



European Committee on Antimicrobial Susceptibility Testing

Zone diameter breakpoint tables for rapid antimicrobial susceptibility testing (RAST) directly from blood culture bottles

Version 9.0, valid from 2026-01-16 [Based on EUCAST Breakpoint Tables version 16.0]

This document should be cited as "The European Committee on Antimicrobial Susceptibility Testing. Zone diameter Breakpoint Tables for rapid antimicrobial susceptibility testing (RAST) directly from blood culture bottles. Version 9.0, 2026. <http://www.eucast.org>."

Content	Page	Additional information
Changes	1	
Notes	2	
Guidance on reading EUCAST RAST Breakpoint Tables	4	
Information on technical uncertainty	5	
Escherichia coli	6	Breakpoints for 4, 6, 8 and 16-20 h
Klebsiella pneumoniae	8	Breakpoints for 4, 6, 8 and 16-20 h
Salmonella enterica	10	Breakpoints for 4, 6, 8 and 16-20 h
Pseudomonas aeruginosa	11	Breakpoints for 6, 8 and 16-20 h
Acinetobacter baumannii	12	Breakpoints for 4, 6, 8 and 16-20 h
Staphylococcus aureus	13	Breakpoints for 4, 6, 8 and 16-20 h
Enterococcus faecalis	14	Breakpoints for 4, 6, 8 and 16-20 h
Enterococcus faecium	15	Breakpoints for 4, 6, 8 and 16-20 h
Streptococcus pneumoniae	16	Breakpoints for 4, 6, 8 and 16-20 h

European Committee on Antimicrobial Susceptibility Testing
Zone diameter breakpoint table for rapid antimicrobial susceptibility testing (RAST)
directly from blood culture bottles

Version 9.0, valid from 2026-01-01

This document should be cited as "The European Committee on Antimicrobial Susceptibility Testing. Zone diameter breakpoint tables for rapid antimicrobial susceptibility testing (RAST) directly from blood culture bottles. Version 9.0, 2026. <http://www.eucast.org>."

Version 9.0, 2026-01-01	Changes from v. 8.1 are marked yellow. Changed comments are underlined. Removed comments are shown in strikethrough font style.
General	<ul style="list-style-type: none"> • The explanation of "off scale" breakpoints used to categorise wild-type organisms as "Susceptible, increased exposure" (I) is available only in the Notes sheet. • Link to the Notes sheets for "Abbreviations and explanations of breakpoints" added to all tables.
Notes	<p>Revised notes</p> <ul style="list-style-type: none"> • Note 1, information added on application of EUCAST RAST breakpoints in relation to mode of administration.
<i>E. coli</i>	<p>New breakpoints for 4, 6, 8 and 16-20 h</p> <ul style="list-style-type: none"> • Aztreonam • Aztreonam-avibactam
<i>K. pneumoniae</i>	<p>New breakpoints for 4, 6, 8 and 16-20 h</p> <ul style="list-style-type: none"> • Aztreonam • Aztreonam-avibactam
<i>A. baumannii</i>	<p>Revised breakpoints for 6, 8 and 16-20 h</p> <ul style="list-style-type: none"> • Trimethoprim-sulfamethoxazole

European Committee on Antimicrobial Susceptibility Testing

Zone diameter breakpoint tables for rapid antimicrobial susceptibility testing (RAST) directly from blood culture bottles

Version 9.0, valid from 2026-01-16

1. The EUCAST zone diameter breakpoint tables for rapid antimicrobial susceptibility testing (RAST) should be used to interpret results with EUCAST RAST methodology. Breakpoints apply to intravenous administration. If other forms of administration are considered, attention to achieve sufficient exposure must be exercised.

2. Breakpoints are specific for each species and incubation time and cannot be used for species and/or incubation times not included in the table.

3. EUCAST RAST breakpoints categorise results into three susceptibility categories:

S - Susceptible, standard dosing regimen: A microorganism is categorised as *Susceptible, standard dosing regimen*, when there is a high likelihood of therapeutic success using a standard dosing regimen of the agent.

I - Susceptible, increased exposure: A microorganism is categorised as *Susceptible, increased exposure** when there is a high likelihood of therapeutic success because exposure to the agent is increased by adjusting the dosing regimen or by its concentration at the site of infection. *Susceptible, increased exposure*, is only used when wild-type isolates of a species is categorised as "I" with standard EUCAST breakpoints. For these, an arbitrary off-scale zone diameter breakpoint of "S ≥ 50 mm" is used and isolates with zone diameters greater than the ATU interval are reported "*Susceptible, increased exposure*" (I).

R - Resistant: A microorganism is categorised as *Resistant* when there is a high likelihood of therapeutic failure even when there is increased exposure.

*Exposure is a function of how the mode of administration, dose, dosing interval, infusion time, as well as distribution and excretion of the antimicrobial agent will influence the infecting organism at the site of infection.

4. For all organism-agent combinations with RAST there is a defined area where the interpretation is uncertain, due to the poorer separation between susceptible and resistant isolates. EUCAST has designated this an Area of Technical Uncertainty (ATU). It corresponds to a zone diameter interval where the categorisation is doubtful. See separate page/tab for more information on ATU and how to deal with results in the ATU with the RAST method.

5. ND in the breakpoint table indicates that a breakpoint is not defined and that a susceptibility categorization cannot be achieved.

6. A screening test uses one agent to predict resistance or susceptibility to one or more antimicrobial agents in the same class. The screening test is often more sensitive and/or robust than testing individual agents. Using a screening test will often reduce the number of tests needed in primary susceptibility testing since it will predict susceptibility and/or resistance to several agents. Guidance on how to act on the screening test result is described in the Note related to each specific screening test.

Negative screening test: Zone diameter above or equal to the susceptible breakpoint for the screening agent. No resistance mechanism to agents in the antimicrobial class detected.

Positive screening test: Zone diameter below the resistant breakpoint for the screening agent. Resistance mechanism to one or more agents in the antimicrobial class detected.

7. Breakpoints in brackets distinguish between isolates without and with phenotypically detectable resistance mechanisms. For these agents, clinical evidence as monotherapy is usually lacking but for a specific indication or in combination with another active agent or measure they may still be used. Isolates with resistance can be reported R (resistant). Reporting S or I should be avoided and if considered necessary, there should be a comment to explain the need for adjunctive measures as mentioned above.

8. RAST with prolonged incubation time of 16-20 hours shall only be used when plates can not be read after 4, 6 or 8 hours. Do not incubate longer than 20 hours.

9. Sometimes it is not possible to report a susceptibility category for all tested antimicrobial agents, either because there is no growth, you cannot read the zone in a reliable way or because the zone diameter is in the ATU. In these cases leave the report blank for the relevant agent. We suggest that laboratories include a comment in reports on positive blood cultures which explains why some results may be left blank at times. The comment could read: "Antimicrobial susceptibility testing directly from positive blood culture bottles, where results can often be offered after 4, 6 and/or 8 hours, requires that only reliable results are reported. A susceptibility report lacking results after short incubation, may be supplemented with more results at a later stage."

Species

Each species for which breakpoints have been determined are presented in individual tabs

How to use the RAST breakpoint tables

EUCAST RAST breakpoint tables v. 9.0, valid from 2026-01-16

Zone diameter breakpoint tables for RAST directly from blood culture bottles

RAST with prolonged incubation time of 16-20 hours shall only be used when plates can not be read after 4, 6 or 8 hours.

Zone diameter breakpoint for reading and interpreting results after 4, 6 and 8 hours of incubation.

EUCAST rapid disk diffusion method directly from positive blood culture bottles
 Medium:
 Inoculum:
 Incubation:
 Incubation time:
 Reading:
 RAST QC for implementation of RAST method:
 Standard QC:

EUCAST RAST methodology and quality control.

Antimicrobial agent	Disk content (µg)	4 hours			6 hours			8 hours			16-20 hours		
		S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <
Antimicrobial agent A	30-6	17	12-16	12	18	14-17	14	18	14-17	14	18	14-17	14
Antimicrobial agent B	5	15	13-14	13	16	14-15	14	17	15-16	15	16	14-15	14
Antimicrobial agent C	10	15	12-14	12	16	14-15	14	17	15-16	15	17	15-16	15
Antimicrobial agent D	10	14	6-13	ND	15	6-14	ND	16	6-15	ND	15	6-14	ND
Antimicrobial agent E	10	50	15-17	15	17	15-16	15	17	15-16	15	17	15-16	15
Antimicrobial agent F	5	ND	10-50	10	ND	10-50	10	ND	10-50	10	ND	10-50	10
Antimicrobial agent G	30	(15)	(12-14)	(12)	(15)	(13-14)	(13)	(15)	(13-14)	(13)	(15)	(13-14)	(13)
Antimicrobial agent H	10	14	12-13	12	14	12-13	12	14	12-13	12	13	12	12
Antimicrobial agent I	10	14	12-13	12	15	13-14	13	15	13-14	13	16	13-15	13

ATU - the area of technical uncertainty where no categorisation can be offered - leave blank in report.

An arbitrary "off scale" breakpoint which categorises wild-type organisms as "Susceptible, increased exposure" (I).

Not defined. No breakpoints, susceptibility cannot be reported.

Not defined. No breakpoints, resistance cannot be reported.

Breakpoints in brackets are used to distinguish between organisms with and without acquired resistance mechanisms (see Notes).

European Committee on Antimicrobial Susceptibility Testing
Zone diameter breakpoint tables for rapid antimicrobial susceptibility testing (RAST)
directly from blood culture bottles

Version 9.0, valid from 2026-01-16

How to handle technical uncertainty in RAST directly from blood culture bottles.

The Area of Technical Uncertainty (ATU) is a range of inhibition zone diameters. There are ATUs for all organism-antimicrobial agent combinations with the EUCAST RAST method. The ATU represents an area where the separation between susceptibility categories is poor. Interpretative errors increase dramatically in this area and interpretation is not possible. Results above or below the ATU can reliably be reported.

What to do when in the ATU? A result inside the ATU cannot be interpreted. Do not hesitate to leave the report blank for the agent. At 4 hours, re-incubate plates within 10 minutes and read again at 6 hours and if needed at 8 hours and when necessary at 16-20 hours (see Note 6 in the Notes sheet). If a complete result cannot be given after 8 or 16-20 hours incubation, perform AST with EUCAST standard disk diffusion method.

We suggest that laboratories include a comment in reports on positive blood cultures which explains why some results may be left blank at times. The comment could read: "Antimicrobial susceptibility testing directly from positive blood culture bottles, where results can often be offered after 4, 6 and/or 8 hours, requires that only reliable results are reported. A susceptibility report lacking results after short incubation, may be supplemented with more results at a later stage."

Escherichia coli

Zone diameter breakpoints for RAST directly from blood culture bottles

EUCAST RAST Breakpoint Tables v. 9.0, valid from 2026-01-16

[For abbreviations and explanations of breakpoints, see the Notes sheet](#)

EUCAST rapid disk diffusion method directly from positive blood culture bottles
Medium: Mueller-Hinton (MH) agar
Inoculum: 125±25 µL directly from a positive blood culture bottle
Incubation: Air, 35±1°C
Incubation time: 4, 6, 8 and 16-20 hours
General reading instructions: Inhibition zones should only be read when the growth is confluent and zone edges are clearly visible.
Reading 4, 6 and 8 hours: Remove the lid and read zone diameters from the front against a dark background illuminated with reflected light.
Reading 16-20 hours: Read zone diameters from the back of the plate against a dark background illuminated with reflected light.
[QC for implementation of RAST](#)

Antimicrobial agent	Disk content (µg)	4 hours			6 hours			8 hours			16-20 hours		
		S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <
Ampicillin	10	12	10-11	10	13	11-12	11	13	11-12	11	14	12-13	12
Amoxicillin-clavulanic acid	20-10	16	14-15	14	17	15-16	15	17	15-16	15	19	17-18	17
Piperacillin-tazobactam	30-6	17	14-16	14	18	15-17	15	18	15-17	15	17	15-16	15
Temocillin	30	50	13-14	13	50	15-16	15	50	15-16	15	50	17-18	17
Cefotaxime ¹	5	15	13-14	13	16	14-15	14	17	15-16	15	16	14-15	14
Ceftazidime ¹	10	15	12-14	12	16	14-15	14	17	15-16	15	17	15-16	15
Ceftazidime-avibactam	10-4	12	10-11	10	12	10-11	10	12	10-11	10	13	11-12	11
Ceftolozane-tazobactam	30-10	16	14-15	14	18	16-17	16	18	16-17	16	20	16-19	16
Imipenem ²	10	16	12-15	12	17	13-16	13	17	13-16	13	17	12-16	12
Imipenem-relebactam	10-25	13	11-12	11	15	13-14	13	15	13-14	13	17	15-16	15
Meropenem ²	10	17	15-16	15	17	15-16	15	17	15-16	15	15	13-14	13
Meropenem-vaborbactam	20-10	16	12-15	12	16	14-15	14	17	15-16	15	16	14-15	14
Aztreonam	30	18	16-17	16	19	17-18	17	20	18-19	18	22	20-21	20
Aztreonam-avibactam	30-20	18	15-17	15	19	16-18	16	20	18-19	18	22	19-21	19
Ciprofloxacin	5	17	14-16	14	19	16-18	16	20	17-19	17	21	18-20	18
Levofloxacin	5	16	14-15	14	18	15-17	15	18	15-17	15	23	15-22	15
Amikacin ³	30	(15)	(13-14)	(13)	(15)	(13-14)	(13)	(15)	(13-14)	(13)	(13)	(11-12)	(11)
Gentamicin ³	10	(14)	(12-13)	(12)	(14)	(12-13)	(12)	(14)	(12-13)	(12)	(13)	(11-12)	(11)
Tobramycin ³	10	(14)	(12-13)	(12)	(15)	(13-14)	(13)	(15)	(13-14)	(13)	(13)	(11-12)	(11)
Trimethoprim-sulfamethoxazole	1.25-23.75	12	10-11	10	14	12-13	12	14	12-13	12	14	12-13	12

Escherichia coli

Zone diameter breakpoints for RAST directly from blood culture bottles

EUCAST RAST Breakpoint Tables v. 9.0, valid from 2026-01-16

[For abbreviations and explanations of breakpoints, see the Notes sheet](#)

Notes

1. Cephalosporin breakpoints for *E. coli* will detect all clinically important resistance mechanisms. The presence or absence of an ESBL does not in itself influence the categorisation of susceptibility. However, ESBL detection and characterisation are recommended for public health and infection control purposes.

[See document EUCAST RAST screening for resistance mechanisms \(link to document\) for screening cut-offs.](#)

2. Carbapenem breakpoints for *E. coli* will detect all clinically important resistance mechanisms. The presence or absence of a carbapenemase does not in itself influence the categorisation of susceptibility. However, carbapenemase detection and characterisation are recommended for public health and infection control purposes.

[See document EUCAST RAST screening for resistance mechanisms \(link to document\) for screening cut-offs.](#)

3. Aminoglycoside breakpoints distinguish between isolates without and with resistance mechanisms. For blood stream infections, EUCAST recommends that aminoglycosides are used in combination with other active therapy.

Klebsiella pneumoniae

Zone diameter breakpoints for RAST directly from blood culture bottles

EUCAST RAST Breakpoint Tables v. 9.0, valid from 2026-01-16

[For abbreviations and explanations of breakpoints, see the Notes sheet](#)

EUCAST rapid disk diffusion method directly from positive blood culture bottles
Medium: Mueller-Hinton (MH) agar
Inoculum: 125±25 µL directly from a positive blood culture bottle
Incubation: Air, 35±1°C
Incubation time: 4, 6, 8 and 16-20 hours
General reading instructions: Inhibition zones should only be read when the growth is confluent and zone edges are clearly visible.
Reading 4, 6 and 8 hours: Remove the lid and read zone diameters from the front against a dark background illuminated with reflected light.
Reading 16-20 hours: Read zone diameters from the back of the plate against a dark background illuminated with reflected light.
[QC for implementation of RAST](#)

Breakpoints are valid for *K. pneumoniae*, *K. variicola* and *K. quasipneumoniae*.

Antimicrobial agent	Disk content (µg)	4 hours			6 hours			8 hours			16-20 hours		
		S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <
Amoxicillin-clavulanic acid	20-10	15	13-14	13	16	14-15	14	16	14-15	14	18	16-17	16
Piperacillin-tazobactam	30-6	15	13-14	13	16	14-15	14	16	14-15	14	17	15-16	15
Temocillin	30	50	14	14	50	15	15	50	16	16	50	16	16
Cefotaxime ¹	5	15	12-14	12	18	15-17	15	18	15-17	15	16	14-15	14
Ceftazidime ¹	10	15	13-14	13	16	14-15	14	16	14-15	14	18	15-17	15
Ceftazidime-avibactam	10-4	12	10-11	10	13	11-12	11	13	11-12	11	14	12-13	12
Ceftolozane-tazobactam	30-10	16	14-15	14	16	14-15	14	17	15-16	15	20	17-19	17
Imipenem ²	10	16	14-15	14	17	15-16	15	17	15-16	15	15	12-14	12
Imipenem-relebactam	10-25	15	13-14	13	15	14	14	15	14	14	17	15-16	15
Meropenem ²	10	15	13-14	13	17	15-16	15	17	15-16	15	15	13-14	13
Meropenem-vaborbactam	20-10	16	14-15	14	17	16	16	17	16	16	15	13-14	13
Aztreonam	30	20	17-19	17	21	18-20	18	22	19-21	19	23	20-22	20
Aztreonam-avibactam	30-20	18	15-17	15	20	18-19	18	21	19-20	19	22	20-21	20
Ciprofloxacin	5	17	15-16	15	18	16-17	16	18	16-17	16	19	17-18	17
Levofloxacin	5	17	14-16	14	18	15-17	15	18	15-17	15	18	15-17	15
Amikacin ³	30	(15)	(13-14)	(13)	(14)	(12-13)	(12)	(14)	(12-13)	(12)	(15)	(13-14)	(13)
Gentamicin ³	10	(14)	(12-13)	(12)	(14)	(12-13)	(12)	(13)	(11-12)	(11)	(14)	(13)	(13)
Tobramycin ³	10	(14)	(12-13)	(12)	(13)	(11-12)	(11)	(13)	(11-12)	(11)	(14)	(13)	(13)
Trimethoprim-sulfamethoxazole	1.25-23.75	11	9-10	9	11	9-10	9	11	9-10	9	10	8-9	8

Klebsiella pneumoniae

Zone diameter breakpoints for RAST directly from blood culture bottles

EUCAST RAST Breakpoint Tables v. 9.0, valid from 2026-01-16

[For abbreviations and explanations of breakpoints, see the Notes sheet](#)

Notes

1. Cephalosporin breakpoints for *K. pneumoniae* will detect all clinically important resistance mechanisms. The presence or absence of an ESBL does not in itself influence the categorisation of susceptibility. However, ESBL detection and characterisation are recommended for public health and infection control purposes.

[See document EUCAST RAST screening for resistance mechanisms \(link to document\) for screening cut-offs.](#)

2. Carbapenem breakpoints for *K. pneumoniae* will detect all clinically important resistance mechanisms. The presence or absence of a carbapenemase does not in itself influence the categorisation of susceptibility. However, carbapenemase detection and characterisation are recommended for public health and infection control purposes.

[See document EUCAST RAST screening for resistance mechanisms \(link to document\) for screening cut-offs.](#)

3. Aminoglycoside breakpoints distinguish between isolates without and with resistance mechanisms. For blood stream infections, EUCAST recommends that aminoglycosides are used in combination with other active therapy.

Salmonella enterica

Zone diameter breakpoints for RAST directly from blood culture bottles

EUCAST RAST Breakpoint Tables v. 9.0, valid from 2026-01-16

[For abbreviations and explanations of breakpoints, see the Notes sheet](#)

EUCAST rapid disk diffusion method directly from positive blood culture bottles
Medium: Mueller-Hinton (MH) agar
Inoculum: 125±25 µL directly from a positive blood culture bottle
Incubation: Air, 35±1°C
Incubation time: 4, 6, 8 and 16-20 hours
General reading instructions: Inhibition zones should only be read when the growth is confluent and zone edges are clearly visible.
Reading 4, 6 and 8 hours: Remove the lid and read zone diameters from the front against a dark background illuminated with reflected light.
Reading 16-20 hours: Read zone diameters from the back of the plate against a dark background illuminated with reflected light.
[QC for implementation of RAST](#)

Antimicrobial agent	Disk content (µg)	4 hours			6 hours			8 hours			16-20 hours		
		S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <
Piperacillin-tazobactam	30-6	ND	ND	ND	16	14-15	14	17	15-16	15	18	16-17	16
Cefotaxime ¹	5	14	11-13	11	16	14-15	14	17	16	16	18	16-17	16
Ceftazidime ¹	10	11	9-10	9	17	15-16	15	19	17-18	17	19	17-18	17
Ceftazidime-avibactam	10-4	13	11-12	11	16	14-15	14	17	15-16	15	18	16-17	16
Imipenem ²	10	14	12-13	12	16	14-15	14	17	15-16	15	21	19-20	19
Meropenem ²	10	16	14-15	14	18	15-17	15	19	16-18	16	17	15-16	15
Ciprofloxacin		Note ³											
Pefloxacin (screen only) ³	5	18	16-17	16	19	17-18	17	20	18-19	18	21	19-20	19
Azithromycin	15	11	8-10	9	11	9-10	9	11	9-10	9	11	9-10	9
Trimethoprim-sulfamethoxazole	1.25-23.75	13	11-12	11	14	12-13	12	16	14-15	14	14	12-13	12

Notes

1. Cephalosporin breakpoints for *Salmonella enterica* will detect all clinically important resistance mechanisms. The presence or absence of an ESBL does not in itself influence the categorisation of susceptibility. However, ESBL detection and characterisation are recommended for public health and infection control purposes.

See document [EUCAST RAST screening for resistance mechanisms \(link to document\) for screening cut-offs](#).

2. Carbapenem breakpoints for *Salmonella enterica* will detect all clinically important resistance mechanisms. The presence or absence of a carbapenemase does not in itself influence the categorisation of susceptibility. There is no screening cut-off value for carbapenemase production in *Salmonella enterica* with the RAST method.

3. A ciprofloxacin 5 µg disk will not reliably exclude all fluoroquinolone resistance mechanisms in *Salmonella*. A negative pefloxacin screen test allows reporting *Salmonella enterica* susceptible to the relevant fluoroquinolones.

Pseudomonas aeruginosa

EUCAST RAST Breakpoint Tables v. 9.0, valid from 2026-01-16

Zone diameter breakpoints for RAST directly from blood culture bottles

[For abbreviations and explanations of breakpoints, see the Notes sheet](#)

EUCAST rapid disk diffusion method directly from positive blood culture bottles

Medium: Mueller-Hinton (MH) agar

Inoculum: 125±25 µL directly from a positive blood culture bottle

Incubation: Air, 35±1°C

Incubation time: 4, 6, 8 and 16-20 hours

Weak growth/general reading instructions: For some isolates there is weak growth at RAST, the isolates usually have weak growth at standard disk diffusion 16-20 hours incubation as well. Inhibition zones should only be read when the growth is confluent and zone edges are clearly visible.

Reading 4, 6 and 8 hours: Remove the lid and read zone diameters from the front against a dark background illuminated with reflected light.

Reading 16-20 hours: Read zone diameters from the back of the plate against a dark background illuminated with reflected light.

[QC for implementation of RAST](#)

Antimicrobial agent	Disk content (µg)	6 hours			8 hours			16-20 hours		
		S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <
Piperacillin-tazobactam	30-6	50	13-15	13	50	14-16	14	50 ¹	15-16 ¹	15 ¹
Cefepime	30	50	15-16	15	50	15-16	15	50	17	17
Ceftazidime	10	50	12-14	12	50	13-15	13	50	14	14
Ceftazidime-avibactam	10-4	15	13-14	13	16	14-15	14	18	15-17	15
Ceftolozane-tazobactam	30-10	15	14	14	16	15	15	ND	18-50	18
Imipenem	10	50	15-16	15	50	15-16	15	50 ¹	16 ¹	16 ¹
Imipenem-relebactam	10-25	18	16-17	16	20	18-19	18	22 ¹	20-21 ¹	20 ¹
Meropenem	10	16	14-15	14	16	14-15	14	16 ¹	15 ¹	15 ¹
Meropenem-vaborbactam	20-10	14	13	13	14	13	13	14 ¹	11-13 ¹	11 ¹
Ciprofloxacin	5	50	17-18	17	50	20-21	20	50	20-22	20
Levofloxacin	5	50	14-15	14	50	15-16	15	50	15-16	15
Amikacin ²	30	(15)	(13-14)	(13)	(14)	(13)	(13)	(12)	(11)	(11)
Tobramycin ²	10	(14)	(13)	(13)	(15)	(14)	(14)	(14)	(13)	(13)

1. Ignore isolated colonies inside the inhibition zone when reading plates after 16-20 h.

2. Aminoglycoside breakpoints distinguish between isolates without and with resistance mechanisms. For blood stream infections, EUCAST recommends that aminoglycosides are used in combination with other active therapy.

Acinetobacter baumannii

Zone diameter breakpoints for RAST directly from blood culture bottles

EUCAST RAST Breakpoint Tables v. 9.0, valid from 2026-01-16

[For abbreviations and explanations of breakpoints, see the Notes sheet](#)

EUCAST rapid disk diffusion method directly from positive blood culture bottles
Medium: Mueller-Hinton (MH) agar
Inoculum: 125±25 µL directly from a positive blood culture bottle
Incubation: Air, 35±1°C
Incubation time: 4, 6, 8 and 16-20 hours
General reading instructions: Inhibition zones should only be read when the growth is confluent and zone edges are clearly visible.
Reading 4, 6 and 8 hours: Remove the lid and read zone diameters from the front against a dark background illuminated with reflected light.
Reading 16-20 hours: Read zone diameters from the back of the plate against a dark background illuminated with reflected light.
[QC for implementation of RAST](#)

Antimicrobial agent	Disk content (µg)	4 hours			6 hours			8 hours			16-20 hours		
		S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <
Imipenem	10	18	16-17	16	19	17-18	17	19	17-18	17	21	19-20	19
Meropenem	10	14	12-13	12	17	15-16	15	18	16-17	16	20	18-19	18
Ciprofloxacin	5	50	14-15	14	50	15-16	15	50	16-17	16	50	18-19	18
Levofloxacin	5	17	15-16	15	18	16-17	16	19	17-18	17	20	18-19	18
Amikacin ¹	30	ND	(13-50)	(13)	(15)	(13-14)	(13)	(15)	(13-14)	(13)	(16)	(14-15)	(14)
Gentamicin ¹	10	(14)	(12-13)	(12)	(14)	(12-13)	(12)	(15)	(13-14)	(13)	(16)	(14-15)	(14)
Tobramycin ¹	10	(14)	(12-13)	(12)	(14)	(12-13)	(12)	(14)	(12-13)	(12)	(15)	(14)	(14)
Trimethoprim-sulfamethoxazole	1.25-23.75	13 ²	6-12 ²	ND	15 ²	12-14 ²	12 ²	15 ²	13-14 ²	13 ²	15	13-14	13

Notes

1. Aminoglycoside breakpoints distinguish between isolates without and with resistance mechanisms. For blood stream infections, EUCAST recommends that aminoglycosides are used in combination with other active therapy.
2. Read the outer zone edge and ignore growth within the zone.

Staphylococcus aureus

Zone diameter breakpoints for RAST directly from blood culture bottles

EUCAST RAST Breakpoint Tables v. 9.0, valid from 2026-01-16

[For abbreviations and explanations of breakpoints, see the Notes sheet](#)

<p>EUCAST rapid disk diffusion method directly from positive blood culture bottles</p> <p>Medium: Mueller-Hinton (MH) agar</p> <p>Inoculum: 125±25 µL directly from a positive blood culture bottle</p> <p>Incubation: Air, 35±1°C</p> <p>Incubation time: 4, 6, 8 and 16-20 hours</p> <p>General reading instructions: Inhibition zones should only be read when the growth is confluent and zone edges are clearly visible.</p> <p>Reading 4, 6 and 8 hours: Remove the lid and read zone diameters from the front against a dark background illuminated with reflected light.</p> <p>Reading 16-20 hours: Read zone diameters from the back of the plate against a dark background illuminated with reflected light.</p> <p>QC for implementation of RAST</p>
--

Antimicrobial agent	Disk content (µg)	4 hours			6 hours			8 hours			16-20 hours		
		S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <
Cefoxitin (screen only) ¹	30	16	15	15	18	17	17	19	18	18	22	21	21
Norfloxacin (screen only) ²	10	13	11-12	11	14	13	13	15	14	14	16	15	15
Amikacin ³	30	(12)	(11)	(11)	(13)	(12)	(12)	(14)	(13)	(13)	(14)	(12-13)	(12)
Gentamicin ³	10	(14)	(12-13)	(12)	(15)	(13-14)	(13)	(15)	(13-14)	(13)	(16)	(14-15)	(14)
Tobramycin ³	10	(15)	(13-14)	(13)	(16)	(14-15)	(14)	(16)	(14-15)	(14)	(16)	(14-15)	(14)
Clindamycin ⁴	2	16	14-15	14	19	16-18	16	19	16-18	16	19	16-18	16

Notes

- For screen negative isolates, report all beta-lactam agents with breakpoints (including those with "Note") in the EUCAST Clinical Breakpoint Tables (standard methodology) as susceptible. If cefotaxime and ceftriaxone are reported for methicillin-susceptible *S. aureus*, these should be reported "Susceptible, increased exposure" (I). Screen positive isolates are likely to be methicillin resistant and thus resistant to all beta-lactam agents except possibly ceftaroline and ceftobiprole.
- Isolates categorised as screen negative can be reported susceptible to moxifloxacin and "susceptible increased exposure" (I) to levofloxacin. Isolates categorised as screen positive should be tested for susceptibility to individual agents or reported as resistant.
- Aminoglycoside breakpoints distinguish between isolates without and with resistance mechanisms. For blood stream infections, EUCAST recommends that aminoglycosides are used in combination with other active therapy.
- Test for inducible clindamycin resistance: Place a clindamycin 2 µg disk and an erythromycin 15 µg disk 6-12 mm apart (edge to edge). Look for a D phenomenon after 6, 8 and 16-20 hours. A positive test is reliable but a negative test does not guarantee the absence of inducible resistance. Note: An additional clindamycin disk should be tested separately to avoid interference of the erythromycin disk when measuring the clindamycin zone diameter.

Enterococcus faecalis

Zone diameter breakpoints for RAST directly from blood culture bottles

EUCAST RAST Breakpoint Tables v. 9.0, valid from 2026-01-16

[For abbreviations and explanations of breakpoints, see the Notes sheet](#)

EUCAST rapid disk diffusion method directly from positive blood culture bottles
Medium: Mueller-Hinton (MH) agar
Inoculum: 125±25 µL directly from a positive blood culture bottle
Incubation: Air, 35±1°C
Incubation time: 4, 6, 8 and 16-20 hours
General reading instructions: Inhibition zones should only be read when the growth is confluent and zone edges are clearly visible.
Reading 4, 6 and 8 hours: Remove the lid and read zone diameters from the front against a dark background illuminated with reflected light.
Reading 16-20 hours: Read zone diameters from the back of the plate against a dark background illuminated with reflected light.
[QC for implementation of RAST](#)

Antimicrobial agent	Disk content (µg)	4 hours			6 hours			8 hours			16-20 hours		
		S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <
Ampicillin ^{1,2}	2	9	6-8	ND	9	6-8	ND	9	6-8	ND	9	6-8	ND
Imipenem ²	10	50	6-13	ND	50	6-14	ND	50	6-15	ND	50	6-13	ND
Vancomycin ³	5	ND	10-50	10	ND	10-50	10	ND	10-50	10	ND	11-50	11
Linezolid	10	17	14-16	14	17	14-16	14	17	14-16	14	15	12-14	12

Antimicrobial agent	Disk content (µg)	4 hours			6 hours			8 hours			16-20 hours		
		Negative test ≥	ATU	Positive test <	Negative test ≥	ATU	Positive test <	Negative test ≥	ATU	Positive test <	Negative test ≥	ATU	Positive test <
Gentamicin (test for acquired aminoglycoside-modifying enzyme) ⁴	30	16	14-15	14	16	14-15	14	16	14-15	14	16	14-15	14

Notes

1. Susceptibility to intravenous ampicillin and amoxicillin (with and without beta-lactamase inhibitor) can be inferred from ampicillin.

2. For *E. faecalis* results in the ATU, confirm with a standard test.

3. With the RAST method, vancomycin susceptibility can not be determined by examining if the zone edge is sharp or fuzzy. Only vancomycin resistance can be predicted by the RAST breakpoints; when vancomycin resistance is not detected, susceptibility cannot be inferred.

4. Gentamicin can be used to screen for aminoglycoside-modifying enzyme (high-level aminoglycoside resistance).

Negative test: the isolate is wild type for gentamicin and expected low-level resistant phenotype. There may be synergy with penicillins and glycopeptides.

Positive test: the isolate is high-level resistant to gentamicin and other aminoglycosides, possibly except streptomycin (which must be tested separately if relevant; see the standard EUCAST breakpoint table). There will be no synergy with penicillins or glycopeptides.

Enterococcus faecium

Zone diameter breakpoints for RAST directly from blood culture bottles

EUCAST RAST Breakpoint Tables v. 9.0, valid from 2026-01-16

[For abbreviations and explanations of breakpoints, see the Notes sheet](#)

EUCAST rapid disk diffusion method directly from positive blood culture bottles
Medium: Mueller-Hinton (MH) agar
Inoculum: 125±25 µL directly from a positive blood culture bottle
Incubation: Air, 35±1°C
Incubation time: 4, 6, 8 and 16-20 hours
General reading instructions: Inhibition zones should only be read when the growth is confluent and zone edges are clearly visible.
Reading 4, 6 and 8 hours: Remove the lid and read zone diameters from the front against a dark background illuminated with reflected light.
Reading 16-20 hours: Read zone diameters from the back of the plate against a dark background illuminated with reflected light.
[QC for implementation of RAST](#)

Antimicrobial agent	Disk content (µg)	4 hours			6 hours			8 hours			16-20 hours		
		S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <
Ampicillin ¹	2	10	8-9	8	10	8-9	8	10	8-9	8	10	8-9	8
Vancomycin ²	5	ND	12-50	12	ND	13-50	13	ND	13-50	13	ND	13-50	13
Linezolid	10	ND	ND	ND	19	17-18	17	19	17-18	17	16	14-15	14

Antimicrobial agent	Disk content (µg)	4 hours			6 hours			8 hours			16-20 hours		
		Negative test ≥	ATU	Positive test <	Negative test ≥	ATU	Positive test <	Negative test ≥	ATU	Positive test <	Negative test ≥	ATU	Positive test <
Gentamicin (test for acquired aminoglycoside-modifying enzyme) ⁴	30	13	11-12	11	13	11-12	11	14	12-13	12	17	15-16	15

Notes

1. Susceptibility to intravenous ampicillin and amoxicillin (with and without beta-lactamase inhibitor) can be inferred from ampicillin. Ampicillin resistance is common in *E. faecium*.

2. With the RAST method, vancomycin susceptibility can not be determined by examining if the zone edge is sharp or fuzzy. Only vancomycin resistance can be predicted by the RAST breakpoints; when vancomycin resistance is not detected, susceptibility cannot be inferred.

4. Gentamicin can be used to screen for aminoglycoside-modifying enzyme (high-level aminoglycoside resistance).

Negative test: the isolate is wild type for gentamicin and expected low-level resistant phenotype. There may be synergy with penicillins and glycopeptides.

Positive test: the isolate is high-level resistant to gentamicin and other aminoglycosides, possibly except streptomycin (which must be tested separately if relevant; see the standard EUCAST breakpoint table). There will be no synergy with penicillins or glycopeptides.

Streptococcus pneumoniae

Zone diameter breakpoints for RAST directly from blood culture bottles

EUCAST RAST Breakpoint Tables v. 9.0, valid from 2026-01-16

[For abbreviations and explanations of breakpoints, see the Notes sheet](#)

EUCAST rapid disk diffusion method directly from positive blood culture bottles
Medium: Mueller-Hinton agar + 5% defibrinated horse blood and 20 mg/L β-NAD (MH-F)
Inoculum: 125±25 µL directly from a positive blood culture bottle
Incubation: 5% CO₂, 35±1°C
Incubation time: 4, 6, 8 and 16-20 hours
General reading instructions: Inhibition zones should only be read when the growth is confluent and zone edges are clearly visible.
Reading 4, 6, 8 and 16-20 hours: Remove lid and read zone edges from the front illuminated with reflected light.
[QC for implementation of RAST](#)

Antimicrobial agent	Disk content (µg)	4 hours			6 hours			8 hours			16-20 hours		
		S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <
Oxacillin (screen only) ^{1,2}	1	16	14-15	14	19	17-18	17	20	18-19	18	19	18	18
Norfloxacin (screen only) ³	10	11	9-10	9	12	10-11	10	12	10-11	10	13	11-12	11
Erythromycin	15	19	17-18	17	19	17-18	17	19	17-18	17	24	22-23	22
Clindamycin ⁴	2	17	15-16	15	17	15-16	15	17	15-16	15	12	11	11
Trimethoprim-sulfamethoxazole	1.25-23.75	12	10-11	10	12	10-11	10	12	10-11	10	11	9-10	9

Notes

- For oxacillin screen negative isolates**, report all beta-lactam agents with breakpoints or Note in the standard EUCAST Clinical Breakpoint Tables as susceptible.
- For oxacillin screen positive isolates**, report benzylpenicillin resistant in meningitis and endocarditis. For other indications, see the table below. If the oxacillin zone diameter is ≥9 mm (irrespective of incubation time 4, 6, 8 and 16-20 hours), report ampicillin, amoxicillin and piperacillin (with and without β-lactamase inhibitor), cefotaxime, ceftriaxone, ceftaroline, ceftobiprole, cefepime, imipenem and meropenem, susceptible. For any other agent and when the oxacillin zone is <9 mm, perform an MIC for the agent considered for clinical use.
- The norfloxacin disk diffusion test can be used to screen for fluoroquinolone resistance. Isolates categorised as screen negative can be reported susceptible to moxifloxacin and as "susceptible increased exposure" (I) to levofloxacin. Isolates categorised as screen positive should be tested for susceptibility to individual agents or reported resistant.
- Test for inducible clindamycin resistance: Place a clindamycin 2 µg disk and an erythromycin 15 µg disk 6-12 mm apart (edge to edge). Look for a D phenomenon after 6, 8 and 16-20 hours. A positive test can be trusted but a negative test does not guarantee the absence of inducible resistance. Note: An additional clindamycin disk should be tested separately to avoid interference of the erythromycin disk when measuring the clindamycin zone diameter.

In oxacillin screen positive isolates and for indications other than meningitis and endocarditis, read the benzylpenicillin 1 unit disk and interpret according to the table below.

Antimicrobial agent	Disk content	4 hours			6 hours			8 hours			16-20 hours		
		S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <	S ≥	ATU	R <
Benzylpenicillin (indications other than meningitis and endocarditis)	1 unit	50	11-13	11	50	12-13	12	50	12-14	12	50	13-15	13