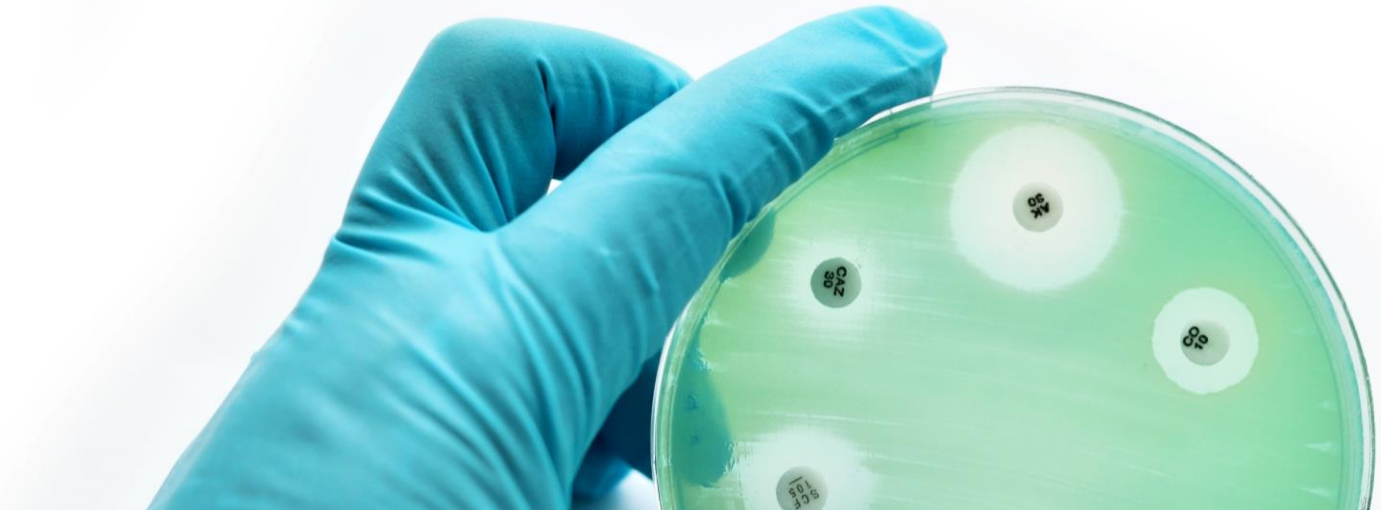
BVIKM/SBIMC

Belgische Vereniging voor Infectiologie en Klinische Microbiologie
Société Belge d'Infectiologie et de Microbiologie Clinique

PRESENTATIONS

# Local experience of switch to new EUCAST Guidelines

Dr. Laetitia Brassinne



CLINIQUES DE L'EUROPE

EUROPA ZIEKENHUIZEN

advanced care - personal touch

# LOCAL EXPERIENCE OF SWITCH TO NEW EUCAST GUIDELINES

DR. LAETITIA BRASSINNE

24/09/2021

# CONTEXT AND SITUATION

Europe Hospitals (member of Huni network) - our sites :

- St-Elisabeth site – hospital with hospital practitioners
- St-Michael site – hospital with hospital practitioners
- Bella Vita Medical center – general practitioners and external care providers
- Polyclinic Halle – external care providers

Our laboratory serves and gives advices essentially to hospital practitioners, but also to GP's and other external care providers.

NB: There is no team of infectious disease specialists (only general internists).

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# HISTORY

Implementation of our LIS : GLIMS in 2004

Start reporting antibiograms with « masks» and «comments »

***For example :***

*E. coli* in a urinary sample (outpatient setting)

**BACTERIOLOGIE**

URINE 1/2 jet (Borate)

| | | | | |
|---|---|---|---|---|
| Sédiment | | | | |
| pH | | 5.0 | | |
| Densité | | 1.007 | | |
| Glucose | | Négatif | | |
| Protéines | | Négatif | | |
| Acétone | | Négatif | | |
| Bilirubine | | Négatif | | |
| Urobilinogène | | Négatif | | |
| Hémoglobine | | Traces | | |
| Estérase (leucocytes) | | Positif +++ | | |
| Nitrites (germes) | | Négatif | | |
| Examen microscopique | | | | |
| Globules rouges | | 7 | /µL | <25 |
| Globules blancs | # | 593 | /µL | <35 |
| Cellules épithéliales | | Négatif | | |
| Cylindres hyalins | | Négatif | | |
| Cylindres non hyalins | | Négatif | | |
| Germes | | Positif ++ | | |
| Commentaire | | Forte probabilité de présence de bacilles Gram Négatif | | |
| Levures | | Négatif | | |
| Culture | | | | |
| Aérobie | | Escherichia coli > 100.10 ³ /mL | | |
| Antibiogramme (EUCAST) | | | | |

| | E. coli |
|---|---|
| Amoxicilline (Clamoxyl) | Sensible |
| Amoxi-Clav (Augmentin) | Sensible |
| Céfuroxime axétil (Zinnat) | Sensible |
| Ciprofloxacine (Ciproxine) | Sensible |
| Nitrofurantoïne (Furadantine MC) | Sensible |
| Fosfomycine (Monuril) | Sensible |
| Triméth-Sulfaméth. (Bactrim) | Sensible |

Commentaire : Cefuroxime axetil (PO) : ne peut être utilisé que dans le traitement des infections urinaires basses non compliquées (EUCAST Clinical Breakpoint).

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## BACTERIOLOGIE

URINE 1/2 jet (Borate)

| | | | | |
|---|---|---|---|---|
| Sédiment | | | | |
| pH | | 5.0 | | |
| Densité | | 1.007 | | |
| Glucose | | Négatif | | |
| Protéines | | Négatif | | |
| Acétone | | Négatif | | |
| Bilirubine | | Négatif | | |
| Urobilinogène | | Négatif | | |
| Hémoglobine | | Traces | | |
| Estérase (leucocytes) | | Positif +++ | | |
| Nitrites (germes) | | Négatif | | |
| Examen microscopique | | | | |
| Globules rouges | | 7 | /µL | <25 |
| Globules blancs | # | 593 | /µL | <35 |
| Cellules épithéliales | | Négatif | | |
| Cylindres hyalins | | Négatif | | |
| Cylindres non hyalins | | Négatif | | |
| Germes | | Positif ++ | | |
| Commentaire | | Forte probabilité de présence de bacilles Gram Négatif | | |
| Levures | | Négatif | | |
| Culture | | | | |
| Aérobie | | Escherichia coli > 100.10 ³ /mL | | |

Antibiogramme (EUCAST)

| | E. coli |
|---|---|
| Amoxicilline (Clamoxyl) | Sensible |
| Amoxi-Clav (Augmentin) | Sensible |
| Céfuroxime axétil (Zinnat) | Sensible |
| Ciprofloxacine (Ciproxine) | Sensible |
| Nitrofurantoïne (Furadantine MC) | Sensible |
| Fosfomycine (Monuril) | Sensible |
| Triméth-Sulfaméth. (Bactrim) | Sensible |

Commentaire :

Cefuroxime axetil (PO) : ne peut être utilisé que dans le traitement des infections urinaires basses non compliquées (EUCAST Clinical Breakpoint).

Cefuroxime axetil (PO) : may only be used for the treatment of uncomplicated lower urinary tract infections (EUCAST Clinical Breakpoint).

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So having written comments on our report is not something new for our medical doctors !

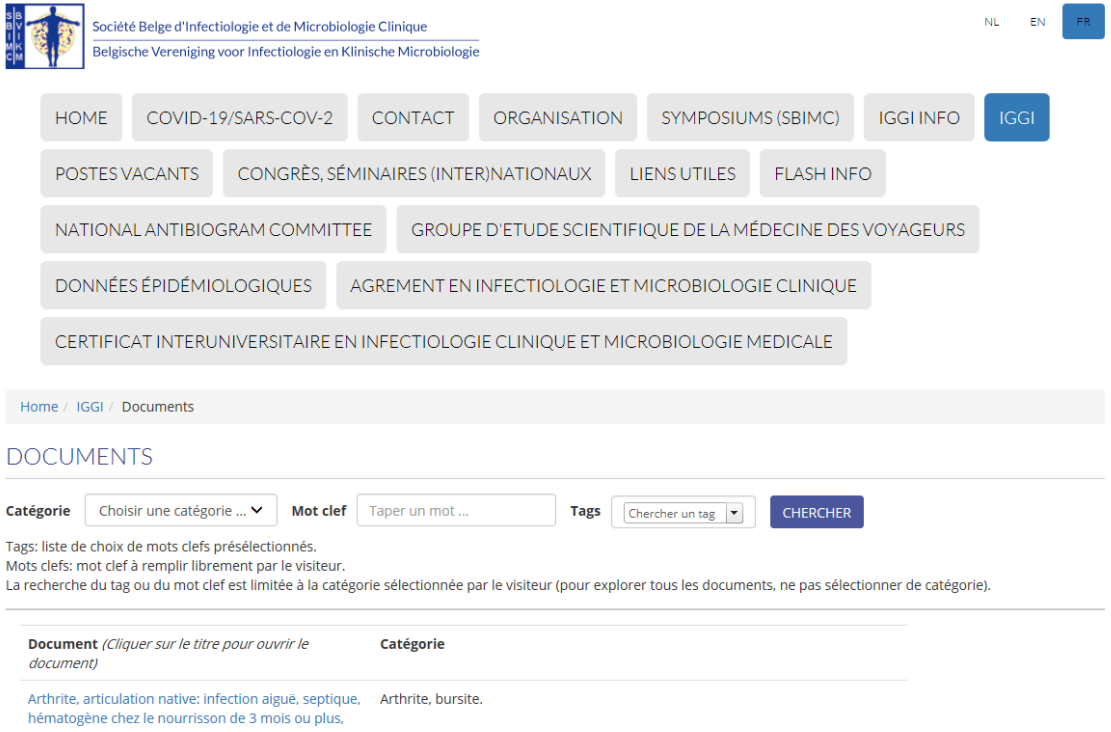
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YOU'RE HEALTHY BUT I HAVE TO GIVE YOU A PRESCRIPTION FOR TOXIKILL.
www.dilbert.com scottadams@aol.com
THE DRUG COMPANY'S REP IS TOTALLY HOT AND SHE SAID SHE'D TAKE ME TO LUNCH IF I SELL ENOUGH OF THIS STUFF.
4-20-05 ©2005 Scott Adams, Inc./Dist. by UFS, Inc.
WILL THERE BE ANY SIDE EFFECTS?
DEPENDS ON WHAT I EAT.

# WE TRY TO BE PROACTIVE !

- 2012 : switch from CLSI to EUCAST
- In the daily routine we try to comply with the new guidelines/breakpoints and adapt our comments in accordance to these
- 2018 : In collaboration with the GGA/ABG we have implemented the IGGI guide in our hospitals. We bought the licence so that all our medical doctors have a very easy acces to these guidelines. On a daily basis, we inform and train them on using that guide !




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# WE TRY TO BE PROACTIVE!

- Regular information of the clinicians on the use of EUCAST clinical breakpoint for our antibiograms

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

So more and more Clinicians from Europe Hospitals are familiar with the IGGI guide and with EUCAST

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# WE TRY TO BE PROACTIVE!

- 2020-2021 : When the « new EUCAST guidelines » were published, we rapidly decided to gradually implement these guidelines in our reports.

« An MIC breakpoint of S ≤ 0,001 mg/L is an arbitrary, « off scale » breakpoint (corresponding to a zone diameter breakpoint of « S ≥ 50mm ») which categorises wild-type organisms (organisms without phenotypically detectable resistance mechanisms to the agent) as « Susceptible, increased exposure » (I). For these organisms-agent combinations, never report «  Susceptible, standard dosing regimen » (S).

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# IN PRACTICE

In practice, for « off scale » breakpoint we have decided to report S on our reports AND to add **automatics comments** (no manual action needed from the microbiologists during the validation in our LIS) according to the organism-agent combinations.

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# SOME PRACTICAL EXAMPLES

Enterobacterales (for example E. coli) and Temocillin :

| | | | | |
|---|---|---|---|---|
| Sédiment | | | | |
| pH | | 5.5 | | |
| Densité | | 1.004 | | |
| Glucose | | Négatif | | |
| Protéines | | Traces | | |
| Acétone | | Négatif | | |
| Bilirubine | | Négatif | | |
| Urobilinogène | | Négatif | | |
| Hémoglobine | | Positif +++ | | |
| Estérase (leucocytes) | | Positif +++ | | |
| Nitrites (germes) | | Négatif | | |
| Examen microscopique | | | | |
| Globules rouges | | 6 | /µL | <25 |
| Globules blancs | # | 157 | /µL | <35 |
| Cellules épithéliales | | Négatif | | |
| Cylindres hyalins | | Négatif | | |
| Cylindres non hyalins | | Négatif | | |
| Germes | | Négatif | | |
| Levures | | Négatif | | |
| Culture | | | | |
| Aérobie | | Escherichia coli > 100.10 ³ /mL | | |
| Antibiogramme (EUCAST) | | | | |

| | E. coli |
|---|---|
| Amoxicilline (Clamoxyl) | Sensible |
| Amoxi-Clav (Augmentin) | Sensible |
| Céfuroxime axétil (Zinnat) | Sensible |
| Témocilline (Negaban) | Sensible (<= 4) |
| Ciprofloxacine (Ciproxine) | Sensible |
| Nitrofurantoïne (Furadantine MC) | Sensible |
| Fosfomycine (Monuril) | Sensible |
| Triméth-Sulfaméth. (Bactrim) | Sensible |

Temocillin: the classification S can only be used for a posology :

- systemic infection: 2g / 8h (IV) = high dose
- lower urinary tract infection: 2g / 12h (IV)

(EUCAST Clinical Breakpoint)

| | | |
|---|---|---|
| Commentaire : | | Cefuroxime axetil (PO) : ne peut être utilisé que dans le traitement des infections urinaires basses non compliquées (EUCAST Clinical Breakpoint). |
| Commentaire : | | Temocilline : la classification S n'est valable que pour une posologie de :<br>- infection systémique : 2g/8h (IV) = high dose<br>- infection urinaire basse : 2g/12h (IV)<br>(EUCAST Clinical Breakpoint) |

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# SOME PRACTICAL EXAMPLES

Staphylococcus spp. (for example S. aureus) and Ciprofloxacin :

**BACTERIOLOGIE**

Site profond Plaie

| | |
|---|---|
| Examen microscopique (Gram) | |
| Globules blancs | Négatif |
| Flore | Pas observé de flore |
| Culture | |
| Aérobie | Staphylococcus aureus ++++ |
| Anaérobie | Absence de germes anaérobes |
| Antibiogramme (EUCAST) | |

| | S. aureus |
|---|---|
| Flucloxacilline (Floxapen) | Sensible |
| Amoxi-Clav (Augmentin) | Sensible |
| Erythromycine (Erythrocine/-forte) | Sensible |
| Gentamicine (Geomycine) | Sensible |
| Clindamycine (Dalacin C) | Sensible |
| Ciprofloxacine (Ciproxine) | Sensible |
| Tétracycline ( ) | Sensible |
| Acide fusidique (Fucidine) | Résistant |
| Triméth-Sulfaméth. (Bactrim) | Sensible |
| Rifampicine (Rifadine) | Sensible |
| Vancomycine (Vancocin) | Sensible |
| Mupirocine (Bactroban) | Sensible |

Staphylococcus and Fluoroquinolones: the classification S can only be used for a posology :

- Ciprofloxacin: 750mg / 12h (PO) or 400mg / 8h (IV) = high dose
- Levofloxacin: 500mg / 12h (PO) or 500mg / 12h (IV) = high dose

(EUCAST Clinical Breakpoint)

| | |
|---|---|
| Commentaire : | Staphylococcus et Fluoroquinolones : la classification S n'est valable que pour une posologie de :<br>- Ciprofloxacine : 750mg/12h (PO) ou 400mg/8h (IV) = high dose<br>- Levofloxacine : 500mg/12h (PO) ou 500mg/12h (IV) = high dose<br>(EUCAST Clinical Breakpoint) |

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# SOME PRACTICAL EXAMPLES

Pseudomonas spp. (for example P. aeruginosa) and Cefepime/Ceftazidime, Piperacillin-tazobactam, Ciprofloxacin :

**BACTERIOLOGIE**

ORL Oreille externe droite

| | |
|---|---|
| Examen microscopique (Gram) | |
| Globules blancs | Négatif |
| Flore | Polymorphe |
| Culture | |
| Aérobie | Pseudomonas aeruginosa ++++ |
| Levures | Négative |
| Champignons | Négative |
| Antibiogramme (EUCAST) | |

| | P.aeruginosa |
|---|---|
| Pipéra-Tazo (Tazocin) | Sensible |
| Ceftazidime (Glazidim) | Sensible |
| Céfépime (Maxipime) | Sensible |
| Méropénem (Meronem) | Sensible |
| Amikacine (Amukin) | Sensible |
| Ciprofloxacine (Ciproxine) | Sensible |

Pseudomonas spp. : the classification S can only be used for a posology :
- Cefepime/Ceftazidime: 2g/8h (IV) = high dose
- Piperacillin-Tazobactam: 4g/6h (IV) = high dose
- Ciprofloxacin: 750mg/12h (PO) or 400mg/8h (IV) = high dose
(EUCAST Clinical Breakpoint)

| | |
|---|---|
| Commentaire : | P. aeruginosa : en attente de l'antibiogramme, pensez à associer un aminoglycoside à une beta lactamine en cas de sepsis ou d'immunodépression profonde (hémopathie, chimiothérapie récente, greffés,...). |
| Commentaire : | Pseudomonas spp : la classification S n'est valable que pour une posologie de :<br>- Cefepime/Ceftazidime: 2g/8h (IV) = high dose<br>- Piperacilline-Tazobactam: 4g/6h (IV) = high dose<br>- Ciprofloxacine: 750mg/12h (PO) ou 400mg/8h (IV) = high dose<br>(EUCAST Clinical Breakpoint) |

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# SOME PRACTICAL EXAMPLES

Acinetobacter spp. and Ciprofloxacin :

**BACTERIOLOGIE**

Prélèvement respiratoire Aspiration endotrachéale

| | | |
|---|---|---|
| Examen microscopique (Gram) | | |
| Cellules épithéliales | <10 | /champ |
| Globules blancs | >25 | /champ |
| Levures | Très nombreuses | |
| Bacilles Gram négatif | Très nombreux | |
| Culture | | |
| Aérobie | Acinetobacter baumanii ++++ | |
| Antibiogramme (EUCAST) | | |

| | A.baumanii |
|---|---|
| Méropénem (Meronem) | Sensible (<= 0.25) |
| Gentamicine (Geomycine) | Sensible (<= 1) |
| Ciprofloxacine (Ciproxine) | Sensible (<= 0.25) |
| Triméth-Sulfaméth. (Bactrim) | Sensible (<= 20) |

Commentaire : Acinetobacter spp. et Ciprofloxacine : la classification S n'est valable que pour une posologie de :
- Ciprofloxacine : 750mg/12h (PO) ou 400mg/8h (IV) = high dose
(EUCAST Clinical Breakpoint)

Acinetobacter spp. and Ciprofloxacin : the classification S can only be used for a posology :
- Ciprofloxacin: 750mg / 12h (PO) or 400mg / 8h (IV) = high dose

(EUCAST Clinical Breakpoint)

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# AND WHAT ABOUT « AREA OF TECHNICAL UNCERTAINTY (ATU) »

- How to deal with results in the ATU?
  - *What we choice to do in pratice?*

- We perform the majority of our AST on VITEK2 and we observe that ATU rarely occur

- Currently the ATU concerns a minority of organism-agent combinations (view table next slide)

Our choice :

1. **Downgrade the susceptibility category :** our favorite choice.
2. **Omit an uncertain result :** may also be among our favorite actions (strategy of masks already implemented).
3. **Use an alternative test (perform an MIC or a genotypic test):** Yes but rare, only if multi-resistant organism.
4. **Repeat the test :** Rare! Only if technical problem in the primary AST.
5. **Include the uncertainty as part of the report :** Really rarely ! because that begin to be complicated for the clinicians. Only for serious situations (explain and discuss the results).

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| EUCAST Clinical Breakpoint 2021 | | | | |
|---|---|---|---|---|
| | **Antibiotics** | **"off scale" breakpoints** | **ATU (mg/L)** | **ATU (mm)** |
| **Enterobacterales** | | | | |
| | Amoxicillin-clavulanic acid | / | / | 19-20 |
| | Piperacillin-tazobactam | / | 16 | 19 |
| | Temocillin | YES | / | / |
| | Cefazolin | YES | / | / |
| | Cefiderocol | / | / | 18-22 |
| | Ceftaroline | / | / | 22-23 |
| | Ceftolozane-tazobactam | / | / | 19-21 |
| | Cefuroxime IV | YES | / | / |
| | Imipenem (*Morganellaceae*) | YES | / | / |
| | Ciprofloxacin | / | 0,5 | 22-24 |
| **Pseudomonas spp.** | | | | |
| | Piperacillin | YES | / | 18-19 |
| | Piperacillin-tazobactam | YES | / | 18-20 |
| | Ticarcillin | YES | / | / |
| | Ticarcillin-clavulanic acid | YES | / | / |
| | Cefepime | YES | / | / |
| | Cefiderocol (*P. aeruginosa*) | / | / | 14-22 |
| | Ceftazidime | YES | / | / |
| | Ceftazidime-avibactam (P. aeruginosa) | / | / | 16-17 |
| | Doripenem | YES | / | / |
| | Imipenem | YES | / | / |
| | Aztreonam | YES | / | / |
| | Ciprofloxacin | YES | / | / |
| | Levofloxacin | YES | / | / |
| | Colistin | / | 4 | / |
| **Stenotrophomonas maltophilia** | | | | |
| | Trimethoprim-sulfamethoxazole | YES | / | / |
| **Acinetobacter spp.** | | | | |
| | Doripenem | YES | / | / |
| | Ciprofloxacin | YES | / | / |
| **Staphylococcus spp.** | | | | |
| | Cefoxitin (*S. epidermidis*) | / | / | 25-27 |
| | Ceftaroline (*S. aureus*) | / | 1 | 19-20 |
| | Ceftobiprole (*S. aureus*) | / | 2 | 16-17 |
| | Ciprofloxacin | YES | / | / |
| | Levofloxacin | YES | / | / |
| | Amikacin (S. aureus) | / | / | 16-19 |
| **Enterococcus spp.** | | | | |
| | Imipenem | YES | / | / |
| **Streptococcus groups A, B, C and G** | | | | |
| | / | / | / | / |
| **Streptococcus pneumoniae** | | | | |
| | Cefaclor | YES | / | / |
| | Levofloxacin | YES | / | / |
| **Viridans group streptococci** | | | | |
| | / | / | / | / |

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# CHALLENGES

- That works perfectly with our « internal system » Glims > Omnipro or Glims > Cyberlab for our comments
- That works with our paper reports
- That works with heathone for the external practionners/GP's who use that software
- BUT that doesn't work with medidoc because the are no medidoc code for comments…

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# FEEDBACK FROM OUR MEDICAL DOCTORS

We have positive feedback from our medical doctors which says :

“These comments are of great help to guide us in our choice.”

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# FEEDBACK FROM THE HOSPITAL PHARMACY

We have positive feedback from the hospital pharmacy which says that our medical doctors ask for example 750 mg ciprofloxacin twice a day when it is necessary. But sometimes it's « complicated » because there is no ciprofloxacin 750mg tablet on the market, so it's 1 tablet of 500mg + 1 tablet of 250mg…

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# FOR THE FUTURE

It’s nice to have good feedback from our medical doctors and the hospital pharmacy BUT we plan to develop indicators in collaboration with the GGA/ABG that could allow to verify in an objective manner that the comments are really used in terms of choice of antibiotics and adherence/compliance with the recommended dosage.

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# TAKE HOME MESSAGE

- Seems to be complicated but in reality it's feasible
- Try to automatize in AST system and/or LIS
- Don't hesitate to discuss these guidelines in GGA/ABG
- Don't hesitate to discuss regularly with the clinicians to inform them about the use of IGGI guide and EUCAST Clinical Breakpoint

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# THANK YOU!

I would like to thank my dear colleague Mathieu Cauchie and all my other biologist colleagues, as well as all the technologists from the microbiology department.

**Because without team we are nothing!**

I would also like to thank you Pr. Y. Glupczynski for his comments and advice.

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