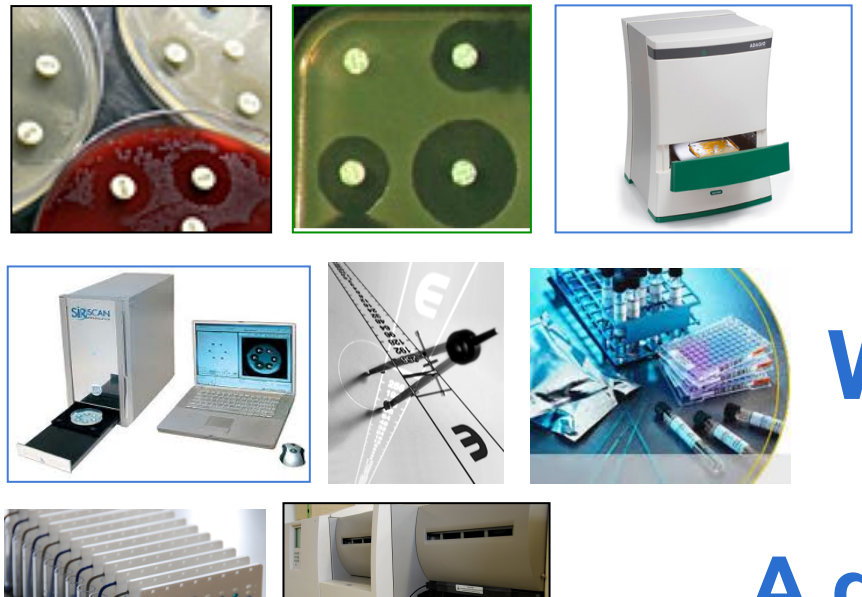
EUCAST EUROPEAN COMMITTEE ON ANTIMICROBIAL SUSCEPTIBILITY TESTING

European Society of Clinical Microbiology and Infectious Diseases

CHU de Liège

Université de Liège



EUCAST

Where are we Today?

What's New?

A difficult road in Belgium

Pierrette Melin

Microbiology, University of Liege

Medical Microbiology, CHU of Liege

Scientific secretary of NAC

Technical auditor BELAC

- Nouvelles de EUCAST par Gunnar Kahlmeter
- Niveaux de compliance des fabricants
- Agar DD method
- EUCAST implémentation
  - BE, UK, FR, SP, AU

Nouvelles de l'EUCAST

EUCAST

- **Historique**
  - 1996, 2001, 2002 → 6 NAC acceptent développement breakpoints
  - 2002 - Accord avec European Medicines Agency (EMA)
  - 2002-2008: établissement des bkpts
  - 2008 – décision développement DD et bkpts
  - 2012 – L'Australie choisit l'EUCAST et pas CLSI !!
- **Divers**
  - Harmonisation, développement méthodes et QC
  - Collecte des distributions de CMI et détermination des ECOFFs
  - Etablissement d'un réseau des NACs/
    - Lien avec EUCAST
    - Missions d'éducation, …
  - Tous les documents sont disponibles et gratuits !
  - Reconnaissance EUCAST par ECDC, EMA, EFSA, industries pharma et diagnostiques

EUCAST

- **Tables annuelles**
  - **Publiées et applicables dés janvier de chaque annnée**
  - **Draft pour 2013 disponible pour commentaires jusqu'au 20.12.2012**
  - **2013**
    - **Tables pour *Campylo, Pasteurella***
    - **Valeurs pour SXT pour *S.maltophilia***
    - **Diverses révisions**

Version 3.0, valid from 2013-01-01

Table	Changes (cells containing a change, a deletion or an addition) from v 2.0 are marked yellow
All	• New breakpoints: Ceftaroline. • Cefuroxime changed to cefuroxime iv. Cefuroxime axetil changed to cefuroxime oral. • Fosfomycin-trometamol changed to fosfomycin oral. • Clarification regarding zone diameter breakpoints for screening disks. Resistant breakpoint expressed as Note. • Breakpoints for organisms with few options are sorted into antibiotic groups. • Information on testing conditions added to organisms with no disk diffusion criteria.
Enterobacteriaceae	• Revised breakpoints: Piperacillin, cefalexin and aztreonam (zone).
***Pseudomonas* spp.**	• Revised comments: Piperacillin-tazobactam and ticarcillin-clavulanate (typo corrected).
Stenotrophomonas maltophilia	• Pictures with reading examples for trimethoprim-sulfamethoxazole disk added.
***Staphylococcus* spp.**	• Clarification regarding testing of benzylpenicillin added in antibiotic agent column. • Clarification regarding *S. saprophyticus* added to ampicillin and cefoxitin in antibiotic agent column. • Pictures with reading examples for *S. aureus* with benzylpenicillin disk added. • Revised comments: Penicillins (*S. saprohyticus* added), ampicillin, cephalosporins (ceftaroline added), cefoxitin, ceftaroline (new), fluoroquinolones (norfloxacin screen) and linezolid.
***Enterococcus* spp.**	• Specific instructions for incubation and reading when testing glycopeptides added. • Clarification regarding tests for high-level resistance added to gentamicin and streptomycin in antibiotic agent column. • Revised breakpoints: Amikacin, netilmicin and tobramycin (IE replaced with Note). • Revised comments: Ampicillin, aminoglycosides (clarification regarding high-level resistance), teicoplanin (comment removed) and vancomycin. • Pictures with reading examples for enterococci with vancomycin disk added.
Streptococcus groups A, B, C and G	• Revised breakpoints: Telithromycin (zone) and chloramphenicol (zone). • Revised comments: Fluoroquinolones (norfloxacin screen).
Stretococcus pneumoniae	• Revised breakpoints: Ampicillin (zone diameter breakpoints removed). Zone diameter breakpoints revised for ciprofloxacin, levofloxacin, ofloxacin, teicoplanin, telithromycin and tetracycline. • Revised comments: Penicillins (several comment relating to oxacilllin screen), cephalosporins Note A (ceftaroline added and oxacillin screen update), carbapenems Note A (oxacillin screen update) and fluoroquinolones (norfloxacin screen). • Supplementary table for interpretation of the oxacillin disk screen added.
Viridans group streptococci (Other streptococci)	• Revised breakpoints: Carbapenems (zone diameter breakpoints replaced with Note). • Revised comments: Benzylpenicillin (screen), cephalosporins Note A and carbapenems Note A (related to benzylpenicillin screen).
Haemophilus influenzae	• General information for *Haemophilus* spp. added. • Revised breakpoints: Amoxicillin-clavulanate (zone) and cefaclor (zone diameter breakpoint replaced with Note). • Revised comments: Benzylpenicillin (screen), penicillins Note 1, cephalosporins Note B, carbapenems Note A (benzylpenicillin screen update) and fluoroquinolones (nalidixic acid screen). • Supplementary table for interpretation of the benzylpenicillin disk screen added.
Moraxella catarrhalis	• Revised breakpoints: Cefaclor (zone diameter breakpoints replaced with Note). • Revised comments: Fluoroquinolones (nalidixic acid screen).
Neisseria gonorrhoeae	• Revised breakpoints: Minocycline (replaced with IE). • Revised comments: Cefixime (removed).
Pasteurella multocida	• New table. All breakpoints and comments new.
Campylobacter jejuni and C. coli	• New table. All breakpoints and comments new.
PK/PD (Non-species related) breakpoints	• New title. • General information regarding the use of PK/PD breakpoints added. • Revised comments: Ceftaroline (new).

EUCAST

- **Nouveaux sous-comités**
  - **Mécanismes de R**
    - **Guidance sur méthodes de détection, caractérisation**
    - **Fiches standardisées**
      - **Definition, importance clinique et épidémio, description du mécanisme,methodes de détection, critères interprétation, MIC et DD, détection génotypique, ref…**
    - **MRSA, VISA et hVISA, VRE, HLR amino enterococci, Pneumo pen nonS, ESBL dans entb etP.aeruginosa, Aminoglycosides R ds entb, AmpC acquise entb, …**

Niveaux de compliance des fabricants

- Data are based on questionnaires to manufacturers of materials and devices for antimicrobial susceptibility testing.
- The tables will be updated when manufacturers report changes (contact erika.matuschek@ltkronoberg.se).
- The accuracy of data in these tables is not verified by EUCAST and the inclusion of any materials or devices does not indicate endorsement by EUCAST.

Last updated 20 July 2012

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

Methods for antimicrobial susceptibility testing

- Some practical issues with EUCAST breakpoints implementation
  - Lower ranges of concentrations are needed
    - EUCAST breakpoints often lower than CLSI
      - New testing panels for MIC determination
  - Desirable specification
    - To include drug concentration equal to ECOFFs
      - Allowing detection of wild type organisms
  - A technical change
    - Expression of breakpoints interpretation

	S	R
EUCAST	<=	>
CLSI	<=	>=

Méthode de diffusion disques EUCAST

Manufacturer	Disks available	MH-F plates available
Abtek	All	No
BD	All except: Ceftibuten 30µg	Expected December 2012
Bio-Rad	All	Yes
bioMérieux	No disks marketed	Yes
I2a	All	No
Liofilchem	All	Yes
MAST Group	All	No but supply β-NAD supplement
Thermo Fisher Scientific (Oxoid)	All	Yes
Rosco	All (Neo-Sensitabs)	No

Systèmes automatisés de lecture de boîtes

Manufacturer	System	EUCAST breakpoints implemented	EUCAST Expert Rules implemented	EUCAST terminology implemented			
				S≤	R>	-	IE
Bio-Rad	OSIRIS/ADAGIO	Yes	Yes	Yes	Yes	Yes	Yes
Giles Scientific	BIOMIC V3	Yes	Yes	Yes	Yes	Yes	Yes
I2a	SIRSCAN: 2000 2000 automatic Micro	Yes	Yes	Yes	Yes	Yes	Yes

Phoenix / EpiCenter automated system (BD)

EUCAST terminology implemented	**In computer database**	**S ≤**	Yes
		R >	No (R ≥)
		-	Yes
		IE	Yes
	In reports	**S ≤**	Yes
		R >	Yes (≥ converted to R >)
		-	Yes (MICs reported for agents with no EUCAST breakpoints)
		IE	Yes (MICs reported for agents with no EUCAST breakpoints)
EUCAST Expert Rules implemented	Yes		
EUCAST organism groups with no test in the system	*H. influenzae* *M. catarrhalis*	*N. meningitidis* *N. gonorrhoeae*	Gram-negative anaerobes Gram-positive anaerobes
Agents in EUCAST tables but not available in the system	None		
Agents available but EUCAST breakpoints not implemented in the system	Rifampicin (*Staphylococcus* spp.) Trimethoprim (*Enterococcus* spp.) Cotrimoxazole (*Enterococcus* spp.)		

Microscan automated system (Siemens)

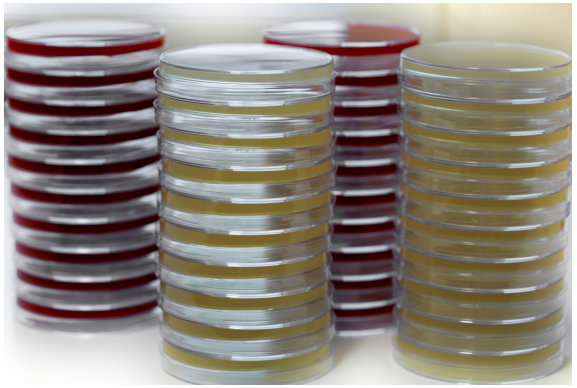
EUCAST terminology implemented	**In computer database**	**S ≤**	Yes
		R >	Yes
		-	No
		IE	No
	In reports	**S ≤**	Yes
		R >	Yes
		-	Most ”-” do not have interpretations reported
		IE	No
EUCAST Expert Rules implemented	Yes		
EUCAST organism groups with no test in the system	*H. influenzae* *M. catarrhalis* Strep A, C and G	*N. meningitidis* *N. gonorrhoeae* *S. pneumoniae*	Gram-negative anaerobes Gram-positive anaerobes Viridans streptococci (except *S. bovis)*
Agents in EUCAST tables but not available in the system	Trimethoprim Chloramphenicol Fusidic acid Rifampicin		
Agents available but EUCAST breakpoints not implemented in the system	Roxithromycin Telithromycin Doxycycline Tigecycline (Gram-positive organisms)		

Vitek2 automated system (bioMérieux)

EUCAST terminology implemented	**In computer database**	**S ≤**	Yes
		R >	No
		-	Not reported or reported ”R”
		IE	Not reported
	In reports	**S ≤**	Yes
		R >	No
		-	Not reported
		IE	Not reported
EUCAST Expert Rules implemented	Yes		
EUCAST organism groups with no test in the system	*H. influenzae* *M. catarrhalis*	*N. meningitidis* *N. gonorrhoeae*	Gram-negative anaerobes Gram-positive anaerobes
Agents in EUCAST tables but not available in the system	Ampicillin-sulbactam Rifampicin Netilmicin (*Staphylococcus* spp.) Trimethoprim (*Enterococcus* spp.)		Tri-sulfa (*Enterococcus* spp.) Gentamicin (*Enterococcus* spp.) Ofloxacin (*S. pneumoniae*)
Agents available but EUCAST breakpoints not implemented in the system	Cefadroxil Ceftibuten Azithromycin Roxithromycin		Cefepime *(S. pneumoniae)* Cefpodoxime (*S. pneumoniae*) Cefuroxime (*S. pneumoniae*) Teicoplanin (*S. pneumoniae*) Doxycycline (*S. pneumoniae*) Minocycline (*S. pneumoniae*)

Methods for antimicrobial susceptibility testing

- « EUCAST » Disk diffusion testing
  - Susceptibility testing media
    - MH
    - MH-Fastidious
      - MH + 5% horse blood + 20 mg/L β- nicotinamide adenine dinucleotide (NAD)
  - Inoculum
    - 0.5 McFarland std



Methods for antimicrobial susceptibility testing

« EUCAST » Disk diffusion testing

- The 15-15-15 minute rule
  - Preparation of plates
    - Use the inoculum within 15 minutes of preparation (and never beyond 60 min)
    - Apply disks within 15 minutes of inoculating plates
    - Start incubation within 15 minutes of application of disks

Methods for antimicrobial susceptibility testing

« EUCAST » Disk diffusion testing

- **Incubation**

Organism	Incubation conditions
Enterobacteriaceae	35±1 ºC in air for 16-20h
Pseudomonas spp.	35±1 ºC in air for 16-20h
Stenotrophomonas maltophilia	35±1 ºC in air for 16-20h
Acinetobacter spp.	35±1 ºC in air for 16-20h
Staphylococcus spp.	35±1 ºC in air for 16-20h
Enterococcus spp.	35±1 ºC in air for 16-20h
Streptococcus groups A, B, C and G	35±1 ºC in air with 4-6% CO_2 for 16-20h
Viridans group streptococci	35±1 ºC in air with 4-6% CO_2 for 16-20h
Streptococcus pneumoniae	35±1 ºC in air with 4-6% CO_2 for 16-20h
Haemophilus spp.	35±1 ºC in air with 4-6% CO_2 for 16-20h
Moraxella catarrhalis	35±1 ºC in air with 4-6% CO_2 for 16-20h
Listeria monocytogenes	35±1 ºC in air with 4-6% CO_2 for 16-20h
Other fastidious organisms	Pending

- ***Pasteurella* et *Campylo* plus long cf table**

Methods for antimicrobial susceptibility testing

« EUCAST » Disk diffusion testing

- Charges disques différentes pour quelques ATB!
- Souches contrôles assez semblables + qq différences
- Boites de 90 mm : maximum 6 disques !
- QC Interne
  - OK si stabilisé à 1x/sem
  - Bcp mieux ts les jours pour 5 souches minimum

Belgique, United Kingdom, Espagne, France, Autriche

IMPLEMENTATION EUCAST

EUCAST en Belgique

- **Avant 2007**
  - **Pas de NAC**
  - **La plupart des labos: CLSI**
- **Efforts de la SBIMC**
  - **Constitution d'un groupe de travail EUCAST**
  - **Convaincre de l'intérêt de passer à l'EUCAST**
  - **Constitution d'un NAC en réponse à demande EUCAST**
  - **Décision passage à EUCAST 01.2010 !!**
    - **Divers obstacles < manque compliance, niveaux préparations fabricants**

EUCAST en Belgique

- Questionnaire à tous les labos
  - 7 labos/10 utilisent des automates
    - 82% Vitek, bioMérieux
    - →Réunion avec bioMérieux promesses depuis 2008
  - Un pourcentage élevé d'utilisateurs ROSCO
    - ROSCO pas EUCAST
    - → réunion avec ROSCO, mais d'abord refus
- En 2011
  - Quelques laboratoires →EUCAST
    - = utilisateurs Phoenix car arrêt disponibilité panels CLSI
- En 2012
  - Nombreuses versions différentes du CLSI en cours d'utilisation
- Source d'information des labos
  - IMPORTANCE majeure des firmes
  - et sous-estimée par NAC

EUCAST en Belgique

- **Autres tâches du NAC**
  - **Propositions de bkpts pour témocilline**
  - **Etablissement d'une collection de souches QC pour verification d'implémentation**
    - **→ panel de Souches de challenge**
    - **En collaboration avec NRCs et SBIMC**
    - **Collaboration d'ISP**

Practical implementation of the EUCAST breakpoints and methods

VERIFICATION & VALIDATION

Recommandations for laboratories for verification of new test methods for AST

For (semi-) automated systems

- Cumitech 31A. ASM Press 2009
  - Verification and validation of procedures in the clinical microbiology laboratory
- Clinical Microbiology Procedures Handbook, 3rd edition, Garcia. ASM Press 2010
- ISO 20776-2, 2007
- Guidance for Industry and FDA, 2009
- CLSI M50-A, 2008

Recommandations for laboratories for verification of new test methods for AST

Clinical Microbiology Procedures Handbook, 3rd edition, Garcia. ASM Press 2010

- **Performed by « NAC », not by every lab ! (>Sept.2012)**
  - **Lab could rely on these data + minimum implementation**
  - **> 50 isolates of**
    - **various species**
    - **various antimicrobial susceptibility profiles**
    - **ATCC strains**
  - **To assess performance**
    - **Precision (reproducibility)**
    - **Agreement**

Recommandations for laboratories for verification of new test methods for AST

Clinical Microbiology Procedures Handbook, 3rd edition, Garcia. ASM Press 2010

*For **agreement** with automated systems*

- Selected « validation » laboratories
  - KUL & CHU Lg for Vitek
  - Alost & Hasselt for Phoenix
  - 2 others for Microscan
- Selected strains
  - A challenge panel with varied resistance
    - 50 strains provided by the Belgian NRC
      - GNB, *S.aureus*, Enterococci, GAS, GBS, *S.pneumoniae*
  - 60 clinical isolates
    - 10 isolates /validation lab

Recommandations for laboratories for verification of new test methods for AST

Clinical Microbiology Procedures Handbook, 3rd edition, Garcia. ASM Press 2010

*For **agreement** with automated systems*

- **Use of latest panels available in Be**
- **Acceptation**
  - **< 1.5 % very major error**
  - **<= 3% major error**
  - **Essential agreement > 90%**

Recommandations for laboratories for verification of new test methods for AST

Clinical Microbiology Procedures Handbook, 3rd edition, Garcia. ASM Press 2010

*For **precision (reproducibility)** with automated systems*

- **Strains**
  - **Minimum 5 strains**
    - **Variety of species and resistance**
- **Test**
  - **Minimum 5 strains in triplicate for 3 days**
- **Acceptation**
  - **Results for each antimicrobial agent within +/- doubling dilution 95% of time**

EUCAST NAC belge

Collection de 60 souches préparée par NRC

- 33 Gram-negative strains of different species
  - Y Glupczynski – Mont-Godinne
- 5 *Staphylococcus aureus* strains and 3 coagulase negative Staphylococci
  - O Denis, Erasme
- 5 enterococci and 2 *S pyogenes*
  - H Goossens – Antwerp
- 7 *S. pneumoniae*
  - J Verhaegen – Leuven
- 5 strains *S agalactiae*
  - P Melin – Liège

EUCAST NAC belge

- Y Glupczynski multiplies strains X8
  - sends 6 sets of 60 strains to 6 labs for automated AST testing
  - 1 to IPH and 1 stored at Mont-Godinne
- P Melin, Liège et J Verhaegen, Leuven
  - test 60 collection strains + 10 clinical strains on Vitek
  - + send 10 clinical strains to 5 other testing labs + IPH + Mont Godinne
- Idem 2 labo pour Phoenix
- Idem 2 labo pour Microscan
- + DD en parallèle

EUCAST en Belgique courrier du 25.10.12

We are currently trying to get everything ready for the validation collection – as discussed earlier. All labs involved are ready to participate; we are now trying to get the diagnostic firms to donate us the reagents and also get some money to compensate all involved for their trouble.

A second point on which we would like to have your opinion is the timing of the switch to EUCAST.

As you know, we already proposed to switch to EUCAST two years ago, but - to a large extent because VITEK and ROSCO were not ready- many labs did not switch to EUCAST. As a result many labs in Belgium still use many different versions of CLSI. We are therefore proposing that the NAC would advise all labs to switch their automated AST system to EUCAST. Vitek is almost completely EUCAST compatible now and even with some gaps still there, we believe this would be preferable to the current chaos. At the same time we could also advise the disk diffusion AST to switch to EUCAST. For the paper discs this would be easy and for ROSCO, EUCAST diameters are available and have been to some extent validated.

A possible dat for switching would be 2013 jan 1st

What is your opinion ?

Johan VE, Youri G et Pierrette M

EUCAST NAC belge

- Négociation mise à disposition des réactifs, panels, etc < firmes
- Disponibilité des panels EUCAST
- Prise en charge des coûts réels

EUCAST en Grande Bretagne

- BSAC guidelines
  - Un peu différent, adaptation nécessaire
  - Expertise dans l'établissement de bkpts
    - Volonté de la garder
  - Workshops, users meeting
  - Doc disponible sur www.BSAC.org.uk
  - Relativement bien adopté
    - EQC NEQAS 2012: +/- 50-60% BSAC; 4 à 20% EUCAST
    - mais R au changement pour certains
  - Soucis pour AMC et ratio conc ac.clav
    - Actuellement pas utilisation bkpts EUCAST car trop R pour *E.coli* urinaires
  - Difficulté acceptation rapportage SIR pour C3 sans tenir compte de ESBL par ex.

EUCAST en Grande Bretagne

- En Ecosse
  - Décision acquisition de Vitek par tous les labos
    - → toujours en CLSI !
- Futur
  - DD tjs adaptation BSAC
  - Automates → EUCAST

EUCAST en France

- SFM > 40 ans, un des plus vieux NAC
  - Difficulté de faire changer les gens!
  - Ds Table « en gras » = EUCAST sinon SFM
  - Necessité de donner bcp explications et justification pour changement
  - Difficulté d'approvisionnement disques bonnes charges et milieux
    - Pq changer, ok depuis 20 ans ?
    - Tout est ok mnt sauf OUI des labos pour DD
      - Trop de modifications de procédure
    - +/- OK pour automates, plus facile moins de modifications
- Pour SFM , OK, très bien. Pq réinventer la roue puisque tout est fait par EUCAST?

« La France fut longtemps en avance mais aujourd'hui en retard » (L Dubreuil, Lille)

EUCAST en Espagne

- Pas de NAC en 2008
  - Comme en Belgique
    - CLSI
  - 1997-2008
    - Le MENSURA groupe
  - 2008
    - Décision d'adopter EUCAST
  - 2012
    - NAC constitué
    - 10 à 50% des labos passés à l'EUCAST

EUCAST en Autriche

- Pas de NAC en 2008
  - Avantage si passage à EUCAST / CLSI
    - Gratuité!
- 11/2009
  - Gunnar Kahlmeter a expliqué les avantages
    - Oct 2010, décision changement de tous avant fin 2011
- Traduction des docs
- Organisation de workshops avec implication du Ministère de la Santé
- Recommandations pratiques
  - Check list pour labos
  - Désignation de « champions »
  - Posters, photos avec distributeurs de disques et guide lecture

EUCAST en Autriche

- Nv workshop avec ministère 9 mois plus tard
  - 09.2011 : 90 % des labos étaient passés à Eucast
- Rassemblement des questions
  - Table pour Campylo, qd?
  - Directive pour rapportage des ESBL, …
- Mars 2012, nv workshop
  - Discussion CPE et update
  - Les labos attendent ce meeting devenu annuel !

DOCUMENTS & MATERIAL

DOCUMENTS & MATERIAL

NAC page from the SBIMC-BVIKM website

- Link to EUCAST website and all available documents
- Step by step document on implementation of AST with EUCAST breakpoints
  - Based on EUCAST documents
    - Disk diffusion test procedure and guide for reading and interpretation
    - Checklist to facilitate implementation
- Results of the performed verification of the 3 mainly used (semi-)automated systems in Belgium

- Distribution of sets of « challenge » strains and instructions
  - During a NAC meeting *(end of 2012 or beginning 2013)*

QUALITY CONTROL

QUALITY CONTROL

- To monitor test performance
  - Use of the recommended routine quality control strains
  - EUCAST Quality control tables
- To confirm the ability to detect resistance
  - QC strains with defined resistance mechanisms may be used

EUCAST routine quality control strains

Organism	Culture collection numbers	Characteristics
E. coli	ATCC 25922; NCTC 12241; CIP 7624 DSM 1103; CCUG 17620, CECT 434	Susceptible, wild-type
P. aeruginosa	ATCC 27853; NCTC 12903; CIP 76110 DSM 1117; CCUG 17619; CECT 108	Susceptible, wild-type
S. aureus	ATCC 29213; NCTC 12973; CIP 103429 DSM 2569; CCUG 15915; CECT 794	Weak β-lactamase producer
E. faecalis	ATCC 29212; NCTC 12697; CIP 103214 DSM 2570; CCUG 9997; CECT 795	Susceptible, wild-type
S. pneumoniae	ATCC 49619; NCTC 12977; CIP 104340 DSM 11967; CCUG 33638	Penicillin intermediate
H. influenzae	NCTC 8468; CIP5494, CCUG 23946	Susceptible, wild-type

ATCC, American Type Culture Collection, 12301 Parklawn Drive, Rockville, MD 20852, USA.
NCTC, National Collection of Type Cultures, Health Protection Agency Centre for Infections, 61 Colindale Avenue, London NW9 5HT, UK.
CIP, Collection de Institut Pasteur, 25–28 Rue du Docteur Roux, 75724 Paris Cedex 15 France.
DSMZ, Deutsche Stammsammlung für Mikroorganismen und Zellkulturen, Mascheroder Weg 16, D-38124 Braunschweig, Germany.
CCUG, The Culture Collection University of Gothenburg http://www.ccug.se/
CECT. Colección Española de Cultivos Tipo. Universidad de Valencia. 46100. Burjassot. Valencia. Spain. http://www.cect.org

EUCAST strains for detection of specific resistance mechanisms *(under development)*

Organism	Culture collection numbers	Characteristics
E. coli	ATCC 35218; NCTC 11954; CIP 102181; DSM 5564; CCUG 30600; CECT 943	TEM-1 β-lactamase producer
K. pneumoniae	ATCC 700603; NCTC 13368; CCUG 45421; CECT 7787	ESBL producer (SHV-18)
S. aureus	NCTC 12493	Oxacillin hetero-resistant, *mecA* positive
E. faecalis	ATCC 51922; NCTC 13379; CIP 104676;	High-level aminoglycoside resistant (HLAR) and vancomycin resistant (*vanB* positive)
H. influenzae	ATCC 49247; NCTC 12699; CIP 104604; DSM 9999; CCUG 26214	β-lactamase negative, ampicillin-resistant (BLNAR)

Answers to questions…

Q	How in practice perform the necessary validation when moving from CLSI to EUCAST ?
A	*Use control strains that can be obtained from national culture collections (ATCC, NCTC, CIP, etc.) or can be purchased in various convenient formats by companies supplying materials for antimicrobial susceptibility testing.*
Q	*Enterococci* with a high dose of gentamicin give a disk diameter of 28 mm but show a 9 mm diameter with Rosco tablets
A	*EUCAST documents state: disk content, 30 µg; ECOFF (WT), ≥ 8 mm (MIC ≤ 32). Check your Rosco tablet against correct disk or make an MIC.* *There is a note in the breakpoint Table that says: Isolates with gentamicin MIC >128 mg/L or an inhibition zone diameter <8 mm have acquired resistance mechanisms and can be reported as high-level aminoglycoside resistant (with the exception of streptomycin, which must be tested separately). There is no synergistic effect between aminoglycosides and beta-lactam agents in enterococci with high-level aminoglycoside resistance.*

Eucast in practice (a Bio-Rad Laboratories Seminar)

Answers to questions…

Q	Viridans strepto Version 1.3 differs from that of the other streptococci published in versions 1.1
A	*Please, refer to the last version (version v. 2.0, valid from 01/01/2012 and check the cells highlighted in yellow that corresponds to last changes from the previous version.*
Q	*H. influenzae*: is it enough to test for β-lactamase ?
A	*Yes and No… H. influenzae strains resistant by PBP modification are still rare. However, you may like to be on the forefront by checking that for your self in your environment. The EUCAST Table version 2.0 states:* *Benzylpenicillin can be used to screen for but not to distinguish between beta-lactamase producing isolates and isolates with PBP changes.* *Isolates categorised as resistant with the screen breakpoint should be checked for beta-lactamase and non-beta-lactamase-mediated resistance to aminopenicillins (without and with inhibitors), cephalosporins and/or carbapenems.*
Q	What about aztreonam for a carbapenemase (+) *P. aeruginosa* ?
A	*Test aztreonam and report susceptibility as found (1/16; the resistant breakpoint relates to high dose therapy. The susceptible breakpoint is set to ensure that wild type isolates are reported intermediate).*

Answers to questions…

Q	What do we need to do for cefazolin and *Enterobacteriaceae* ?
A	*Cefazolin is not recommended for treatment of infections caused by Enterobacteriaceae. If you decide to test it in a context of Gram-negative infection, I'd suggest to use the non-species specific breakpoint (1/2). Remember that the detection of ESBL in Enterobacteriaceae remains important for epidemiological purposes.*
Q	Why is NAD added to the MH + blood medium even when for non-*Haemophilus* testing ?
A	*This has been made for simplifying the testing (by avoiding the need to stock different media).*
Q	Do we need to test for ESBL and carbapenemase (in a context of Hospital Hygiene) and where do we need to report the results to the NAC?
A	*Yes, in the context of epidemiology. However, do not use the answer ESBL + / carbapenemase + as an indication for not recommending a cephalosporin or a carbapenem. The clinical outcome is indeed strictly related to the MIC. Refer to the values shown in the Table.* *NAC is not involved in epidemiological surveys. I suggest to discuss this point during the symposium.*

Answers to questions…

Q	What should we do for antibiotics for which there are not (yet) EUCAST criteria for disk-based assays
A	*Zone of inhibition (diameters) with corresponding susceptibility criteria are now available for almost if not all antibiotics/bacteria combination for which a MIC-based breakpoint is available.*
Q	What should we do when there is no EUCAST breakpoint ? Use CLSI, CA-SFM ?
A	*This is becoming less and less frequent. If you are faced with this problem often* • *tell us about it so that we can try correcting it* • *in the meantime, use preferably an European breakpoint if available (CA-SFM, BSAC, …) as this may be more relevant of your environment.* *Please, do NOT confuse "no EUCAST breakpoint on EUCAST web site" and "no EUCAST breakpoint implemented in your automatic system" (beware of the systems that cannot easily be adapted…)*

Answers to questions…

Q	Quid about NAC ? Which are the guidelines for antibiotics for which when there is no EUCAST breakpoint (e.g., temocillin) ?
A	*NAC is addressing those issues and now come with a provisional breakpoint for temocillin. Send all questions related to NAC to Prof. J. Van Eldere or Prof. P. Melin*
Q	and cefazolin, doxicycline ?
A	*Cefazolin is essentially used for prophylaxis. Infer from cefoxitin for S. aureus, penicillin for Streptococci A, B, C, and G, 0.5/0.5 for viridans, or to the non-species-related breakpoint (1/2).* *Doxicycline is now covered in the Table. Please, check each note as these may be important (An MIC method should be used to test doxycycline susceptibility of tetracycline resistant isolates if required).*
Q	Which scientific support can we expect from the NAC ?
A	*Good question. I hope this will come.* *But did CLSI provided Belgian-adapted support ?*

Answers to questions…

Q	…and bacitracine, en fosfomycin …
A	*The use of these antibiotics is either very limited or specific (bacitracine) or largely off-label and/or anecdotal (fosfomycin if outside of urinary tract infections).* *However, fosfomycin breakpoints have been set* • *for its use IV against Enterocateriaceae (32/32)* • *for its oral use in a context of uncomplicated urinary tract infection (32/32)* • *for its use IV against S. auerus (32/32; with an MIC method)* *Other uses are not recommended or have insufficient evidence for safe breakpoint setting*
Q	Quid for bacteria that have not (yet) EUCAST breakpoints ?
A	*EUCAST is trying to improve this by adding new bacterials species not yet covered in the current Tables. If you are expert or even simply good amateur for one of those species, contact EUCAST and make suggestions for (i) MIC distributions; (ii) breakpoints (use the information provided here and in EUCAST documents for guidance)*

Answers to questions…

Q	What about combinations bug/antibiotic for which EUCAST gives no breakpoint ?
A	*Look first at "**non-species specific breakpoints**" available at the end of the Table (and also on the "Rational Document" of each antibiotic* *Contact EUCAST to propose an action for "bug/antibiotic combination" that you consider as important and not correctly covered by the "non-species specific breakpoint.*
Q	EUCAST Breakpoints Eucast for *Vibrionaceae,* for non-fermenters other than *P. aeruginosa and S. malophila, Campylobacter…*
A	*Please, look at the 2 previous Q/A. If you consider that these bacteria need to be added, please, send us a request and a justification, or, better, make a proposal.*
Q	On which basis do we need to make a confirmatory E-test of an antibiogram made with disks for Streptococci ? (MH Agar +5% PB +20 mg/L β-NAD)
A	*I'd only do this if you suspect that the isolate has an MIC close to the breakpoint and that a dose adjustment or a change in antibiotic is critical (patient at risk or with potential or proven perturbations of pharmacokinetic parameters).*

Answers to questions…

Q	*P. aeruginosa* and *A. baumannii* ? Anaerobes ? When (if ever ?)
A	*Please, refer to Pseudomonas spp. and Acinetobacter spp. as those cover the two species mentioned (there is no compelling reason to believe that the relation MIC – clinical success/clinical failure should be specific of the species within these genus) ;* *Gram-positive (except C. difficile) and Gram-negative anaerobes are covered globally for a similar reason;* *C. difficile has its own section in the current Breakpoint Table.*
Q	Nitrofuranes: only for *E. coli*… / Cefuroxime : only for *E. coli, Klebsiella, Proteus*/ Ceftazidime : not for *Acinetobacter*... Why ?
A	*EUCAST sets breakpoint for specific bacteria only when (i) there is a recognized and/ or real indication (beyond anecdotal use) and (ii) there is sufficient clinical evidence of successful treatment of real infections. If you wish to recommend an antibiotic for infections caused by bacteria for which EUCAST does not have a breakpoint* *• think twice about issuing that recommendation (what is the evidence ?);* *• use the non-species specific breakpoints;* *• contact EUCAST is you believe this should be corrected (and explain us why …).*

Answers to questions…

Q	How do we know that there has been an update of the EUCAST documents ?
A	*EUCAST breakpoint Table is now systematically update in December for implementation of the changes next January.* *During the year, the EUCAST web site chnages ate posted on a special page: http://www.eucast.org/website_changes/ that can be accessed at all times*
Q	A which date should have all laboratories switched to EUCAST
A	*EUCAST does not impose any date, but* • *the later you switch, the more "outdated" you will be compared to oether countries and to the E-CDC* • *it will probably be the role of the NAC to discuss this with the Scientific Institute of Public Health (within a context of Quality Control)**

* See presentation given at the ISP/WIV on 31 May 2012 at http://www.facm.ucl.ac.be/facm-conferences.htm