Antibiotic policy control group: "why, who, how ?"

F. Van Bambeke
Pharmacologie cellulaire et moléculaire
Louvain Drug Research Institute & Centre de Pharmacie clinique
Université catholique de Louvain
Brussels, Belgium

Based on material kindly provided by
- Pharm. Caroline Briquet, Groupe de Gestion de l'antibiothérapie, cliniques universitaires St Luc, Université catholique de Louvain, Bruxelles, Belgium
- Dr C. Rossi, infectiologue - hygiéniste, CHU Ambroise Paré, Mons, Belgium
- Dr C. Potvliege, microbiologiste – hygiéniste, CHU Tivoli, La Louvière, Belgium

Bach Mai Hospital, Hanoi, Vietnam – 20 April 2011

Antibiotic policy control group:

1.Why ?

Inorderly use of antibiotics causes major problems !

Antimicrobial resistance is a major problem in hospitals …

Factors that may increase antimicrobial resistance in hospitals.

Greater severity of illness of hospitalized patients
More severely immunocompromised patients
Newer devices and procedures in use
Increased introduction of resistant organisms from the community
Ineffective infection control and isolation practices and compliance
Increased use of antimicrobial prophylaxis
Increased empiric polymicrobial antimicrobial therapy
High antimicrobial usage per geographic area per unit time

NOTE. Modified from McGowan JE Jr.

You can act upon these parameters by a rational policy of use !

Shlaes et al. Infect Control Hosp Epidemiol. 1997 Apr;18(4):275-91

Milestones in Belgium

- 1997: « package deal » for antibioprophylaxis in surgery
- 1998: Copenhagen conference « the microbial threat »
- 1999: launching of a Belgian Antibiotic Policy Coordination Committee
- 2001: European conference on AB use in Europe, Brussels, Belgium
- 2002: Pilot projects of antibiotic policy control groups in a few hospitals

3 major papers describing the role of an antiobiotic policy committee…

JAMA. 1996 Jan 17;275(3):234-40.

Strategies to Prevent and Control the Emergence and Spread of Antimicrobial-Resistant Microorganisms in Hospitals. A challenge to hospital leadership.

Goldmann DA, Weinstein RA, Wenzel RP, Tablan OC, Duma RJ, Gaynes RP, Schlosser J, Martone WJ.

Department of Medicine, Children's Hospital, Boston, Mass 02115, USA.

Infect Control Hosp Epidemiol. 1997 Apr;18(4):275-91.

Society for Healthcare Epidemiology of America and Infectious Diseases Society of America Joint Committee on the Prevention of Antimicrobial Resistance: guidelines for the prevention of antimicrobial resistance in hospitals.

Shlaes DM, Gerding DN, John JF Jr, Craig WA, Bornstein DL, Duncan RA, Eckman MR, Farrer WE, Greene WH, Lorian V, Levy S, McGowan JE Jr, Paul SM, Ruskin J, Tenover FC, Watanakunakorn C.

Wyeth-Ayerst Research, Pearl River, NY 10965, USA.

Clin Infect Dis. 2007 Jan 15;44(2):159-77. Epub 2006 Dec 13.

Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America guidelines for developing an institutional program to enhance antimicrobial stewardship.

Dellit TH, Owens RC, McGowan JE Jr, Gerding DN, Weinstein RA, Burke JP, Huskins WC, Paterson DL, Fishman NO, Carpenter CF, Brennan PJ, Billeter M, Hooton TM; Infectious Diseases Society of America; Society for Healthcare Epidemiology of America.

Harborview Medical Center and the University of Washington, Seattle, USA.

IDSA/SHEA recommandations*

Infect Control Hosp Epidemiol. 1997 Apr;18(4):275-91.

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Prevent and control the transmission of resistant bacteria

Optimize antibiotic usage

* American Society of Infectious Diseases; Society for Healthcare Epidemiology of America

IDSA/SHEA recommandations*

Prevent and control the transmission of resistant bacteria

Recommendations	*Strength of* recommendation*	*Quality of* evidence†
It is recommended that hospitals have a system for monitoring antimicrobial resistance of both community and nosocomial isolates (by hospital location and patient site) on a monthly basis or at a frequency appropriate to the volume of isolates.	A	III
Monitoring use of antimicrobials by hospital location or prescribing service is recommended on a monthly basis or at a frequency appropriate to the prescription volume.	A	III
It is recommended that hospitals monitor the relationship between antimicrobial use and resistance, and assign responsibility through practice guidelines or other institutional policies.	A	II
It is recommended that hospitals apply Contact Precautions to specified patients known or suspected to be colonized or infected with epidemiologically important microorganisms that can be transmitted by direct or indirect contact.	A	III

* Categories for strength of recommendation: A, good evidence for support; B, moderate evidence for support; C, poor evidence to support.

† Categories reflecting the quality of evidence on which recommendations are based: I, evidence from at least one properly randomized controlled trial; II, evidence from at least one well-designed clinical trial without randomization, from cohort or case-controlled analytic studies (preferably from more than one center), from multiple time-series studies, or from dramatic results in uncontrolled experiments; III, evidence from opinions of respected authorities, based on clinical experience, descriptive studies, or reports from expert committees.

* American Society of Infectious Diseases; Society for Healthcare Epidemiology of America

IDSA/SHEA recommandations

Prevent and control the transmission of resistant bacteria

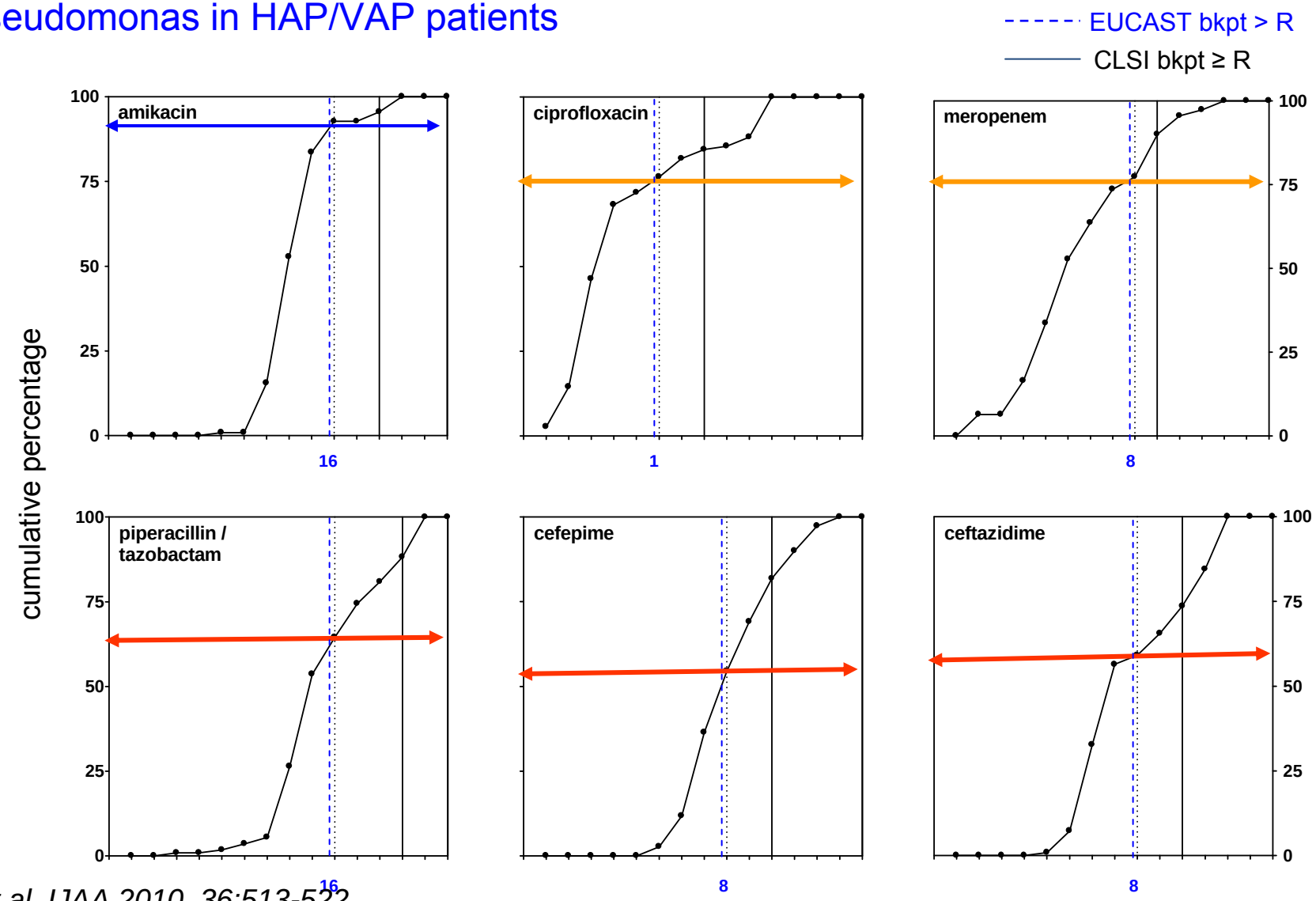
Elements of an optimal antimicrobial control program to study the prevention or reduction of antimicrobial resistance.

- Precise definitions of antimicrobial resistance for antimicrobials and organisms
- A system for monitoring the frequency of resistance (clinical and environmental)
- A determination of which antimicrobial(s) to control
- A method to achieve usage control
- A determination of who will be responsible for maintaining control
- A method to educate and enroll prescribers in the control process
- A stable system of hospital infection control
- A system to measure use of controlled and uncontrolled antimicrobials
- A method to determine antimicrobial use per geographic area per unit time
- Ability to distinguish community from nosocomial isolates
- Ability to identify isolates by body site and hospital location
- A method to assure that clinical care will not be harmed by control measures
- Ability to identify known mechanisms of antimicrobial resistance
- Ability to type organisms by phenotypic or genetic methods

Evaluate resistance and infections in your hospital!

An examplative epidemiological survey

Pseudomonas in HAP/VAP patients



Riou et al, IJAA 2010, 36:513-522

MIC (mg/L : 0.0156 to 512 mg/L)

IDSA/SHEA recommendations

Prevent and control the transmission of resistant bacteria

Control antibiotic usage without impairing quality of care!

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IDSA/SHEA recommendations*

Optimize antibiotic usage

Strategic goal 1: Optimize choice and duration of prophylactic antibiotic therapy.

Strategic goal 2: Optimize choice and duration of empiric antibiotic therapy.

Strategic goal 3: Improve antibiotic prescribing practices by educational and administrative means.

Strategic goal 4: Establish a system to monitor and provide feedback on the occurrence and impact of antibiotic resistance.

Strategic goal 5: Define and implement institutional or health care delivery-system guidelines for important types of antibiotic use.

* American Society of Infectious Diseases; Society for Healthcare Epidemiology of America

IDSA/SHEA recommendations*

Optimize antibiotic usage

Proposed methods to control antimicrobial use to prevent or control antimicrobial resistance.

Optimal use of all antimicrobials
Selective removal, control, or restriction of antimicrobial agents or classes
Rotational or cyclic antimicrobial use
Use of combination antimicrobial therapy to prevent the emergence of resistance

* American Society of Infectious Diseases; Society for Healthcare Epidemiology of America

IDSA/SHEA recommendations

WHAT SHOULD WE DO IN PRACTICE ?

WHO SHOULD DO THAT ?

Methods to implement antibiotic control or restriction poli cies.

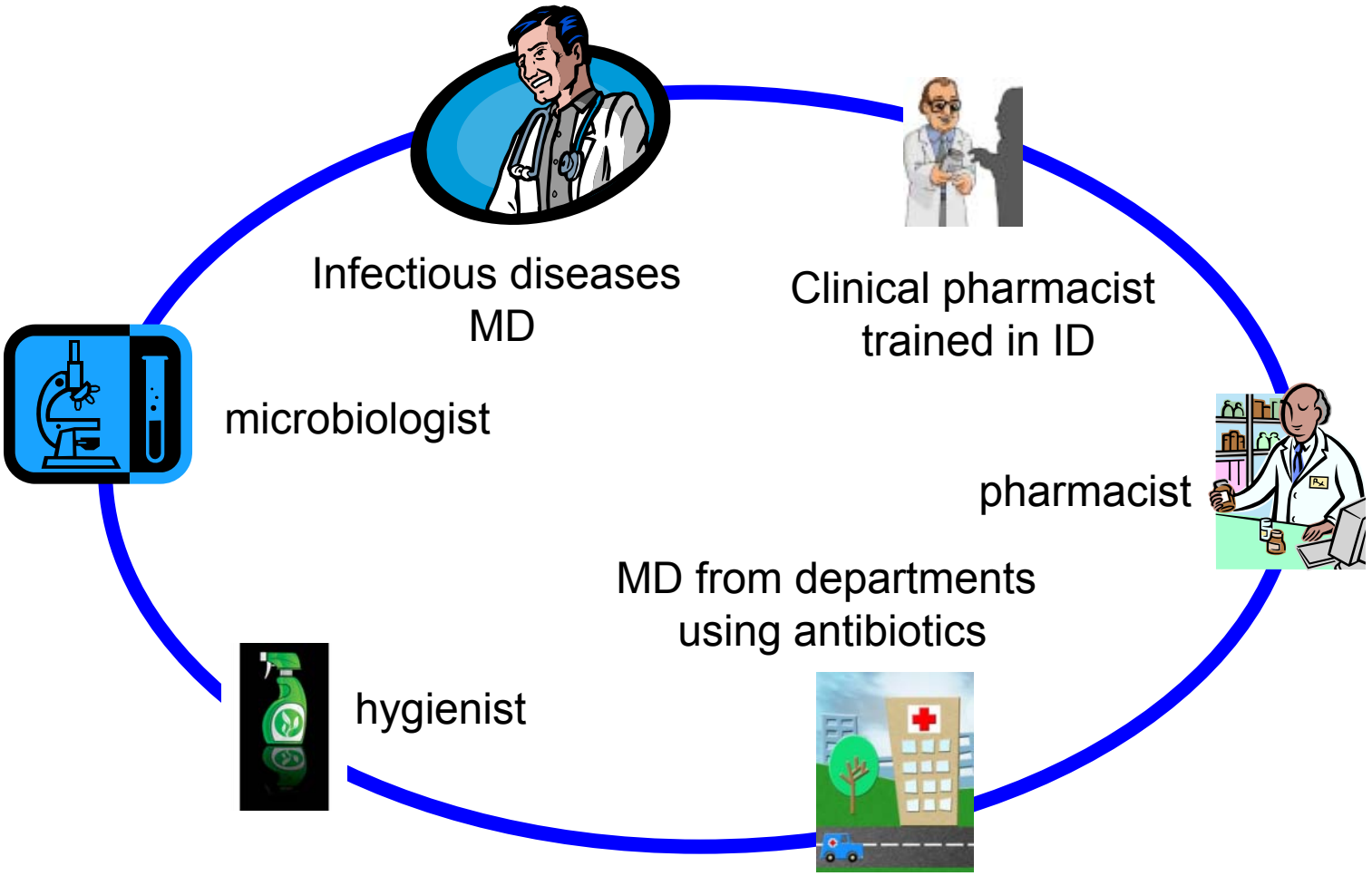
- Written hospital guidelines
  - National [49]
  - Regional (state regulations)
  - Local [68]
- Educational efforts aimed at changing prescribing practices of physicians
  - Face-to-face-presentations [72]
  - Computer interactions [73]
  - Pharmacy ''Top 100'' expenditures list
- Restriction of hospital formulary through pharmacy and therapeutics committee
  - Cyclic rotation of antimicrobials within a class [34]
  - Antibiotic order forms [74, 75]
  - Antibiotic stop orders
    - Therapeutic use
    - Prophylactic use
  - Restriction of use [77]
  - Removal of specific agents [78]
  - Review of medical record by pharmacists [79]
    - Decentralized pharmacies
    - PharmDs to interact with physicians [80]
  - Usage feedback to physician [78]
  - Computerized review
  - Group purchasing practices
  - Generic substitution [81]
- Utilization review with guidelines for rational and appropriate usage
  - Antibiotic utilization subcommittee
    - Multidisciplinary teams [79]
- Requirement of consultation with infectious diseases subspecialists for certain antimicrobial choices
  - By telephone approval [78]
  - By written audit [82, 83]
- Antimicrobial susceptibility reporting [84]
- Reduction of pharmaceutical promotion [68]

Antibiotic policy control group:
2. Who ?

You need a whole team …

Antibiotic policy control group in Belgium

Multidisciplinary team …



Position within the hospital organigram

Direction médicale

Comité Médico-pharmaceutique
Formulaire thérapeutique hospitalier

Comité d'hygiène hospitalière
Prévention des IH
Epidémiologie de la résistance
Suivi des IH

Groupe de gestion des AB
GGA

DGA
Rapports au
Groupe des antibiotiques

Unités
Traitements
antibiotiques

Délégué à la **G**estion de l'**A**ntibiothérapie

- de 1 à 4 DGA selon les hôpitaux
- formation de base du DGA:
  - interniste - pneumologues,
  - biologistes-cliniciens, microbiologistes
  - ou pharmaciens hospitaliers.
- Formation complémentaire de 2 ans

Priority tasks

- **Mandatory interventions**
  - Hospital formularium
- **Required interventions**
  - Guidelines
  - Local epidemiology
- **Priority interventions**
  - Evaluation of consumption
  - Link between consumption and epidemiology
  - Providing advice about antibiotic use
  - Limitation and control of antibiotic usage
  - Staff education
  - Annual report for the commission coordinating antibiotic policy

Antibiotic policy control group:

3. How ?

This is a multistep approach !

A. How to set up an antibiotic policy control group ?

1. Clearly establish the main goals of the working group.
   - → improve antibiotic usage (efficacy AND security)
   - → reduce the cost without altering quality of care

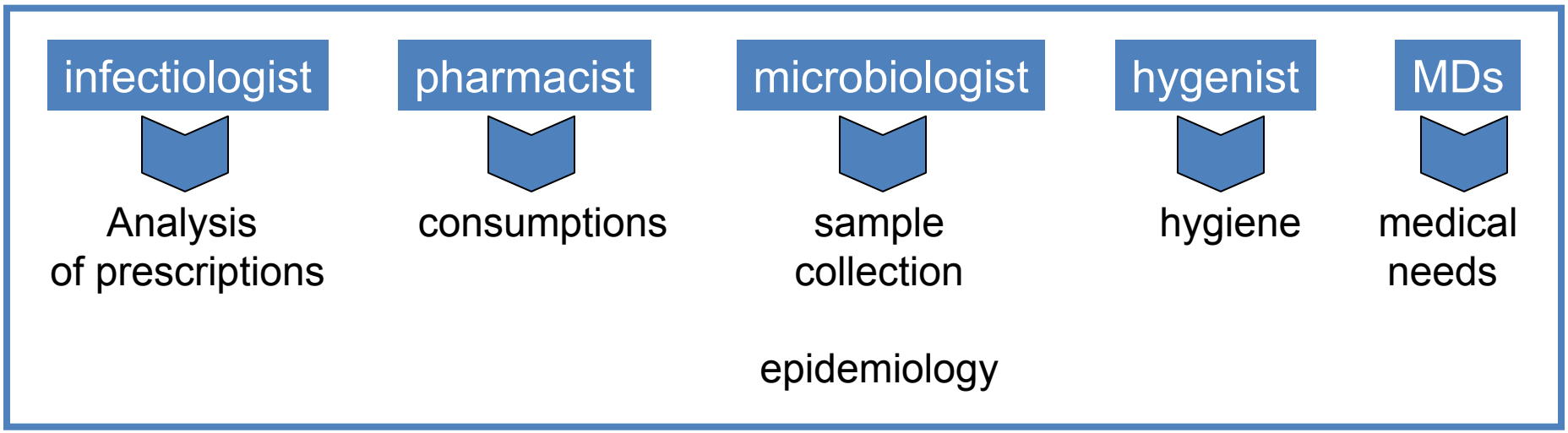
2. Convince the medical direction of the need
   - → self-supported by cost savings and improving of quality of care

3. Examine the local situation
   - → number and type of beds
   - → number and type of hospital stays
   - → type of activities (surgery, ICU, oncology, …)

A. How to set up an antibiotic policy control group ?

4. Determine human resources that are needed
   … and available

5. Describe the current situation

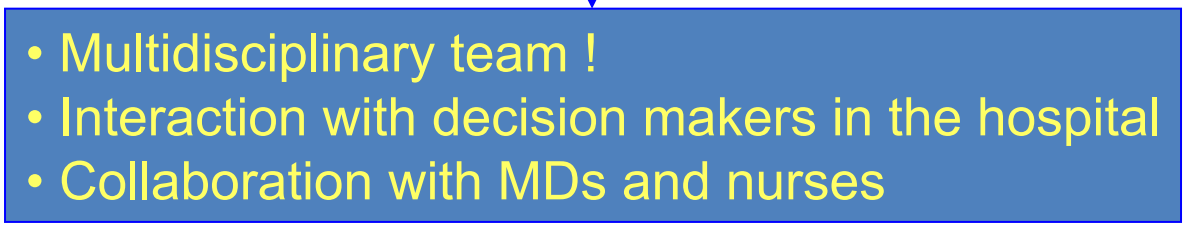


6. Establish a working plan for YOUR hospital

B. How to structure the group ?

1. Expertises that are needed

- ✓ infectiologist and/or clinical pharmacist specialized in infectious diseases
- ✓ pharmacist
- ✓ microbiologist
- ✓ hygienist
- ✓ epidemiologist
- ✓ informatician



B. How to structure the group ?

2. Prepare your working plan

- Establish the role of each member
- Involve each member based on his/her competences
- Define a realistic calendar

C. How should this group act in practice ?

1. « Face to Face » interventions

- Prospective and direct interaction between the prescriptor and the infectiologist/clinical pharmacist and feed-back
- Des-escalation (if empirical treatement) based on lab data
- Dose adaptation
- IV-Oral switch

⇨ Very efficient to reduce inappropriate usage !

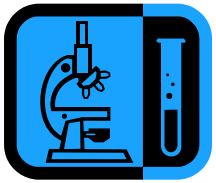
C. How should this group act in practice ?

2. Formularium

- list of antibiotics that are available in the hospital
- list of « reserved » antibiotics (broad spectrum) with specific modalities of use

⇨ Very efficient to reduce consumption !

C. How should this group act in practice ?



3. At the level of the laboratorium

- **modalities of sample collection**
  why, when, how ?
- **data interpretation**
  criteria used
  colonisation vs infection
  sample quality
- **testings**
  antibiograms vs MIC
  which antibiotics to test ?
- **epidemiology**
  how often ?
  which type of sample ?

C. How should this group act in practice ?

4. At the level of the pharmacy

- **consumption data** (per ward)

- **detailed evaluation of specific antibiotics**
  - carbapenems
  - fluoroquinolones
  - glycopeptides

- **tables to improve antibiotic use**
  - dose
  - compatibilities and storage
  - interactions, …

C. How should this group act in practice ?

5. Education

- guidelines
- analysis and feed back of data (resistance and consumption)

Should be accompanied by active interventions to be efficient

C. How should this group act in practice ?

6. Evaluation

- compliance to guidelines
- reasons for non-observance

Propose new measures to improve at the next round !

Successes and Difficulties

- accepted as a reference in the hospital for

  - evaluation of consumption
  - prescription habits
  - detection of inappropriate use
  - reminding of guidelines

- Diffusion of information
- Communication
- Data availability
- unlinked softwares (laboratory vs pharmacy)
- Heaviness of evaluation

Antibiotic policy control group:
examples of activities in Belgium…

Cliniques universitaires St Luc

Hôpital universitaire, 928 lits

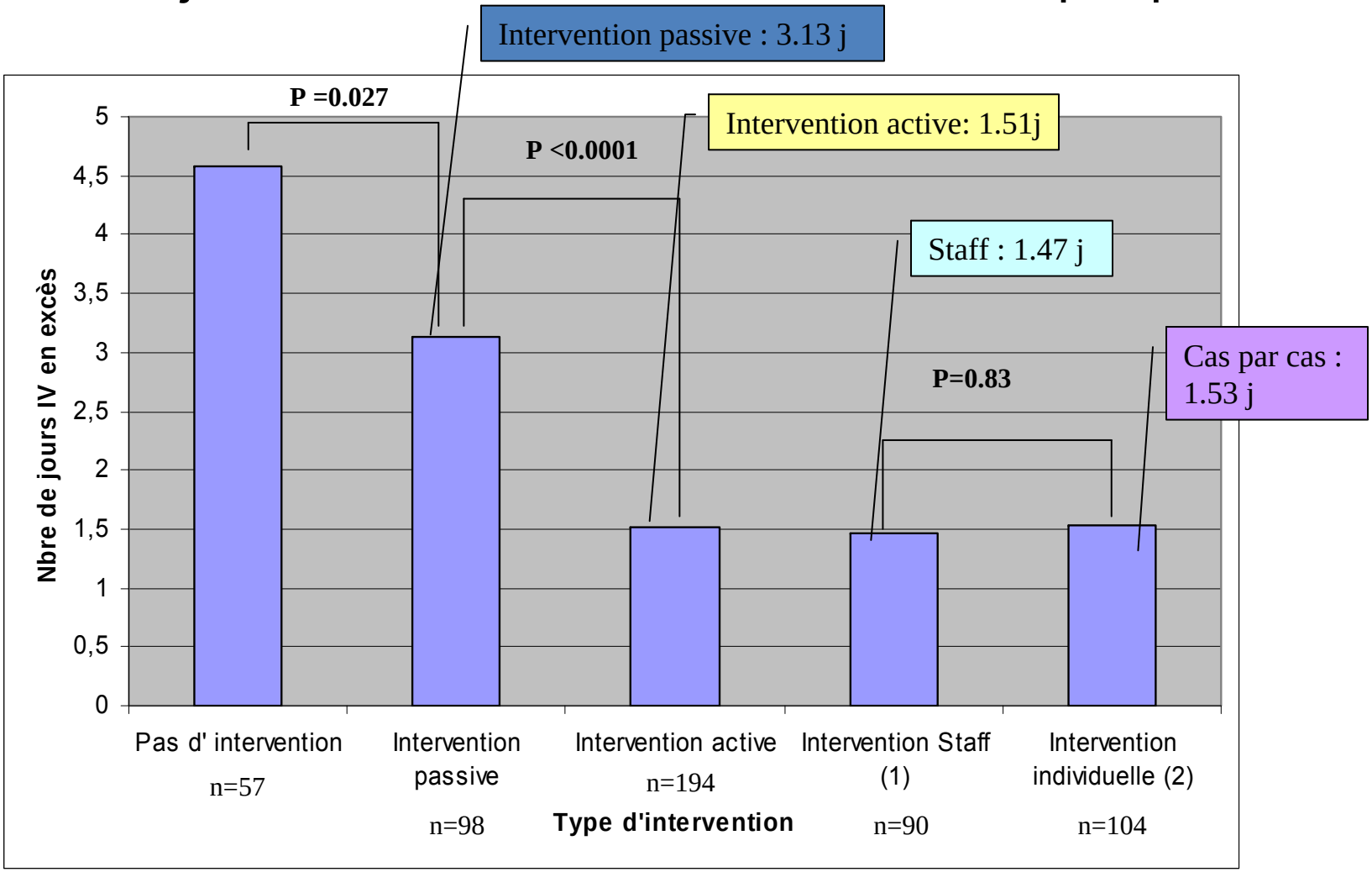
22 pharmaciens
dont 5 temps plein en pharmacie clinique
Et 2 mi-temps

Caroline Briquet
Groupe de Gestion de l'Antibiothérapie

1. Switch IV-per os

- Critère de jugement principal
  - Nombre de jours de traitement IV excédentaires (calculé en fonction de la pathologie et du contexte patient)
- Critères secondaires
  - Nombre de flacons de quinolones IV excédentaires
  - Budget pour les flacons de quinolone IV excédentaires (2004 point de vue du GGA)

Nombre de jours de traitement IV excédentaires par périodes



⇒ Différence significative entre la période sans intervention et la diffusion passive

⇒ Différence significative entre la diffusion passive et les interventions

2. Suivi des habitudes de prescription AB large spectre

- **Antibiotiques Etudiés** : Meronem, Tazocin, Rocéphine

(meropenem, piperacillin/tazobactam, ceftriaxone)

	Durée de l'étude	Nbre de cas suivis	Collecte des données à partir des dossiers papiers ou électroniques des patients
Méronem	6 mois (nov 2002 à mai 2003)	73 chez 72 patients	**<u>des informations sur le patient</u>** **<u>des informations sur l'infection</u>** **<u>des informations sur le traitement</u>**
Tazocin	6 mois (juin 2003 à déc 2003)	131 chez 72 patients Dossiers pris au hasard	
Rocéphine	1 mois (octobre 2003)	42	Analyse des résultats par les membres du GGA

Suivi des habitudes de prescription AB large spectre

Résultats	Méronem	Tazocin	Rocéphine
Indications justifiées répertoriées	Septicémies Infections respiratoires Infections de plaies Infections digestives	des neutropénies fébriles bactériologiquement documentées (21) des neutropénies fébriles cliniques (11) des sepsis cliniques avec germe (6) et sans germe (3) des infections respiratoires (6) des infections de plaies superficielles et profondes (7)	- Inf. respiratoires (23/25) - Susp de méningite (2/2) - Infect de la peau et des tissus mous (2/2) - Septicémies avec ou sans germe (2/2)
% d'infections nosocomiales	68 %	53 %	27 %

Suivi des habitudes de prescription AB large spectre

Résultats	Meronem	Tazocin	Rocephine
Prescriptions cliniquement justifiées	84 %	83%	86%
Prescriptions Bactério justifiées	56 %	28 %	17% (avec 29 % :aucun pélèvements)
Prescriptions bactério et clin.justifiées	52 %	26 %	17 %
Prescriptions jugées justifiées par le GGA (en tenant compte du contexte clinique)	69 %	78 %	79 %
% de durée de traitement correcte	84.5 %	90 %	76%
% de posologies correctes	86 %	76 %	95 %

Suivi des habitudes de prescription AB large spectre

	Meronem	**Tazocin**	**Rocephine**
Adaptation des traitements secondairement	26 % Sur les 31 cas bactériologiquement non justifiés, on observe 8 adaptation de traitement	19 % d'adaptation Sur les 52 cas bactériologiquement non justifiés, on observe 10 adaptation de traitement et 33 % d'ajout d'un autre AB	26% Sur les 31 cas bactériologiquement non justifiés, on observe 8 adaptation de traitement
% de cas où l'AB est associée avec un autre AB	-	48 % de bithérapie (d'emblée ou à postériori)	31%
Associations rencontrées	-	Tazocin + Amukin (69%) Tazocin + Flagyl (5.7%) Tazocin + Rifocine (5.7%) Tazocin + Vancocin (5.7%) Penstapho, géomycine, diflucan	Rocéphine + Vancocin (1/13) Rocéphine + Amukin (1/13) Rocéphine + Lévofloxacine (1/13) Rocéphine + Vfend (1/13) Rocéphine + Vancocin + Pentrexyl (1/13)

Antibiotic policy control group:
national evaluation

Evaluation of activities

Select & Zoom	2008				2007			
	Groupe A 2002	Groupe B 2006	Groupe C 2007	Total 2008	Groupe A 2002	Groupe B 2006	Groupe C 2007	Total 2007
Formulaire antibiotique	100	100	91.8	**96.3**	100	95.6	93.7	**96.3**
Directives thérapeutiques	100	95.2	81.6	**90.7**	100	91.3	85.1	**91.6**
Directives prophylactiques	97.4	100	87.8	**93.5**	100	95.6	93.7	**96.3**
Avis concernant la thérapie anti-infectieuse	100	100	**100**	**100**	86.5	95.7	**64.6**	**78.7**
Prescription spécifique	50	57.1	30.6	**42.6**	51.4	39.1	22.9	**36.1**
Antibiotiques dits "réservés"	86.8	90.5	61.2	**75.9**	86.5	95.6	58.3	**75.9**
Controle quotidien de la thérapie anti-infectieuse pa run membre du GGA	78.9	85.7	40.8	**63.0**	86.1	73.9	42.5	**64.2**
Politique d'arrêt automatique	55.3	47.6	30.6	**42.6**	64.9	47.8	25	**43.5**
Révision de la thérapie anti-infectieuse en fonction des résultats de cultures, de l'antibiogramme et de l'évolution clinique du patient	97.4	90.5	**85.7**	**90.7**	75.7	73.9	**50**	**63.9**
Thérapie séquentielle (passage d'IV à PO)	94.7	90.5	69.4	**82.4**	86.5	91.3	66.7	**78.7**
Prescription electronique	52.6	33.3	34.7	**40.7**	/	/	/	/
Analyse de la consommation d'antibiotiques	100	95.2	95.9	**97.2**	100	100	91.3	**96.2**
Analyse des profils de résistance	97.4	100	89.8	**94.4**	97.3	95.6	81.2	**89.8**

Tableau 26: Implémentation des initiatives des groupes de gestion de l'antibiothérapie dans les hôpitaux aigus selon la date de création (en pourcentage)

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Evaluation of activities

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Take home message

1. Define your priorities
2. Constitute an efficient team
3. Start by evaluating current situation
   - consumption
   - MIC distribution
4. Design well targeted interventions
5. Evaluate your impact