial susceptibility testing by disk diffusion and recommendations for quality control**

---

**Breakpoints with a species name apply only to that particular species (in this example S. aureus)**
European Committee on Antimicrobial Susceptibility Testing
Breakpoint tables for interpretation of MICs and zone diameters
Version 4.0, valid from 2014-01-01

Changes (cells containing a change, a deletion or an addition) from v 3.1 are marked yellow

<table>
<thead>
<tr>
<th>Version 4.0, 2014-01-01</th>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Links added to each table in the list of contents.</td>
</tr>
<tr>
<td></td>
<td>A table with guidance on reading EUCAST breakpoint tables added.</td>
</tr>
<tr>
<td></td>
<td>Links to guidance documents and expert rules added.</td>
</tr>
<tr>
<td>Notes</td>
<td>Explanation on MIC scale added, Note 10.</td>
</tr>
</tbody>
</table>

Enterobacteriaceae

|                         | New breakpoints: Amoxicillin-clavulanate (uncomplicated UTI only), ciprofloxacin (Salmonella spp.) and pefloxacin screen (Salmonella spp.). |
|                         | Revised breakpoints: Amoxicillin-clavulanate (zone diameter breakpoints for systemic infections), doripenem (MIC and zone diameter) and fosfomycin iv and oral (Note replaced with IP for zone diameter breakpoints). |
|                         | New comment: Pefloxacin. |
|                         | Revised comments: Ciprofloxacin (comment moved to row for Salmonella spp. and Note A added). |

Pseudomonas spp.

|                         | Revised breakpoints: Zone diameter breakpoints for piperacillin, piperacillin-tazobactam, ticarcillin, ticarcillin-clavulanate and cefepime. Doripenem (MIC and zone diameter). |
|                         | New comment: Doripenem. |
|                         | Revised comment: Cefepime (dose removed). |

Stenotrophomonas maltophilia

|                         | General information with link to EUCAST guidance document added. |

Acinetobacter spp.

|                         | Revised breakpoints: Doripenem (MIC and zone diameter). |
|                         | New comments: Doripenem and imipenem (dose removed). |

Staphylococcus spp.

|                         | Clarification regarding cefoxitin (screen) added in antibiotic agent column. |
|                         | New breakpoints: Benzylpenicillin (S. lugdunensis), benzylpenicillin (coagulase negative staphylococci) and cefoxitin screen (S. pseudintermedius). |
|                         | Revised breakpoints: Ampicillin (zone diameter). |
|                         | New comment: Benzylpenicillin (coagulase negative staphylococci). |
|                         | Revised comments: Benzylpenicillin, ampicillin, ampicillin-sublactam, amoxicillin, amoxicillin-clavulanate, piperacillin, piperacillin-tazobactam, ceftriaxone, clindamycin and mupirocin. |

Enterococcus spp.

|                         | New breakpoints: Ciprofloxacin (uncomplicated UTI only), levofloxacin (uncomplicated UTI only) and norfloxacin (screen). |
|                         | New comments: Fluoroquinolones Note A and Note B. |

Streptococcus groups A, B, C and G

|                         | New comments: Clindamycin, dicloxacillin and flucloxacillin. |
|                         | Revised comments: Penicillins Note 1/A and clindamycin. |

Streptococcus pneumoniae

|                         | Revised comment: Clindamycin. |
|                         | Supplementary table for interpretation of the oxacillin screen updated: Clarification regarding interpretation of cefaclor. Piperacillin (without and with beta-lactamase inhibitor) and ceftriaxone added. Clarification regarding meningitis. |

Viridans group streptococci

|                         | New comments: Aminoglycosides Notes 1 and 2. Screening test for high-level aminoglycoside resistance added. |

Haemophilus influenzae

|                         | Revised breakpoints and comments: Cefaclor (breakpoints and comment removed). |
|                         | Supplementary table for interpretation of the benzylpenicillin screen updated: Clarification regarding interpretation of cefaclor and cefuroxime oral. Clarification regarding beta-lactam resistance mechanisms for isolates with benzylpenicillin 1 unit zone diameters < 12 mm. |

Moraxella catarrhalis

|                         | Revised breakpoints and comments: Cefaclor (breakpoints and comment removed). |

Pasteurella multocida

|                         | Recommended QC strain changed to Haemophilus influenzae NCTC 8468. |

Corynebacterium spp.

|                         | New table. All breakpoints and comments new. |

PK/PD (Non-species related) breakpoints

|                         | Revised breakpoint: Doripenem. |
|                         | Revised comment: Doripenem. |
Enterobacteriaceae

EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

<table>
<thead>
<tr>
<th>Penicillins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td></td>
<td>S ≥ R &lt;</td>
<td></td>
</tr>
</tbody>
</table>

- **Benzylpenicillin**
  - -

- **Ampicillin**
  - 8 10
  - 14 A
  - 14 B

  1. Wild type Enterobacteriaceae are categorised as susceptible to aminopenicillins. Some countries prefer to categorise wild type isolates of *E. coli* and *P. mirabilis* as intermediate. When this is the case, use the MIC breakpoint S ≤ 0.5 mg/L and the corresponding zone diameter breakpoint S ≥ 50 mm. B. Ignore growth that may appear as a thin inner zone on some batches of Mueller-Hinton agars.

- **Ampicillin-sulbactam**
  - 8 10
  - 14 A
  - 14 B

  2. For susceptibility testing purposes, the concentration of sulbactam is fixed at 4 mg/L.

- **Ampicillin-clavulanate**
  - 8 20
  - 19 A
  - 19 B

  3. For susceptibility testing purposes, the concentration of clavulanate is fixed at 2 mg/L.

- **Ampicillin-clavulanate (uncomplicated UTI only)**
  - 32 20
  - 16 A
  - 16 B

- **Piperacillin**
  - 8 16
  - 20 B

- **Piperacillin-tazobactam**
  - 16 30
  - 20 B

  4. For susceptibility testing purposes, the concentration of tazobactam is fixed at 4 mg/L.

- **Ticarcillin**
  - 8 16
  - 75 23

- **Ticarcillin-clavulanate**
  - 8 16
  - 75 23

- **Phenoxyethylpenicillin**
  - -

- **Oxacillin**
  - -

- **Cloxacillin**
  - -

- **Dicloxacillin**
  - -

- **Flucloxacillin**
  - -

- **Mecillinam (uncomplicated UTI only)**
  - 8 10
  - 15 B

  5. E. Mecillinam (pivmecillinam) breakpoints relate to *E. coli*, *Klebsiella* spp. and *P. mirabilis* only. F. Ignore isolated colonies within the inhibition zone for *E. coli.*
## Enterobacteriaceae

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

### Cephalosporins\(^1\)

<table>
<thead>
<tr>
<th></th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cefaclor</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefadroxil (uncomplicated UTI only)</td>
<td>16 16 30</td>
<td>12 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefalexin (uncomplicated UTI only)</td>
<td>16 16 30</td>
<td>14 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefazolin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefepime</td>
<td>1 4 30</td>
<td>24 21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefixime (uncomplicated UTI only)</td>
<td>1 1 5 17 17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>1 2 5 20 17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefotaxime (screen)(^2)</td>
<td>NA NA 30</td>
<td>19 19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefpodoxime (uncomplicated UTI only)</td>
<td>1 1 10 21 21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ceftaroline</td>
<td>0.5</td>
<td>0.5</td>
<td>5</td>
<td>23 23</td>
</tr>
<tr>
<td>Ceftazidime</td>
<td>1 4 10</td>
<td>19 19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>1 2 10</td>
<td>23 23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefuroxime iv</td>
<td>8(^3) 8 30</td>
<td>18 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefuroxime oral (uncomplicated UTI only)</td>
<td>8 8 30</td>
<td>18 18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. The cephalosporin breakpoints for Enterobacteriaceae will detect all clinically important resistance mechanisms (including ESBL and plasmid mediated AmpC). Some isolates that produce beta-lactamasases are susceptible or intermediate to 3rd or 4th generation cephalosporins with these breakpoints and should be reported as tested, i.e. the presence or absence of an ESBL does not in itself influence the categorisation of susceptibility. In many areas, ESBL detection and characterisation is recommended or mandatory for infection control purposes.

2. The cefotaxime ECOFF (WT ≤ 8 mg/L) has a high sensitivity, but poor specificity for identification of AmpC-producing Enterobacteriaceae as this antibiotic is also affected by permeability alterations and some carbapenemases. Classical non-AmpC producers are wild type, whereas plasmid AmpC producers or chromosomal AmpC hyperproducers are non-wild type.

3. The breakpoint relates to a dosage of 1.5 g x 3 and to *E. coli*, *P. mirabilis* and *Klebsiella* spp. only.

### Carbapenems\(^1\)

<table>
<thead>
<tr>
<th></th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doripenem</td>
<td>1 2 10</td>
<td>24 21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ertapenem</td>
<td>0.5 1 10</td>
<td>25 22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imipenem(^2)</td>
<td>2 8 10</td>
<td>22 16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meropenem</td>
<td>2 8 10</td>
<td>22 16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. The carbapenem breakpoints for Enterobacteriaceae will detect all clinically important resistance mechanisms (including the majority of carbapenemases). Some isolates that produce carbapenemase are categorised as susceptible with these breakpoints and should be reported as tested, i.e. the presence or absence of a carbapenemase does not in itself influence the categorisation of susceptibility. In many areas, carbapenemase detection and characterisation is recommended or mandatory for infection control purposes.

2. Low-level resistance is common in *Morganella* spp., *Proteus* spp. and *Providencia* spp.
### Enterobacteriaceae

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

#### Monobactams

<table>
<thead>
<tr>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aztreonam</strong></td>
<td>S ≤ 1 R &gt; 4</td>
<td>S ≥ 30 R &lt; 24</td>
<td><strong>1.</strong> The aztreonam breakpoints for Enterobacteriaceae will detect clinically important resistance mechanisms (including ESBL). Some isolates that produce beta-lactamases are susceptible or intermediate to 3rd or 4th generation cephalosporins with these breakpoints and should be reported as tested, i.e. the presence or absence of an ESBL does not in itself influence the categorisation of susceptibility. In many areas, ESBL detection and characterisation is recommended or mandatory for infection control purposes.</td>
</tr>
</tbody>
</table>

#### Fluoroquinolones

<table>
<thead>
<tr>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ciprofloxacin</strong></td>
<td>0.5 ≤ 1 R &gt; 5</td>
<td>22 ≤ 19</td>
<td><strong>1.</strong> There is clinical evidence for ciprofloxacin to indicate a poor response in systemic infections caused by <em>Salmonella</em> spp. with low-level ciprofloxacin resistance (MIC&gt;0.06 mg/L). The available data relate mainly to <em>S. typhi</em> but there are also case reports of poor response with other <em>Salmonella</em> species.</td>
</tr>
<tr>
<td><strong>Ciprofloxacin, Salmonella spp.</strong></td>
<td>0.06 ≤ 0.06</td>
<td>Note A</td>
<td>Note A</td>
</tr>
<tr>
<td><strong>Pefloxacin (screen), Salmonella spp.</strong></td>
<td>NA ≤ NA</td>
<td>5 ≤ 24</td>
<td>24 B</td>
</tr>
<tr>
<td><strong>Levofloxacin</strong></td>
<td>1 ≤ 2 R &gt; 5</td>
<td>22 ≤ 19</td>
<td><strong>B.</strong> Susceptibility of <em>Salmonella</em> spp. to ciprofloxacin can be inferred from the pefloxacin disk diffusion susceptibility test result.</td>
</tr>
<tr>
<td><strong>Moxifloxacin</strong></td>
<td>0.5 ≤ 1 R &gt; 5</td>
<td>20 ≤ 17</td>
<td></td>
</tr>
<tr>
<td><strong>Nalidixic acid (screen)</strong></td>
<td>NA ≤ NA</td>
<td>22</td>
<td>19</td>
</tr>
<tr>
<td><strong>Norfloxacin</strong></td>
<td>0.5 ≤ 1 R &gt; 10</td>
<td>22 ≤ 19</td>
<td></td>
</tr>
<tr>
<td><strong>Ofloxacin</strong></td>
<td>0.5 ≤ 1 R &gt; 5</td>
<td>22 ≤ 19</td>
<td></td>
</tr>
</tbody>
</table>

#### Aminoglycosides

<table>
<thead>
<tr>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amikacin</strong></td>
<td>8 ≤ 16 R &gt; 30</td>
<td>16 ≤ 13</td>
<td><strong>1.</strong> Aminoglycoside breakpoints are based on once-daily administration of high aminoglycoside dosages. Most often aminoglycosides are given in combination with beta-lactam agents.</td>
</tr>
<tr>
<td><strong>Gentamicin</strong></td>
<td>2 ≤ 4 R &gt; 10</td>
<td>17 ≤ 14</td>
<td></td>
</tr>
<tr>
<td><strong>Netilmicin</strong></td>
<td>2 ≤ 4 R &gt; 10</td>
<td>15 ≤ 12</td>
<td></td>
</tr>
<tr>
<td><strong>Tobramycin</strong></td>
<td>2 ≤ 4 R &gt; 10</td>
<td>17 ≤ 14</td>
<td></td>
</tr>
<tr>
<td>Glycopeptides</td>
<td>MIC breakpoint (mg/L)</td>
<td>Disk content (µg)</td>
<td>Zone diameter breakpoint (mm)</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------------</td>
<td>-------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
</tr>
<tr>
<td>Teicoplanin</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Telavancin</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>-</td>
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</table>

<table>
<thead>
<tr>
<th>Macrolides, lincosamides and streptogramins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Azithromycin¹</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Clarithromycin</td>
<td>-</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Erythromycin¹</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Roxithromycin</td>
<td>-</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Telithromycin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Quinupristin-dalfopristin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

1. Azithromycin has been used in the treatment of infections with Salmonella typhi (MIC ≤16 mg/L for wild type isolates) and Shigella spp.
### Enterobacteriaceae

#### EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

<table>
<thead>
<tr>
<th>Tetracyclines</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Minocycline</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Tigecycline†</td>
<td>1</td>
<td>2</td>
<td>15</td>
<td>18×</td>
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</table>

<table>
<thead>
<tr>
<th>Miscellaneous agents</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>8</td>
<td>8</td>
<td>30</td>
<td>17</td>
</tr>
<tr>
<td>Colistin</td>
<td>2</td>
<td>2</td>
<td></td>
<td>Note×</td>
</tr>
<tr>
<td>Daptomycin</td>
<td>-</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Fosfomycin iv</td>
<td>32</td>
<td>32</td>
<td></td>
<td>IP</td>
</tr>
<tr>
<td>Fosfomycin oral (uncomplicated UTI only)</td>
<td>32</td>
<td>32</td>
<td></td>
<td>IP</td>
</tr>
<tr>
<td>Fusidic acid</td>
<td>-</td>
<td>-</td>
<td></td>
<td>-</td>
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<tr>
<td>Linezolid</td>
<td>-</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>-</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Mupirocin</td>
<td>-</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Nitrofurantoin (uncomplicated UTI only)</td>
<td>64†</td>
<td>64†</td>
<td>100</td>
<td>11×</td>
</tr>
<tr>
<td>Rifampicin</td>
<td>-</td>
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<tr>
<td>Spectinomycin</td>
<td>-</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Trimethoprim (uncomplicated UTI only)</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>18</td>
</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole†</td>
<td>2</td>
<td>4</td>
<td>1.25-23.75</td>
<td>10</td>
</tr>
</tbody>
</table>
### EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

**Medium:** Mueller-Hinton agar  
**Inoculum:** McFarland 0.5  
**Incubation:** Air, 35±1°C, 18±2h  
**Reading:** Read zone edges as the point showing no growth viewed from the back of the plate against a dark background illuminated with reflected light.  
**Quality control:** *Pseudomonas aeruginosa* ATCC 27853

<table>
<thead>
<tr>
<th>Penicillins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
</table>
|                              | S ≤ | R ≥ | S ≥ | R < |                                                            | Numbers for comments on MIC breakpoints  
|                              |     |     |     |     |                                                            | Letters for comments on disk diffusion |
| Benzylpenicillin             | -   | -   | -   | -   |                                                            | 1. Breakpoints are based on high dose therapy (with or without tazobactam, 4 g x 4). |
| Ampicillin                   | -   | -   | -   | -   |                                                            | 2. For susceptibility testing purposes, the concentration of tazobactam is fixed at 4 mg/L. |
| Ampicillin-sulbactam         | -   | -   | -   | -   |                                                            | 3. Breakpoints are based on high dose therapy (with or without clavulanate, 3 g x 4). |
| Amoxicillin                  | -   | -   | -   | -   |                                                            | 4. For susceptibility testing purposes, the concentration of clavulanate is fixed at 2 mg/L. |
| Piperacillin<sup>1</sup>      | 16  | 16  | 30  | 18  | 18  | 1. Breakpoints are based on high dose therapy (with or without tazobactam, 4 g x 4). |
| Piperacillin-tazobactam<sup>1</sup> | 16<sup>2</sup> | 16<sup>2</sup> | 30-6 | 18  | 18  | 2. For susceptibility testing purposes, the concentration of tazobactam is fixed at 4 mg/L. |
| Ticarcillin<sup>1</sup>       | 16  | 16  | 75  | 18  | 18  | 3. Breakpoints are based on high dose therapy (with or without clavulanate, 3 g x 4). |
| Ticarcillin-clavulanate<sup>3</sup> | 16<sup>3</sup> | 16<sup>3</sup> | 75-10 | 18  | 18  | 4. For susceptibility testing purposes, the concentration of clavulanate is fixed at 2 mg/L. |
| Phenoxymerthylpenicillin     | -   | -   | -   | -   |                                                            |                                                |
| Oxacillin                    | -   | -   | -   | -   |                                                            |                                                |
| Cloxacillin                  | -   | -   | -   | -   |                                                            |                                                |
| Dicloxacillin                | -   | -   | -   | -   |                                                            |                                                |
| Flucloxacillin               | -   | -   | -   | -   |                                                            |                                                |
| Mecillinam (uncomplicated UTI only) | -   | -   | -   | -   |                                                            |                                                |
### Pseudomonas spp.

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

#### Cephalosporins

<table>
<thead>
<tr>
<th>Cephalosporin</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Cefaclor</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefadroxil</td>
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<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Cefalexin</td>
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<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefazolin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefepime</td>
<td>≤</td>
<td>8</td>
<td>≥ 30</td>
<td>19</td>
</tr>
<tr>
<td>Cefixime</td>
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<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Cefoxitin</td>
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<td>NA</td>
<td>NA</td>
<td>NA</td>
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<tr>
<td>Cefpodoxime</td>
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<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefaroline</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Cefazidime</td>
<td>≤ 8</td>
<td>8</td>
<td>10</td>
<td>16</td>
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<td>Cefibuten</td>
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<td>-</td>
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<tr>
<td>Ceftriazone</td>
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</tr>
<tr>
<td>Cefuroxime iv</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Cefuroxime oral</td>
<td>-</td>
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</table>

**Notes**

Numbers for comments on MIC breakpoints
Letters for comments on disk diffusion

#### Carbapenems

<table>
<thead>
<tr>
<th>Carbapenem</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Doripenem</td>
<td>≤ 1</td>
<td>2</td>
<td>10</td>
<td>25</td>
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<tr>
<td>Ertapenem</td>
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<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Imipenem</td>
<td>≤ 4</td>
<td>8</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Meropenem</td>
<td>≤ 2</td>
<td>8</td>
<td>10</td>
<td>24</td>
</tr>
</tbody>
</table>

**Notes**

Numbers for comments on MIC breakpoints
Letters for comments on disk diffusion

#### Monobactams

<table>
<thead>
<tr>
<th>Monobactam</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Aztreonam</td>
<td>1</td>
<td>16</td>
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<td>50</td>
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</table>
## Pseudomonas spp.

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

### Fluoroquinolones

<table>
<thead>
<tr>
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<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Numbers for comments on MIC breakpoints</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Letters for comments on disk diffusion</td>
</tr>
<tr>
<td><strong>S ≤</strong></td>
<td><strong>R &gt;</strong></td>
<td><strong>S ≥</strong></td>
<td><strong>R &lt;</strong></td>
<td></td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>0.5</td>
<td>1</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>Moxifloxacin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nalidixic acid (screen)</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Norfloxacin</td>
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<tr>
<td>Ofloxacin</td>
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</table>

### Aminoglycosides

<table>
<thead>
<tr>
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<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Numbers for comments on MIC breakpoints</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Letters for comments on disk diffusion</td>
</tr>
<tr>
<td><strong>S ≤</strong></td>
<td><strong>R &gt;</strong></td>
<td><strong>S ≥</strong></td>
<td><strong>R &lt;</strong></td>
<td>1. Aminoglycoside breakpoints are based on once-daily administration of high aminoglycoside dosages. Most often aminoglycosides are given in combination with beta-lactam agents.</td>
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<tr>
<td>Amikacin</td>
<td>8</td>
<td>16</td>
<td>30</td>
<td>18</td>
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<tr>
<td>Gentamicin</td>
<td>4</td>
<td>4</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Netilmicin</td>
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<td>4</td>
<td>10</td>
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<td>Tobramycin</td>
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### Glycopeptides

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<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
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</thead>
<tbody>
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<td>Numbers for comments on MIC breakpoints</td>
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<tr>
<td></td>
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<td>Letters for comments on disk diffusion</td>
</tr>
<tr>
<td><strong>S ≤</strong></td>
<td><strong>R &gt;</strong></td>
<td><strong>S ≥</strong></td>
<td><strong>R &lt;</strong></td>
<td></td>
</tr>
<tr>
<td>Teicoplanin</td>
<td>-</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Telavancin</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Vancomycin</td>
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</table>
### Macrolides, lincosamides and streptogramins

<table>
<thead>
<tr>
<th></th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>Azithromycin</td>
<td>-</td>
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</tr>
<tr>
<td>Clarithromycin</td>
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</tr>
<tr>
<td>Erythromycin</td>
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</tr>
<tr>
<td>Roxithromycin</td>
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</tr>
<tr>
<td>Telithromycin</td>
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<td>-</td>
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</tr>
<tr>
<td>Clindamycin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Quinupristin-dalfopristin</td>
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<td>-</td>
<td>-</td>
<td></td>
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</tbody>
</table>

**Notes:**
- Numbers for comments on MIC breakpoints
- Letters for comments on disk diffusion

### Tetracyclines

<table>
<thead>
<tr>
<th></th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>Doxycycline</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Minocycline</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Tetracycline</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Tigecycline</td>
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</table>

**Notes:**
- Numbers for comments on MIC breakpoints
- Letters for comments on disk diffusion

### Miscellaneous

<table>
<thead>
<tr>
<th></th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>Chloramphenicol</td>
<td>-</td>
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</tr>
<tr>
<td>Colistin</td>
<td>4</td>
<td>4</td>
<td>Note⁵ Note⁴</td>
<td>A. Use an MIC method.</td>
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<td>Daptomycin</td>
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</tr>
<tr>
<td>Fosfomycin iv⁷</td>
<td>-</td>
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<td>-</td>
<td></td>
</tr>
<tr>
<td>Fosfomycin oral</td>
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<td>-</td>
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</tr>
<tr>
<td>Fusidic acid</td>
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<tr>
<td>Linezolid</td>
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<tr>
<td>Metronidazole</td>
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</tr>
<tr>
<td>Mupirocin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Nitrofurantoin (uncomplicated UTI only)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Rifampcin</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Spectinomycin</td>
<td>-</td>
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</tr>
<tr>
<td>Trimethoprim (uncomplicated UTI only)</td>
<td>-</td>
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<tr>
<td>Trimethoprim-sulfamethoxazole</td>
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**Notes:**
- Numbers for comments on MIC breakpoints
- Letters for comments on disk diffusion

₁ Anecdotal evidence suggests that infections caused by wild type isolates (ECOFF: WT ≤ 128 mg/L) may be treated with combinations of fosfomycin and other agents.
**Stenotrophomonas maltophilia**

**Trimethoprim-sulfamethoxazole is the only agent for which EUCAST breakpoints are currently available. For further information, see guidance document on www.eucast.org.**

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

**Disk diffusion (EUCAST standardised disk diffusion method)**

- **Medium:** Mueller-Hinton agar
- **Inoculum:** McFarland 0.5
- **Incubation:** Air, 35±1ºC, 18±2h
- **Reading:** Read zone edges as the point showing no growth viewed from the back of the plate against a dark background illuminated with reflected light.
- **Quality control:** *Escherichia coli* ATCC 25922

**Miscellaneous agents**

<table>
<thead>
<tr>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S ≤</strong></td>
<td><strong>R &gt;</strong></td>
<td><strong>S ≥</strong></td>
<td><strong>R &lt;</strong></td>
</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole</td>
<td>4</td>
<td>4</td>
<td>1.25-23.75</td>
</tr>
</tbody>
</table>

1. Trimethoprim:sulfamethoxazole in the ratio 1:19. Breakpoints are expressed as the trimethoprim concentration.

A. Ignore haze or fine growth within the inhibition zone (see pictures below).

**Examples of inhibition zones for *Stenotrophomonas maltophilia* with trimethoprim-sulfamethoxazole.**

- a-c) An outer zone can be seen. Report susceptible if the zone diameter ≥ 16 mm.
- d) Growth up to the disk and no sign of inhibition zone. Report resistant.
### Acinetobacter spp.

EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

**Disk diffusion (EUCAST standardised disk diffusion method)**
- **Medium:** Mueller-Hinton agar
- **Inoculum:** McFarland 0.5
- **Incubation:** Air, 35±1°C, 18±2h
- **Reading:** Read zone edges as the point showing no growth viewed from the back of the plate against a dark background illuminated with reflected light.
- **Quality control:** *Pseudomonas aeruginosa* ATCC 27853

<table>
<thead>
<tr>
<th>Penicillins¹</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzylpenicillin</td>
<td>- -</td>
<td>- -</td>
<td>-</td>
<td></td>
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<tr>
<td>Ampicillin</td>
<td>- -</td>
<td>- -</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Ampicillin-sulbactam</td>
<td>IE IE</td>
<td>IE IE</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Amoxicillin</td>
<td>- -</td>
<td>- -</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Amoxicillin-clavulanate</td>
<td>- -</td>
<td>- -</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Piperacillin</td>
<td>IE IE</td>
<td>IE IE</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Piperacillin-tazobactam</td>
<td>IE IE</td>
<td>IE IE</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Ticarcillin</td>
<td>IE IE</td>
<td>IE IE</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Ticarcillin-clavulanate</td>
<td>IE IE</td>
<td>IE IE</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Phenoxymethylpenicillin</td>
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<td>- -</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Oxacillin</td>
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<td>- -</td>
<td>-</td>
<td></td>
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<tr>
<td>Cloxacin</td>
<td>- -</td>
<td>- -</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Dicloxacillin</td>
<td>- -</td>
<td>- -</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Flucloxacillin</td>
<td>- -</td>
<td>- -</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Mecillinam (uncomplicated UTI only)</td>
<td>- -</td>
<td>- -</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

1. Susceptibility testing of *Acinetobacter* spp. to penicillins is unreliable. In most instances *Acinetobacter* spp. are resistant to penicillins.
### Acinetobacter spp.

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

#### Cephalosporins

<table>
<thead>
<tr>
<th></th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
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<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Cefaclor</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefadroxil</td>
<td>-</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Cefalexin</td>
<td>-</td>
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<tr>
<td>Cefazolin</td>
<td>-</td>
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<td>-</td>
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</tr>
<tr>
<td>Cefepime</td>
<td>-</td>
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</tr>
<tr>
<td>Cefixime</td>
<td>-</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefoxitin</td>
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<tr>
<td>Cepodoxime</td>
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<tr>
<td>Ceftaroline</td>
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<td>Ceftazidime</td>
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<td>Ceftibuten</td>
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<tr>
<td>Ceftriaxone</td>
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<tr>
<td>Cefuroxime iv</td>
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<td>-</td>
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<tr>
<td>Cefuroxime oral</td>
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#### Carbapenems

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<tr>
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<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
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<tr>
<td>Doripenem</td>
<td>1&lt;sup&gt;1&lt;/sup&gt;</td>
<td>2</td>
<td>10</td>
<td>23</td>
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<td>Ertapenem</td>
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<td>-</td>
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</tr>
<tr>
<td>Imipenem</td>
<td>2&lt;sup&gt;1&lt;/sup&gt;</td>
<td>8</td>
<td>10</td>
<td>23</td>
</tr>
<tr>
<td>Meropenem</td>
<td>2</td>
<td>8</td>
<td>10</td>
<td>21</td>
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#### Monobactams

<table>
<thead>
<tr>
<th></th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Aztreonam</td>
<td>-</td>
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</table>
### Acinetobacter spp.

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

<table>
<thead>
<tr>
<th>Fluoroquinolones</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
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<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>21</td>
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<tr>
<td>Levofloxacin</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>21</td>
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<td>Moxifloxacin</td>
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<tr>
<td>Nalidixic acid (screen)</td>
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<td>NA</td>
<td>NA</td>
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<tr>
<td>Ofloxacin</td>
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</table>

<table>
<thead>
<tr>
<th>Aminoglycosides&lt;sup&gt;1&lt;/sup&gt;</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Amikacin</td>
<td>8</td>
<td>16</td>
<td>30</td>
<td>18</td>
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<tr>
<td>Gentamicin</td>
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<td>4</td>
<td>10</td>
<td>17</td>
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<tr>
<td>Netilmicin</td>
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<td>4</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td>Tobramycin</td>
<td>4</td>
<td>4</td>
<td>10</td>
<td>17</td>
</tr>
</tbody>
</table>

1. Aminoglycoside breakpoints are based on once-daily administration of high aminoglycoside dosages. Most often aminoglycosides are given in combination with beta-lactam agents.

<table>
<thead>
<tr>
<th>Glycopeptides</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Teicoplanin</td>
<td>-</td>
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<tr>
<td>Telavancin</td>
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<tr>
<td>Vancomycin</td>
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</tr>
</tbody>
</table>

**Disk content (µg)**

**MIC breakpoint (mg/L)**

**Zone diameter breakpoint (mm)**

**Notes**

Numbers for comments on MIC breakpoints
Letters for comments on disk diffusion
### Acinetobacter spp.

#### Macrolides, lincosamides and streptogramins

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azithromycin</td>
<td>-</td>
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</tr>
<tr>
<td>Clarithromycin</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>-</td>
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</tr>
<tr>
<td>Roxithromycin</td>
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<td>-</td>
</tr>
<tr>
<td>Telithromycin</td>
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<tr>
<td>Clindamycin</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Quinupristin-dalfopristin</td>
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</table>

**Notes**
- Numbers for comments on MIC breakpoints
- Letters for comments on disk diffusion

#### Tetracyclines

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Doxycycline</td>
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<tr>
<td>Minocycline</td>
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<td>IE</td>
<td>IE</td>
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<tr>
<td>Tetracycline</td>
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<tr>
<td>Tigecycline</td>
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</table>

**Notes**
- Numbers for comments on MIC breakpoints
- Letters for comments on disk diffusion

#### Miscellaneous

<table>
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<th>Drug</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>Chloramphenicol</td>
<td>-</td>
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<tr>
<td>Colistin</td>
<td>2</td>
<td>2</td>
<td>Note⁴ Note⁴</td>
<td>A. Use an MIC method.</td>
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<tr>
<td>Daptomycin</td>
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<td>Fosfomycin</td>
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<tr>
<td>Fosfomycin oral</td>
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<tr>
<td>Fusidic acid</td>
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<tr>
<td>Linezolid</td>
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<tr>
<td>Metronidazole</td>
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<tr>
<td>Mupirocin</td>
<td>-</td>
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</tr>
<tr>
<td>Nitrofurantoin (uncomplicated UTI only)</td>
<td>-</td>
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<td>-</td>
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</tr>
<tr>
<td>Rifampicin</td>
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<td>Spectinomycin</td>
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<tr>
<td>Trimethoprim (uncomplicated UTI only)</td>
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<td>-</td>
</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole</td>
<td>2</td>
<td>4</td>
<td>1.25-23.75</td>
<td>16</td>
</tr>
</tbody>
</table>

**Notes**
- Numbers for comments on MIC breakpoints
- Letters for comments on disk diffusion

1. Trimethoprim:sulfamethoxazole in the ratio 1:16. Breakpoints are expressed as the trimethoprim concentration.
# EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

**Staphylococcus spp.**

<table>
<thead>
<tr>
<th>Penicillins¹</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benzylpenicillin, S. aureus</strong></td>
<td>0.12&lt;sup&gt;1&lt;/sup&gt;</td>
<td>0.12&lt;sup&gt;1,4&lt;/sup&gt;</td>
<td>1 unit</td>
<td>26&lt;sup&gt;A&lt;/sup&gt; 26&lt;sup&gt;A&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Benzylpenicillin, S. lugdunensis</strong></td>
<td>0.12&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0.12&lt;sup&gt;1,4&lt;/sup&gt;</td>
<td>1 unit</td>
<td>26&lt;sup&gt;A&lt;/sup&gt; 26&lt;sup&gt;A&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Benzylpenicillin, Coagulase negative staphylococci</strong></td>
<td>-</td>
<td>-</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Ampicillin, S. saprophyticus</strong></td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>2</td>
<td>18&lt;sup&gt;D,0&lt;/sup&gt; 18&lt;sup&gt;A,2&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Ampicillin-sulbactam</strong></td>
<td>Note&lt;sup&gt;1,4&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1,4&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;A,D&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;A,D&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Amoxicillin</strong></td>
<td>Note&lt;sup&gt;1,4&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1,4&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;A,D&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;A,D&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Amoxicillin-clavulanate</strong></td>
<td>Note&lt;sup&gt;1,4&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1,4&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;A,D&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;A,D&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Piperacillin</strong></td>
<td>Note&lt;sup&gt;1,4&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1,4&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;A,D&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;A,D&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Piperacillin-tazobactam</strong></td>
<td>Note&lt;sup&gt;1,4&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1,4&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;A,D&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;A,D&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Ticarcillin</strong></td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
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<td><strong>Ticarcillin-clavulanate</strong></td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
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<tr>
<td><strong>Phenoxybenzylpenicillin</strong></td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Oxacillin&lt;sup&gt;2&lt;/sup&gt;</strong></td>
<td>Note&lt;sup&gt;1,2&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1,2&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Cloxacillin</strong></td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Dicloxacillin</strong></td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Flucloxacillin</strong></td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Mecillinam (uncomplicated UTI only)</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

1. Most staphylococci are penicillinase producers, which are resistant to benzylpenicillin, phenoxybenzylpenicillin, ampicillin, amoxicillin, piperacillin and ticarcillin. Isolates negative for penicillinase and susceptible to methicillin can be reported susceptible to these agents. Isolates positive for penicillinase and methicillin susceptible are susceptible to beta-lactamase inhibitor combinations and isoxazolylpenicillins (oxacillin, cloxacillin, dicloxacillin and flucloxacillin).

2. S. aureus and S. lugdunensis with oxacillin MIC values >2 mg/L are mostly methicillin resistant due to the presence of the mecA gene. The corresponding oxacillin MIC for coagulase-negative staphylococci is >0.25 mg/L.

3. Chromogenic cephalosporin-based beta-lactamase tests do not reliably detect staphylococcal penicillinase.

4. For S. aureus, disk diffusion is more reliable than MIC determination for detection of penicillinase producers, provided the zone diameter is measured AND the zone edge closely inspected (see pictures below). If the zone diameter is <26 mm, then report resistant. If the zone diameter is ≥26 mm AND the zone edge is sharp, then report resistant. If not sharp, then report susceptible and if uncertain, then report resistant.
### Staphylococcus spp.

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

#### Cephalosporins

<table>
<thead>
<tr>
<th>Cephalosporins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cefaclor²</strong></td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁴</td>
<td>Note⁴</td>
</tr>
<tr>
<td><strong>Cefadroxil</strong></td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁴</td>
<td>Note⁴</td>
</tr>
<tr>
<td><strong>Cefalexin</strong></td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁴</td>
<td>Note⁴</td>
</tr>
<tr>
<td><strong>Cefazolin</strong></td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁴</td>
<td>Note⁴</td>
</tr>
<tr>
<td><strong>Cefepime</strong></td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁴</td>
<td>Note⁴</td>
</tr>
<tr>
<td><strong>Cefixime</strong></td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁴</td>
<td>Note⁴</td>
</tr>
<tr>
<td><strong>Ceftazidime</strong></td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁴</td>
<td>Note⁴</td>
</tr>
<tr>
<td><strong>Ceftabutin</strong></td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁴</td>
<td>Note⁴</td>
</tr>
<tr>
<td><strong>Ceftibuten</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Ceftriaxone</strong></td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁴</td>
<td>Note⁴</td>
</tr>
<tr>
<td><strong>Cefuroxime IV</strong></td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁴</td>
<td>Note⁴</td>
</tr>
<tr>
<td><strong>Cefuroxime oral</strong></td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁴</td>
<td>Note⁴</td>
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</table>

#### Carbapenems

<table>
<thead>
<tr>
<th>Carbapenems</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Doripenem</strong></td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁴</td>
<td>Note⁴</td>
</tr>
<tr>
<td><strong>Ertapenem</strong></td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁴</td>
<td>Note⁴</td>
</tr>
<tr>
<td><strong>Imipenem</strong></td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁴</td>
<td>Note⁴</td>
</tr>
<tr>
<td><strong>Meropenem</strong></td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁴</td>
<td>Note⁴</td>
</tr>
</tbody>
</table>

---

¹ Numbers for comments on MIC breakpoints
² Letters for comments on disk diffusion
³ S. aureus and *S. lugdunensis* with cefoxitin MIC values >4 mg/L are methicillin resistant, mostly due to the presence of the *mecA* gene. Disk diffusion reliably predicts methicillin resistance.
⁴ C.    
⁵ For coagulase-negative staphylococci other than *S. lugdunensis* the cefoxitin MIC is a poorer predictor of methicillin resistance than the disk diffusion test.
⁶ Methicillin-susceptible isolates can be reported susceptible to ceftaroline without further testing.
### Staphylococcus spp.

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

<table>
<thead>
<tr>
<th>Monobactams</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aztreonam</td>
<td>-</td>
<td>-</td>
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</table>

<table>
<thead>
<tr>
<th>Fluoroquinolones&lt;sup&gt;1&lt;/sup&gt;</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ciprofloxacin&lt;sup&gt;2&lt;/sup&gt;</td>
<td>1 1 5 20&lt;sup&gt;a&lt;/sup&gt;</td>
<td>20&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>1 2 5 22&lt;sup&gt;a&lt;/sup&gt;</td>
<td>19&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moxifloxacin</td>
<td>0.5 1 5 24&lt;sup&gt;a&lt;/sup&gt;</td>
<td>21&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nalidixic acid (screen)</td>
<td>NA NA NA</td>
<td>NA NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norfloxacin (screen)</td>
<td>NA NA 10 17&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;8&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ofloxacin</td>
<td>1 1 5 20&lt;sup&gt;a&lt;/sup&gt;</td>
<td>20&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Aminoglycosides&lt;sup&gt;3&lt;/sup&gt;</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amikacin&lt;sup&gt;4&lt;/sup&gt;, S. aureus</td>
<td>8 16 30 18 16</td>
<td>18 16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amikacin&lt;sup&gt;4&lt;/sup&gt;, Coagulase-negative staphylococci</td>
<td>8 16 30 22 19</td>
<td>18 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gentamicin, S. aureus</td>
<td>1 1 10 18 18</td>
<td>18 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gentamicin, Coagulase-negative staphylococci</td>
<td>1 1 10 22 22</td>
<td>18 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Netilmicin, S. aureus</td>
<td>1 1 10 18 18</td>
<td>18 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Netilmicin, Coagulase-negative staphylococci</td>
<td>1 1 10 22 22</td>
<td>18 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobramycin, S. aureus</td>
<td>1 1 10 18 18</td>
<td>18 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobramycin, Coagulase-negative staphylococci</td>
<td>1 1 10 22 22</td>
<td>18 18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. For breakpoints for other fluoroquinolones (e.g. pefloxacin and enoxacin), refer to breakpoints set by national breakpoint committees.

2. Breakpoints relate to high dose therapy.

A. The norfloxacin disk diffusion test can be used to screen for fluoroquinolone resistance. See Note B.

B. Isolates categorised as susceptible to norfloxacin can be reported susceptible to ciprofloxacin, levofloxacin, moxifloxacin and ofloxacin. Isolates categorised as non-susceptible should be tested for susceptibility to individual agents.

1. Aminoglycoside breakpoints are based on once-daily administration of high aminoglycoside dosages. Most often aminoglycosides are given in combination with beta-lactam agents.

2. Resistance to amikacin is most reliably determined by testing with kanamycin (zone diameter breakpoints under development).
### Staphylococcus spp.

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

#### Glycopeptides

<table>
<thead>
<tr>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Teicoplanin, <em>S. aureus</em></td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Teicoplanin, <em>Coagulase-negative staphylococci</em></td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Telavancin, <em>MRSA</em></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Vancomycin, <em>S. aureus</em></td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Vancomycin, <em>Coagulase-negative staphylococci</em></td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

1. Glycopeptide MICs are method dependent and should be determined by broth microdilution (reference ISO 20776). *S. aureus* with vancomycin MIC values of 2 mg/L are on the border of the wild type MIC distribution and there may be an impaired clinical response. The resistant breakpoint has been reduced to 2 mg/L to avoid reporting “GISA” isolates intermediate as serious infections with “GISA” isolates are not treatable with increased doses of vancomycin or teicoplanin.

#### Macrolides, lincosamides and streptogramins

<table>
<thead>
<tr>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Azithromycin</td>
<td>1$^1$</td>
<td>2$^1$</td>
<td></td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>1$^1$</td>
<td>2$^1$</td>
<td></td>
</tr>
<tr>
<td>Erythromycin</td>
<td>1$^1$</td>
<td>2$^1$</td>
<td>15</td>
</tr>
<tr>
<td>Roxithromycin</td>
<td>1$^1$</td>
<td>2$^1$</td>
<td></td>
</tr>
<tr>
<td>Telithromycin</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>0.25</td>
<td>0.5</td>
<td>2</td>
</tr>
</tbody>
</table>

1. 1/A. Erythromycin can be used to determine susceptibility to azithromycin, clarithromycin and roxithromycin.

#### Tetracyclines

<table>
<thead>
<tr>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
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<tbody>
<tr>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>1$^1$</td>
<td>2$^1$</td>
<td></td>
</tr>
<tr>
<td>Minocycline</td>
<td>0.5$^1$</td>
<td>1$^1$</td>
<td>30</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>1$^1$</td>
<td>2$^1$</td>
<td>30</td>
</tr>
<tr>
<td>Tigecycline</td>
<td>0.5$^2$</td>
<td>0.5</td>
<td>15</td>
</tr>
</tbody>
</table>

1. 1/A. Isolates susceptible to tetracycline are also susceptible to doxycycline and minocycline, but some resistant to tetracycline may be susceptible to minocycline and/or doxycycline. An MIC method should be used to test doxycycline susceptibility of tetracycline resistant isolates if required.

2. Isolates with MIC values above the susceptible breakpoint are very rare or not yet reported. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC values above the current resistant breakpoint they should be reported resistant.

---

**Notes**

- A. Disk diffusion is unreliable and cannot distinguish between wild type isolates and those with non-vanA-mediated resistance.
- Note$^4$: Isolates non-susceptible by disk diffusion should be confirmed by MIC testing.
**Staphylococcus spp.**

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

<table>
<thead>
<tr>
<th>Miscellaneous</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>8</td>
<td>8</td>
<td>30</td>
<td>18</td>
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<tr>
<td>Colistin</td>
<td>-</td>
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<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Daptomycin</td>
<td>1</td>
<td>1†</td>
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<td>-</td>
</tr>
<tr>
<td>Fosfomycin iv</td>
<td>32</td>
<td>32</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fosfomycin oral</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fusidic acid</td>
<td>1</td>
<td>1†</td>
<td>10</td>
<td>24</td>
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<tr>
<td>Linezolid</td>
<td>4</td>
<td>4</td>
<td>10</td>
<td>19B</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Mupirocin</td>
<td>1²</td>
<td>256²</td>
<td>200</td>
<td>30²</td>
</tr>
<tr>
<td>Nitrofurantoin (uncomplicated UTI only)</td>
<td>64²</td>
<td>64²</td>
<td>100</td>
<td>13²</td>
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<tr>
<td>Rifampicin</td>
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<td>0.5</td>
<td>5</td>
<td>26</td>
</tr>
<tr>
<td>Spectinomycin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Trimethoprim (uncomplicated UTI only)</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole⁴</td>
<td>2</td>
<td>4</td>
<td>1.25-23.75</td>
<td>17</td>
</tr>
</tbody>
</table>

**Notes:**
- Numbers for comments on MIC breakpoints
- Letters for comments on disk diffusion

1. Isolates with MIC values above the susceptible breakpoint are very rare or not yet reported. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC values above the current resistant breakpoint they should be reported resistant.
2. Use an MIC method.
3. Breakpoints relate to nasal decolonisation of *S. aureus*. Intermediate isolates are associated with short term suppression (useful preoperatively) but, unlike susceptible isolates, long term eradication rates are low.
4. Trimethoprim:sulfamethoxazole in the ratio 1:19. Breakpoints are expressed as the trimethoprim concentration.

**Examples of inhibition zones for *Staphylococcus aureus* with benzylpenicillin.**

a) Fuzzy zone edge and zone diameter ≥ 26 mm. Report susceptible.

b) Sharp zone edge and zone diameter ≥ 26 mm. Report resistant.
In endocarditis, refer to national or international endocarditis guidelines for breakpoints for *Enterococcus* spp.

### Penicillins

<table>
<thead>
<tr>
<th></th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Benzylpenicillin</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ampicillin</strong></td>
<td>4 8 2 10 8</td>
<td>Note^a Note^a</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ampicillin-sulbactam</strong></td>
<td>4 8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Amoxicillin</strong></td>
<td>4 8</td>
<td>Note^a</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Amoxicillin-clavulanate</strong></td>
<td>4^3 8^3</td>
<td>Note^a Note^a</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Piperacillin</strong></td>
<td>Note^a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Piperacillin-tazobactam</strong></td>
<td>Note^a Note^a Notes</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Ticarcillin</strong></td>
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</tr>
<tr>
<td><strong>Ticarcillin-clavulanate</strong></td>
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<td></td>
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<tr>
<td><strong>Phenoxymercaptenicillin</strong></td>
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<tr>
<td><strong>Oxacillin</strong></td>
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<td></td>
</tr>
<tr>
<td><strong>Cloxacillin</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dicloxacillin</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Flucloxacillin</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mecillinam (uncomplicated UTI only)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. *E. faecium* resistant to penicillins can be considered resistant to all other beta-lactam agents including carbapenems.

2. The susceptibility to ampicillin, amoxicillin and piperacillin with and without beta-lactamase inhibitor can be inferred from ampicillin.

3. For susceptibility testing purposes, the concentration of clavulanate is fixed at 2 mg/L.

<table>
<thead>
<tr>
<th></th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Disk diffusion (EUCAST standardised disk diffusion method)

**Medium:** Mueller-Hinton agar

**Inoculum:** McFarland 0.5

**Incubation:** Air, 35±1°C, 18±2h (for glycopeptides 24 h)

**Reading:** Read zone edges as the point showing no growth viewed from the back of the plate against a dark background illuminated with reflected light (except for glycopeptides, see below).

**Quality control:** *Enterococcus faecalis* ATCC 29212

---

---
### Cephalosporins

<table>
<thead>
<tr>
<th>Cephalosporins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Cefaclor</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefadroxil</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefalexin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefazolin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefepine</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefixime</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefoxitin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefpodoxime</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ceftaroline</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ceftazidime</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefitobuten</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ceftriazone</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefuroxime iv</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefuroxime oral</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### Carbapenems

<table>
<thead>
<tr>
<th>Carbapenems</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Doripenem</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ertapenem</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Imipenem</td>
<td>4</td>
<td>8</td>
<td>10</td>
<td>21</td>
</tr>
<tr>
<td>Meropenem</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>


### Enterococcus spp.

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

#### Monobactams

<table>
<thead>
<tr>
<th>Medication</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aztreonam</td>
<td>S - R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Fluoroquinolones

<table>
<thead>
<tr>
<th>Medication</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ciprofloxacin (uncomplicated UTI only)</td>
<td>4 4 5</td>
<td>IP&lt;sup&gt;A&lt;/sup&gt; IP&lt;sup&gt;A&lt;/sup&gt;</td>
<td>A. The norfloxacin disk diffusion test can be used to screen for fluoroquinolone resistance. See Note B.</td>
<td></td>
</tr>
<tr>
<td>Levofloxacin (uncomplicated UTI only)</td>
<td>4 4 5</td>
<td>IP&lt;sup&gt;A&lt;/sup&gt; IP&lt;sup&gt;A&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moxifloxacin</td>
<td>- -</td>
<td>- -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nalidixic acid (screen)</td>
<td>NA NA</td>
<td>NA NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norfloxacin (screen)</td>
<td>NA NA 10</td>
<td>12&lt;sup&gt;B&lt;/sup&gt; 12&lt;sup&gt;B&lt;/sup&gt;</td>
<td>8. Susceptibility of ciprofloxacin and levofloxacin can be inferred from the norfloxacin susceptibility.</td>
<td></td>
</tr>
<tr>
<td>Ofloxacin</td>
<td>- -</td>
<td>- -</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Aminoglycosides<sup>3</sup>

<table>
<thead>
<tr>
<th>Medication</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amikacin</td>
<td>Note&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;2&lt;/sup&gt; Note&lt;sup&gt;2&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Gentamicin (test for high-level aminoglycoside resistance)</td>
<td>Note&lt;sup&gt;2&lt;/sup&gt; Note&lt;sup&gt;2&lt;/sup&gt; 30</td>
<td>Note&lt;sup&gt;2&lt;/sup&gt; Note&lt;sup&gt;2&lt;/sup&gt;</td>
<td>2/A. Negative test: Isolates with gentamicin MIC &lt; 128 mg/L or a zone diameter ≥ 8 mm. The isolate is wild type for gentamicin and low-level intrinsic resistant. For other aminoglycosides, this may not be the case. Synergy with penicillins or glycopeptides can be expected if the isolate is susceptible to the penicillin or glycopeptide. Positive test: Isolates with gentamicin MIC &gt; 128 mg/L or a zone diameter &lt; 8 mm. The isolate is high-level resistant to gentamicin and other aminoglycosides, except streptomycin which must be tested separately if required (see note 3/B). There will be no synergy with penicillins or glycopeptides.</td>
<td></td>
</tr>
<tr>
<td>Netilmicin</td>
<td>Note&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;2&lt;/sup&gt; Note&lt;sup&gt;2&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Streptomycin (test for high-level streptomycin resistance)</td>
<td>Note&lt;sup&gt;2&lt;/sup&gt; Note&lt;sup&gt;2&lt;/sup&gt; 300</td>
<td>Note&lt;sup&gt;2&lt;/sup&gt; Note&lt;sup&gt;2&lt;/sup&gt;</td>
<td>3/B. Isolates with high-level gentamicin resistance may not be high-level resistant to streptomycin. Negative test: Isolates with streptomycin MIC &lt; 512 mg/L or a zone diameter ≥ 19 mm. The isolate is wild type for streptomycin and low-level intrinsic resistant. Synergy with penicillins or glycopeptides can be expected if the isolate is susceptible to the penicillin or glycopeptide. Positive test: Isolates with streptomycin MIC &gt; 512 mg/L or a zone diameter &lt; 19 mm. The isolate is high-level resistant to streptomycin. There will be no synergy with penicillins or glycopeptides.</td>
<td></td>
</tr>
<tr>
<td>Tobramycin</td>
<td>Note&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;2&lt;/sup&gt; Note&lt;sup&gt;2&lt;/sup&gt;</td>
<td></td>
</tr>
</tbody>
</table>
### Enterococcus spp.

#### EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

<table>
<thead>
<tr>
<th>Glycopeptides</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Teicoplanin</td>
<td>2</td>
<td>2</td>
<td>30</td>
<td>16</td>
</tr>
<tr>
<td>Telavancin</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>12*</td>
</tr>
</tbody>
</table>

A. Vancomycin susceptible enterococci exhibit sharp zone edges. Examine zone edges with transmitted light (plate held up to light) and suspect resistance when the vancomycin zone edge is fuzzy or colonies grow within the inhibition zone (see pictures below). Isolates must not be reported susceptible before 24 h incubation.

#### Macrolides, lincosamides and streptogramins

<table>
<thead>
<tr>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Azithromycin</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Roxithromycin</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Telithromycin</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Quinupristin-dalfopristin</td>
<td>1¹</td>
<td>4¹</td>
<td>15</td>
</tr>
</tbody>
</table>

1/A. Quinupristin-dalfopristin breakpoints apply to *E. faecium* only.

#### Tetracyclines

<table>
<thead>
<tr>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Minocycline</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Tigecycline</td>
<td>0.25*</td>
<td>0.5</td>
<td>15</td>
</tr>
</tbody>
</table>

1. Isolates with MIC values above the susceptible breakpoint are very rare or not yet reported. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC values above the current resistant breakpoint they should be reported resistant.
<table>
<thead>
<tr>
<th>Miscellaneous</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Colistin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Daptomycin</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Fosfomycin iv</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fosfomycin oral</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fusidic acid</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Linezolid</td>
<td>4</td>
<td>4</td>
<td>10</td>
<td>19</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mupirocin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nitrofurantoin (uncomplicated UTI only)</td>
<td>64¹ 64¹</td>
<td>100</td>
<td>15³</td>
<td>15³</td>
</tr>
<tr>
<td>Rifampicin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Spectinomycin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Trimeprorphim (uncomplicated UTI only)²</td>
<td>0.03 1.03</td>
<td>1</td>
<td>5</td>
<td>50 21</td>
</tr>
<tr>
<td>Trimeprorphim-sulfamethoxazole³</td>
<td>0.03 1.03</td>
<td>1.25-23.75</td>
<td>50</td>
<td>21</td>
</tr>
</tbody>
</table>

1. Nitrofurantoin breakpoints apply to E. faecalis only.

2. The activity of trimethoprim is uncertain against enterococci, hence the wild type population is categorised as intermediate.

3. Trimethoprim-sulfamethoxazole in the ratio 1:19. Breakpoints are expressed as the trimethoprim concentration.

Examples of inhibition zones for Enterococcus spp. with vancomycin.

a) Sharp zone edge and zone diameter ≥ 12 mm. Report susceptible.

b-d) Fuzzy zone edge or colonies within zone. Report resistant even if the zone diameter ≥ 12 mm.
### Penicillins

<table>
<thead>
<tr>
<th>Penicillin</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzylpenicillin</td>
<td>0.25 0.25</td>
<td>1 unit</td>
<td>16 18</td>
<td>1/A. The susceptibility of streptococcus groups A, B, C and G to penicillins is inferred from the benzylpenicillin susceptibility with the exception of phenoxymethylpenicillin and isoxazolylpenicillins for streptococcus group B. 2. Isolates with MIC values above the susceptible breakpoint are very rare or not yet reported. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC values above the current resistant breakpoint they should be reported resistant.</td>
</tr>
<tr>
<td>Ampicillin</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Ampicillin-sulbactam</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Amoxicillin</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Amoxicillin-clavulanate</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Piperacillin</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Piperacillin-tazobactam</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Ticarcillin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ticarcillin-clavulanate</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Phenoxymethylpenicillin</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Oxacillin</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Cloxacillin</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Dicloxacillin</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Flucloxacillin</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Mecillinam (uncomplicated UTI only)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### Benzylpenicillin

- MIC breakpoint: 0.25 mg/L
- Disk content: 1 unit
- Zone diameter breakpoint: 16 mm
- Notes: 1/A. The susceptibility of streptococcus groups A, B, C and G to penicillins is inferred from the benzylpenicillin susceptibility with the exception of phenoxymethylpenicillin and isoxazolylpenicillins for streptococcus group B. 2. Isolates with MIC values above the susceptible breakpoint are very rare or not yet reported. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC values above the current resistant breakpoint they should be reported resistant.

### Notes

- **S ≤**: Susceptible
- **R >**: Resistant
- **S ≥**: Susceptible
- **R <**: Resistant

### EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

- **Disk diffusion (EUCAST standardised disk diffusion method)**
- **Medium**: Mueller-Hinton agar + 5% defibrinated horse blood and 20 mg/L β-NAD (MH-F)
- **Inoculum**: McFarland 0.5
- **Incubation**: 5% CO₂, 35±1°C, 18±2h
- **Reading**: Read zone edges as the point showing no growth viewed from the front of the plate with the lid removed and with reflected light.
- **Quality control**: Streptococcus pneumoniae ATCC 49619

### Penicillins Table

<table>
<thead>
<tr>
<th>Penicillin</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzylpenicillin</td>
<td>0.25 0.25</td>
<td>1 unit</td>
<td>16 18</td>
<td>1/A. The susceptibility of streptococcus groups A, B, C and G to penicillins is inferred from the benzylpenicillin susceptibility with the exception of phenoxymethylpenicillin and isoxazolylpenicillins for streptococcus group B. 2. Isolates with MIC values above the susceptible breakpoint are very rare or not yet reported. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC values above the current resistant breakpoint they should be reported resistant.</td>
</tr>
<tr>
<td>Ampicillin</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Ampicillin-sulbactam</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Amoxicillin</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Amoxicillin-clavulanate</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Piperacillin</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Piperacillin-tazobactam</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Ticarcillin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ticarcillin-clavulanate</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Phenoxymethylpenicillin</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Oxacillin</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Cloxacillin</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Dicloxacillin</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Flucloxacillin</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note²</td>
<td>Note²</td>
</tr>
<tr>
<td>Mecillinam (uncomplicated UTI only)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
## Streptococcus groups A, B, C and G

### EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

<table>
<thead>
<tr>
<th>Cephalosporins¹</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td></td>
<td>S ≥ R &lt;</td>
<td></td>
</tr>
<tr>
<td>Cefaclor</td>
<td>Note¹ Note¹</td>
<td>Note² Note²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefadroxil</td>
<td>Note¹ Note¹</td>
<td>Note² Note²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefalexin</td>
<td>Note¹ Note¹</td>
<td>Note² Note²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefazolin</td>
<td>Note¹ Note¹</td>
<td>Note² Note²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefepime</td>
<td>Note¹ Note¹</td>
<td>Note² Note²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefixime</td>
<td>- -</td>
<td>- -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>Note¹ Note¹</td>
<td>Note² Note²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefoxitin</td>
<td>NA NA</td>
<td>NA NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefpodoxime</td>
<td>Note¹ Note¹</td>
<td>Note² Note²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ceftriazone</td>
<td>Note¹ Note¹</td>
<td>Note² Note²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefuroxime iv</td>
<td>Note¹ Note¹</td>
<td>Note² Note²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefuroxime oral</td>
<td>Note¹ Note¹</td>
<td>Note² Note²</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1/A. The susceptibility of streptococcus groups A, B, C and G to cephalosporins is inferred from the benzylpenicillin susceptibility.

<table>
<thead>
<tr>
<th>Carbapenems¹</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td></td>
<td>S ≥ R &lt;</td>
<td></td>
</tr>
<tr>
<td>Doripenem</td>
<td>Note¹ Note¹</td>
<td>Note² Note²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ertapenem</td>
<td>Note¹ Note¹</td>
<td>Note² Note²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imipenem</td>
<td>Note¹ Note¹</td>
<td>Note² Note²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meropenem</td>
<td>Note¹ Note¹</td>
<td>Note² Note²</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1/A. The susceptibility of streptococcus groups A, B, C and G to carbapenems is inferred from the benzylpenicillin susceptibility.

<table>
<thead>
<tr>
<th>Monobactams</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td></td>
<td>S ≥ R &lt;</td>
<td></td>
</tr>
<tr>
<td>Aztreonam</td>
<td>- -</td>
<td>- -</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Fluoroquinolones

<table>
<thead>
<tr>
<th>Fluoroquinolones</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>18&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Moxifloxacin</td>
<td>0.5</td>
<td>1</td>
<td>5</td>
<td>18&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Nalidixic acid (screen)</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Norfloxacin (screen)</td>
<td>NA</td>
<td>NA</td>
<td>10</td>
<td>12&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Ofloxacin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Notes**

Numbers for comments on MIC breakpoints
Letters for comments on disk diffusion

**Disk content (µg)**

- NA: Not available

**Notes**

- A: The norfloxacin disk diffusion test can be used to screen for fluoroquinolone resistance. See Note B.
- B: Isolates categorised as susceptible to norfloxacin can be reported susceptible to levofloxacin and moxifloxacin. Isolates categorised as non-susceptible should be tested for susceptibility to individual agents.

### Aminoglycosides

<table>
<thead>
<tr>
<th>Aminoglycosides</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amikacin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Netilmicin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Tobramycin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Notes**

Numbers for comments on MIC breakpoints
Letters for comments on disk diffusion

**Disk content (µg)**

- NA: Not available

### Glycopeptides

<table>
<thead>
<tr>
<th>Glycopeptides</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teicoplanin</td>
<td>2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2</td>
<td>30</td>
<td>15&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Telavancin</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2</td>
<td>5</td>
<td>13&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>
**Streptococcus groups A, B, C and G**

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

### Macrolides, lincosamides and streptogramins

<table>
<thead>
<tr>
<th>Antimicrobial</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Azithromycin</strong></td>
<td>0.25</td>
<td>0.5</td>
<td>S ≤ R ≥ 15</td>
<td></td>
</tr>
<tr>
<td><strong>Clarithromycin</strong></td>
<td>0.25</td>
<td>0.5</td>
<td>S ≤ R ≥ 15</td>
<td></td>
</tr>
<tr>
<td><strong>Erythromycin</strong></td>
<td>0.25</td>
<td>0.5</td>
<td>15 ≤ R ≥ 15</td>
<td></td>
</tr>
<tr>
<td><strong>Roxithromycin</strong></td>
<td>0.5</td>
<td>1</td>
<td>S ≤ R ≥ 15</td>
<td></td>
</tr>
<tr>
<td><strong>Telithromycin</strong></td>
<td>0.25</td>
<td>0.5</td>
<td>15 ≤ R ≥ 15</td>
<td></td>
</tr>
<tr>
<td><strong>Clindamycin</strong></td>
<td>0.5</td>
<td>0.5</td>
<td>2 ≤ R ≥ 17</td>
<td></td>
</tr>
</tbody>
</table>

1. Inducible clindamycin resistance can be detected by antagonism of clindamycin activity by a macrolide agent. If not detected, then report as susceptible. If detected, then report as susceptible and add this comment to the report: "Patients with serious infections caused by isolates with inducible clindamycin resistance should not be treated with clindamycin alone as full resistance may develop during therapy".

2. Place the erythromycin and clindamycin disks 12-16 mm apart (edge to edge) and look for antagonism (the D phenomenon).

### Tetracyclines

<table>
<thead>
<tr>
<th>Antimicrobial</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Doxycycline</strong></td>
<td>1</td>
<td>2</td>
<td>S ≤ R ≥ 30</td>
<td></td>
</tr>
<tr>
<td><strong>Minocycline</strong></td>
<td>0.5</td>
<td>1</td>
<td>30 ≤ R ≥ 23</td>
<td></td>
</tr>
<tr>
<td><strong>Tetracycline</strong></td>
<td>1</td>
<td>2</td>
<td>30 ≤ R ≥ 23</td>
<td></td>
</tr>
<tr>
<td><strong>Tigecycline</strong></td>
<td>0.25</td>
<td>0.5</td>
<td>15 ≤ R ≥ 19</td>
<td></td>
</tr>
</tbody>
</table>

1. Isolates susceptible to tetracycline are also susceptible to doxycycline and minocycline, but some resistant to tetracycline may be susceptible to minocycline and/or doxycycline. An MIC method should be used to test doxycycline susceptibility of tetracycline resistant isolates if required.

2. Isolates with MIC values above the susceptible breakpoint are very rare or not yet reported. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC values above the current resistant breakpoint they should be reported resistant.
<table>
<thead>
<tr>
<th>Miscellaneous agents</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td></td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colistin</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daptomycin</td>
<td>1¹ 1</td>
<td></td>
<td>Note²</td>
<td></td>
</tr>
<tr>
<td>Fosfomycin iv</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fosfomycin oral</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fusidic acid</td>
<td>IE IE</td>
<td>IE IE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linezolid</td>
<td>2 4</td>
<td>10</td>
<td>19 16</td>
<td></td>
</tr>
<tr>
<td>Metronidazole</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Mupirocin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Nitrofurantoin (uncomplicated UTI only)</td>
<td>64² 64²</td>
<td>100</td>
<td>15³ 15³</td>
<td>2/B. Nitrofurantoin breakpoints apply to <em>S. agalactiae</em> (group B streptococci) only.</td>
</tr>
<tr>
<td>Rifampicin</td>
<td>0.06 0.5</td>
<td>5</td>
<td>21 15</td>
<td></td>
</tr>
<tr>
<td>Spectinomycin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Trimethoprim (uncomplicated UTI only)</td>
<td>2² 2²</td>
<td>5</td>
<td>IP IP</td>
<td>3. Trimethoprim breakpoints apply to <em>S. agalactiae</em> (group B streptococci) only.</td>
</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole</td>
<td>1 2</td>
<td>1.25-23.75</td>
<td>18 15</td>
<td>4. Trimethoprim-sulfamethoxazole in the ratio 1:19. Breakpoints are expressed as the trimethoprim concentration.</td>
</tr>
</tbody>
</table>

Note: for trimethoprim-sulfamethoxazole, breakpoints are expressed as the trimethoprim concentration.
**Streptococcus pneumoniae**

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

**Disk diffusion (EUCAST standardised disk diffusion method)**
- **Medium:** Mueller-Hinton agar + 5% defibrinated horse blood and 20 mg/L β-NAD (MH-F)
- **Inoculum:** McFarland 0.5 from blood agar or McFarland 1.0 from chocolate agar
- **Incubation:** 5% CO₂, 35±1°C, 18±2h
- **Reading:** Read zone edges as the point showing no growth viewed from the front of the plate with the lid removed and with reflected light.
- **Quality control:** *Streptococcus pneumoniae* ATCC 49619

<table>
<thead>
<tr>
<th>Penicillins¹</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td></td>
</tr>
</tbody>
</table>

1. Breakpoints for penicillins other than benzylpenicillin relate only to non-meningitis isolates. Isolates fully susceptible to benzylpenicillin (MIC ≤0.06 mg/L and/or susceptible by oxacillin disk screen, see note C) can be reported susceptible to beta-lactam agents for which clinical breakpoints are listed (including those with "Note").

**Benzylpenicillin (infections other than meningitis)**

|              | 0.06², 1² | 2¹² | Note⁶ | Note⁶ |

| Benzylpenicillin (meningitis) | 0.06 | 0.06 | Note⁶ | Note⁶ |

**Ampicillin**

|              | 0.5 | ² | Note³⁶ | Note³⁶ |

**Amoxicillin-sulbactam**

|              | Note¹³ | Note¹³ | Note³⁶ | Note³⁶ |

**Amoxicillin**

|              | Note¹³ | Note¹³ | Note³⁶ | Note³⁶ |

**Amoxicillin-clavulanate**

|              | Note¹³ | Note¹³ | Note³⁶ | Note³⁶ |

**Piperacillin**

|              | Note¹³ | Note¹³ | Note³⁶ | Note³⁶ |

**Piperacillin-tazobactam**

|              | Note¹³ | Note¹³ | Note³⁶ | Note³⁶ |

**Ticarcillin**

|              | - | - | - | - |

**Ticarcillin-clavulanate**

|              | - | - | - | - |

**Phenoxyethylpenicillin**

|              | Note¹ | Note¹ | Note⁶ | Note⁶ |

**Oxacillin (screen)**

|              | NA | NA | 1 | 20² | Note² |

C. For interpretation of the oxacillin disk screen, see supplementary table below. For oxacillin non-susceptible isolates, always determine the MIC of benzylpenicillin.

**Cloxacillin**

|              | - | - | - | - |

**Dicloxacillin**

|              | - | - | - | - |

**Flucloxacillin**

|              | - | - | - | - |

**Mecillinam (uncomplicated UTI only)**

|              | - | - | - | - |
**Streptococcus pneumoniae**

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

### Cephalosporins

<table>
<thead>
<tr>
<th>Cephalosporins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td></td>
</tr>
<tr>
<td>Cefaclor</td>
<td>0.03</td>
<td>0.5</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Cefadroxil</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefalexin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefazolin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefepime</td>
<td>1</td>
<td>2</td>
<td>Note^A  Note^A</td>
<td></td>
</tr>
<tr>
<td>Cefixime</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>0.5^C</td>
<td>2</td>
<td>Note^A  Note^A</td>
<td></td>
</tr>
<tr>
<td>Cefoxitin</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Cefpodoxime</td>
<td>0.25</td>
<td>0.5</td>
<td>Note^A  Note^A</td>
<td></td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>0.25</td>
<td>0.25</td>
<td>Note^A  Note^A</td>
<td></td>
</tr>
<tr>
<td>Cefazolin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Ceflibuten</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>0.5^C</td>
<td>2</td>
<td>Note^A  Note^A</td>
<td></td>
</tr>
<tr>
<td>Cefuroxime iv</td>
<td>0.5</td>
<td>1</td>
<td>Note^A  Note^A</td>
<td></td>
</tr>
<tr>
<td>Cefuroxime oral</td>
<td>0.25</td>
<td>0.5</td>
<td>Note^A  Note^A</td>
<td></td>
</tr>
</tbody>
</table>

1. Isolates with MIC values above the susceptible breakpoint are very rare or not yet reported. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC values above the current resistant breakpoint they should be reported resistant.

A. Screen for beta-lactam resistance with the oxacillin 1 µg disk. See supplementary table below.

### Carbapenems

<table>
<thead>
<tr>
<th>Carbapenems</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td></td>
</tr>
<tr>
<td>Doripenem^1</td>
<td>1^A</td>
<td>1</td>
<td>Note^A  Note^A</td>
<td></td>
</tr>
<tr>
<td>Ertapenem^1</td>
<td>0.5^D</td>
<td>0.5</td>
<td>Note^A  Note^A</td>
<td></td>
</tr>
<tr>
<td>Imipenem^1</td>
<td>2^E</td>
<td>2</td>
<td>Note^A  Note^A</td>
<td></td>
</tr>
<tr>
<td>Meropenem^2 (infections other than meningitis)</td>
<td>2</td>
<td>2</td>
<td>Note^A  Note^A</td>
<td></td>
</tr>
<tr>
<td>Meropenem^2 (meningitis)</td>
<td>0.25</td>
<td>1</td>
<td>Note^O, Note^O</td>
<td></td>
</tr>
</tbody>
</table>

1. Not for meningitis (meropenem is the only carbapenem used for meningitis).
2. Isolates with MIC values above the susceptible breakpoint are very rare or not yet reported. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC values above the current resistant breakpoint they should be reported resistant.

A. Screen for beta-lactam resistance with the oxacillin 1 µg disk. See supplementary table below.

B. For use in meningitis determine the meropenem MIC.
### Streptococcus pneumoniae

#### EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

<table>
<thead>
<tr>
<th>Monobactams</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
<td>Numbers for comments on MIC breakpoints Letters for comments on disk diffusion</td>
</tr>
<tr>
<td>Aztreonam</td>
<td>- -</td>
<td>- -</td>
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</table>

<table>
<thead>
<tr>
<th>Fluoroquinolones</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
<td>Numbers for comments on MIC breakpoints Letters for comments on disk diffusion</td>
</tr>
<tr>
<td>Ciprofloxacin¹</td>
<td>0.12 2 5 50⁴ 16⁴</td>
<td>1. Wild type <em>S. pneumoniae</em> are not considered susceptible to ciprofloxacin and are therefore categorised as intermediate. A. The norfloxacin disk diffusion test can be used to screen for fluoroquinolone resistance. See Note B.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Levofloxacin²</td>
<td>2 2 5 17³ 17³</td>
<td>2. The breakpoints for levofloxacin relate to high dose therapy.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moxifloxacin</td>
<td>0.5 0.5 5 22⁴ 22⁴</td>
<td>B. Isolates categorised as susceptible to norfloxacin can be reported susceptible to levofloxacin and moxifloxacin and intermediate to ciprofloxacin and ofloxacin. Isolates categorised as non-susceptible should be tested for susceptibility to individual agents.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norfloxacin (screen)</td>
<td>NA NA 10 12² Note⁵</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ofloxacin²</td>
<td>0.12 4 5 50³ 13³</td>
<td>3. Wild type <em>S. pneumoniae</em> are not considered susceptible to ofloxacin and are therefore categorised as intermediate.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Aminoglycosides</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
<td>Numbers for comments on MIC breakpoints Letters for comments on disk diffusion</td>
</tr>
<tr>
<td>Amikacin</td>
<td>- -</td>
<td>- -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gentamicin</td>
<td>- -</td>
<td>- -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Netilimcin</td>
<td>- -</td>
<td>- -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobramycin</td>
<td>- -</td>
<td>- -</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Glycopeptides</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
<td>Numbers for comments on MIC breakpoints Letters for comments on disk diffusion</td>
</tr>
<tr>
<td>Teicoplanin</td>
<td>2⁴ 2 30 17³ 17³</td>
<td>1. Isolates with MIC values above the susceptible breakpoint are very rare or not yet reported. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC values above the current resistant breakpoint they should be reported resistant. A. Zone diameter breakpoints are based on wild type distributions as there are currently no resistant isolates.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telavancin</td>
<td>IE IE</td>
<td>IE IE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vancomycin</td>
<td>2⁴ 2 5 16³ 16³</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Streptococcus pneumoniae**

EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

### Macrolides, lincosamides and streptogramins

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azithromycin</td>
<td>0.25&lt;sup&gt;1&lt;/sup&gt; 0.5&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;a&lt;/sup&gt; Note&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1/A. Erythromycin can be used to determine susceptibility to azithromycin, clarithromycin and roxithromycin.</td>
<td></td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>0.25&lt;sup&gt;1&lt;/sup&gt; 0.5&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;a&lt;/sup&gt; Note&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erythromycin</td>
<td>0.25&lt;sup&gt;1&lt;/sup&gt; 0.5&lt;sup&gt;1&lt;/sup&gt; 15</td>
<td>22&lt;sup&gt;a&lt;/sup&gt; 19&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roxithromycin</td>
<td>0.5&lt;sup&gt;1&lt;/sup&gt; 1&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;a&lt;/sup&gt; Note&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telithromycin</td>
<td>0.25 0.5 15</td>
<td>23 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clindamycin&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0.5 0.5 2</td>
<td>19&lt;sup&gt;a&lt;/sup&gt; 19&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2. Inducible clindamycin resistance can be detected by antagonism of clindamycin activity by a macrolide agent. If not detected, then report as susceptible. If detected, then report as susceptible and add this comment to the report: “Patients with serious infections caused by isolates with inducible clindamycin resistance should not be treated with clindamycin alone as full resistance may develop during therapy”.</td>
<td></td>
</tr>
<tr>
<td>Quinupristin-dalfopristin</td>
<td>- - -</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Tetracyclines

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doxycycline</td>
<td>1&lt;sup&gt;1&lt;/sup&gt; 2&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;a&lt;/sup&gt; Note&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1/A. Isolates susceptible to tetracycline are also susceptible to doxycycline and minocycline, but some resistant to tetracycline may be susceptible to minocycline and/or doxycycline. An MIC method should be used to test doxycycline susceptibility of tetracycline resistant isolates if required.</td>
<td></td>
</tr>
<tr>
<td>Minocycline</td>
<td>0.5&lt;sup&gt;1&lt;/sup&gt; 1&lt;sup&gt;1&lt;/sup&gt; 30</td>
<td>24&lt;sup&gt;a&lt;/sup&gt; 21&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tigecycline</td>
<td>1&lt;sup&gt;1&lt;/sup&gt; 2&lt;sup&gt;1&lt;/sup&gt; 30</td>
<td>25&lt;sup&gt;a&lt;/sup&gt; 22&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tigecycline</td>
<td>IE IE</td>
<td>IE IE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
- **A**: Indicating the clinical breakpoint
- **B**: Indicating the disk diffusion method

**Numbers for comments on MIC breakpoints**
- **1**: Erythromycin can be used to determine susceptibility to azithromycin, clarithromycin and roxithromycin.
- **2**: Inducible clindamycin resistance can be detected by antagonism of clindamycin activity by a macrolide agent. If not detected, then report as susceptible. If detected, then report as susceptible and add this comment to the report: “Patients with serious infections caused by isolates with inducible clindamycin resistance should not be treated with clindamycin alone as full resistance may develop during therapy.”
- **B**: Place the erythromycin and clindamycin disks 12-16 mm apart (edge to edge) and look for antagonism (the D phenomenon).
### EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

#### Miscellaneous agents

<table>
<thead>
<tr>
<th>Antimicrobial agent</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>8</td>
<td>8</td>
<td>30</td>
<td>21</td>
</tr>
<tr>
<td>Colistin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Daptomycin</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Fosfomycin iv</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Fosfomycin oral</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fusidic acid</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Linezolid</td>
<td>2</td>
<td>4</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mupirocin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nitrofurantoin (uncomplicated UTI only)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Rifampicin</td>
<td>0.06</td>
<td>0.5</td>
<td>5</td>
<td>22</td>
</tr>
<tr>
<td>Spectinomycin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Trimethoprim (uncomplicated UTI only)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole</td>
<td>1</td>
<td>2</td>
<td>1.25-23.75</td>
<td>18</td>
</tr>
</tbody>
</table>

1. Trimethoprim:sulfamethoxazole in the ratio 1:19. Breakpoints are expressed as the trimethoprim concentration.

### Screening for beta-lactam resistance in *S. pneumoniae*

#### Supplementary table

**Oxacillin 1 µg disk**

<table>
<thead>
<tr>
<th>Zone diameter</th>
<th>Antimicrobial agent</th>
<th>Further testing and/or interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 20 mm</td>
<td>All beta-lactam agents for which clinical breakpoints are listed (including those with &quot;Note&quot;)</td>
<td>Report susceptible irrespective of clinical indication, except for cefaclor, which if reported, should be reported as intermediate.</td>
</tr>
<tr>
<td>&lt; 20 mm*</td>
<td>Benzylpenicillin (meningitis) and phenoxymethylpenicillin (all indications)</td>
<td>Report resistant.</td>
</tr>
<tr>
<td></td>
<td>Benzylpenicillin (for infections other than meningitis)</td>
<td>Determine the MIC and interpret according to the clinical breakpoints.</td>
</tr>
<tr>
<td></td>
<td>Ampicillin, amoxicillin and piperacillin (without and with beta-lactamase inhibitor), cefepime, cefotaxime, cefaroline and ceftriaxone</td>
<td><strong>Oxacillin zone diameter ≥ 8 mm</strong>: Report susceptible. In meningitis confirm by determining the MIC for the agent considered for clinical use.</td>
</tr>
<tr>
<td></td>
<td>Other beta-lactam agents</td>
<td><strong>Oxacillin zone diameter &lt; 8 mm</strong>: Determine the MIC of the beta-lactam agent intended for clinical use but for ampicillin, amoxicillin and piperacillin (without and with beta-lactamase inhibitor) infer susceptibility from the MIC of ampicillin.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Determine the MIC of the agent considered for clinical use and interpret according to the clinical breakpoints.</td>
</tr>
</tbody>
</table>

*Oxacillin 1 µg < 20 mm: Always determine the MIC of benzylpenicillin but do not delay reporting as recommended above.
### Viridans group streptococci

In endocarditis, refer to national or international endocarditis guidelines for breakpoints for viridans group streptococci.

#### EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

**Disk diffusion (EUCAST standardised disk diffusion method)**
- **Medium:** Mueller-Hinton agar + 5% defibrinated horse blood and 20 mg/L β-NAD (MH-F)
- **Inoculum:** McFarland 0.5
- **Incubation:** 5% CO₂, 35±1°C, 18±2h
- **Reading:** Read zone edges as the point showing no growth viewed from the front of the plate with the lid removed and with reflected light.
- **Quality control:** *Streptococcus pneumoniae* ATCC 49619

<table>
<thead>
<tr>
<th>Penicillins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benzylpenicillin</strong></td>
<td>0.25</td>
<td>2</td>
<td>1 unit</td>
<td>A. Benzylpenicillin 1 unit can be used to screen for beta-lactam resistance in viridans group streptococci. Isolates categorised as susceptible can be reported susceptible to beta-lactam agents for which clinical breakpoints are listed (including those with &quot;Note&quot;). Isolates categorised as non-susceptible should be tested for susceptibility to individual agents.</td>
</tr>
<tr>
<td><strong>Benzylpenicillin (screen)</strong></td>
<td>NA</td>
<td>NA</td>
<td>1 unit</td>
<td></td>
</tr>
<tr>
<td><strong>Ampicillin</strong></td>
<td>0.5</td>
<td>2</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td><strong>Ampicillin-sulbactam</strong></td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note¹</td>
<td>A/B. For isolates susceptible to benzylpenicillin, susceptibility can be inferred from benzylpenicillin or ampicillin. For isolates resistant to benzylpenicillin, susceptibility is inferred from ampicillin.</td>
</tr>
<tr>
<td><strong>Amoxicillin</strong></td>
<td>0.5</td>
<td>2</td>
<td>Note¹</td>
<td></td>
</tr>
<tr>
<td><strong>Amoxicillin-clavulanate</strong></td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note¹</td>
<td></td>
</tr>
<tr>
<td><strong>Piperacillin</strong></td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note¹</td>
<td></td>
</tr>
<tr>
<td><strong>Piperacillin-tazobactam</strong></td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note¹</td>
<td></td>
</tr>
<tr>
<td><strong>Ticarcillin</strong></td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td><strong>Ticarcillin-clavulanate</strong></td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td><strong>Phenoxyxymethylpenicillin</strong></td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
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</tr>
<tr>
<td><strong>Oxacillin</strong></td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td><strong>Cloxacillin</strong></td>
<td>-</td>
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</tr>
<tr>
<td><strong>Dicloxacillin</strong></td>
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<td></td>
</tr>
<tr>
<td><strong>Flucloxacillin</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Mecillinam (uncomplicated UTI only)</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
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</tbody>
</table>
## Viridans group streptococci

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

### Cephalosporins

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefaclor</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Cefadroxil</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Cefalexin</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Cefazolin</td>
<td>0.5 0.5</td>
<td>30 IP  IP</td>
<td>- -</td>
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</tr>
<tr>
<td>Cefepime</td>
<td>0.5 0.5</td>
<td>30 25ₐ 25ₐ</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Cefixime</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>0.5 0.5</td>
<td>5 23ₐ 23ₐ</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Cefoxitin</td>
<td>NA NA</td>
<td>NA NA</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Cefpodoxime</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
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<tr>
<td>Ceftriaxone</td>
<td>0.5 0.5</td>
<td>30 27ₐ 27ₐ</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Cefuroxime</td>
<td>0.5 0.5</td>
<td>30 26ₐ 26ₐ</td>
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</tbody>
</table>

A. Benzylpenicillin 1 unit can be used to screen for beta-lactam resistance in viridans group streptococci. See Note A on penicillins.

### Carbapenems

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doripenem</td>
<td>1ₐ 1</td>
<td>Noteₐ Noteₐ</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>1</td>
<td>Noteₐ</td>
<td>Noteₐ</td>
</tr>
<tr>
<td>Ertapenem</td>
<td>0.5 0.5</td>
<td>Noteₐ Noteₐ</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Imipenem</td>
<td>2ₐ 2</td>
<td>Noteₐ Noteₐ</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Meropenem</td>
<td>2ₐ 2</td>
<td>Noteₐ Noteₐ</td>
<td>- -</td>
<td></td>
</tr>
</tbody>
</table>

1. Isolates with MIC values above the susceptible breakpoint are very rare or not yet reported. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC values above the current resistant breakpoint they should be reported resistant.

A. Benzylpenicillin 1 unit can be used to screen for beta-lactam resistance in viridans group streptococci. See Note A on penicillins.

### Monobactams

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aztreonam</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
<td></td>
</tr>
</tbody>
</table>
Viridans group streptococci

Fluoroquinolones

<table>
<thead>
<tr>
<th>Fluoroquinolones</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Moxifloxacin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Nalidixic acid (screen)</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Norfloxacin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Ofloxacin</td>
<td>-</td>
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</tbody>
</table>
### Viridans group streptococci

#### EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

<table>
<thead>
<tr>
<th>Glycopeptides</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teicoplanin</td>
<td>2¹ 2 30</td>
<td>16⁴ 16⁴</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telavancin</td>
<td>IE IE</td>
<td>IE IE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vancomycin</td>
<td>2¹ 2 5</td>
<td>15⁴ 15⁴</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Isolates with MIC values above the susceptible breakpoint are very rare or not yet reported. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC values above the current resistant breakpoint they should be reported resistant.

A. Zone diameter breakpoints are based on wild type distributions as there are currently no resistant isolates.

#### Macrolides, lincosamides and streptogramins

<table>
<thead>
<tr>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
</tr>
<tr>
<td>Azithromycin</td>
<td>IE IE</td>
<td>IE IE</td>
<td>IE IE</td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>IE IE</td>
<td>IE IE</td>
<td>IE IE</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>IE IE</td>
<td>IE IE</td>
<td>IE IE</td>
</tr>
<tr>
<td>Roxithromycin</td>
<td>IE IE</td>
<td>IE IE</td>
<td>IE IE</td>
</tr>
<tr>
<td>Telithromycin</td>
<td>IE IE</td>
<td>IE IE</td>
<td>IE IE</td>
</tr>
<tr>
<td>Clindamycin¹</td>
<td>0.5 0.5 2</td>
<td>19⁴ 19⁴</td>
<td></td>
</tr>
<tr>
<td>Clindamycin</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Inducible clindamycin resistance can be detected by antagonism of clindamycin activity by a macrolide agent. If not detected, then report as susceptible. If detected, then report as susceptible and add this comment to the report: "Patients with serious infections caused by isolates with inducible clindamycin resistance should not be treated with clindamycin alone as full resistance may develop during therapy".

B. Place the erythromycin and clindamycin disks 12-16 mm apart (edge to edge) and look for antagonism (the D phenomenon).

<table>
<thead>
<tr>
<th>Quinupristin-dalfopristin</th>
<th>IE IE</th>
<th>IE IE</th>
</tr>
</thead>
</table>

#### Tetracyclines

<table>
<thead>
<tr>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
</tr>
<tr>
<td>Doxycycline</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>Minocycline</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>Tigecycline</td>
<td>IE IE</td>
<td>IE IE</td>
<td>IE IE</td>
</tr>
</tbody>
</table>

Numbers for comments on MIC breakpoints
Letters for comments on disk diffusion

### Glycopeptides

<table>
<thead>
<tr>
<th>Glycopeptides</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≥ R &lt;</td>
<td></td>
</tr>
<tr>
<td>Teicoplanin</td>
<td>2</td>
<td>16⁴</td>
</tr>
<tr>
<td>Telavancin</td>
<td>2</td>
<td>15⁴</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>2</td>
<td>15⁴</td>
</tr>
</tbody>
</table>

### Macrolides, lincosamides and streptogramins

<table>
<thead>
<tr>
<th>Macrolides, lincosamides and streptogramins</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≥ R &lt;</td>
<td></td>
</tr>
<tr>
<td>Azithromycin</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Roxithromycin</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Telithromycin</td>
<td>IE</td>
<td>IE</td>
</tr>
</tbody>
</table>

### Tetracyclines

<table>
<thead>
<tr>
<th>Tetracyclines</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≥ R &lt;</td>
<td></td>
</tr>
<tr>
<td>Doxycycline</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Minocycline</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Tigecycline</td>
<td>IE</td>
<td>IE</td>
</tr>
</tbody>
</table>

### Notes

Numbers for comments on MIC breakpoints
Letters for comments on disk diffusion

- **IE**: Interpretation extended
- **A**: Indicates comments for disk diffusion

- **S ≥ R <**: S denotes susceptibility, R resistant, ≥ greater than or equal to, < less than
- **S ≤ R >**: S denotes susceptibility, R resistant, ≤ less than or equal to, > greater than

**Glycopeptides**

1. **Glycopeptides**

1. Teicoplanin

- MIC breakpoint (mg/L): 2
- Disk content (µg): 2
- Zone diameter breakpoint (mm): 30
- Notes: 1. Isolates with MIC values above the susceptible breakpoint are very rare or not yet reported. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC values above the current resistant breakpoint they should be reported resistant.

- **Telavancin**

- MIC breakpoint (mg/L): 2
- Disk content (µg): 2
- Zone diameter breakpoint (mm): 5
- Notes: They should be reported resistant.

- **Vancomycin**

- MIC breakpoint (mg/L): 2
- Disk content (µg): 2
- Zone diameter breakpoint (mm): 5
- Notes: They should be reported resistant.

**Macrolides, lincosamides and streptogramins**

1. **Macrolides, lincosamides and streptogramins**

1. Azithromycin

- MIC breakpoint (mg/L): 0.5
- Disk content (µg): 0.5
- Zone diameter breakpoint (mm): 2
- Notes: 2. Inducible clindamycin resistance can be detected by antagonism of clindamycin activity by a macrolide agent. If not detected, then report as susceptible. If detected, then report as susceptible and add this comment to the report: "Patients with serious infections caused by isolates with inducible clindamycin resistance should not be treated with clindamycin alone as full resistance may develop during therapy".

- **Clindamycin**

- MIC breakpoint (mg/L): 0.5
- Disk content (µg): 0.5
- Zone diameter breakpoint (mm): 2
- Notes: 2. Inducible clindamycin resistance can be detected by antagonism of clindamycin activity by a macrolide agent. If not detected, then report as susceptible. If detected, then report as susceptible and add this comment to the report: "Patients with serious infections caused by isolates with inducible clindamycin resistance should not be treated with clindamycin alone as full resistance may develop during therapy".

**Tetracyclines**

1. **Tetracyclines**

1. Doxycycline

- MIC breakpoint (mg/L): -
- Disk content (µg): -
- Zone diameter breakpoint (mm): -

- **Minocycline**

- MIC breakpoint (mg/L): -
- Disk content (µg): -
- Zone diameter breakpoint (mm): -

- **Tetracycline**

- MIC breakpoint (mg/L): -
- Disk content (µg): -
- Zone diameter breakpoint (mm): -

- **Tigecycline**

- MIC breakpoint (mg/L): IE
- Disk content (µg): IE
- Zone diameter breakpoint (mm): IE

**Notes**

- **S ≤ R >**: S denotes susceptibility, R resistant, ≤ less than or equal to, > greater than
- **S ≥ R <**: S denotes susceptibility, R resistant, ≥ greater than or equal to, < less than

**References**

- **Glycopeptides**

- **Macrolides, lincosamides and streptogramins**

- **Tetracyclines**
## Viridans group streptococci

### EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

<table>
<thead>
<tr>
<th>Miscellaneous agents</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Colistin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Daptomycin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fosfomycin iv</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fosfomycin oral</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fusidic acid</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Linezolid</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mupirocin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nitrofurantoin (uncomplicated UTI only)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Rifampicin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Spectinomycin</td>
<td>-</td>
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<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Trimethoprim (uncomplicated UTI only)</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole</td>
<td>-</td>
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<td>-</td>
</tr>
</tbody>
</table>
EUCAST breakpoints have been defined for *H. influenzae* only. Clinical data for other *Haemophilus* species are scarce. MIC distributions for *H. parainfluenzae* are similar to those for *H. influenzae*. In the absence of specific breakpoints the *H. influenzae* breakpoints can be applied to *H. parainfluenzae*.

<table>
<thead>
<tr>
<th>Penicillins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benzylpenicillin</strong></td>
<td></td>
<td></td>
<td></td>
<td>A. Benzylpenicillin 1 unit can be used to screen for, but not to distinguish between, beta-lactamase producing isolates and isolates with PBP mutations. For interpretation of the benzylpenicillin disk screen, see supplementary table below.</td>
</tr>
<tr>
<td><strong>Benzylpenicillin (screen)</strong></td>
<td>NA</td>
<td>1 unit</td>
<td>12(^{A}) Note(^{A})</td>
<td></td>
</tr>
<tr>
<td><strong>Ampicillin</strong></td>
<td>1(^{1})</td>
<td>2</td>
<td>16(^{A}) 16(^{A})</td>
<td>1. Breakpoints are based on intravenous administration. For penicillins without inhibitors, breakpoints apply to beta-lactamase negative isolates only. For penicillins without inhibitors, beta-lactamase positive isolates should be reported resistant.</td>
</tr>
<tr>
<td><strong>Ampicillin-sulbactam</strong></td>
<td>1(^{1,3,3}) 1(^{1,3,3})</td>
<td>10-10</td>
<td>Note(^{B} \text{C}) Note(^{A, B} \text{C})</td>
<td>2. For susceptibility testing purposes, the concentration of sulbactam is fixed at 4 mg/L. 3/B. Susceptibility can be inferred from amoxicillin-clavulanate.</td>
</tr>
<tr>
<td><strong>Amoxicillin</strong></td>
<td>2(^{1})</td>
<td>4</td>
<td>15(^{A}) 15(^{A})</td>
<td>C. Susceptibility inferred from ampicillin.</td>
</tr>
<tr>
<td><strong>Amoxicillin-clavulanate</strong></td>
<td>2(^{1,4}) 2(^{1,4})</td>
<td>2-1</td>
<td>15(^{A}) 15(^{A})</td>
<td>4. For susceptibility testing purposes, the concentration of clavulanate is fixed at 2 mg/L.</td>
</tr>
<tr>
<td><strong>Piperacillin</strong></td>
<td>Note(^{1,2})</td>
<td>Note(^{1,2})</td>
<td>Note(^{A, D} \text{C}) Note(^{A, D} \text{C})</td>
<td>5/D. Susceptibility inferred from ampicillin or amoxicillin.</td>
</tr>
<tr>
<td><strong>Piperacillin-tazobactam</strong></td>
<td>Note(^{1,3}) Note(^{1,3})</td>
<td>Note(^{A}) Note(^{A})</td>
<td>Note(^{A}) Note(^{A})</td>
<td></td>
</tr>
<tr>
<td><strong>Ticarcillin</strong></td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td><strong>Ticarcillin-clavulanate</strong></td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td><strong>Phenoxymethylpenicillin</strong></td>
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<td>IE</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td><strong>Oxacillin</strong></td>
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<tr>
<td><strong>Cloxacillin</strong></td>
<td>-</td>
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<td></td>
</tr>
<tr>
<td><strong>Dicloxacillin</strong></td>
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</tr>
<tr>
<td><strong>Flucloxacillin</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Mecillinam (uncomplicated UTI only)</strong></td>
<td>-</td>
<td>-</td>
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</tbody>
</table>
### Haemophilus influenzae

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

#### Cephalosporins

<table>
<thead>
<tr>
<th>Cephalosporins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Cefaclor</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefadroxil</td>
<td>-</td>
<td>-</td>
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<td></td>
</tr>
<tr>
<td>Cefalexin</td>
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<td></td>
</tr>
<tr>
<td>Cefazolin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefepime</td>
<td>0.25</td>
<td>0.25</td>
<td>30</td>
<td>27&lt;sup&gt;A&lt;/sup&gt; 27&lt;sup&gt;A&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefixime</td>
<td>0.12&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0.12</td>
<td>5</td>
<td>25&lt;sup&gt;A&lt;/sup&gt; 25&lt;sup&gt;A&lt;/sup&gt;</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>0.12&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0.12</td>
<td>5</td>
<td>26&lt;sup&gt;A&lt;/sup&gt; 26&lt;sup&gt;A&lt;/sup&gt;</td>
</tr>
<tr>
<td>Cefoxitin</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Cefpodoxime</td>
<td>0.25&lt;sup&gt;1&lt;/sup&gt;</td>
<td>0.5</td>
<td>10</td>
<td>26&lt;sup&gt;A&lt;/sup&gt; 23&lt;sup&gt;A&lt;/sup&gt;</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>0.03</td>
<td>0.03</td>
<td>IP</td>
<td>IP</td>
</tr>
<tr>
<td>Ceftriazone</td>
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<td></td>
</tr>
<tr>
<td>Cefuroxime iv</td>
<td>1&lt;sup&gt;2&lt;/sup&gt;</td>
<td>-</td>
<td>30</td>
<td>25&lt;sup&gt;A&lt;/sup&gt; 25&lt;sup&gt;A&lt;/sup&gt;</td>
</tr>
<tr>
<td>Cefuroxime oral</td>
<td>0.12</td>
<td>1</td>
<td>30</td>
<td>50     26</td>
</tr>
</tbody>
</table>

1. Isolates with MIC values above the susceptible breakpoint are very rare or not yet reported. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC values above the current resistant breakpoint they should be reported resistant.

**A. Benzylpenicillin 1 unit can be used to screen for beta-lactam resistance. See supplementary table below.**

#### Carbapenems

<table>
<thead>
<tr>
<th>Carbapenems</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doripenem</td>
<td>1&lt;sup&gt;2&lt;/sup&gt;</td>
<td>1</td>
<td>10</td>
<td>20&lt;sup&gt;A&lt;/sup&gt; 20&lt;sup&gt;A&lt;/sup&gt;</td>
</tr>
<tr>
<td>Ertapenem</td>
<td>0.5&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0.5</td>
<td>10</td>
<td>20&lt;sup&gt;A&lt;/sup&gt; 20&lt;sup&gt;A&lt;/sup&gt;</td>
</tr>
<tr>
<td>Imipenem</td>
<td>2&lt;sup&gt;2&lt;/sup&gt;</td>
<td>2</td>
<td>10</td>
<td>20&lt;sup&gt;A&lt;/sup&gt; 20&lt;sup&gt;A&lt;/sup&gt;</td>
</tr>
<tr>
<td>Meropenem</td>
<td>2&lt;sup&gt;2&lt;/sup&gt;</td>
<td>2</td>
<td>10</td>
<td>20&lt;sup&gt;A&lt;/sup&gt; 20&lt;sup&gt;A&lt;/sup&gt;</td>
</tr>
<tr>
<td>Meropenem</td>
<td>0.25</td>
<td>1</td>
<td>Note&lt;sup&gt;B&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;B&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

1. Not for meningitis (meropenem is the only carbapenem used for meningitis).

2. Isolates with MIC values above the susceptible breakpoint are very rare or not yet reported. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC values above the current resistant breakpoint they should be reported resistant.

**A. Benzylpenicillin 1 unit can be used to screen for beta-lactam resistance. See supplementary table below.**

3. Meropenem is the only carbapenem used for meningitis.

**B. For use in meningitis determine the meropenem MIC value.**
**Haemophilus influenzae**

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

<table>
<thead>
<tr>
<th>Monobactams</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Aztreonam</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fluoroquinolones&lt;sup&gt;1,2&lt;/sup&gt;</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>0.5&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0.5</td>
<td>5</td>
<td>26&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1</td>
<td>5</td>
<td>26&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Moxifloxacin</td>
<td>0.5&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0.5</td>
<td>5</td>
<td>25&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Nalidixic acid (screen)</td>
<td>NA</td>
<td>NA</td>
<td>30</td>
<td>23&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Norfloxacin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ofloxacin</td>
<td>0.5&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0.5</td>
<td>5</td>
<td>23&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

| Nalidixic acid disk diffusion | 23<sup>a</sup> |

<table>
<thead>
<tr>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints Letters for comments on disk diffusion</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Aminocephalosides</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Amikacin</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Netilmicin</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Tobramycin</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
</tbody>
</table>

**Notes**

<sup>1</sup>Numbers for comments on MIC breakpoints

<sup>2</sup>Letters for comments on disk diffusion

See Note B.
### Haemophilus influenzae

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

#### Glycopeptides

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Teicoplanin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Telavancin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

#### Macrolides, lincosamides and streptogramins

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Azithromycin</td>
<td>0.12</td>
<td>4</td>
<td>Note¹</td>
<td>Note²</td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>1²</td>
<td>32</td>
<td>Note³</td>
<td>Note⁴</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>0.5</td>
<td>16</td>
<td>15</td>
<td>50</td>
</tr>
<tr>
<td>Roxithromycin</td>
<td>1²</td>
<td>16²</td>
<td>Note⁵</td>
<td>Note⁶</td>
</tr>
<tr>
<td>Telithromycin</td>
<td>0.12</td>
<td>8</td>
<td>15</td>
<td>50</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Quinupristin-dalfopristin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

1. Correlation between macrolide MICs and clinical outcome is weak for *H. influenzae*. Therefore, breakpoints for macrolides and related antibiotics have been set to categorise wild type *H. influenzae* as intermediate.

2/A. Erythromycin can be used to determine susceptibility to azithromycin, clarithromycin and roxithromycin.

#### Tetracyclines

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>1³</td>
<td>2¹</td>
<td>Note⁴</td>
<td>Note⁵</td>
</tr>
<tr>
<td>Minocycline</td>
<td>1³</td>
<td>2¹</td>
<td>30</td>
<td>24³</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>1³</td>
<td>2¹</td>
<td>30</td>
<td>25³</td>
</tr>
<tr>
<td>Tigecycline</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
</tbody>
</table>

1/A. Isolates susceptible to tetracycline are also susceptible to doxycycline and minocycline, but some resistant to tetracycline may be susceptible to minocycline and/or doxycycline. An MIC method should be used to test doxycycline susceptibility of tetracycline resistant isolates if required.
### Haemophilus influenzae

#### EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

<table>
<thead>
<tr>
<th>Miscellaneous agents</th>
<th>MIC breakpoint (mg/L)</th>
<th>Zone diameter breakpoint (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Collistin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Daptomycin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fosfomycin iv</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Fosfomycin oral</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fusidic acid</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Linezolid</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mupirocin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nitrofurantoil (uncomplicated UTI only)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Rifampicin (for prophylaxis only)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Spectinomycin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Trimethoprim (uncomplicated UTI only)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole</td>
<td>0.5</td>
<td>1</td>
</tr>
</tbody>
</table>

1. Trimethoprim:sulfamethoxazole in the ratio 1:19. Breakpoints are expressed as the trimethoprim concentration.

### Screening for beta-lactam resistance in H. influenzae

#### Supplementary table

<table>
<thead>
<tr>
<th>Benzylpenicillin 1 unit disk Zone diameter</th>
<th>Beta-lactamase</th>
<th>Further testing and/or interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 12 mm</td>
<td>Do not test</td>
<td>Report susceptible to all beta-lactam agents for which clinical breakpoints are listed (including those with &quot;Note&quot;), and cefuroxime oral, which if reported, should be reported intermediate.</td>
</tr>
<tr>
<td>&lt; 12 mm</td>
<td>Beta-lactamase negative</td>
<td>A resistance mechanism other than beta-lactamase production is present. As the effect on individual beta-lactam agents differs, test susceptibility to the beta-lactam agent intended for clinical use.</td>
</tr>
<tr>
<td></td>
<td>Beta-lactamase positive</td>
<td>For ampicillin, amoxicillin and piperacillin, report resistant. For other beta-lactam agents, test susceptibility to the beta-lactam agent intended for clinical use as another resistance mechanism cannot be excluded by the screen test.</td>
</tr>
</tbody>
</table>
### Moraxella catarrhalis

EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

<table>
<thead>
<tr>
<th>Penicillins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
<th>Letters for comments on disk diffusion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzylpenicillin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ampicillin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ampicillin-sulbactam</td>
<td>1&lt;sup&gt;1,3&lt;/sup&gt;</td>
<td>1&lt;sup&gt;2,3&lt;/sup&gt;</td>
<td></td>
<td></td>
<td>Note&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Amoxicillin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amoxicillin-clavulanate</td>
<td>1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2-1</td>
<td>19</td>
<td>19</td>
<td>2. For susceptibility testing purposes, the concentration of sulbactam is fixed at 4 mg/L.</td>
</tr>
<tr>
<td>PIPERACILLIN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIPERACILLIN-TAZOBACTAM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ticarcillin</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ticarcillin-clavulanate</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenoxymethylpenicillin</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Oxacillin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cloxacillin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dicloxacillin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FLUOXACILLIN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mecillinam (uncomplicated UTI only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Disk diffusion (EUCAST standardised disk diffusion method)**
- **Medium:** Mueller-Hinton agar + 5% defibrinated horse blood and 20 mg/L β-NAD (MH-F)
- **Inoculum:** McFarland 0.5
- **Incubation:** 5% CO<sub>2</sub>, 35±1ºC, 18±2h
- **Reading:** Read zone edges as the point showing no growth viewed from the front of the plate with the lid removed and with reflected light.
- **Quality control:** Haemophilus influenzae NCTC 8468

1. Most *M. catarrhalis* produce beta-lactamase, although beta-lactamase production is slow and may give weak results with *in vitro* tests. Beta-lactamase producers should be reported resistant to penicillins and aminopenicillins without inhibitors.

2. For susceptibility testing purposes, the concentration of sulbactam is fixed at 4 mg/L.

3/A. Susceptibility can be inferred from amoxicillin-clavulanate.

3. For susceptibility testing purposes, the concentration of clavulanate is fixed at 2 mg/L.
### Moraxella catarrhalis

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

<table>
<thead>
<tr>
<th>Cephalosporins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt; S ≥ R &lt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefaclor</td>
<td>- - -</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefadroxil</td>
<td>- - -</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefalexin</td>
<td>- - -</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefazolin</td>
<td>- - -</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefepime</td>
<td>4 4 30 20 20</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefixime</td>
<td>0.5 1 5 21 18</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>1 2 5 20 17</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefoxitin</td>
<td>NA NA 10 NA NA</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefpodoxime</td>
<td>IP IP 10 IP IP</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefazidime</td>
<td>- - -</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefitobuten</td>
<td>IE IE 30 IE IE</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>1 2 30 24 21</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefuroxime iv</td>
<td>4 8 30 21 18</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefuroxime oral</td>
<td>0.12 4 30 50 21</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Carbapenems</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt; S ≥ R &lt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doripenem</td>
<td>1¹ 1 10 30 30</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Ertapenem</td>
<td>0.5¹ 0.5 10 29 29</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Imipenem</td>
<td>2¹ 2 10 29 29</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Meropenem</td>
<td>2¹ 2 10 33 33</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

1. Isolates with MIC values above the susceptible breakpoint are very rare or not yet reported. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC values above the current resistant breakpoint they should be reported resistant.

<table>
<thead>
<tr>
<th>Monobactams</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt; S ≥ R &lt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aztreonam</td>
<td>IE IE IE IE IE</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Fluoroquinolones</td>
<td>MIC breakpoint (mg/L)</td>
<td>Disk content (µg)</td>
<td>Zone diameter breakpoint (mm)</td>
<td>Notes</td>
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<tr>
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<td>-----------------------</td>
<td>-------------------</td>
<td>-----------------------------</td>
<td>-------</td>
</tr>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
<td>Numbers for comments on MIC breakpoints Letters for comments on disk diffusion</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>0.5 0.5</td>
<td>5</td>
<td>23&lt;sup&gt;a&lt;/sup&gt; 23&lt;sup&gt;a&lt;/sup&gt;</td>
<td>A. The nalidixic acid disk diffusion test can be used to screen for fluoroquinolone resistance. See Note B.</td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>1 1</td>
<td>5</td>
<td>23&lt;sup&gt;a&lt;/sup&gt; 23&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Moxifloxacin</td>
<td>0.5 0.5</td>
<td>5</td>
<td>23&lt;sup&gt;a&lt;/sup&gt; 23&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Nalidixic acid (screen)</td>
<td>NA NA</td>
<td>30</td>
<td>23&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;B&lt;/sup&gt; B. Isolates categorised as susceptible to nalidixic acid can be reported susceptible to levofloxacin, ciprofloxacin, moxifloxacin and ofloxacin. Isolates categorised as non-susceptible may have fluoroquinolone resistance and should be tested against the appropriate agent.</td>
</tr>
<tr>
<td>Norfloxacin</td>
<td>- -</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Ofloxacin</td>
<td>0.5 0.5</td>
<td>5</td>
<td>25&lt;sup&gt;a&lt;/sup&gt; 25&lt;sup&gt;a&lt;/sup&gt;</td>
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<table>
<thead>
<tr>
<th>Aminoglycosides</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
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<tbody>
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<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
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<td>Numbers for comments on MIC breakpoints Letters for comments on disk diffusion</td>
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<tr>
<td>Amikacin</td>
<td>IE IE</td>
<td>IE IE</td>
<td></td>
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<tr>
<td>Gentamicin</td>
<td>IE IE</td>
<td>IE IE</td>
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<tr>
<td>Netilmicin</td>
<td>IE IE</td>
<td>IE IE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobramycin</td>
<td>IE IE</td>
<td>IE IE</td>
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<table>
<thead>
<tr>
<th>Glycopeptides</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
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<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
<td>Numbers for comments on MIC breakpoints Letters for comments on disk diffusion</td>
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<tr>
<td>Teicoplanin</td>
<td>- -</td>
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<tr>
<td>Telavancin</td>
<td>- -</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Vancomycin</td>
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### EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

#### Macrolides, lincosamides and streptogramins

<table>
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<th></th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Azithromycin</td>
<td>0.25 0.5</td>
<td>Note6 Note6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>0.25 0.5</td>
<td>Note6 Note6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erythromycin</td>
<td>0.25 0.5 15</td>
<td>23³ 20³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roxithromycin</td>
<td>0.5 1 15</td>
<td>Note6 Note6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telithromycin</td>
<td>0.25 0.5 15</td>
<td>23 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clindamycin</td>
<td>- - -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quinupristin-dalfopristin</td>
<td>- - -</td>
<td></td>
<td></td>
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</table>

1/A. Erythromycin can be used to determine susceptibility to azithromycin, clarithromycin and roxithromycin.

#### Tetracyclines

<table>
<thead>
<tr>
<th></th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>1¹ 2¹</td>
<td>Note6 Note6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minocycline</td>
<td>1² 2² 30</td>
<td>25³ 22³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetracycline</td>
<td>1 ² 30</td>
<td>28³ 25³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tigecycline</td>
<td>IE IE</td>
<td>IE IE</td>
<td>IE IE</td>
<td></td>
</tr>
</tbody>
</table>

1/A. Isolates susceptible to tetracycline are also susceptible to doxycycline and minocycline, but some resistant to tetracycline may be susceptible to minocycline and/or doxycycline. An MIC method should be used to test doxycycline susceptibility of tetracycline resistant isolates if required.

#### Miscellaneous agents

<table>
<thead>
<tr>
<th></th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>2¹ 2¹ 30</td>
<td>30³ 30³</td>
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<td></td>
</tr>
<tr>
<td>Colistin</td>
<td>- - -</td>
<td>- -</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Daptomycin</td>
<td>- - -</td>
<td>- -</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Fosfomycin iv</td>
<td>IE IE</td>
<td>IE IE</td>
<td>IE IE</td>
<td></td>
</tr>
<tr>
<td>Fosfomycin oral</td>
<td>- - -</td>
<td>- -</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Fusidic acid</td>
<td>- - -</td>
<td>- -</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Linezolid</td>
<td>- - -</td>
<td>- -</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Metronidazole</td>
<td>- - -</td>
<td>- -</td>
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</tr>
<tr>
<td>Mupirocin</td>
<td>- - -</td>
<td>- -</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Nitrofurantoin (uncomplicated UTI only)</td>
<td>- - -</td>
<td>- -</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Rifampicin</td>
<td>- - -</td>
<td>- -</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Spectinomycin</td>
<td>- - -</td>
<td>- -</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Trimethoprim (uncomplicated UTI only)</td>
<td>- - -</td>
<td>- -</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole¹</td>
<td>0.5 1 1.25-23.75</td>
<td>18 15</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1/A. Breakpoints relate to the topical use of chloramphenicol.

1/A. Breakpoints are expressed as the trimethoprim:sulfamethoxazole in the ratio 1:19. Breakpoints are expressed as the trimethoprim concentration.
**Neisseria gonorrhoeae**

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

Disk diffusion criteria for antimicrobial susceptibility testing of *Neisseria gonorrhoeae* have not yet been defined and an MIC method should be used. If a commercial MIC method is used, follow the manufacturer’s instructions.

<table>
<thead>
<tr>
<th>Penicillins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
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</tr>
<tr>
<td>Benzylpenicillin</td>
<td>0.06 1</td>
<td></td>
</tr>
<tr>
<td>Ampicillin¹</td>
<td>Note¹ Note¹</td>
<td></td>
</tr>
<tr>
<td>Ampicillin-sulbactam</td>
<td>IE IE</td>
<td></td>
</tr>
<tr>
<td>Amoxicillin</td>
<td>Note¹ Note¹</td>
<td></td>
</tr>
<tr>
<td>Amoxicillin-clavulanate</td>
<td>Note¹ Note¹</td>
<td></td>
</tr>
<tr>
<td>Piperacillin</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Piperacillin-tazobactam</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Ticarcillin</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Ticarcillin-clavulanate</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Phenoxymerhiylpenicillin</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Oxacillin</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Cloxacillin</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Dicloxacillin</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Flucloxacillin</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Mecillinam (uncomplicated UTI only)</td>
<td>- -</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

1. Always test for beta-lactamase. If positive, report resistant to benzylpenicillin, ampicillin and amoxicillin. The susceptibility of beta-lactamase negative isolates to ampicillin and amoxicillin can be inferred from benzylpenicillin.
### Neisseria gonorrhoeae

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

<table>
<thead>
<tr>
<th>Cephalosporins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td></td>
</tr>
<tr>
<td>Cefaclor</td>
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<td>-</td>
<td></td>
</tr>
<tr>
<td>Cefadroxil</td>
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<td>-</td>
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</tr>
<tr>
<td>Cefalexin</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Cefazolin</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Cefepime</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Cefixime</td>
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<td>0.12</td>
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<td>Cefotaxime</td>
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<td>Cefoxitin</td>
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<tr>
<td>Cefpodoxime</td>
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<td>IE</td>
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<tr>
<td>Ceftriazone</td>
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<tr>
<td>Ceftriazone</td>
<td>IE</td>
<td>IE</td>
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<td>Ceftriazone</td>
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<td>0.12</td>
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</tr>
<tr>
<td>Cefuroxime iv</td>
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<td>Cefuroxime oral</td>
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<table>
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<tr>
<th>Carbapenems</th>
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<th>Numbers for comments on MIC breakpoints</th>
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<tbody>
<tr>
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<tr>
<td>Doripenem</td>
<td>IE</td>
<td>IE</td>
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</tr>
<tr>
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<td>IE</td>
<td></td>
</tr>
<tr>
<td>Imipenem</td>
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<td>Meropenem</td>
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<td>IE</td>
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<table>
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<tr>
<th>Monobactams</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
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<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
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</tr>
<tr>
<td>Aztreonam</td>
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<td>IE</td>
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### Neisseria gonorrhoeae

#### EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

<table>
<thead>
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<th>Fluoroquinolones</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Notes for comments on MIC breakpoints</th>
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<tbody>
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<td></td>
<td>S ≤ R &gt;</td>
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<td>Levofloxacin</td>
<td>IE IE</td>
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</tr>
<tr>
<td>Moxifloxacin</td>
<td>IE IE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nalidixic acid (screen)</td>
<td>NA NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norfloxacin</td>
<td>IE IE</td>
<td></td>
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</tr>
<tr>
<td>Ofloxacin</td>
<td>0.12 0.25</td>
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<th>Aminoglycosides</th>
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<tr>
<td>Netilmicin</td>
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<tr>
<td>Tobramycin</td>
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<table>
<thead>
<tr>
<th>Glycopeptides</th>
<th>MIC breakpoint (mg/L)</th>
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<th>Notes for comments on MIC breakpoints</th>
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<tr>
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<td>S ≤ R &gt;</td>
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<td></td>
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<tr>
<td>Teicoplanin</td>
<td>- -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telavancin</td>
<td>- -</td>
<td></td>
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</tr>
<tr>
<td>Vancomycin</td>
<td>- -</td>
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</table>
### Neisseria gonorrhoeae

#### EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

<table>
<thead>
<tr>
<th>Macrolides, lincosamides and streptogramins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
</tr>
<tr>
<td>Azithromycin</td>
<td>0.25</td>
<td>0.5</td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Roxithromycin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Telithromycin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Quinupristin-dalfopristin</td>
<td>-</td>
<td>-</td>
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<table>
<thead>
<tr>
<th>Tetracyclines†</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
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<tbody>
<tr>
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<td>R &gt;</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Minocycline</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Tetracycline†</td>
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<td>1</td>
</tr>
<tr>
<td>Tigecycline</td>
<td>IE</td>
<td>IE</td>
</tr>
</tbody>
</table>

1. Isolates susceptible to tetracycline are also susceptible to minocycline, but some isolates resistant to tetracycline may be susceptible to minocycline.

<table>
<thead>
<tr>
<th>Miscellaneous agents</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Colistin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Daptomycin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fosfomycin iv</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fosfomycin oral</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fusidic acid</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Linezolid</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mupirocin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nitrofurantoin (uncomplicated UTI only)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Rifampicin</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Spectinomycin</td>
<td>64</td>
<td>64</td>
</tr>
<tr>
<td>Trimethoprim (uncomplicated UTI only)</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Trimethoprim-sulfamethoxazole</td>
<td>-</td>
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</table>
**Neisseria meningitidis**

Disk diffusion criteria for antimicrobial susceptibility testing of *Neisseria meningitidis* have not been defined and an MIC method should be used. If a commercial MIC method is used, follow the manufacturer’s instructions.

### EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

<table>
<thead>
<tr>
<th>Penicillins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
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<tr>
<td><strong>Benzylpenicillin</strong></td>
<td>0.06</td>
<td>0.25</td>
<td></td>
</tr>
<tr>
<td><strong>Ampicillin</strong></td>
<td>0.12</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Ampicillin-sulbactam</strong></td>
<td>IE</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td><strong>Amoxicillin</strong></td>
<td>0.12</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Amoxicillin-clavulanate</strong></td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Piperacillin</strong></td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>** Piperacillin-tazobactam**</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Ticarcillin</strong></td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Ticarcillin-clavulanate</strong></td>
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<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Phenoxybenzylicillin</strong></td>
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<td><strong>Oxacillin</strong></td>
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<td><strong>Cloxacillin</strong></td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Dicloxacillin</strong></td>
<td>-</td>
<td>-</td>
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<tr>
<td><strong>Flucloxacillin</strong></td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Mecillinam (uncomplicated UTI only)</strong></td>
<td>-</td>
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</table>
### Neisseria meningitidis

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

#### Cephalosporins

<table>
<thead>
<tr>
<th>Antimicrobial</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
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<tbody>
<tr>
<td>Cefaclor</td>
<td>-</td>
<td></td>
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</tr>
<tr>
<td>Cefadroxil</td>
<td>-</td>
<td></td>
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<tr>
<td>Cefalexin</td>
<td>-</td>
<td></td>
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</tr>
<tr>
<td>Cefazolin</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefepine</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefixime</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>0.12</td>
<td>0.12</td>
<td>1. Isolates with MIC values above the susceptible breakpoint are very rare or not yet reported. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC values above the current resistant breakpoint they should be reported resistant.</td>
</tr>
<tr>
<td>Cefoxitin</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefpodoxime</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ceftaroline</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ceftazidime</td>
<td>-</td>
<td></td>
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</tr>
<tr>
<td>Ceftibuten</td>
<td>-</td>
<td></td>
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<tr>
<td>Ceftriazone</td>
<td>0.12</td>
<td>0.12</td>
<td></td>
</tr>
<tr>
<td>Cefuroxime iv</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefuroxime oral</td>
<td>-</td>
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#### Carbapenems

<table>
<thead>
<tr>
<th>Antimicrobial</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
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</thead>
<tbody>
<tr>
<td>Doripenem</td>
<td>IE</td>
<td>IE</td>
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<tr>
<td>Ertapenem</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imipenem</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meropenem¹</td>
<td>0.25</td>
<td>0.25</td>
<td>1. Isolates with MIC values above the susceptible breakpoint are very rare or not yet reported. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC values above the current resistant breakpoint they should be reported resistant. 2. Breakpoints relate to meningitis only.</td>
</tr>
</tbody>
</table>

#### Monobactams

<table>
<thead>
<tr>
<th>Antimicrobial</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
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</thead>
<tbody>
<tr>
<td>Aztreonam</td>
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### Neisseria meningitidis

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>Numbers for comments on MIC breakpoints</td>
</tr>
<tr>
<td>Fluoroquinolones</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>0.03&lt;sup&gt;1&lt;/sup&gt; 0.06&lt;sup&gt;1&lt;/sup&gt;</td>
<td>1. Breakpoints apply only to use in the prophylaxis of meningococcal disease.</td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>IE IE</td>
<td></td>
</tr>
<tr>
<td>Moxifloxacin</td>
<td>IE IE</td>
<td></td>
</tr>
<tr>
<td>Nalidixic acid (screen)</td>
<td>NA NA</td>
<td></td>
</tr>
<tr>
<td>Norfloxacin</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Ofloxacin</td>
<td>IE IE</td>
<td></td>
</tr>
<tr>
<td>Aminoglycosides</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amikacin</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Gentamicin</td>
<td>- -</td>
<td></td>
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<tr>
<td>Netilmicin</td>
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<td></td>
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<tr>
<td>Tobramycin</td>
<td>- -</td>
<td></td>
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<tr>
<td>Glycopeptides</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teicoplanin</td>
<td>- -</td>
<td></td>
</tr>
<tr>
<td>Telavancin</td>
<td>- -</td>
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</tr>
<tr>
<td>Vancomycin</td>
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</table>
### Neisseria meningitidis

#### EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

<table>
<thead>
<tr>
<th>Macrolides, lincosamides and streptogramins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes Numbers for comments on MIC breakpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azithromycin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Erythromycin</td>
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<td>-</td>
</tr>
<tr>
<td>Roxithromycin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Telithromycin</td>
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<td>-</td>
</tr>
<tr>
<td>Clindamycin</td>
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<td>-</td>
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<tr>
<td>Quinupristin-dalfopristin</td>
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</table>

<table>
<thead>
<tr>
<th>Tetracyclines</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes Numbers for comments on MIC breakpoints</th>
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<tbody>
<tr>
<td>Doxycycline</td>
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<td>-</td>
</tr>
<tr>
<td>Minocycline</td>
<td>1, 2</td>
<td>1. Tetracycline can be used to predict susceptibility to minocycline for prophylaxis against N. meningitidis infections.</td>
</tr>
<tr>
<td>Tetracycline</td>
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<tr>
<td>Tigecycline</td>
<td>IE, IE</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Miscellaneous agents</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes Numbers for comments on MIC breakpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloramphenicol</td>
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<tr>
<td>Colistin</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Daptomycin</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Fosfomycin iv</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Fosfomycin oral</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Fusidic acid</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Linezolid</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Metronidazole</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Mupirocin</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Nitrofurantion (uncomplicated UTI only)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Rifampicin¹</td>
<td>0.25, 0.25</td>
<td>1. For prophylaxis of meningitis only (refer to national guidelines).</td>
</tr>
<tr>
<td>Spectinomycin</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Trimethoprim (uncomplicated UTI only)</td>
<td>-</td>
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</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole</td>
<td>-</td>
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</tr>
</tbody>
</table>

**Notes**

1. Numbers for comments on MIC breakpoints.
**Gram-positive anaerobes**

*except* *Clostridium difficile*

Disk diffusion criteria for antimicrobial susceptibility testing of anaerobes have not yet been defined and an MIC method should be used. If a commercial MIC method is used, follow the manufacturer’s instructions.

<table>
<thead>
<tr>
<th>Penicillins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>S ≤</strong></td>
<td><strong>R &gt;</strong></td>
</tr>
<tr>
<td><strong>Benzylpenicillin</strong></td>
<td>0.25</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Ampicillin</strong></td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td><strong>Ampicillin-sulbactam</strong></td>
<td>4²</td>
<td>8²</td>
</tr>
<tr>
<td><strong>Amoxicillin</strong></td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td><strong>Amoxicillin-clavulanate</strong></td>
<td>4²</td>
<td>8²</td>
</tr>
<tr>
<td><strong>Piperacillin</strong></td>
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<tr>
<td><strong>Piperacillin-tazobactam</strong></td>
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<td>16²</td>
</tr>
<tr>
<td><strong>Ticarcillin</strong></td>
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<td>16</td>
</tr>
<tr>
<td><strong>Ticarcillin-clavulanate</strong></td>
<td>8²</td>
<td>16²</td>
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<tr>
<td><strong>Phenoxyethylpenicillin</strong></td>
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<td>IE</td>
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<tr>
<td><strong>Oxacillin</strong></td>
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<td>-</td>
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<tr>
<td><strong>Cloxacillin</strong></td>
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<td>-</td>
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<tr>
<td><strong>Dicloxacillin</strong></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Flucloxacillin</strong></td>
<td>-</td>
<td>-</td>
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<tr>
<td><strong>Mecillinam (uncomplicated UTI only)</strong></td>
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</table>
### Gram-positive anaerobes

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

**except Clostridium difficile**

#### Cephalosporins

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
</tr>
<tr>
<td>Cefaclor</td>
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<td></td>
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<tr>
<td>Cefadroxil</td>
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<td>Cefalexin</td>
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<td>Cefazolin</td>
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</tr>
<tr>
<td>Cefepime</td>
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<td></td>
</tr>
<tr>
<td>Cefixime</td>
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</tr>
<tr>
<td>Cefotaxime</td>
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</tr>
<tr>
<td>Cefoxitin</td>
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<tr>
<td>Cefpodoxime</td>
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<td>Ceftaroline</td>
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<td>Ceftazidime</td>
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</tr>
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<td>Ceftibuten</td>
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<td></td>
</tr>
<tr>
<td>Ceftriaxone</td>
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<td></td>
</tr>
<tr>
<td>Cefuroxime iv</td>
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</tr>
<tr>
<td>Cefuroxime oral</td>
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#### Carbapenems

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>R &gt;</td>
</tr>
<tr>
<td>Doripenem</td>
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<td>Imipenem</td>
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<tr>
<td>Meropenem</td>
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#### Monobactams

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
</tr>
<tr>
<td>Aztreonam</td>
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### EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

**Gram-positive anaerobes**

*except Clostridium difficile*

<table>
<thead>
<tr>
<th>Fluoroquinolones</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Moxifloxacin</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Nalidixic acid (screen)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Norfloxacin</td>
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<tr>
<td>Ofloxacin</td>
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<thead>
<tr>
<th>Aminoglycosides</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td></td>
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<td>R &gt;</td>
</tr>
<tr>
<td>Amikacin</td>
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<tr>
<td>Gentamicin</td>
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<td>-</td>
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<tr>
<td>Netilmicin</td>
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<td>-</td>
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<tr>
<td>Tobramycin</td>
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<td>-</td>
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<table>
<thead>
<tr>
<th>Glycopeptides</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>R &gt;</td>
</tr>
<tr>
<td>Teicoplanin</td>
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<td>IE</td>
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<tr>
<td>Telavancin</td>
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<td>IE</td>
</tr>
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<td>Vancomycin</td>
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**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

### Gram-positive anaerobes

**except Clostridium difficile**

<table>
<thead>
<tr>
<th>Macrolides, lincosamides and streptogramins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azithromycin</td>
<td>S ≤ - R &gt; -</td>
<td></td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>S ≤ - R &gt; -</td>
<td></td>
</tr>
<tr>
<td>Erythromycin</td>
<td>S ≤ IE R &gt; IE</td>
<td></td>
</tr>
<tr>
<td>Roxithromycin</td>
<td>S ≤ - R &gt; -</td>
<td></td>
</tr>
<tr>
<td>Telithromycin</td>
<td>S ≤ - R &gt; -</td>
<td></td>
</tr>
<tr>
<td>Clindamycin</td>
<td>S ≤ 4 R &gt; 4</td>
<td></td>
</tr>
<tr>
<td>Quinupristin/dalfopristin</td>
<td>S ≤ - R &gt; -</td>
<td></td>
</tr>
</tbody>
</table>

**Tetracyclines¹**

<table>
<thead>
<tr>
<th>Tetracyclines¹</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doxycycline</td>
<td>S ≤ Note¹ R &gt; Note¹</td>
<td></td>
</tr>
<tr>
<td>Minocycline</td>
<td>S ≤ Note¹ R &gt; Note¹</td>
<td></td>
</tr>
<tr>
<td>Tetracycline</td>
<td>S ≤ Note¹ R &gt; Note¹</td>
<td></td>
</tr>
<tr>
<td>Tigecycline</td>
<td>S ≤ Note¹ R &gt; Note¹</td>
<td></td>
</tr>
</tbody>
</table>

**Miscellaneous agents**

<table>
<thead>
<tr>
<th>Miscellaneous agents</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloramphenicol</td>
<td>S ≤ 8 R &gt; 8</td>
<td></td>
</tr>
<tr>
<td>Colistin</td>
<td>S ≤ - R &gt; -</td>
<td></td>
</tr>
<tr>
<td>Daptomycin</td>
<td>S ≤ - R &gt; -</td>
<td></td>
</tr>
<tr>
<td>Fosfomycin iv</td>
<td>S ≤ - R &gt; -</td>
<td></td>
</tr>
<tr>
<td>Fosfomycin oral</td>
<td>S ≤ - R &gt; -</td>
<td></td>
</tr>
<tr>
<td>Fusidic acid</td>
<td>S ≤ - R &gt; -</td>
<td></td>
</tr>
<tr>
<td>Linezolid</td>
<td>S ≤ - R &gt; -</td>
<td></td>
</tr>
<tr>
<td>Metronidazole</td>
<td>S ≤ 4 R &gt; 4</td>
<td></td>
</tr>
<tr>
<td>Mupirocin</td>
<td>S ≤ - R &gt; -</td>
<td></td>
</tr>
<tr>
<td>Nitrofurantoin (uncomplicated UTI only)</td>
<td>S ≤ - R &gt; -</td>
<td></td>
</tr>
<tr>
<td>Rifampicin</td>
<td>S ≤ - R &gt; -</td>
<td></td>
</tr>
<tr>
<td>Spectinomycin</td>
<td>S ≤ - R &gt; -</td>
<td></td>
</tr>
<tr>
<td>Trimethoprim (uncomplicated UTI only)</td>
<td>S ≤ - R &gt; -</td>
<td></td>
</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole</td>
<td>S ≤ - R &gt; -</td>
<td></td>
</tr>
</tbody>
</table>

*Note: ¹ For anaerobic bacteria there is clinical evidence of activity in mixed intra-abdominal infections, but no correlation between MIC values, Pk/Pd data and clinical outcome. Therefore no breakpoints for susceptibility testing are given.*
**Disk diffusion criteria for antimicrobial susceptibility testing of *Clostridium difficile* have not yet been defined and an MIC method should be used. If a commercial MIC method is used, follow the manufacturer’s instructions.**

<table>
<thead>
<tr>
<th>Fluoroquinolones</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moxifloxacin</td>
<td>≤1; &gt;1</td>
<td>1. Not used clinically. May be tested for epidemiological purposes only (ECOFF: WT ≤ 4 mg/L).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Glycopeptides</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vancomycin</td>
<td>≤2; &gt;2</td>
<td>1. The breakpoints are based on epidemiological cut-off values (ECOFFs), which distinguish wild-type isolates from those with reduced susceptibility.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tetracyclines</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tigecycline</td>
<td>≤1; &gt;1</td>
<td>1. Not used clinically. May be tested for epidemiological purposes only (ECOFF: WT ≤ 0.25 mg/L).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Miscellaneous agents</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daptomycin</td>
<td>≤1; &gt;1</td>
<td>1. Not used clinically. May be tested for epidemiological purposes only (ECOFF: WT ≤ 4 mg/L).</td>
<td></td>
</tr>
<tr>
<td>Fusidic acid</td>
<td>≤2; &gt;2</td>
<td>2. Not used clinically. May be tested for epidemiological purposes only (ECOFF: WT ≤ 2 mg/L).</td>
<td></td>
</tr>
<tr>
<td>Metronidazole</td>
<td>≤2; &gt;2</td>
<td>3. The breakpoints are based on epidemiological cut-off values (ECOFFs), which distinguish wild-type isolates from those with reduced susceptibility.</td>
<td></td>
</tr>
<tr>
<td>Rifampicin</td>
<td>≤4; &gt;4</td>
<td>4. Not used clinically. May be tested for epidemiological purposes only (ECOFF: WT ≤ 0.004 mg/L).</td>
<td></td>
</tr>
</tbody>
</table>
Disk diffusion criteria for antimicrobial susceptibility testing of anaerobes have not yet been defined and an MIC method should be used. If a commercial MIC method is used, follow the manufacturer’s instructions.

<table>
<thead>
<tr>
<th>Penicillins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benzylpenicillin</strong></td>
<td>0.25</td>
<td>1. Susceptibility to ampicillin, amoxicillin and piperacillin without beta-lactamase inhibitors can be inferred from benzylpenicillin.</td>
</tr>
<tr>
<td><strong>Ampicillin</strong></td>
<td>0.5</td>
<td>2</td>
</tr>
<tr>
<td><strong>Ampicillin-sulbactam</strong></td>
<td>4&lt;sup&gt;+&lt;/sup&gt;</td>
<td>8&lt;sup&gt;+&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Amoxicillin</strong></td>
<td>0.5</td>
<td>2</td>
</tr>
<tr>
<td><strong>Amoxicillin-clavulanate</strong></td>
<td>4&lt;sup&gt;+&lt;/sup&gt;</td>
<td>8&lt;sup&gt;+&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Piperacillin</strong></td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td><strong>Piperacillin-tazobactam</strong></td>
<td>8&lt;sup&gt;+&lt;/sup&gt;</td>
<td>16&lt;sup&gt;+&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Ticarcillin</strong></td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td><strong>Ticarcillin-clavulanate</strong></td>
<td>8&lt;sup&gt;+&lt;/sup&gt;</td>
<td>16&lt;sup&gt;+&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Phenoxyethylpenicillin</strong></td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td><strong>Oxacillin</strong></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Cloxacillin</strong></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Dicloxacillin</strong></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Flucloxacillin</strong></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Mecillinam (uncomplicated UTI only)</strong></td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
### Gram-negative anaerobes

#### EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

<table>
<thead>
<tr>
<th>Cephalosporins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
</tr>
<tr>
<td>Cefaclor</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefadroxil</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefalexin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefazolin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefepine</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefixime</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefoxitin</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Cepodoxime</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefaroline</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ceftazidime</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefitoxitin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefuroxime iv</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cefuroxime oral</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

#### Carbapenems

<table>
<thead>
<tr>
<th>Carbapenems</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
</tr>
<tr>
<td>Doripenem</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Ertapenem</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Imipenem</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Meropenem</td>
<td>2</td>
<td>8</td>
</tr>
</tbody>
</table>

#### Monobactams

<table>
<thead>
<tr>
<th>Monobactams</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
</tr>
<tr>
<td>Aztreonam</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
### Fluoroquinolones

<table>
<thead>
<tr>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **S ≤**
- **R >**

- **Ciprofloxacin**
- **Levofloxacin**
- **Moxifloxacin**
- **Nalidixic acid (screen)**
- **Norfloxacin**
- **Ofloxacin**

### Aminoglycosides

<table>
<thead>
<tr>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **S ≤**
- **R >**

- **Amikacin**
- **Gentamicin**
- **Netilmicin**
- **Tobramycin**

### Glycopeptides

<table>
<thead>
<tr>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **S ≤**
- **R >**

- **Teicoplanin**
- **Telavancin**
- **Vancomycin**

### Macrolides, lincosamides and streptogramins

<table>
<thead>
<tr>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **S ≤**
- **R >**

- **Azithromycin**
- **Clarithromycin**
- **Erythromycin**
- **Roxithromycin**
- **Telithromycin**

- **Clindamycin**
- **Quinupristin/dalfopristin**

---

**Notes**

Numbers for comments on MIC breakpoints

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**
## Gram-negative anaerobes

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

### Tetracyclines

<table>
<thead>
<tr>
<th>Mic breakpoint (mg/L)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>S ≤ R &gt;</td>
<td></td>
</tr>
</tbody>
</table>

1. For anaerobic bacteria there is clinical evidence of activity in mixed intra-abdominal infections, but no correlation between MIC values, Pk/Pd data and clinical outcome. Therefore no breakpoints for susceptibility testing are given.

### Miscellaneous agents

<table>
<thead>
<tr>
<th>Mic breakpoint (mg/L)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>S ≤ R &gt;</td>
<td></td>
</tr>
</tbody>
</table>

**Chloramphenicol**

- 8 8

**Colistin**

- -

**Daptomycin**

- -

**Fosfomycin iv**

- -

**Fosfomycin oral**

- -

**Fusidic acid**

- -

**Linezolid**

- -

**Metronidazole**

4 4

**Mupirocin**

- -

**Nitrofurantoin (uncomplicated UTI only)**

- -

**Rifampicin**

- -

**Spectinomycin**

- -

**Trimethoprim (uncomplicated UTI only)**

- -

**Trimethoprim-sulfamethoxazole**

- -
**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

Disk diffusion criteria for antimicrobial susceptibility testing of *Helicobacter pylori* have not been defined and an MIC method should be used. If a commercial MIC method is used, follow the manufacturer’s instructions.

<table>
<thead>
<tr>
<th>Penicillins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td>S ≤ R &gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amoxicillin</td>
<td>0.12 &lt; 0.12</td>
<td></td>
<td>1. The breakpoints are based on epidemiological cut-off values (ECOFFs), which distinguish wild-type isolates from those with reduced susceptibility.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fluoroquinolones</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td>S ≤ R &gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>1 &lt; 1</td>
<td></td>
<td>1. The breakpoints are based on epidemiological cut-off values (ECOFFs), which distinguish wild-type isolates from those with reduced susceptibility.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Macrolides</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td>S ≤ R &gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>0.25 &lt; 0.5</td>
<td></td>
<td>1. The breakpoints are based on epidemiological cut-off values (ECOFFs), which distinguish wild-type isolates from those with reduced susceptibility.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tetracyclines</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td>S ≤ R &gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetracycline</td>
<td>1 &lt; 1</td>
<td></td>
<td>1. The breakpoints are based on epidemiological cut-off values (ECOFFs), which distinguish wild-type isolates from those with reduced susceptibility.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Miscellaneous agents</th>
<th>MIC breakpoint (mg/L)</th>
<th>Notes</th>
<th>Numbers for comments on MIC breakpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td>S ≤ R &gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metronidazole</td>
<td>8 &lt; 8</td>
<td></td>
<td>1. The breakpoints are based on epidemiological cut-off values (ECOFFs), which distinguish wild-type isolates from those with reduced susceptibility.</td>
</tr>
<tr>
<td>Rifampicin</td>
<td>1 &lt; 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Listeria monocytogenes

EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

Disk diffusion (EUCAST standardised disk diffusion method)
Medium: Mueller-Hinton agar + 5% defibrinated horse blood and 20 mg/L β-NAD (MH-F)
Inoculum: McFarland 0.5
Incubation: 5% CO_2, 35±1°C, 18±2h
Reading: Read zone edges as the point showing no growth viewed from the front of the plate with the lid removed and with reflected light.
Quality control: Streptococcus pneumoniae ATCC 49619

<table>
<thead>
<tr>
<th>Penicillins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤  R &gt;</td>
<td>S ≥  R &lt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzylpenicillin</td>
<td>1</td>
<td>1</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Ampicillin</td>
<td>1</td>
<td>2</td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Carbapenems</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤  R &gt;</td>
<td>S ≥  R &lt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meropenem</td>
<td>0.25</td>
<td>0.25</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Macrolides</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤  R &gt;</td>
<td>S ≥  R &lt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erythromycin</td>
<td>1</td>
<td>1</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Miscellaneous agents</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤  R &gt;</td>
<td>S ≥  R &lt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole¹</td>
<td>0.06</td>
<td>0.06</td>
<td>1.25-23.75</td>
<td>29</td>
</tr>
</tbody>
</table>

¹ Trimethoprim-sulfamethoxazole in the ratio 1:19. Breakpoints are expressed as the trimethoprim concentration.
**Pasteurella multocida**

EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

**Disk diffusion (EUCAST standardised disk diffusion method)**
Medium: Mueller-Hinton agar + 5% defibrinated horse blood and 20 mg/L β-NAD (MH-F)
Inoculum: McFarland 0.5
Incubation: 5% CO₂, 35±1°C, 18±2h
Reading: Read zone edges as the point showing no growth viewed from the front of the plate with the lid removed and with reflected light.
Quality control: Haemophilus influenzae NCTC 8468

<table>
<thead>
<tr>
<th>Penicillins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Benzylpenicillin</td>
<td>0.5</td>
<td>0.5</td>
<td>1 unit</td>
<td>17</td>
</tr>
<tr>
<td>Ampicillin</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>Amoxicillin</td>
<td>1</td>
<td>1</td>
<td>Note⁴</td>
<td>Note⁴</td>
</tr>
<tr>
<td>Amoxicillin-clavulanate</td>
<td>1</td>
<td>1</td>
<td>2-1</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cephalosporins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>0.03</td>
<td>0.03</td>
<td>5</td>
<td>26</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fluoroquinolones</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>0.06</td>
<td>0.06</td>
<td>5</td>
<td>27⁴</td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>0.06</td>
<td>0.06</td>
<td>5</td>
<td>27⁴</td>
</tr>
<tr>
<td>Nalidixic acid (screen)</td>
<td>NA</td>
<td>NA</td>
<td>30</td>
<td>23⁴</td>
</tr>
</tbody>
</table>
### Pasteurella multocida

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

<table>
<thead>
<tr>
<th>Tetracyclines</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>1</td>
<td>1</td>
<td>Note&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Note&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Tetracycline (screen)</td>
<td>NA</td>
<td>NA</td>
<td>30</td>
<td>24&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Miscellaneous agents</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
<td>R &lt;</td>
</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole&lt;sup&gt;1&lt;/sup&gt;</td>
<td>0.25</td>
<td>0.25</td>
<td>1.25-23.75</td>
<td>23</td>
</tr>
</tbody>
</table>
**Campylobacter jejuni and coli**

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

**Disk diffusion (EUCAST standardised disk diffusion method)**

**Medium:** Mueller-Hinton agar + 5% defibrinated horse blood and 20 mg/L β-NAD (MH-F). The MH-F plates should be dried prior to inoculation to reduce swarming (at 20-25°C over night or at 35°C, with the lid removed, for 15 min).

**Inoculum:** McFarland 0.5

**Incubation:** Microaerobic environment, 41±1ºC, 24h. Isolates with insufficient growth after 24 h incubation are reincubated immediately and inhibition zones read after a total of 40-48 h incubation.

**Reading:** Read zone edges as the point showing no growth viewed from the front of the plate with the lid removed and with reflected light.

**Quality control:** Campylobacter jejuni ATCC 33560

### Fluoroquinolones

<table>
<thead>
<tr>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>0.5</td>
<td>0.5</td>
<td>5</td>
</tr>
</tbody>
</table>

### Macrolides

<table>
<thead>
<tr>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
</tr>
<tr>
<td>Azithromycin</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁶</td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁶</td>
</tr>
<tr>
<td>Erythromycin, C. jejuni</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁶</td>
</tr>
<tr>
<td>Erythromycin, C. coli</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁶</td>
</tr>
</tbody>
</table>

1/A. Erythromycin can be used to determine susceptibility to azithromycin and clarithromycin.

### Tetracyclines

<table>
<thead>
<tr>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
<td>S ≥</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁶</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>Note¹</td>
<td>Note¹</td>
<td>Note⁶</td>
</tr>
</tbody>
</table>

1/A. Tetracycline can be used to determine susceptibility to doxycycline.
**Corynebacterium spp.**

*except Corynebacterium diphtheriae*

EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

**Disk diffusion (EUCAST standardised disk diffusion method)**

*Medium: Mueller-Hinton agar + 5% defibrinated horse blood and 20 mg/L β-NAD (MH-F)*

*Inoculum: McFarland 0.5*

*Incubation: 5% CO₂, 35±1°C, 18±2h. Isolates with insufficient growth after 16-20 h incubation are reincubated immediately and inhibition zones read after a total of 40-48 h incubation.*

*Reading: Read zone edges as the point showing no growth viewed from the front of the plate with the lid removed and with reflected light.*

**Quality control: Streptococcus pneumoniae ATCC 49619**

<table>
<thead>
<tr>
<th>Penicillins</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Numbers for comments on MIC breakpoints Letters for comments on disk diffusion</td>
</tr>
<tr>
<td>S ≤ R &gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzylpenicillin</td>
<td>0.12</td>
<td>0.12</td>
<td>1 unit</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fluoroquinolones</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Numbers for comments on MIC breakpoints Letters for comments on disk diffusion</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S ≤ R &gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>Moxifloxacin</td>
<td>0.5</td>
<td>0.5</td>
<td>5</td>
<td>25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Aminoglycosides</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Numbers for comments on MIC breakpoints Letters for comments on disk diffusion</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S ≤ R &gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gentamicin</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td>23</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Glycopeptides</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Numbers for comments on MIC breakpoints Letters for comments on disk diffusion</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S ≤ R &gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vancomycin</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>17</td>
</tr>
</tbody>
</table>
**Corynebacterium spp.**

*except Corynebacterium diphtheriae*

EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01

<table>
<thead>
<tr>
<th>Lincosamides</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clindamycin</td>
<td>0.5 0.5</td>
<td>2 20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tetracyclines</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetracycline</td>
<td>2 2</td>
<td>30 24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Miscellaneous agents</th>
<th>MIC breakpoint (mg/L)</th>
<th>Disk content (µg)</th>
<th>Zone diameter breakpoint (mm)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤ R &gt;</td>
<td>S ≥ R &lt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linezolid</td>
<td>2 2</td>
<td>10 25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rifampicin</td>
<td>0.06 0.5</td>
<td>5 30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PK/PD (Non-species related) breakpoints

These breakpoints should not be used when there are species specific breakpoints, such as values or “-” in the tables.

PK/PD (Non-species related) breakpoints are based on the following dosages
(See section 8 in Rationale Documents)

<table>
<thead>
<tr>
<th>Penicillins</th>
<th>MIC breakpoint (mg/L)</th>
<th>PK/PD (Non-species related) breakpoints are based on the following dosages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S ≤</td>
<td>R &gt;</td>
</tr>
<tr>
<td>Benzytpenicillin</td>
<td>0.25</td>
<td>2</td>
</tr>
<tr>
<td>Ampicillin</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Ampicillin-sulbactam</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Amoxicillin</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Amoxicillin-clavulanate</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Piperacillin</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Piperacillin-tazobactam</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Ticarcillin</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Ticarcillin-clavulanate</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Phenoxymethylpenicillin</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Oxacillin</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Cloxacillin</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Dicloxacillin</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Flucloxacillin</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Mecillinam</td>
<td>IE</td>
<td>IE</td>
</tr>
</tbody>
</table>
### PK/PD (Non-species related) breakpoints

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

#### Cephalosporins

<table>
<thead>
<tr>
<th>Medication</th>
<th>MIC breakpoint (mg/L)</th>
<th>S ≤</th>
<th>R &gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cefaclor</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Cefadroxil</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Cefalexin</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Cefazolin</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Cefepime</td>
<td>4</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Cefixime</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Cefoxitin</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Cefprozolin</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Cefpodoxime</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Cefixime</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
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<tr>
<td>Cefixime</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Cefixime</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
<tr>
<td>Cefuroxime</td>
<td>IE</td>
<td>IE</td>
<td>IE</td>
</tr>
</tbody>
</table>

**Breakpoints apply to a daily intravenous dose of 2 g x 2 and a high dose of at least 2 g x 3.**

- **Cefixime**
  - **Breakpoints apply to a daily intravenous dose of 1 g x 3 and a high dose of at least 2 g x 3.**

- **Cefuroxime**
  - **Breakpoints apply to a daily intravenous infusion over 1 h of 600 mg x 2.**

#### Carbapenemems

<table>
<thead>
<tr>
<th>Medication</th>
<th>MIC breakpoint (mg/L)</th>
<th>S ≤</th>
<th>R &gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doripenem</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Ertapenem</td>
<td>0.5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Imipenem</td>
<td>2</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Meropenem</td>
<td>2</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

**Breakpoints apply to doripenem 500 mg x 3 daily administered intravenously over 1 hour as the lowest dose. 1000 mg x 3 daily administered over 4 hours was taken into consideration for severe infections and in setting the I/R breakpoint.**

- **Ertapenem**
  - **Breakpoints apply to ertapenem 1000 mg x 1 daily administered intravenously over 30 minutes as the only dose.**

- **Imipenem**
  - **Breakpoints apply to imipenem 500 mg x 4 daily administered intravenously over 30 minutes as the lowest dose. 1 g x 4 daily was taken into consideration for severe infections and in setting the I/R breakpoint.**

- **Meropenem**
  - **Breakpoints apply to meropenem 1000 mg x 3 daily administered intravenously over 30 minutes as the lowest dose. 2 g x 3 daily was taken into consideration for severe infections and in setting the I/R breakpoint.**

#### Monobactams

<table>
<thead>
<tr>
<th>Medication</th>
<th>MIC breakpoint (mg/L)</th>
<th>S ≤</th>
<th>R &gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aztreonam</td>
<td>4</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

**PK/PD (Non-species related) breakpoints are based on the following dosages (See section 8 in Rationale Documents)**
## PK/PD (Non-species related) breakpoints

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

### Fluoroquinolones

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC breakpoint (mg/L)</th>
<th>Breakpoints</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ciprofloxacin</td>
<td>0.5</td>
<td>1</td>
<td>Breakpoints apply to an oral dose of 500 mg x 2 (or as low as 250 mg x 2 for uncomplicated urinary tract infections) to 750 mg x 2 and an intravenous dose of 400 mg x 2 to 400 mg x 3.</td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>1</td>
<td>2</td>
<td>Breakpoints apply to an oral dose of 500 mg x 1 to 500 mg x 2 and an intravenous dose of 500 mg x 1 to 500 mg x 2.</td>
</tr>
<tr>
<td>Moxifloxacin</td>
<td>0.5</td>
<td>1</td>
<td>Breakpoints apply to an oral and iv dose of 400 mg x 1.</td>
</tr>
<tr>
<td>Nalidixic acid</td>
<td>IE</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Norfloxacin</td>
<td>0.5</td>
<td>1</td>
<td>Breakpoints apply to an oral dose of 400 mg x 2.</td>
</tr>
<tr>
<td>Ofloxacin</td>
<td>0.5</td>
<td>1</td>
<td>Breakpoints apply to an oral dose of 200 mg x 2 to 400 mg x 2 and an intravenous dose of 200 mg x 2 to 400 mg x 2.</td>
</tr>
</tbody>
</table>

**PK/PD (Non-species related) breakpoints are based on the following dosages (See section 8 in Rationale Documents)**

### Aminoglycosides

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC breakpoint (mg/L)</th>
<th>Breakpoints</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amikacin</td>
<td>8</td>
<td>16</td>
<td>Breakpoints apply to intravenous amikacin dosage of 15 mg/kg/day. In the absence ofPk/Pd data these have been determined mainly on the basis of Pk data and pre-existing breakpoints.</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>2</td>
<td>4</td>
<td>Breakpoints apply to intravenous gentamicin dosage of 3-4.5 mg/kg/day. In the absence of Pk/Pd data these have been determined mainly on the basis of Pk data and pre-existing breakpoints.</td>
</tr>
<tr>
<td>Netilmicin</td>
<td>2</td>
<td>4</td>
<td>Breakpoints apply to intravenous netilmicin dosage of 4-6 mg/kg/day. In the absence of Pk/Pd data these have been determined mainly on the basis of Pk data and pre-existing breakpoints.</td>
</tr>
<tr>
<td>Tobramycin</td>
<td>2</td>
<td>4</td>
<td>Breakpoints apply to intravenous tobramycin dosage of 3-4.5 mg/kg/day. In the absence of Pk/Pd data these have been determined mainly on the basis of Pk data and pre-existing breakpoints.</td>
</tr>
</tbody>
</table>

### Glycopeptides

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC breakpoint (mg/L)</th>
<th>Breakpoints</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teicoplanin</td>
<td>IE</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Telavancin</td>
<td>IE</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Vancomycin</td>
<td>IE</td>
<td>IE</td>
<td></td>
</tr>
</tbody>
</table>

**PK/PD (Non-species related) breakpoints are based on the following dosages (See section 8 in Rationale Documents)**
### PK/PD (Non-species related) breakpoints

**EUCAST Clinical Breakpoint Table v. 4.0, valid from 2014-01-01**

PK/PD (Non-species related) breakpoints are based on the following dosages (See section 8 in Rationale Documents)

<table>
<thead>
<tr>
<th>Macrolides, lincosamides and streptogramins</th>
<th>MIC breakpoint (mg/L)</th>
<th>PK/PD (Non-species related) breakpoints are based on the following dosages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anitromycin</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Erythromycin</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Roxithromycin</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Telithromycin</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Erythromycin</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Roxithromycin</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Telithromycin</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Clindamycin</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Quinupristin/dalfopristin</td>
<td>IE</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tetracyclines</th>
<th>MIC breakpoint (mg/L)</th>
<th>PK/PD (Non-species related) breakpoints are based on the following dosages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doxycycline</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Minocycline</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Tetracycline</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Tigecycline</td>
<td>0.25 0.5</td>
<td>Breakpoints apply to a tigecycline intravenous dose of 100 mg followed by 50 mg 12 hourly for CSSSI and CIAI.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Miscellaneous</th>
<th>MIC breakpoint (mg/L)</th>
<th>PK/PD (Non-species related) breakpoints are based on the following dosages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloramphenicol</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Colistin</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Daptomycin</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Fusimycin iv</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Fusimycin oral</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Fusidic acid</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Linezolid</td>
<td>2 4</td>
<td>Breakpoints apply to a linezolid intravenous and oral dosage of 600 mg x 2.</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Mupirocin</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Nitrofurantoin</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Rifampicin</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Spectinomycin</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Trimethoprim</td>
<td>IE</td>
<td></td>
</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole</td>
<td>IE</td>
<td></td>
</tr>
</tbody>
</table>