EUCAST in 2012
Chairman´s update 2012
EUCAST General Committee
All European Countries + Countries from outside

EUCAST Steering Committee
BSAC, CA-SFM, CRG, NWGA, SRGA
And 3 reps from the General Committee

Subcommittees
Antifungals
Expert Rules
Anaerobes
Resistance mechanisms

Experts (ECDC Networks, ESCMID Study Groups)

National Breakpoint Committees
F, N, NL, S, UK

Contract 2011 - 14
EUCAST Steering Committee to April 2012

- Gunnar Kahlmeter (Chairman)
- Derek Brown (Scientific secretary)
- Rafael Canton (Clinical data coordinator)

- Johan Mouton (The Netherlands)
- Claude James Soussy/Luc Debreuil (France)
- Christian Giske (Sweden)
- Arne Rodloff (Germany) – resigned May, 2011
- Alasdair MacGowan (UK)
- Martin Steinbakk/Arnfinn Sundsfjord (Norway)
- Petra Apfalter (Austria, GC)
- Marina Ivanova (Estonia, GC, to April 2012)
EUCAST Steering Committee from April 2012

- Rafael Canton (Chairman)
- Derek Brown (Scientific secretary)
- Gunnar Kahlmeter (Clinical data coordinator)
- Johan Mouton (The Netherlands)
- Claude James Soussy/Luc Debreuil (France)
- Christian Giske (Sweden)
- Alasdair MacGowan (UK)
- Martin Steinbakk/Arnfinn Sundsfjord (Norway)
- Petra Apfalter (Austria, GC)
- Luis Martinez Martinez (Spain, GC)
- Robert Skov (Denmark, GC)
Steering Committee proposed change

• ESCMID appoints the Chairman, Scientific Secretary and Clinical Data Coordinator. ESCMID decides on 4-6 members representing National Antimicrobial Susceptibility Testing Committees (NACs) with experience in determining breakpoints (currently France, Norway, Sweden, the Netherlands and the UK) and on 2-4 members from the EUCAST General Committee.

• Observers from ECDC and EMA are free to attend Steering Committee meetings.

• Up to two additional “visiting” GC members may attend each SC meeting by prior agreement. No GC member can attend more than two meetings per year under this arrangement.
Steering Committee ”visiting” GC members

- The SC meeting dates will be on the website six months in advance

- A preliminary agenda will be on the website one month before each SC meeting

- GC members must inform the Scientific Secretary no later than three weeks before the meeting of his/her wish to attend the meeting.

- If more than two GC members wish to attend a meeting the EUCAST Executive will decide on who can attend with the intention of fairly distributing GC representation. GC members will then be informed whether they can attend and whether part of the agenda is closed to them (confidential discussions on new agents)

- All travel/accommodation and costs will be organised and borne by the visiting GC representative
General Committee

The General Committee consists of the Chairman, the Scientific Secretary, the Clinical Data Co-ordinator, a representative from each of the European countries and one representative from each of ISC and FESCI.

The current EUCAST general committee is listed below. Nominations for representatives of countries where no official representative is listed should be sent to the EUCAST Administrative Secretariat.

Chairman

Gunnar Kahlmeter

Scientific Secretary

Derek Brown

Clinical data coordinator

Rafael Canton

Country Representatives

Australia  Prof John Turnidge
Austria  Dr Petra Aplfalter
Belgium  Prof Jan Verhaegen
Bosnia  Dr Selma Uzunovic-Kamberovic
Bulgaria  Prof Krassimir Metodiev
Croatia  Dr Anja Tambic-Andrascvic
Czech Republic  Dr Helena Zernickova
Denmark  Dr Robert Skov
Estonia  Dr Marina Ivanova
EUCAST subcommittees

- **Expert rules and interpretive reading**
  - Major revision (v 2.0) available 2011
  - Supplement in CMI during 2011

- **Antifungal susceptibility testing**
  - Breakpoints and RDs for Candida and Aspergillus

- **Anaerobe susceptibility testing**
  - Currently dormant

- **Methods for detection of resistance mechanisms of clinical and/or epidemiological importance** (Febr 2012).
  - Evaluate and recommend methodology
  - Work closely with EARS-NET (ECDC)
The European Committee on Antimicrobial Susceptibility Testing - EUCAST

EUCAST is a standing committee jointly organized by ESCMID, ECDC and European national breakpoint committees. EUCAST deals with breakpoints and technical aspects of phenotypic in vitro antimicrobial susceptibility testing and functions as the breakpoint committee of EMA and ECDC. EUCAST does not deal with antibiotic policies, surveillance or containment of resistance or infection control. The Steering Committee is the decision making body. It is supported by a General Committee with representatives from European and other countries, FESCI and ISC. The Steering Committee also consults on EUCAST proposals with experts within the fields of infectious diseases and microbiology, pharmaceutical companies and susceptibility testing device manufacturers.

EUCAST has a subcommittee on antifungal susceptibility testing. Subcommittees on expert rules for antimicrobial susceptibility testing and antimicrobial susceptibility testing of anaerobes have completed their tasks and have been disbanded.

Most antimicrobial MIC breakpoints in Europe have been harmonised by EUCAST Chairman report
EUCAST News

Here you can find the latest news and updates from EUCAST.

17 Jan 2012
Posaconazole vs. Aspergillus breakpoints and RD
The new posaconazole breakpoints and rationale document for aspergillus [...] 

12 Jan 2012
Amphotericin and itaconazole aspergillus breakpoints and RDs
Amphotericin and itaconazole vs. aspergillus breakpoints and rationale [...] 

31 Dec 2011
EUCAST AFST Subcommittee distributes for consultation.
Consultation on Definitive Document EDef 7.2. [...] 

EUCAST Chairman report
ECDC, EMA and EFSA

EUCAST to remain an external, expert committee for ECDC (to harmonise European clinical breakpoints, ECOFFs and methodology for AMR surveillance),

EMA (to determine clinical breakpoints for new agents,

EFSA (to consult in food and feed safety aspects)
EUCAST and the harmonisation process

Harmonised 2002 - 2009

- Aminoglycosides \( \checkmark \)
- Carbapenems & aztreonam \( \checkmark \)
- Cephalosporins iv \( \checkmark \)
- Cephalosporins oral \( \checkmark \)
- Fluoroquinolones \( \checkmark \)
- Glycopeptides \( \checkmark \)
- Macrolides and lincosamines \( \checkmark \)
- Miscellaneous antimicrobials \( \checkmark \)
- Penicillins \( \checkmark \)
- Tetracyclines \( \checkmark \)

- **Antifungal drugs**
  - Breakpoints for Candida and Aspergillus

Topical agents:
- Retapamulin (ECOFF)
- Mupirocin (LLR/HLR)
- Fidaxomicin (ECOFF)

EUCAST Chairman report
EUCAST

- breakpoints for new drugs with EMA

• Daptomycin ✓
• Tigecycline ✓
• Doripenem ✓
• Telavancin ✓
• Glycopeptides (one ongoing)
• Cephalosporins (activity against MRSA - ongoing)
• Anti-MTB (one - two agents - ongoing)
• Glycopeptid (withdrawn)
• Fluoroquinolone (withdrawn)
• Diaminopyrimidine (withdrawn)

• Extensions of indications (currently none)

EMA = European Medicines Agency
Rationale Documents from EUCAST

The following Rationale Documents (see General Information on Rationale Documents) are currently available from EUCAST:

- General Information on Rationale Documents

- **Amikacin v 1.2**
- **Amoxicillin v 1.0**
- **Benzylpenicillin v 1.0**
- **Cefotaxime v 1.0**
- **Ceftazidime v 1.0**
- **Cefuroxime iv v 1.0**
- **Ciprofloxacine v 1.9**
- **Colistine v 1.0**
- **Daptomycin v 1.0**

Jan 2011: 39 RDs
Jan 2012: 45 RDs
Gennaio 2012

86 lab.
98,8 %

EUCAST

CLSI
Summary of activities completed 2011 - 2012

• "Breakpoint table v 2.0" released 1 Jan 2012 (see website).
• "Expert Rules v 2.0" published in CMI (see website).
• "Pk/Pd as used by EUCAST” published in CMI (see website).
• New subcommittee ”on detection of resistance mechanisms of clinical and/or epidemiological importance”.
• Several guidance and position documents, SOPs and RDs published.
• EUCAST AFST - breakpoints and RDs for antifungal agents published (Candida and Aspergillus).
• New agents with EMA including telavancin, a betalactam with anti-MRSA activity and anti-mycobacterial agents.
• EUCAST website – several new developments and functions.
• MIC/Zone diameter distribution website moved and secured.
• Validation of zone diameter breakpoints – files available on website.
Stenotrophomonas maltophilia

The organism
Stenotrophomonas maltophilia is a ubiquitous environmental organism. In patients it is most often associated with colonization, but is an occasional cause of infection, particularly in immunocompromised patients and patients with cystic fibrosis.

Antimicrobial resistance
Intrinsic antimicrobial resistance of this organism is a major problem, particularly to aminoglycosides and carbapenems. Multiple efflux pumps and modifications to outer membrane proteins confer variable resistance to a wide range of agents. Chromosomal genes for beta-lactamases affect all beta-lactams including carbapenems. Aminoglycoside acetyl transferase and SmQnr genes (confering reduced susceptibility to fluoroquinolones) are almost always present (3). In addition, acquired genes may be present conferring resistance to a wide range of agents, including trimethoprim-sulfamethoxazole (co-trimoxazole) (17). Moreover, the formation of biofilms reduces antimicrobial effectiveness.
Why do EUCAST have no systemic breakpoints for Enterobacteriaceae with oral cephalosporins?

There have been multiple questions from clinicians, particularly those working in orthopaedics, who have “successfully used oral cephalosporins for prophylaxis and to treat Enterobacteriaceae infections for many years”. They ask what has changed and why these agents are now considered inappropriate.

In EUCAST rationale documents it is stated that Enterobacteriaceae are inappropriate targets in sites other than uncomplicated urinary tract infection, but there is no further explanation. In early EUCAST discussions oral cephalosporins were originally considered inappropriate for treatment of infections in other sites than the urinary tract infection for several reasons:

1. Comparison of free drug pharmacokinetics with MICs alone indicates that inadequate concentrations are achieved for most agents and are borderline at best (see table).

2. The relevant pharmacodynamic relationship indicative of activity of cephalosporins is T>MIC and the target %T>MIC is 40-50%. Approximate calculations based on common dosages indicate that activity is inadequate for all agents (see table). It should be emphasized that the figures in the table are based on pharmacokinetic parameter values for the mean of the population. Monte Carlo simulations would show that the %T>MIC values are even less than those in the table for half the population treated.
Direct antimicrobial susceptibility testing

In direct antimicrobial susceptibility testing the specimen (commonly urines) is used as the source of the inoculum. Tests where positive blood cultures are used as the source of the inoculum are also included as direct tests, although they do not use the specimen directly.

The advantage of direct testing is that results may be available earlier than when the organism is isolated in pure culture before testing and this may have direct patient benefit in terms of early appropriate chemotherapy. There may be additional benefits from the ability to narrow the spectrum of therapy at an early stage.

The main disadvantage is that the inoculum cannot be effectively controlled. Also there may be mixed cultures and there may be pH variations or substances in the specimens that affect results (e.g. antimicrobial agents in urine, antimicrobial absorption materials in blood cultures). These problems may result in less reliable results than with pure cultures. EUCAST does not recommend primary susceptibility testing and any laboratory using this approach must take responsibility for ensuring that results are reliable. The following should be noted:

1. There are currently no validated methods for processing specimens to ensure that the correct inoculum is achieved.
2. Tests should be repeated on pure cultures as needed and the correlation of direct and secondary tests should be monitored so that the reliability of direct tests can be assessed.
3. In disk diffusion tests, if the inoculum is visibly light, do not report susceptible results as zone diameters may be increased leading to resistant isolates appearing susceptible.
EUCAST breakpoint decisions 2011/12

- *Moraxella catarrhalis* breakpoints for all relevant agents.
- *C. difficile* breakpoints for metronidazole (2/2 mg/L) and vancomycin (2/2 mg/L).
- *H. pylori* breakpoints (based on ECOFFs) for several agents.
- *L. monocytogenes* breakpoints removed from Pseudomonas.
- Fosfomycin breakpoints removed from Pseudomonas.
- Nitrofurantoin breakpoints removed from *E. fecium.*
- Vancomycin breakpoints for Coag neg staphs increased from 2/2 to 4/4 mg/L.
- Trimethoprim breakpoints 2/2 mg/L included for *S. agalactiae* in UTI.
- Amoxicillin & amox/clav breakpoints in *H. influenzae* increased to 2/2 mg/L.
- Chloramphenicol breakpoint in *H. influenzae* increased to 2/2 mg/L.
- Rifampicin breakpoint in *H. influenzae* increased to 1/1 mg/L.
- Ceftibuten – removed ”uncomplicated” in the caveat ”uncomplicated UTI”.
- Replace ”IE” with ”dash” for ceftibuten for *S. pneumoniae.*
- *Stenotrophomonas maltophilia* – guidance document.
Development and validation of EUCAST Disk Diffusion breakpoints

The EUCAST Disk Diffusion test was developed by EUCAST during 2009 - 2011 under the auspices of ESCMID and with the help of many laboratories. The help of these laboratories is greatly acknowledged.

For each of the species listed below projects are either ongoing or have been concluded. The material for each of these is now being summarized and will be made available during the second half of 2011 (Example 1). All MIC and zone diameter data are entered in the EUCAST MIC- and Zone diameter distribution program (Example 2).

- Enterobacteriaceae
- Pseudomonas aeruginosa
- Salmonella spp.
- Acinetobacter spp.
- Staphylococcus aureus (updated 2011-12-12)
- Staphylococcus, coagulase-negative
- Streptococcus pyogenes (group A)
- Streptococcus pneumoniae
- Enterococcus spp.
- Viridans Group Streptococci
- Haemophilus influenzae - general breakpoints
- Haemophilus influenzae - screening for betalactam resistance
- Moraxella catarrhalis (update 2011-12-12)
- Pasteurella multocida
- Listeria monocytogenes
- Corynebacterium spp.
- Campylobacter spp.
Tetracycline 30 μg vs. MIC
S. aureus, 172 clinical isolates

Inhibition zone diameter (mm)

No of isolates

MIC (mg/L)

Breakpoints

MIC
S≤1, R>2 mg/L

Zone diameter
S≥22, R<19 mm

ECOFF
WT≤1 mg/L

>8
8
4
2
1
0.5
0.25
0.12
EUCAST ongoing projects

• Breakpoints for new agents (with EMA)
  – Anti-mrsa ceph, glycopeptide, anti-mycobacterials (?)

• Breakpoints and/or disk diffusion methodology
  – *Campylobacter* (CB/DD)
  – *Corynebacterium* spp (CB/DD)
  – *Pasteurella multocida* (CB/DD)
  – *Yersinia enterococlitica* (CB/DD)
  – Anaerobic bacteria (DD)
  – *Neisseria gonorrhoeae* (DD)
  – Validation project on Streptococci and *S. pneumoniae* (validation)
  – Screening for beta-lactam resistance in Viridans group streptococci (validation)
  – Screening for FQ resistance in *Salmonella* (DD)
  – *Pseudomonas non-aeruginosa* (CB/DD)
  – *Actinomyces & Nocardia* (CB)
  – *Burkholderia* (CB)
  – *Staphylococcus pseudintermedius* (methicillin resistance, DD)

• Breakpoints for topicals - based on ECOFFs for clinically relevant agents and species.

EUCAST Chairman report
### Topical agents - Draft for consultation

<table>
<thead>
<tr>
<th>Organisms</th>
<th>Gentamicin&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Ciprofloxacin&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Ofloxacin&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Chloramphenicol&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Colistin&lt;sup&gt;1&lt;/sup&gt; (for Polymyxin B)</th>
<th>Fusidic acid&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Neomycin&lt;sup&gt;2&lt;/sup&gt; (framycetin)</th>
<th>Bacitracin&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Mupirocin&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Retapamulin&lt;sup&gt;2&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Enterobacteriaceae</strong></td>
<td>2</td>
<td>0.12</td>
<td>0.25</td>
<td>0.5</td>
<td>16</td>
<td>2</td>
<td>-</td>
<td>8?</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Acinetobacter spp.</strong></td>
<td>4</td>
<td>1</td>
<td>0.5</td>
<td>1</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>ND</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Pseudomonas aeruginosa</strong></td>
<td>8</td>
<td>0.5</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>-</td>
<td>ND</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Staphylococcus aureus</strong></td>
<td>0.5-2</td>
<td>1</td>
<td>0.5-1</td>
<td>1</td>
<td>8-16</td>
<td>-</td>
<td>0.5</td>
<td>1</td>
<td>ND</td>
<td>1&lt;sup&gt;3&lt;/sup&gt; 0.5</td>
</tr>
<tr>
<td><strong>Streptococcus pneumoniae</strong></td>
<td>-</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>-</td>
<td>1</td>
<td>ND</td>
<td>ND</td>
<td>-</td>
</tr>
<tr>
<td><strong>β-haemolytic streptococci</strong></td>
<td>-</td>
<td>2</td>
<td>1-2</td>
<td>4</td>
<td>8</td>
<td>-</td>
<td>0.5</td>
<td>ND</td>
<td>ND</td>
<td>0.5 0.12</td>
</tr>
<tr>
<td><strong>Haemophilus influenzae</strong></td>
<td>4</td>
<td>0.06</td>
<td>0.06</td>
<td>0.06</td>
<td>1</td>
<td>-</td>
<td>ND</td>
<td>ND</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Moraxella spp.</strong></td>
<td>0.25</td>
<td>0.12</td>
<td>0.12</td>
<td>0.25</td>
<td>2</td>
<td>-</td>
<td>ND</td>
<td>ND</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Neisseria gonorrhoeae</strong></td>
<td>32?</td>
<td>0.016</td>
<td>0.06</td>
<td>8?</td>
<td>-</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Neisseria meningitidis</strong></td>
<td>ND</td>
<td>0.016</td>
<td>ND</td>
<td>2</td>
<td>-</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

- = inappropriate combination.
ND = No ECOFF defined on EUCAST MIC distribution website.
? = Estimates where there are few data and no ECOFF defined on the MIC distribution website, or where there are differences among species in the group.

<sup>1</sup>Agents also available for systemic use.

<sup>2</sup>Agents available for topical use only.

<sup>3</sup>Breakpoints for nasal decontamination S≤2, R>256 mg/L.
Compliance of manufacturers
see www.eucast.org for comprehensive review

• Almost all manufacturers of disks can now provide all "EUCAST strength disks":
  – Abtek
  – BD
  – Bio-Rad
  – I2A
  – Liofilchem
  – Mast group
  – Thermo Fisher Scientific (Oxoid)
  – Rosco (tablets)

Each manufacturer is responsible for the quality of their products used for AST.

EUCAST will not be able to provide comprehensive QC on all disks from all manufacturers but will, on intitative from EUCAST, users or manufacturers provide important information on products used for AST on the website.
Compliance of manufacturers
see www.eucast.org for comprehensive review

• Manufacturers with commercial MH-F plates:
  – Thermo Fisher Scientific (Oxoid)
  – bioMérieux
  – Bio-Rad
  – Liofilchem

• Manufacturers not yet ready to supply MH-F plates:
  – BD

Each manufacturer is responsible for the quality of their products used for AST.

EUCAST will not be able to provide comprehensive QC on all disks from all manufacturers but will, on initiative from EUCAST, users or manufacturers provide important information on products used for AST on the website.
Automated devices

• None of the automated devices is yet fully compliant with EUCAST breakpoints and/or terminology.

• This is now the major obstacle for the implementation of EUCAST breakpoints in many countries. Vitek2 is the most commonly used device, which may be one reason for why most complaints are on this device.
Countries are encouraged to form National AST Committees (NAC).
NAC

• Antimicrobial susceptibility testing
  – Strategy at national level
  – Implementation of breakpoints and methods
  – Education (national workshops, websites)
  – Liaison and consultation with EUCAST (chairman or scientific secretary GC representative)
  – Liaison with groups involved in AMR-surveillance (ECDC, EARSS, ....).
  – QA

• Antimicrobial Policies
• Antimicrobial Resistance Surveillance
• Antimicrobial Consumption and Policies
### 3. Automated systems (I)

<table>
<thead>
<tr>
<th>Phoenix/EpiCenter (BD)</th>
<th>S ≤</th>
<th>R &gt;</th>
<th>-</th>
<th>IE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Computer Report</strong></td>
<td>Yes</td>
<td>No (R ≥)</td>
<td>Yes (converted to R &gt;)</td>
<td>Yes*</td>
</tr>
<tr>
<td><strong>EUCAST Expert Rules</strong></td>
<td>Yes</td>
<td></td>
<td>Yes*</td>
<td></td>
</tr>
<tr>
<td><strong>Organisms with no EUCAST test</strong></td>
<td><em>H. influenzae</em></td>
<td><em>M. catarrhalis</em></td>
<td><em>N. gonorrhoeae</em></td>
<td><em>N. meningitidis</em></td>
</tr>
<tr>
<td><strong>Antibiotics with no EUCAST test</strong></td>
<td>Breakpoints Not Available</td>
<td>Antibiotics Not Available</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rifampicin (Staphylococci)</td>
<td>Trimethoprim (Enterococci)</td>
<td>Cotrimoxazole (Enterococci)</td>
<td>None</td>
</tr>
</tbody>
</table>

* Only MIC values are reported for drugs with no EUCAST breakpoints.
## Automated systems (II)

### Microscan (Siemens Healthcare Diagnostics)

<table>
<thead>
<tr>
<th>EUCAST terminology</th>
<th>S ≤</th>
<th>R &gt;</th>
<th>-</th>
<th>IE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Report</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Most &quot;-&quot; do not have interpretations reported</td>
</tr>
</tbody>
</table>

### EUCAST Expert Rules

- Yes

### Organisms with no EUCAST test

- Streptococcus A, C and G
- *S. pneumoniae*
- *S. viridans* (test available only for *S. bovis*)
- *H. influenzae*
- *M. catarrhalis*
- *N. gonorrhoeae*
- *N. meningitidis*

- Gram-positive anaerobes
- Gram-negative anaerobes

### Antibiotics with no EUCAST test

- **Breakpoints Not Available**
  - Trimethoprim
  - Chloramphenicol
  - Fusidic acid
  - Rifampicin

- **Antibiotics Not Available**
  - Tigecycline/Gram-positive organisms
  - Roxithromycin
  - Telithromycin
  - Doxycycline

---

The preparedness of manufacturers of AST materials 26 January, 2012
### Vitek 2 (bioMérieux)

<table>
<thead>
<tr>
<th>EUCAST terminology</th>
<th>S ≤</th>
<th>R &gt;</th>
<th>-</th>
<th>IE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Report</td>
<td>Yes</td>
<td>No</td>
<td>No*</td>
<td>No**</td>
</tr>
<tr>
<td>Report</td>
<td>Yes</td>
<td>No</td>
<td>No*</td>
<td>No**</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>* not reported or reported R</td>
<td>** not reported</td>
</tr>
</tbody>
</table>

**EUCAST Expert Rules**

<table>
<thead>
<tr>
<th>Organisms with no EUCAST test</th>
<th>Antibiotics with no EUCAST test</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>H. influenzae</em></td>
<td><strong>Breakpoints Not Available</strong></td>
</tr>
<tr>
<td><em>N. gonorrhoeae</em></td>
<td><strong>Antibiotics Not Available</strong></td>
</tr>
<tr>
<td>Gram-positive anaerobes</td>
<td>Ampicillin-sulbactam</td>
</tr>
<tr>
<td></td>
<td>Rifampicin</td>
</tr>
<tr>
<td></td>
<td>Netilmicin (Staphylococci)</td>
</tr>
<tr>
<td></td>
<td>Trimethoprim (Enterococci)</td>
</tr>
<tr>
<td></td>
<td>Trimethoprim-sulfa (Enterococci)</td>
</tr>
<tr>
<td></td>
<td>Gentamicin (Enterococci)</td>
</tr>
<tr>
<td></td>
<td>Ofloxacin (Pneumococci)</td>
</tr>
<tr>
<td><em>M. catarrhalis</em></td>
<td>Cefadroxil</td>
</tr>
<tr>
<td><em>N. meningitidis</em></td>
<td>Cefituben</td>
</tr>
<tr>
<td>Gram-negative anaerobes</td>
<td>Azithromycin</td>
</tr>
<tr>
<td></td>
<td>Roxithromycin</td>
</tr>
<tr>
<td></td>
<td>Ampicillin (Pneumococci)</td>
</tr>
<tr>
<td></td>
<td>Cefepime (Pneumococci)</td>
</tr>
<tr>
<td></td>
<td>Cefpodoxime (Pneumococci)</td>
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<td>Cefuroxime (Pneumococci)</td>
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<td>Minocycline (Pneumococci)</td>
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