Antimicrobial susceptibility tests on groups of organisms or agents for which there are no EUCAST breakpoints

There are some bacterial groups and antimicrobial agents for which EUCAST has not determined breakpoints.

Breakpoints for new agents will be set as the agents go through the marketing approval application to the EMA and are released if the agent is granted approval. Breakpoints for some older agents may be set when a convincing need is established (e.g. nitroxoline and temocillin). There are also some less common organism groups (e.g. *Aeromonas* spp., *Vibrio* spp., *Kingella kingae*, *Aerococcus* spp., *Nocardia* spp.) for which breakpoints may eventually be determined. There are also some agents and organism groups where there may never be breakpoints. This mainly relates to older agents which have been replaced by more modern agents with clear advantages (greater activity, improved pharmacokinetics or reduced toxicity) over older agents in the same group. For example, this is the case for the aminoglycoside kanamycin, the quinolone sparfloxacin, the macrolide josamycin and the cephalosporin cephalothin. It is also less likely that breakpoints will be set for rarely isolated species such as *Erysipelothrix rhusopathiae*, *Campylobacter* spp. other than *C. jejuni* and *C. coli*, and groups for which there are difficulties in devising reproducible testing conditions such as *Acinetobacter* spp. for cephalosporins and *Stenotrophomonas maltophilia* for many agents.

In the absence of a breakpoint it will not be possible to proceed with assessment based on phenotypic testing unless a trustworthy and reproducible MIC value can be obtained for the isolate. If an MIC can be reliably determined then guidance can be given. Disk diffusion cannot be used unless correlation with MIC values has been established.

In some cases it is relevant to search the literature to obtain advise on which antimicrobials to include in the testing.

**When there are PK-PD breakpoints for the agent**
Guidance on interpretation of the MIC is available from the EUCAST rationale document and the EUCAST breakpoint table (www.eucast.org), where PK-PD-based breakpoints and dosages are listed in the last two tabs of the breakpoint table.

If the MIC is less than or equal to the PK-PD susceptible breakpoint, suggest that the agent can be used with caution. The MIC may also be reported although this is not essential. Include a note that the guidance is based on PK-PD breakpoints only, and include the dosage on which PK-PD breakpoint is based. If the MIC is greater than the PK-PD resistant breakpoint, advise against use.

**A possible reporting format when PK-PD breakpoints are available is as follows:**
The [organism name], for which EUCAST breakpoints have not been determined, was investigated for antimicrobial susceptibility using interpretation based on PK-PD...
breakpoints and the patient is probably treatable with [agent 1], [agent 2] and [agent 3] but not [agent 4] and [agent 5].

**When there are no PK-PD breakpoints for the agent**

Reporting as S, I or R should be avoided as such categorisation should be reserved for organism-antimicrobial agent combinations where specific breakpoints have been defined. The reasons for why PK-PD breakpoints are not available may be that there were no PK-PD data for the agent when it was originally assessed or subsequently revised. It is then useful to determine whether the MIC for the isolate is consistent with the wild type MIC distribution for the species. Access the EUCAST MIC distribution website ([http://mic.eucast.org/Eucast2](http://mic.eucast.org/Eucast2)) and enter either the name of the species or of the agent. If you find a distribution that matches the relevant species (or that of a species related to the species in question) and agent you will be able to decide whether or not the MIC belongs to the wild type or not. If the MIC is consistent with the wild type, comparison can be made with other species for which a clinical categorization of the wild type already exists (i.e. breakpoints have already been determined) in order to interpret, with caution, the MIC for the relevant isolate. For example, assume you aim to find out whether or not an isolate of *Arcanobacterium haemolyticum* is susceptible to erythromycin. The MIC is determined as 0.5 mg/L. When displaying erythromycin MIC distributions on the EUCAST MIC distribution website you will at present not find data on *Arcanobacterium haemolyticum*, but you will discover that all Gram-positive bacteria considered susceptible to erythromycin exhibit wild type MIC distributions below 1 mg/L and mostly below 0.5 mg/L. Hence it is reasonable to assume that your isolate for which there are no breakpoints is likely to be susceptible to erythromycin.

If the MIC is in the wild type range for the species or related species and the wild type for related species is reported as susceptible, suggest that the agent can be used with caution. The MIC may also be reported although this is not essential. Note that there are no clinical breakpoints for the agent and guidance is based on comparison of the isolate with organisms of the same or similar species. If the MIC is not in the wild type range, advise that the isolate has resistance mechanisms to the agent and that the agent should not be used.

**A possible reporting format when no PK-PD data, is as follows:**

The [organism name], for which EUCAST breakpoints have not been determined, was investigated for antimicrobial susceptibility using interpretation afforded similar species and the patient is probably treatable with [agent 1], [agent 2] and [agent 3] but not [agent 4] and [agent 5].

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