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du mardi 7 au jeudi 9 juin 2016
Lille Grand Palais

Lille
et l'interrégion Nord-Pas-de-Calais-Picardie

La désescalade: comment et pour qui ?

Est-ce que ça change quelque chose ?

Prof. Pierre TATTEVIN
Maladies Infectieuses et Réanimation Médicale
Hôpital Pontchaillou, CHU Rennes

Déclaration de liens d'intérêt avec les industries de santé en rapport avec le thème de la présentation (loi du 04/03/2002) :

Intervenant : Tattevin Pierre

Titre : La désescalade: Comment et pour qui ?

Consultant ou membre d'un conseil scientifique	☐ OUI	☑ NON
Conférencier ou auteur/rédacteur rémunéré d'articles ou documents	☐ OUI	☑ NON
Prise en charge de frais de voyage, d'hébergement ou d'inscription à des congrès ou autres manifestations	☐ OUI	☑ NON
Investigateur principal d'une recherche ou d'une étude clinique	☐ OUI	☑ NON

Au menu

- La ‘desescalade’, qu’est-ce que c’est ?
- Etude de pratiques
- Est-ce risqué ?
- Est-ce vraiment utile ?

Au menu

- La ‘desescalade’, qu’est-ce que c’est ?

= modification de l’antibiothérapie initiale, avec 2 objectifs

  - Réduction du spectre
  - Moindre risque d’émergence de résistance

= moyens

  - Changement de molécule => **spectre + étroit / impact écologique + faible**
  - Interruption d’un ATB dans une combinaison
  - **La désescalade ‘extrême’:** On arrête tout

Step 1: Populate susceptibility percentage estimates for organism domains.[A]

Organism Domain	Vancomycin	Imipenem	Vancomycin plus Imipenem[B]
Staphylococcus aureus	99.3	51.2	99.6
Streptococcus pneumoniae	98.2	80.6	99.7
Enterococcus faecium	18.4	12.6	28.7
Enterococcus faecalis	94.7	88.6	99.4
Escherichia coli	NA	98.9	98.9
Klebsiella spp.	NA	95.6	95.6
Other enterobacteriaceae[C]	NA	96.7	96.7
Pseudomonas aeruginosa	NA	79.6	79.6
Acinetobacter spp.	NA	63.5	63.5
Stenotropomonas spp.	NA	NA	NA
Haemophilus influenzae	NA	100	100
Bacteroides spp.	NA	97.5	97.5
Legionella spp.	NA	NA	NA
Mycoplasma spp.	NA	NA	NA

Step 2: Convert susceptibility values to ordinal scale.[D]

Organism Domain	Vancomycin	Imipenem	Vancomycin plus Imipenem
Staphylococcus aureus	4	2	4
Streptococcus pneumoniae	4	4	4
Enterococcus faecium	0	0	1
Enterococcus faecalis	4	4	4
Escherichia coli	0	4	4
Klebsiella spp.	0	4	4
Other enterobacteriaceae[C]	0	4	4
Pseudomonas aeruginosa	0	3	3
Acinetobacter spp.	0	3	3
Stenotropomonas spp.	0	0	0
Haemophilus influenzae	0	4	4
Bacteroides spp.	0	4	4
Legionella spp.	0	0	0
Mycoplasma spp.	0	0	0

Madaras-Kelly K. Infect Control Hosp Epidemiol 2014

Organism Domain	Vancomycin	Imipenem	Vancomycin plus Imipenem
Staphylococcus aureus	5	2.5	5
Streptococcus pneumoniae	4	4	4
Enterococcus faecium	0	0	1.25
Enterococcus faecalis	4	4	4
Escherichia coli	0	5	5
Klebsiella spp.	0	5	5
Other enterobacteriaceae[C]	0	4	4
Pseudomonas aeruginosa	0	5.25	5.25
Acinetobacter spp.	0	3.75	3.75
Stenotropomonas spp.	0	0	0
Haemophilus influenzae	0	4	4
Bacteroides spp.	0	4	4
Legionella spp.	0	0	0
Mycoplasma spp.	0	0	0
Spectrum Score	13	41.5	45.25

Antibiotic group	Spectrum score
Aminoglycosides	
Amikacin	35.50
Gentamicin, tobramycin	35.50
β-lactamase inhibitors	
Ampicillin/sulbactam, amoxicillin/clavulanate	29.50
Piperacillin/tazobactam	42.25
Ticarcillin/clavulanate	40.50
Carbapenems	
Ertapenem	30.25
Imipenem, meropenem	41.50
Cephalosporins	
Cefazolin, cephalexin	19.25
Cefuroxime	23.50
Ceftriaxone, cefotaxime	25.25
Ceftazidime/cefepime	33.25
Ceftaroline	26.00
Fluoroquinolones	
Ciprofloxacin, levofloxacin	39.75
Moxifloxacin	36.25

Antibiotic group	Spectrum score
Glycopeptides/lipopeptides	
Vancomycin	13.00
Daptomycin	14.25
Macrolides/lincosamides	
Azithromycin, clarithromycin	12.25
Clindamycin	10.75
Penicillins	
Ampicillin, amoxicillin	13.50
Nafcillin, oxacillin	4.25
Tetracyclines	
Tetracycline, doxycycline	38.75
Tigecycline	49.75
Miscellaneous	
Aztreonam	21.50
Colistin, polymyxin B	34.00
Linezolid	18.00
Metronidazole	4.00
Trimethoprim/sulfamethoxazole	33.50

Madaras-Kelly K. Infect Control Hosp Epidemiol 2014

Confrontation du score aux experts (référents ATB US)

Assessment of Antibiotic De-Escalation in 20 Antibiotic Regimen Vignettes: Comparison of Delphi Panelists and Prototype Spectrum Score Method

	Antibiotic regimen		Likert score, %					
Vignette ID	Initial	Subsequent	1–2	6–7	Median	Mean	SD	CV
1	Vancomycin and piperacillin/tazobactam	Ertapenem	4	76	6.0	6.0	1.2	0.2
2	Vancomycin and piperacillin/tazobactam and levofloxacin	Vancomycin and imipenem	40	8	4.0	3.3	1.5	0.5
3	Moxifloxacin	Ceftriaxone	0	24	5.0	4.8	0.9	0.2
4	Ceftriaxone and azithromycin	Levofloxacin	0	0	4.0	3.9	0.6	0.2
5	Cefepime and linezolid	Ceftaroline	4	28	5.0	5.1	1.0	0.2
6	Vancomycin and piperacillin/tazobactam	Vancomycin and piperacillin/tazobactam and levofloxacin	56	4	2.0	2.3	1.1	0.5
7	Ciprofloxacin and ampicillin/sulbactam	Ciprofloxacin and amoxicillin/clavulanate	0	4	4.0	4.3	0.6	0.1
8	Piperacillin/tazobactam	Ampicillin/sulbactam	0	80	6.0	6.1	0.7	0.1
9	Vancomycin	Trimethoprim/sulfamethoxazole	4	56	6.0	5.5	1.3	0.2
10	Vancomycin and piperacillin/tazobactam	Moxifloxacin and clindamycin	0	36	5.0	5.3	0.9	0.2
11	Ceftazidime and gentamicin	Gentamicin and imipenem	28	0	3.0	3.0	1.0	0.3
12	Imipenem	Moxifloxacin	0	64	6.0	5.8	0.7	0.1
13	Ceftriaxone	Piperacillin/tazobactam	80	0	2.0	1.9	0.7	0.4
14	Tigecycline	Ertapenem	4	8	4.0	4.4	1.0	0.2
15	Clindamycin	Vancomycin	24	4	3.0	3.1	1.3	0.4
16	Vancomycin and piperacillin/tazobactam	Levofloxacin and piperacillin/tazobactam	8	4	5.0	4.4	1.1	0.3
17	Levofloxacin	Moxifloxacin	0	0	4.0	4.1	0.7	0.2
18	Ceftriaxone and azithromycin	Cefpodoxime and doxycyline	0	12	4.0	4.4	0.8	0.2
19	Vancomycin and piperacillin/tazobactam	Piperacillin/tazobactam and metronidazole	0	20	5.0	5.0	0.7	0.1
20	Ciprofloxacin	Levofloxacin	12	0	4.0	3.5	0.8	0.2

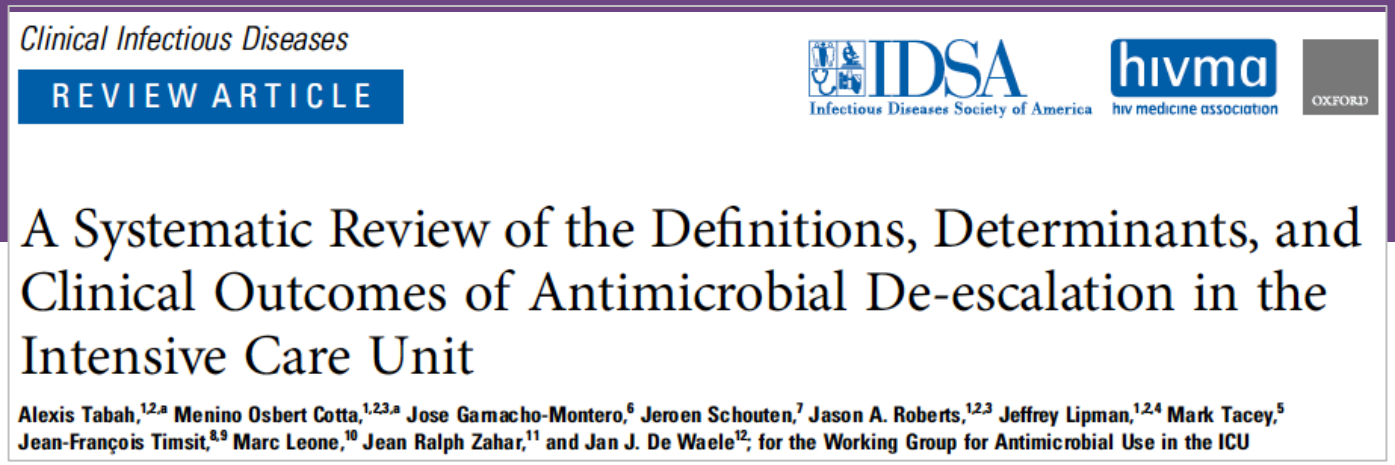
Elaboration of a consensual definition of de-escalation allowing a ranking of β-lactams

E. Weiss[1], J.-R. Zahar[2], P. Lesprit[3], E. Ruppe[4], M. Leone[5], J. Chastre[6], J.-C. Lucet[7], C. Paugam-Burtz[1], C. Brun-Buisson[8] and J.-F. Timsit[9], on behalf of the 'De-escalation' Study Group

TABLE 3. Consensual ranking of β-lactams according to both their spectrum and their resistance-promoting potential

Rank	Molecule(s)	Similar response rate (%)[a]	Consensus reaching round number[b]
1	Amoxicillin	100	2
2	Amoxicillin + Clavulanic Acid	88	3
3	Third-generation cephalosporin Ureido/carboxy-penicillin	81	3
4	Piperacilin + Tazobactam Ticarcilin + Clavulanic Acid Fourth-generation cephalosporin, Antipseudomonal third-generation cephalosporin	71	4
5	Ertapenem	81	3
6	Imipenem Meropenem Doripenem	85	2

Weiss E. Clin Microbiol Infect 2015



- Etudes de faible niveau de preuve
- Aucune démonstration solide de l'intérêt de la désescalade
- Des tests diagnostiques rapides seraient + séduisants !

Tabah A et al. Clin Infect Dis 2016
Kollef MH et al. Clin Infect Dis 2016

Au menu

- La ‘desescalade’, qu’est-ce que c’est ?
- **Etude de pratiques**
- Est-ce risqué ?
- Est-ce vraiment utile ?

Strategies of initiation and streamlining of antibiotic therapy in 41 French intensive care units

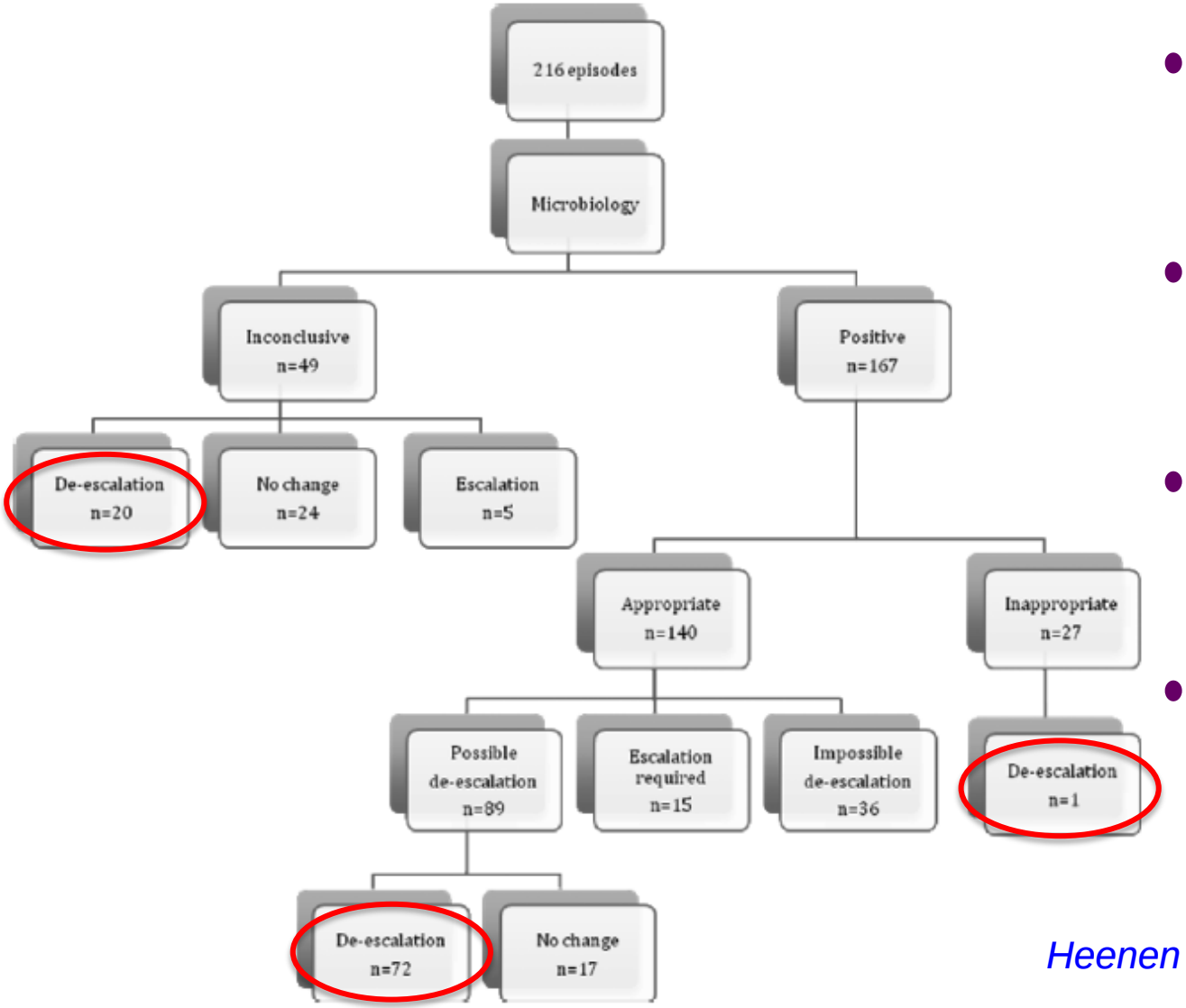
Philippe Montravers[1,2*], Hervé Dupont[3,4], Rémy Gauzit[5], Benoit Veber[6], Jean-Pierre Bedos[7], Alain Lepape[8], CIAR (Club d'infectiologie en Anesthésie-Réanimation) Study Group

- Etude prospective observationnelle, 41 réas françaises, 1 mois (2004)
- 509 initiations d'ATB (1/3 des patients)
- Pour 346 patients (68%), on ne touche plus à rien !
- Pour 163 patients (31%), on change 'un peu'
  - Stop (n=14)
  - Désescalade (n=40 => 8%)

Montravers Ph et al. Crit Care Med 2011

Antibiotic strategies in severe nosocomial sepsis: Why do we not de-escalate more often?*

Sarah Heenen, MD; Frédérique Jacobs, MD; Jean-Louis Vincent, MD, PhD, FCCM



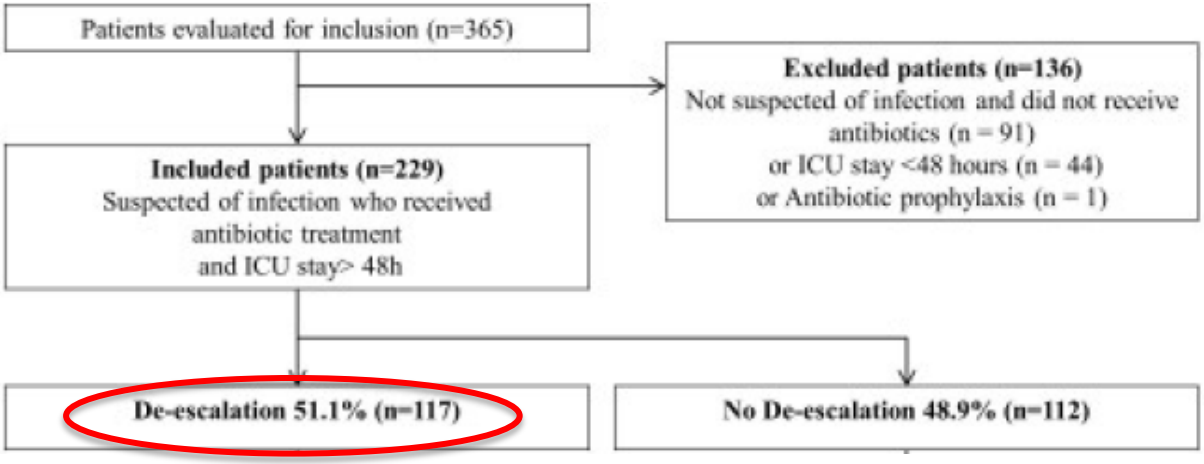
- Etude rétrospective observationnelle
- 1 réa belge, 1 an (2007)
- Désescalade avant J5 = 43%
- Opportunité manquée de désescalade, 5%

Heenen S et al. Crit Care Med 2012

Factors influencing the implementation of antibiotic de-escalation and impact of this strategy in critically ill patients

Leslie Gonzalez, Aurélie Cravoisy, Damien Barraud, Marie Conrad, Lionel Nace, Jérémie Lemarié, Pierre-Edouard Bollaert and Sébastien Gibot*

- Etude rétrospective, réa médicale, Nancy
- Désescalade = réduction spectre et/ou nombre ATB avant J5

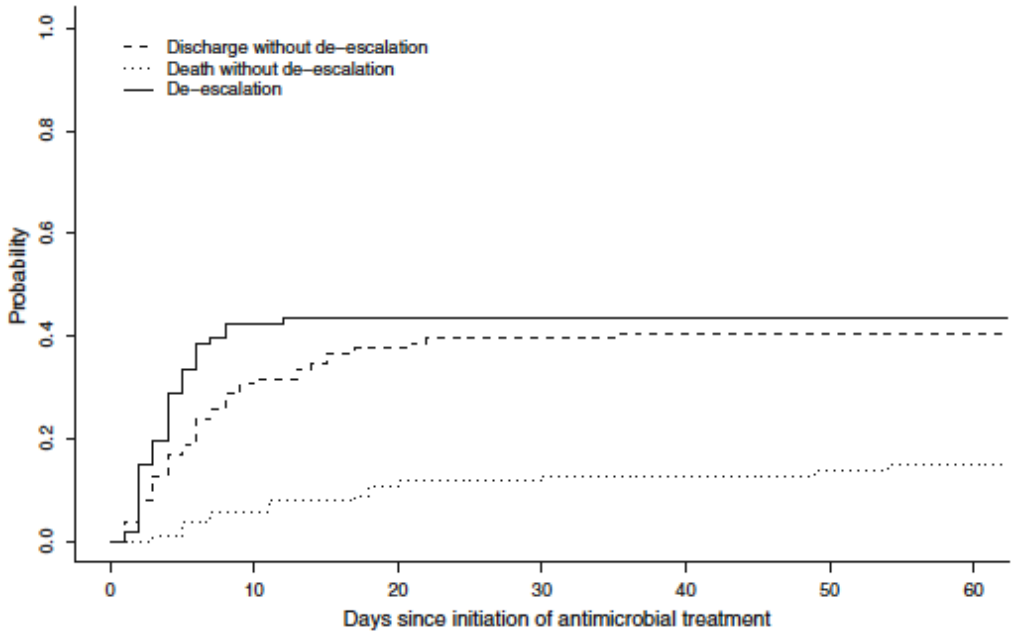


Gonzales L et al. Crit Care 2013

Djamel Mokart
Géraldine Slehofer
Jérôme Lambert
Antoine Sannini
Laurent Chow-Chine
Jean-Paul Brun
Pierre Berger
Ségolène Duran
Marion Faucher
Jean-Louis Blache
Colombe Saillard
Norbert Vey
Marc Leone

De-escalation of antimicrobial treatment in neutropenic patients with severe sepsis: results from an observational study

- Etude prospective observationnelle, réa 'cancéro' Marseille, 2008-2010
- 101 patients neutropéniques avec sepsis grave/choc => 44% désescalade

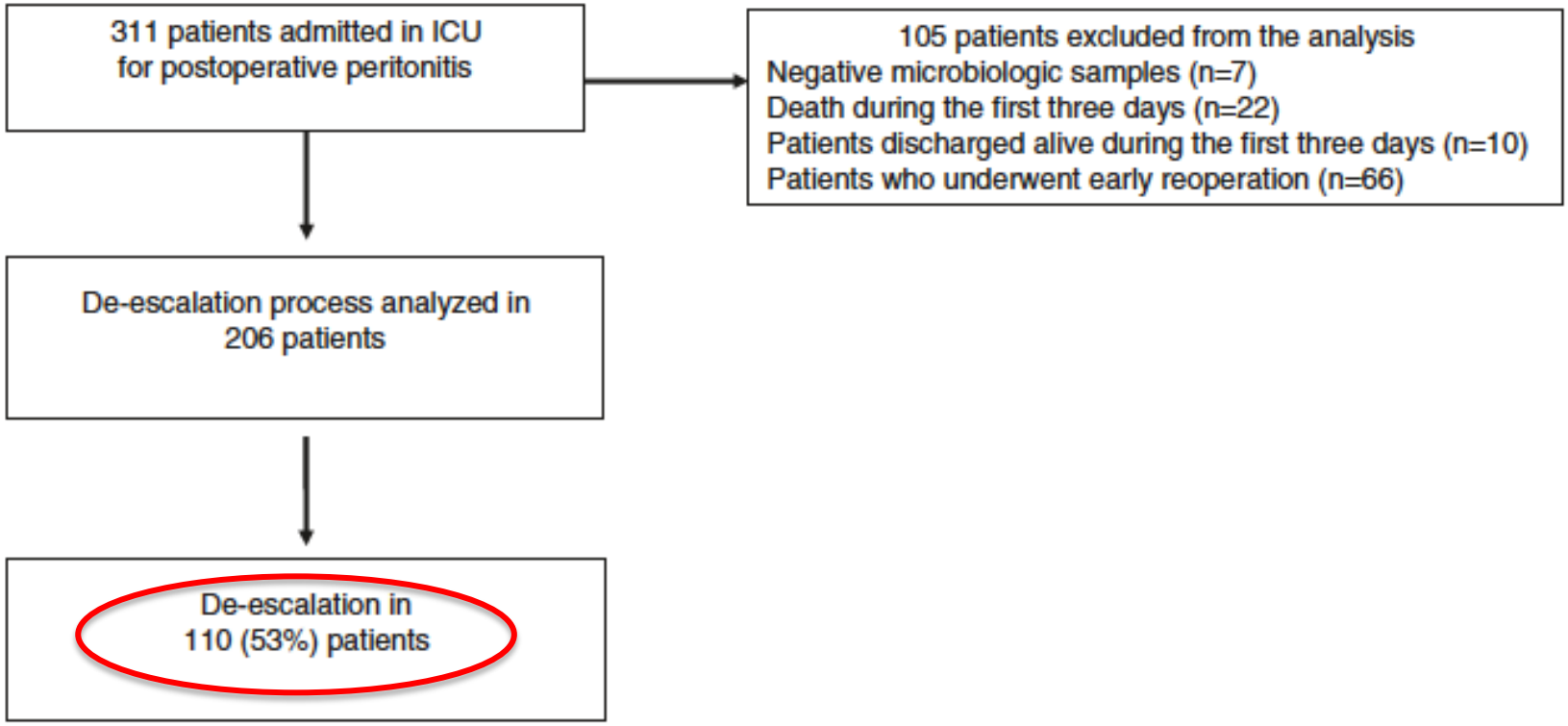


Mokart D et al. Intensive Care Med 2014

Characteristics and outcomes of anti-infective de-escalation during health care-associated intra-abdominal infections

Philippe Montravers[1,2*], Pascal Augustin[1], Nathalie Grall[2,3,4], Mathieu Desmard[1,5], Nicolas Allou[1], Jean-Pierre Marmuse[2,6] and Jean Guglielminotti[1,2,3]

- Etude prospective observationnelle, réa chirurgicale, Bichat, 1999-2011



Montravers Ph et al. Crit Care Med 2016

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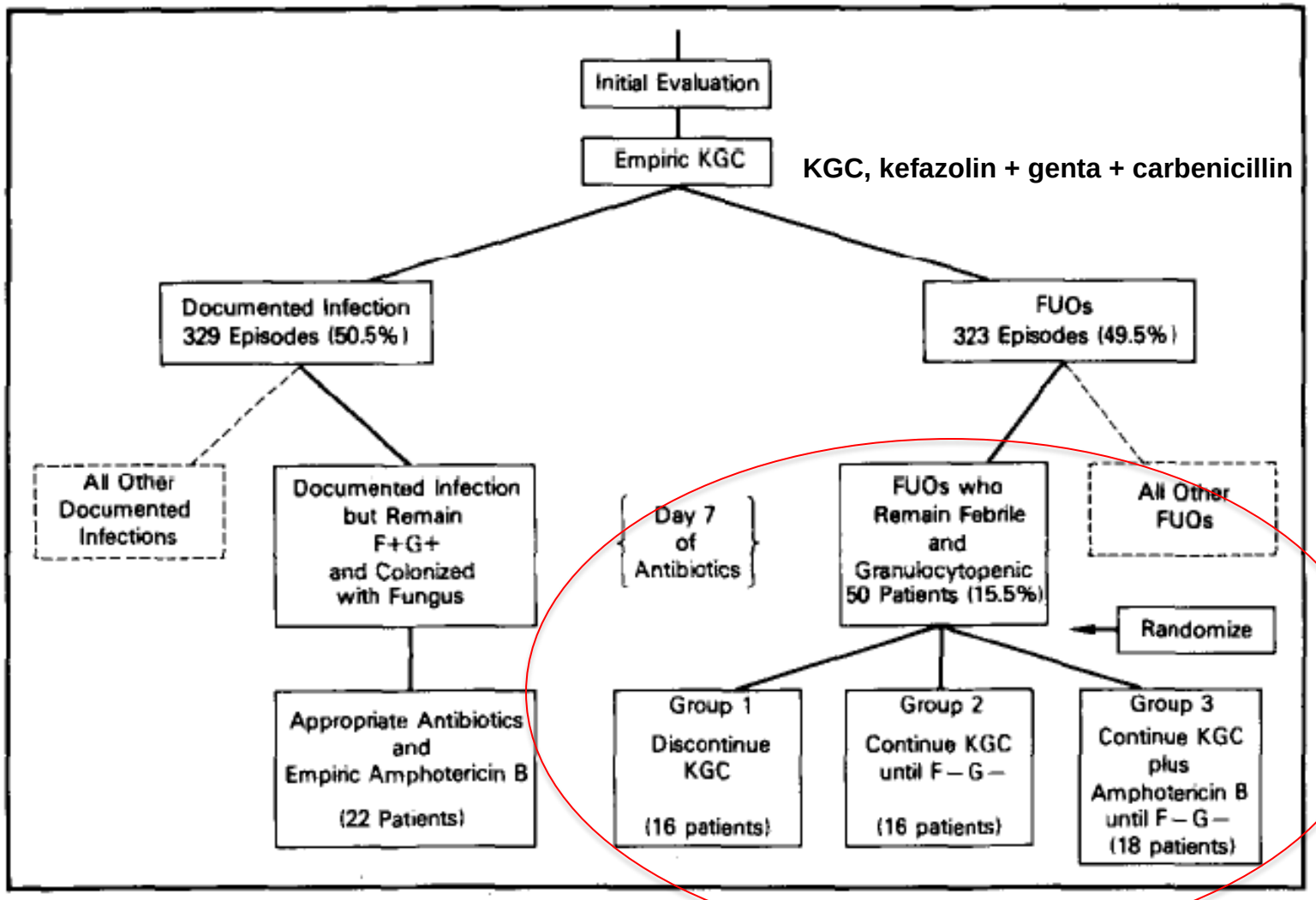
Empiric Antibiotic and Antifungal Therapy for Cancer Patients with Prolonged Fever and Granulocytopenia



Pizzo et al. Am J Med 1982

Empiric Antibiotic and Antifungal Therapy for Cancer Patients with Prolonged Fever and Granulocytopenia

Randomization Group	N	Clinically Documented	Bacterial	Fungal	Viral-Protozoan	Shock
1. Discontinue KGC	16	2	3	1	0	6
2. Continue KGC alone	16	0	1	5	0	0
3. KGC + Amphotericin B	18	0	0	1	1	0

Pizzo et al. Am J Med 1982

Marc Leone
Carole Bechis
Karine Baumstarck
Jean-Yves Lefrant
Jacques Albanèse
Samir Jaber
Alain Lepape
Jean-Michel Constantin
Laurent Papazian
Nicolas Bruder
Bernard Allaouchiche
Karine Bézulier
François Antonini
Julien Textoris
Claude Martin

De-escalation versus continuation of empirical antimicrobial treatment in severe sepsis: a multicenter non-blinded randomized noninferiority trial

- Inclusion: sepsis grave documenté + ATB initiale appropriée (n=59)

Characteristics	De-escalation group ($n = 59$)	Continuation group ($n = 57$)	P
Age (years)	57.9 ± 17.0	66.8 ± 14.9	0.003
Male sex (%)	62.7	66.7	0.66
SAPS II[a]	43.6 ± 18.5	51.4 ± 18.7	0.03

No documentation: 162
Carbapenemase producer: 2
Expected death < 48 h: 18
Other protocol: 21
Antibiotic arrest < 48 h: 52
Late documentation: 12
Inappropriateness: 31
No consent: 22
Deprivation of freedom: 12

Characteristics	De-escalation group ($n = 59$)	Continuation group ($n = 57$)	P
Empirical antibiotics			0.54
Combined therapy (%)	88	91	0.58
Carbapenems (%)	39.0	17.5	0.01

Leone M et al. Intensive Care Med 2014

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De-escalation versus continuation of empirical antimicrobial treatment in severe sepsis: a multicenter non-blinded randomized noninferiority trial

- Inclusion: sepsis sévère + documentation + ATB initiale appropriée (n=59)

  - Critère principal = durée de séjour en réa

    Médiane 9 j (5-22) groupe désescalade, vs. 8 j (4-15), groupe poursuite

    => infériorité non démontrée

  - Critère secondaire = Surinfections

    27% (désescalade) vs. 11% (poursuite); P=0,03

Leone M et al. Intensive Care Med 2014

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The Maxwell Finland Lecture: For the Duration—Rational Antibiotic Administration in an Era of Antimicrobial Resistance and *Clostridium difficile*

Louis B. Rice

Medical Service, Louis Stokes Cleveland Veterans Affairs Medical Center, and Case Western Reserve University, Cleveland, Ohio

‘Among available strategies to reduce use, reductions in length of antimicrobial regimens are the safest and are likely to be the most palatable to practicing clinicians.’

Rice LB. Clin Infect Dis 2008

L’ombre du doute

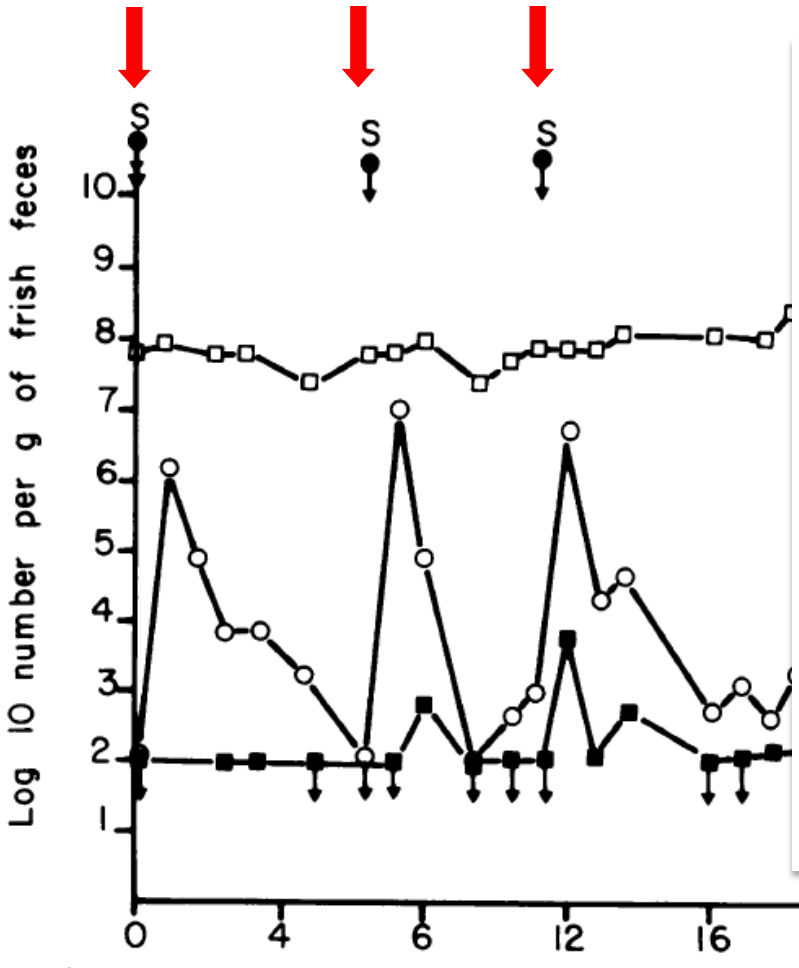
Est-ce que la désescalade a un impact sur le risque d’émergence de résistances ?

Pas sûr…

Cinétique de l'impact des antibiotiques sur les résistances

Inoculation of penicillinase-producing *Serratia liquefaciens*

- Penicillinase-producing *S. liquefaciens*
- Multi-susceptible *E. coli*



Duval-Iflah Y, Infect Immun 1980

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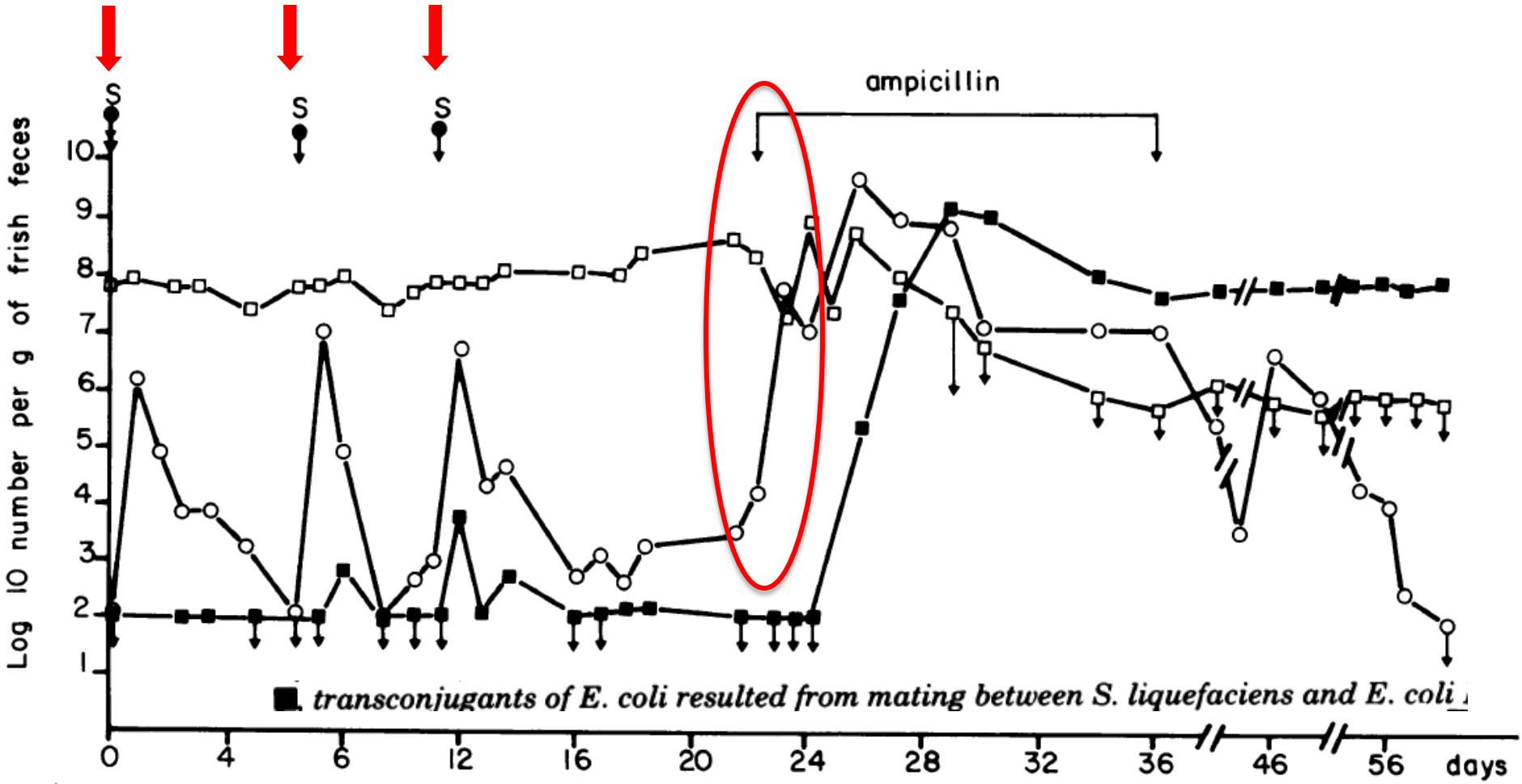
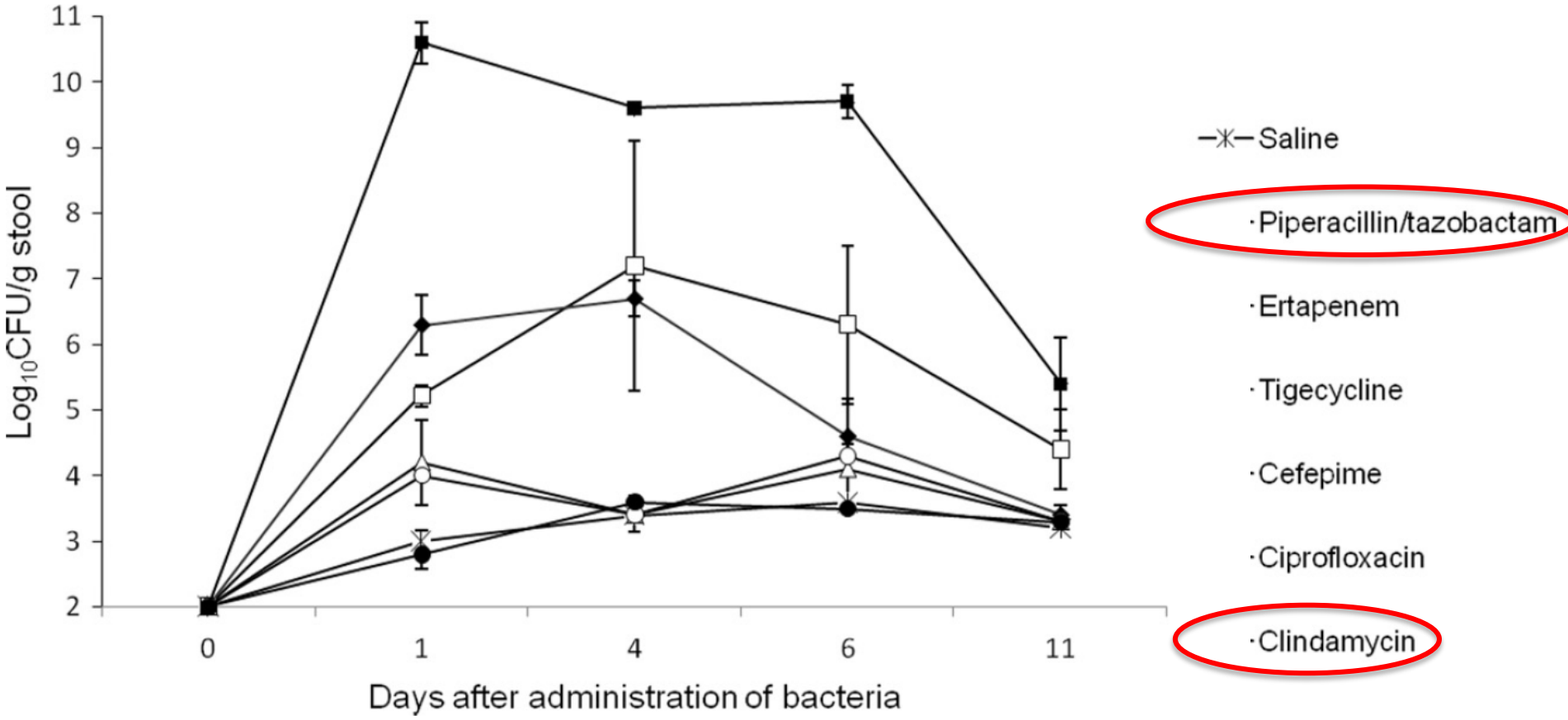


Duval-Iflah Y, Infect Immun 1980

Effect of Antibiotic Treatment on Establishment and Elimination of Intestinal Colonization by KPC-Producing *Klebsiella pneumoniae* in Mice[▽]

Federico Perez,[1,3] Michael J. Pultz,[1] Andrea Endimiani,[1,3]
Robert A. Bonomo,[1,2,3,4,5,6] and Curtis J. Donskey[1,2,3]*

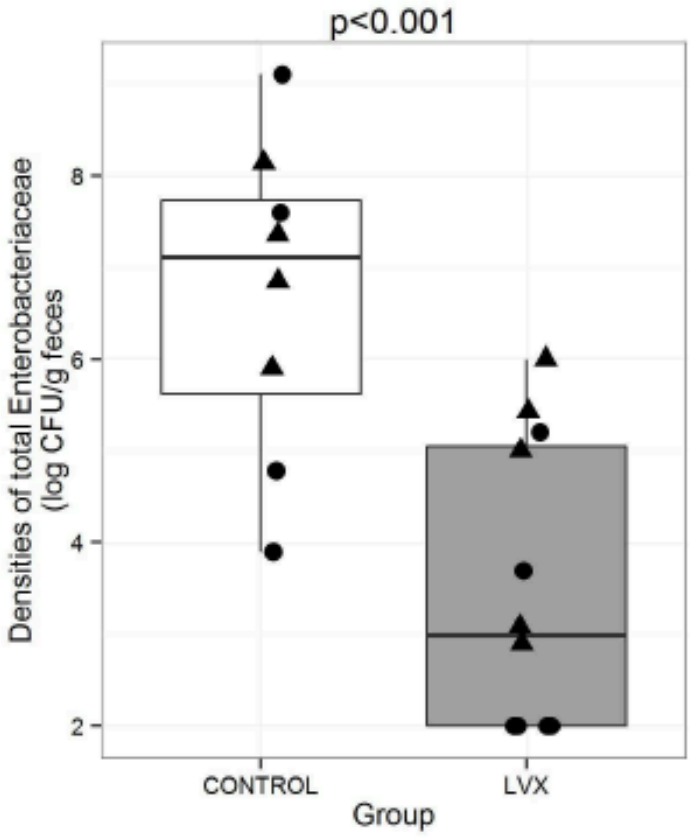


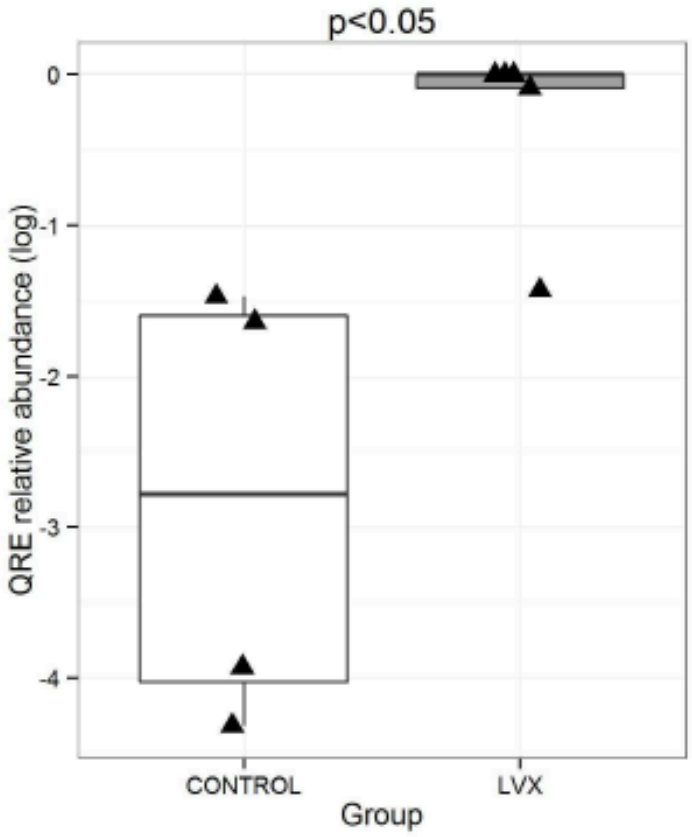
Perez L, Antimicrob Agents Chemother 2011

Impact of a short exposure to levofloxacin on faecal densities and relative abundance of total and quinolone-resistant *Enterobacteriaceae*

Julien Bernard, Laurence Armand-Lefèvre, Elsa Luce, Assiya El Mniai, Françoise Chau, Enrique Casalino, Antoine Andremont, Etienne Ruppé

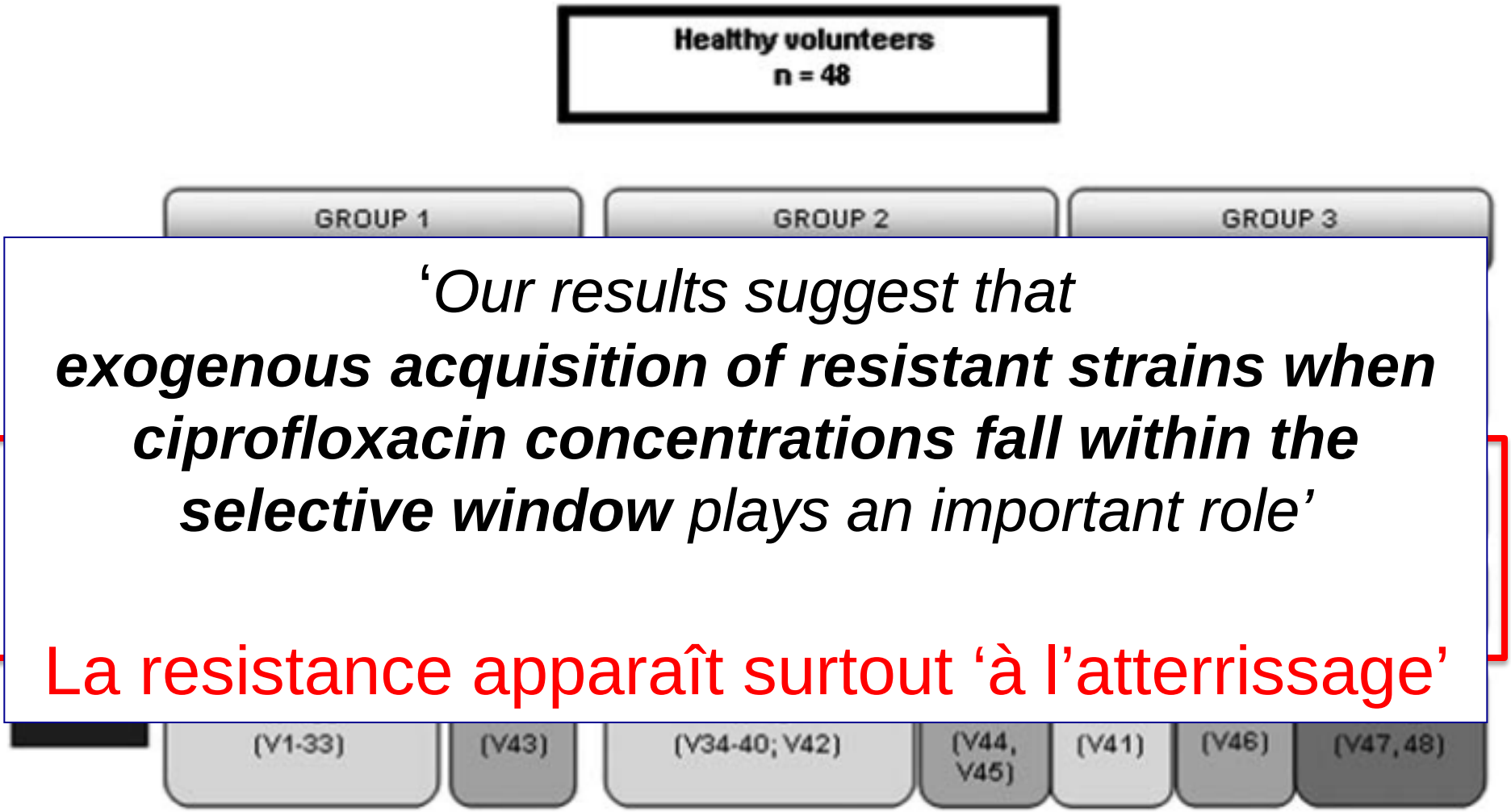
Emergence précoce (< J3 lévofloxacine) d'entérobactéries FQ-R





Bernard J et al. Clin Microbiol Infect 2016

Emergence de résistance sous ciprofloxacine (14 j)



‘*Our results suggest that* ***exogenous acquisition of resistant strains when ciprofloxacin concentrations fall within the selective window*** *plays an important role’*

La resistance apparaît surtout ‘à l’atterrissage’

De Lastours V, J Infect Dis 2012

ORIGINAL ARTICLE

Trial of Short-Course Antimicrobial Therapy for Intraabdominal Infection

R.G. Sawyer, J.A. Claridge, A.B. Nathens, O.D. Rotstein, T.M. Duane, H.L. Evans,

Variable	Control Group (N=260)	Experimental Group (N=257)	P Value
Primary outcome: surgical-site infection, recurrent intraabdominal infection, or death — no. (%)	58 (22.3)	56 (21.8)	0.92
Secondary outcome			
Surgical-site infection or recurrent intraabdominal infection with resistant pathogen — no. (%)	9 (3.5)	6 (2.3)	0.62
Clostridium difficile infection — no. (%)	3 (1.2)	5 (1.9)	0.71
Extraabdominal infection with resistant pathogen — no. (%)	6 (2.3)	2 (0.8)	0.29

Sawyer RG et al. N Engl J Med 2015

ORIGINAL ARTICLE

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Sawyer RG et al. N Engl J Med 2015

Antibiotic treatment for 6 weeks versus 12 weeks in patients with pyogenic vertebral osteomyelitis: an open-label, non-inferiority, randomised, controlled trial

Louis Bernard, Aurélien Dinh, Idir Ghout, David Simo, Valerie Zeller, Bertrand Issartel, Vincent Le Moing, Nadia Belmatoug, Philippe Lesprit,

	6-week regimen	12-week regimen	Difference in proportion of patients*	95% CI
Intention-to-treat analysis, n	176	175		
Cured	160 (90·9%)	159 (90·9%)	+0·1	−6·2 to 6·3

Bernard L et al. Lancet 2014

Antibiotic treatment for 6 weeks versus 12 weeks in patients with pyogenic vertebral osteomyelitis: an open-label, non-inferiority, randomised, controlled trial

Louis Bernard, Aurélien Dinh, Idir Ghout, David Simo, Valerie Zeller, Bertrand Issartel, Vincent Le Moing, Nadia Belmatoug, Philippe Lesprit,

	6-week regimen (n=176)	12-week regimen (n=175)	Total (n=351)	p value
Adverse events	51 (29%)	50 (29%)	101 (29%)	1
Death	14 (8%)	12 (7%)	26 (7%)	0·85
Cardiorespiratory failure	7 (4%)	12 (7%)	19 (5%)	0·33
Digestive tract bleeding	4 (2%)	2 (1%)	6 (2%)	0·68
Clostridium difficile infection	2 (1%)	2 (1%)	4 (2%)	1
Antibiotic intolerance	12 (7%)	9 (5%)	21 (6%)	0·66

Bernard L et al. Lancet 2014

Impact of de-escalation of beta-lactam antibiotics on the emergence of antibiotic resistance in ICU patients: a retrospective observational study

Liesbet De Bus[1*], Wouter Denys[1], Julie Catteeuw[1], Bram Gadeyne[1], Karel Vermeulen[2], Jerina Boelens[3], Geert Claeys[3], Jan J. De Waele[1], Johan Decruyenaere[1] and Pieter O. Depuydt[1,4]

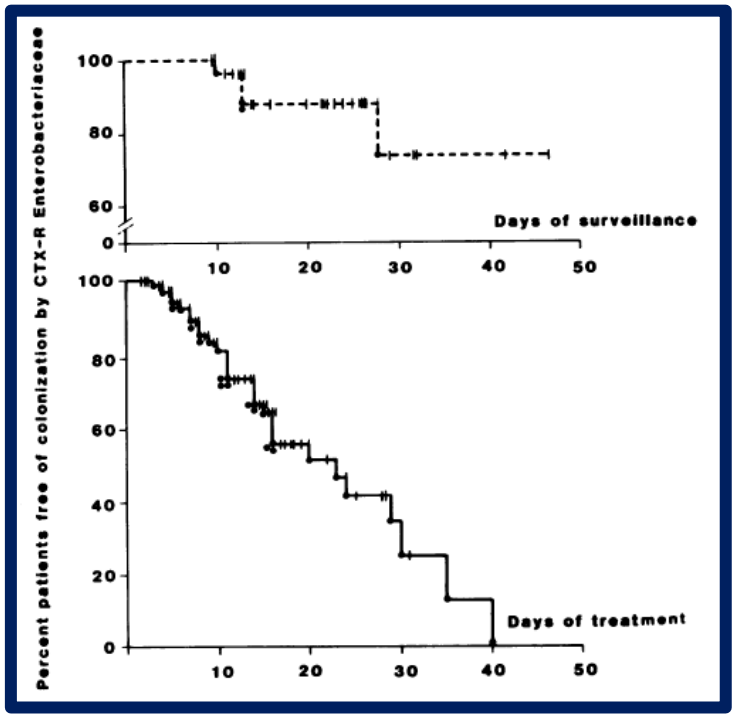
- Etude prospective observationnelle, réa med + chir, Ghent, 2013-2014

Patient outcome	Treatment				*p* value
	Total ($n = 344$)	Continuation ($n = 221$; 64%)	De-escalation ($n = 85$; 25%)	Escalation ($n = 38$; 11%)	De-escalation vs. continuation
Antibiotic treatment duration in the ICU for the infection under study (days)	6 (5–9)	5 (4–7)	8 (6–10)	11 (8–19)	<0.001
Total antibiotic consumption in the ICU (days)	10 (5–20)	7 (4–15)	12 (7–22)	24 (13–39)	<0.001
Antibiotic-free days (14 days after onset of infection)[a] ($n = 116$)	1 (0–4)	2 (0–6)	1 (0–3)	0 (0–1)	0.04
Emergence of pathogens resistant to the initial BL therapy	112 (32.6 %)	68 (30.8 %)	29 (34.1 %)	15 (39.5 %)	0.57

De Bus L et al. Crit Care Med 2016

La durée d'antibiothérapie est un FDR de résistance

Durée de l'antibiothérapie et résistance



Prevot et al, AAC 1986

Table 3. Multivariate analysis of risk factors associated with infection or colonization with multidrug-resistant *Pseudomonas aeruginosa* (MDRPA) among patients hospitalized in intensive care units.

	OR (95% CI)	
Variable	Initial model	Final model
Receipt of hemodiafiltration or hemodialysis	3.05 (1.03–10.4)	…
Receipt of piperacillin or ticarcillin	4.13 (0.78–21.8)	…
Receipt of imipenem for duration longer than the median[a]	4.05 (1.26–13.1)	3.17 (0.92–10.9)
Receipt of ciprofloxacin for duration longer than the median[a]	53.7 (2.94–114)	11.0 (1.27–32.9)
Receipt of metronidazole	3.56 (1.01–12.7)	…

Paramythioutou et al, Clin infect dis 2003

Cumulative Antibiotic Exposures Over Time and the Risk of *Clostridium difficile* Infection

Vanessa Stevens,[1,3,4] Ghinwa Dumyati,[2] Lynn S. Fine,[2] Susan G. Fisher,[3] and Edwin van Wijngaarden[3]

	CDI positive *n* (%)	CDI negative *n* (%)	Adjusted hazard ratio (95% CI)
Defined daily doses[e], median (IQR)	14.8 (21.2)	7.2 (12.3)	—
<3.0	18 (7)	1502 (15)	Ref
3.0 to 7.79	49 (20)	3702 (37)	1.2 (.7, 2.1)
7.80 to 21.0	89 (37)	2952 (30)	2.8 (1.7, 4.6)
>21.0	85 (35)	1757 (18)	5.3 (3.1, 9.0)
Antibiotic days, median (IQR)[f]	14.0 (23.0)	7.0 (9.0)	—
<4	22 (9)	2208 (22)	Ref
4 to 7	41 (17)	3071 (31)	1.4 (.8, 2.4)
8 to 18	87 (36)	3097 (31)	3.0 (1.9, 5.0)
>18	91 (38)	1537 (16)	7.8 (4.6, 13.4)
Number of antibiotics, median (IQR)[f]	3.0 (4.0)	2.0 (2.0)	—
1	31 (13)	3744 (38)	Ref
2	54 (22)	2507 (25)	2.5 (1.6, 4.0)
3 or 4	70 (29)	2505 (25)	3.3 (2.2, 5.2)
5 or more	86 (36)	1157 (12)	9.6 (6.1, 15.1)

Stevens D et al. Clin Infect Dis 2011

Emergence of Imipenem-Resistant Gram-Negative Bacilli in Intestinal Flora of Intensive Care Patients

Laurence Armand-Lefèvre,[a,b] Cécile Angebault,[a,b] François Barbier,[b,c] Emilie Hamelet,[a] Gilles Defrance,[a] Etienne Ruppé,[a,b] Régis Bronchard,[d] Raphaël Lepeule,[b] Jean-Christophe Lucet,[e] Assiya El Mniai,[a] Michel Wolff,[c] Philippe Montravers,[d] Patrick Plésiat,[f] Antoine Andremont[a,b]

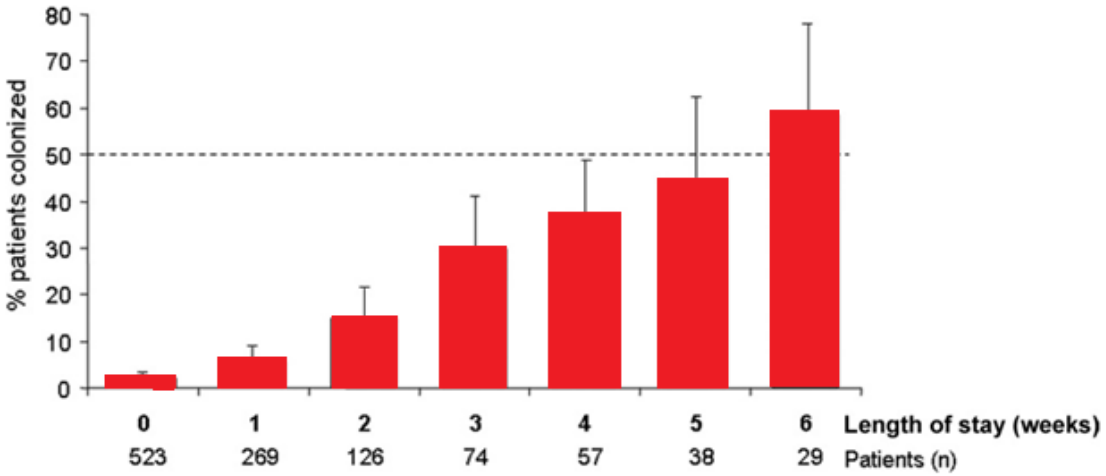


FIG 1 Rates of intestinal colonization by imipenem-resistant gram-negative bacilli in intensive care patients. Bars indicate observed rates ± standard deviation (SD) (error bars).

Characteristic or outcome	No. of individuals or parameter value (%, unless range is specified)		Univariate OR[a]	Univariate P^b	Multivariate OR[c]
	Carrier patients ($n = 22$ (%))	Controls ($n = 22$)			
Days of imipenem exposure				0.09	
0	5 (22.7)	12 (54.5)	1.0		1.0
1 to 3	8 (36.4)	6 (27.3)	3.1 (0.6–18.3)		5.3 (1.0–38.4)
4 to 21	9 (40.9)	4 (18.2)	5.1 (0.9–35.1)		6.8 (1.2–50.2)

Armand-Lefebvre L et al. Antimicrob Agents Chemother 2011

Conclusions: la désescalade

- Concept séduisant, mais intérêt mal documenté
- En termes ‘écologiques’, il est possible que les dés soient jetés dès la prescription initiale…
- Etudes systématiques des microbiotes dans toutes les études prospectives portant sur l’antibiothérapie !
- Objectif ultime =mieux prescrire d’emblée (test diagnostiques rapides, diminuer la surface du parapluie)

La désescalade: un acte multidisciplinaire