



ESGVM

ESCMID STUDY GROUP
FOR VETERINARY
MICROBIOLOGY

European Society of Clinical Microbiology and Infectious Diseases

Current challenges in antibiotic susceptibility testing (VetCAST)

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Do we have challenges in antibiotic susceptibility testing (AST)???

- It is believed by some veterinarians that AST is as simple as this:

Large zone =
susceptible =
treat!

No/small zone =
resistant =
don't treat!



Unfortunately
AST is not that
simple ☹️

Challenge 1 – *in vitro* is not *in vivo*

- AST does not take into account numerous factors that may affect the outcome of antimicrobial therapy, e.g.
 - Host immune status
 - Co-morbidities
 - Strain virulence
 - Compliance
- From human medicine we know the 90/60 rule
 - S: 90% chance of cure
 - R: 60% chance of cure



Challenge 2 – lack of clinical breakpoints (CBPs)

- CBPs are used for defining bacteria as resistant or susceptible to antibiotics based on;
 - MIC values (e.g resistant if MIC \geq 8 mg/L)
 - Inhibition zone diameters (e.g. resistant if zone is \leq 12 mm)
 - CBPs are established by mathematical modelling based on pharmacokinetic, pharmacodynamic, and clinical data
 - CBPs should preferably be
 - Bacterial species specific
 - Animal host specific
 - Infection specific
- The distribution and efficacy of different antibiotics vary depending on the host, the bacterium and the infection

Clinical breakpoints for veterinary pathogens only available from CLSI-VAST* committee

- Example from CLSI Vet01S document:

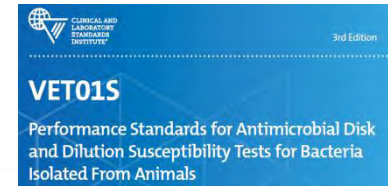


Table 2A. *Enterobacteriaceae* (Continued)

Test/Report Group	Body Site	Antimicrobial Agent	Organism	Disk Content	Zone Diameter Interpretive Criteria (nearest whole mm)			MIC Interpretive Criteria (µg/mL)			Comments
					S	I	R	S	I	R	
Penicillins											
Dogs											
A	Skin, soft tissue	Ampicillin	<i>E. coli</i>	-	-	-	-	≤0.25	0.5	≥1.0	(10) A breakpoint of ≤8 should be used for UTIs. This breakpoint was derived from published literature in which orally administered ampicillin 25.6 mg/kg and amoxicillin 11 mg/kg was administered to healthy dogs at 8-hour intervals for 5 consecutive doses and produced urine concentrations in dogs > 300 µg/mL.
	UTI							≤8	-	-	
Humans											
		Ampicillin	<i>Enterobacteriaceae</i>	10 µg	≥17	14-16	≤13	≤8	16	≥32	(11) Ampicillin is used to test susceptibility to amoxicillin and hetacillin.

Other animals?


Other Enterobacteriaceae?

No interpretive criteria for disk diffusion

*Clinical Laboratory Standards Institute, Veterinary Antimicrobial Susceptibility Testing

What to do when breakpoints are lacking?

- Use another veterinary BP
- Use a human BP
- Report "No Interpretation"



The most correct option, but that doesn't help the veterinarian when a patient is to be treated

Challenge 3 – no CBPs for topical therapy

- CBPs are set for systemic treatment
- The value of CBPs for topical therapy is questionable as very high antimicrobial concentrations can be reached locally
- Example for gentamicin: (Guardabassi et al. Vet. Dermatol, in press)

Compound	Examples of topical products containing compound	Concentration in commercial product (mg/L)	Reported MIC ranges (mg/L)
Gentamicin ^a	Otomax Vet / EasOtic®	2.350 / 4.120	<i>P. aeruginosa</i> : 0.25-16

Gentamicin CBP in dogs: R≥8 mg/L

VetCAST – the Veterinary Committee for Antimicrobial Susceptibility Testing

- Established Oct/Nov 2014
- Steering committee
 - Dik Mevius (Chair)
 - Peter Damborg (Scientific secretary)
 - Kees Veldman (Data manager)
 - Pierre-Louis Toutain (Pharmacologist)
 - Ludovic Pelligand (Pharmacologist)
- + 20 Members
 - Veterinary microbiologists
 - Pharmacologists
 - Clinicians

Vision of VetCAST

**To contribute to global standards for
antimicrobial susceptibility testing of
bacterial pathogens of veterinary
origin**



Remits of VetCAST

- Advisory body for European Medicines Agency
- **Determine antimicrobial breakpoints**
- Harmonize antimicrobial susceptibility testing (AST) in EU
- Provide education on AST and antimicrobial therapy in vet medicine
- Initiate research
 - Missing/insufficient breakpoints
 - Optimized methods for AST
 - Etc.
- Transparency and freely available protocols and interpretive criteria

Initial priorities (2015/2016)

- Liaison with EU-agencies
- Basic funding of VetCAST
- Data collection (MIC and PK data) for generic drugs
 - Tetracyclines
 - Cephalosporins
- SOP for data collection
- Position paper for clinical BP definitions
- Workshop/course on development of clinical breakpoints

Thanks for your attention!

EUCAST EUROPEAN COMMITTEE ON ANTIMICROBIAL SUSCEPTIBILITY TESTING
European Society of Clinical Microbiology and Infectious Diseases

Veterinary Susceptibility Testing

- Organization
- EUCAST News
- Clinical breakpoints
- Expertises and intrinsic resistance
- Resistance mechanisms
- Guidance documents
- MIC distributions and ECOFFs
- Zone distributions and ECOFFs
- AST of bacteria
- AST of mycobacteria
- AST of fungi
- AST of veterinary pathogens
 - VetCAST meetings
- Frequently Asked Questions (FAQ)
- Meetings
- Presentations and statistics
- Warnings!
- Documents
- Videos from EUCAST

Veterinary Committee on Antimicrobial Susceptibility Testing (VetCAST)

VetCAST is a EUCAST subcommittee dealing with all aspects of antimicrobial susceptibility testing of bacterial pathogens of animal origin and animal bacteria with zoonotic potential. The subcommittee will operate within the format and structure of EUCAST (The European Committee on Antimicrobial Susceptibility Testing).

[VetCAST vision, strategy, remit, Steering committee and members.](#)

The VetCAST was formed on the 27 of April 2015, in Copenhagen during ECCMID 2015.

[Agendas and minutes of meetings](#)

Presentations 2016 (Amsterdam)

- Collection of tetracycline MIC data (Kees Veldman)
- Retrieving tetracycline PK/PD data (Ludovic Peilligand)
- VetCast from the industry perspective (Hilde Moyaert)

http://www.eucast.org/ast_of_veterinary_pathogens/