Severe MRSA in acute care setting

Key factors for preventing MRSA in the ICU

Philippe Eggimann MD
Adult intensive Care
www.soins-intensifs.chuv.ch

Hosted by
Martin Kiernan

CHUV

UNIL | Université de Lausanne

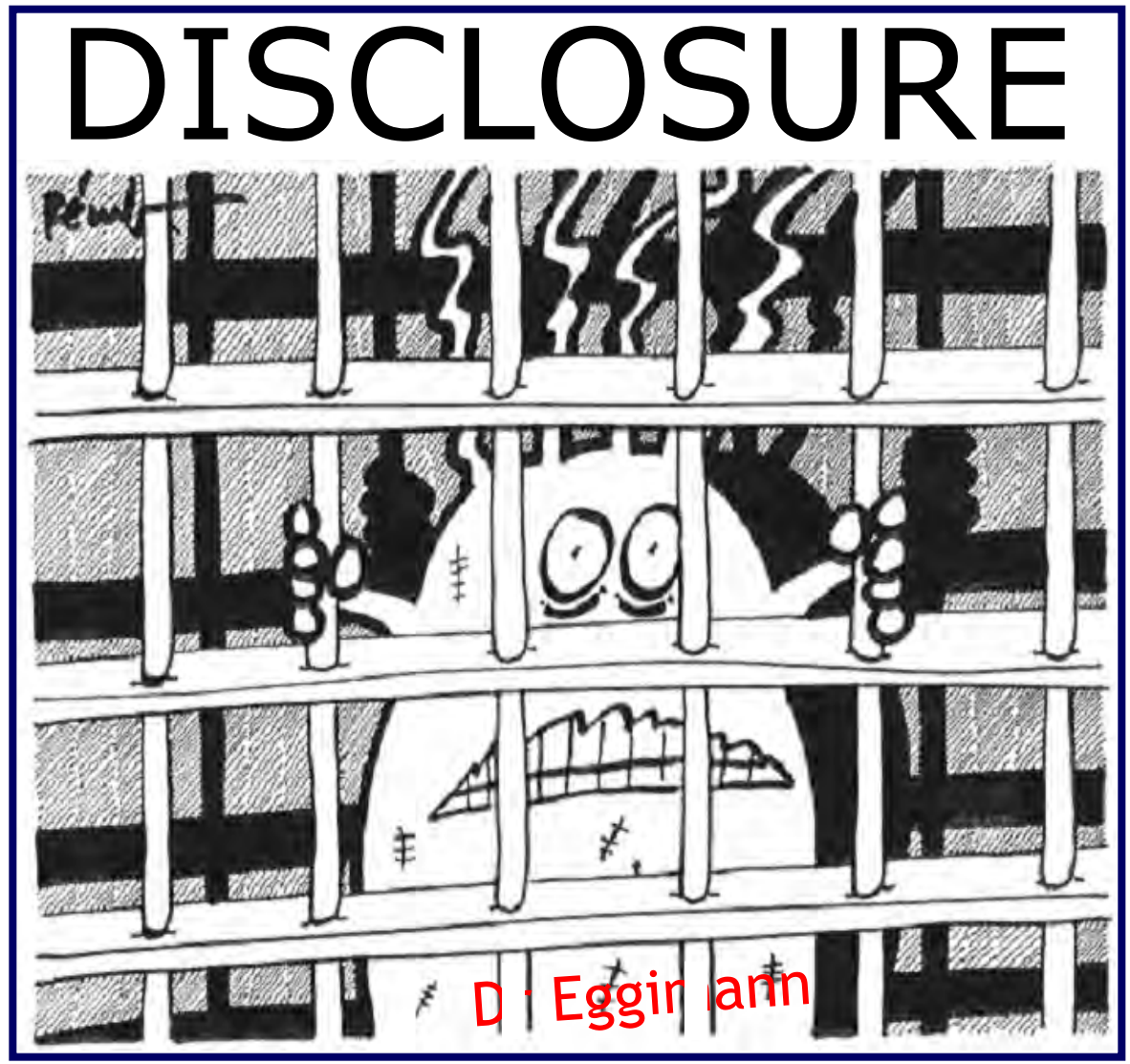
www.webbertraining.com

March 28, 2017

Anything I say can be highly biased

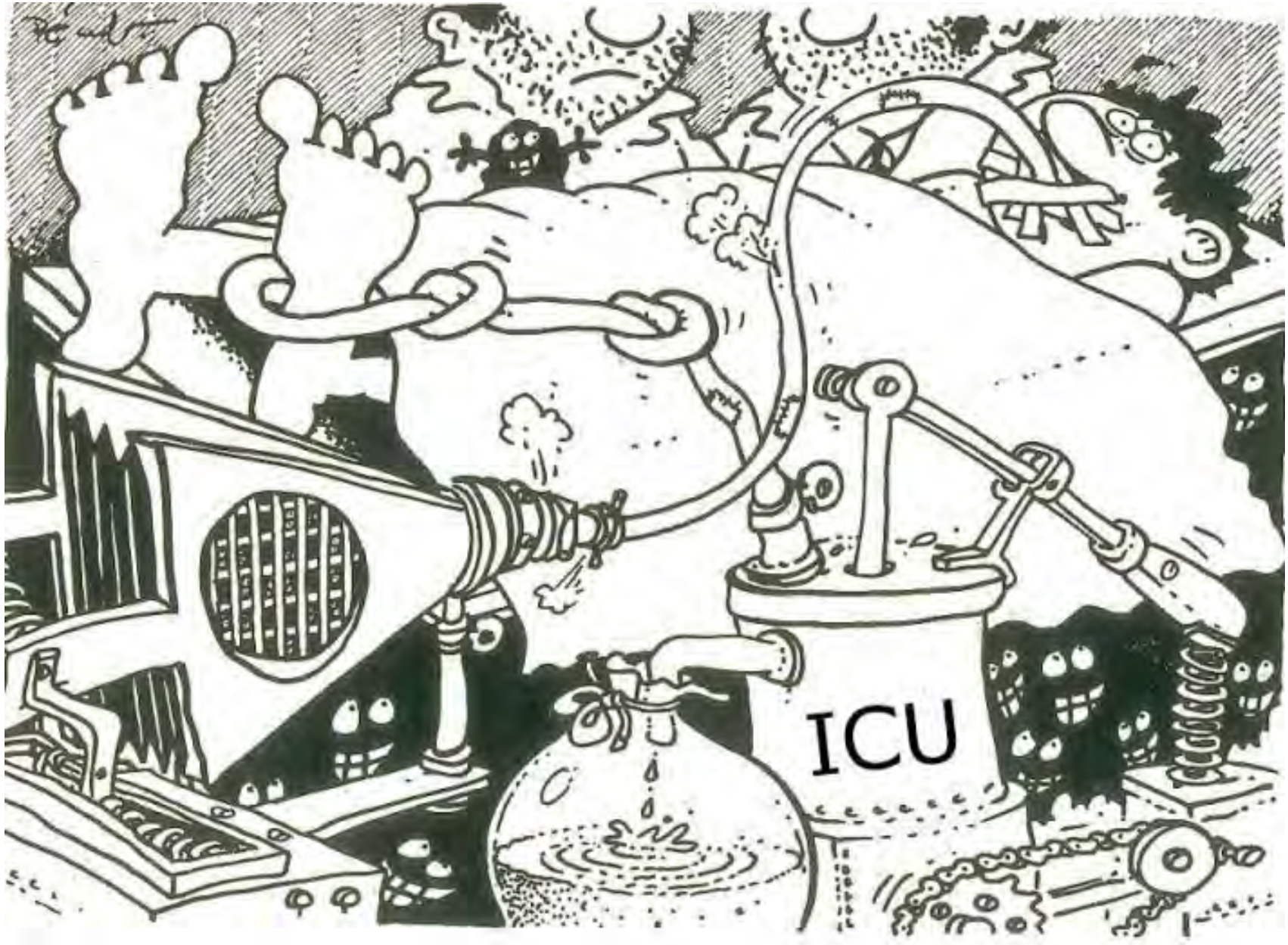
Dr Eggimann collaborated to several industry-sponsorized clinical trials since 1990.

No offshore account ! all goes to the Hospital to pay research nurse data manager



Dr Eggimann served on an advisory board for and/or sponsorized lectures for Astellas 3M, Janssen, Lilly, Medex MSD, Pfizer, Weyth-Lederle

ICUs, the world of infection

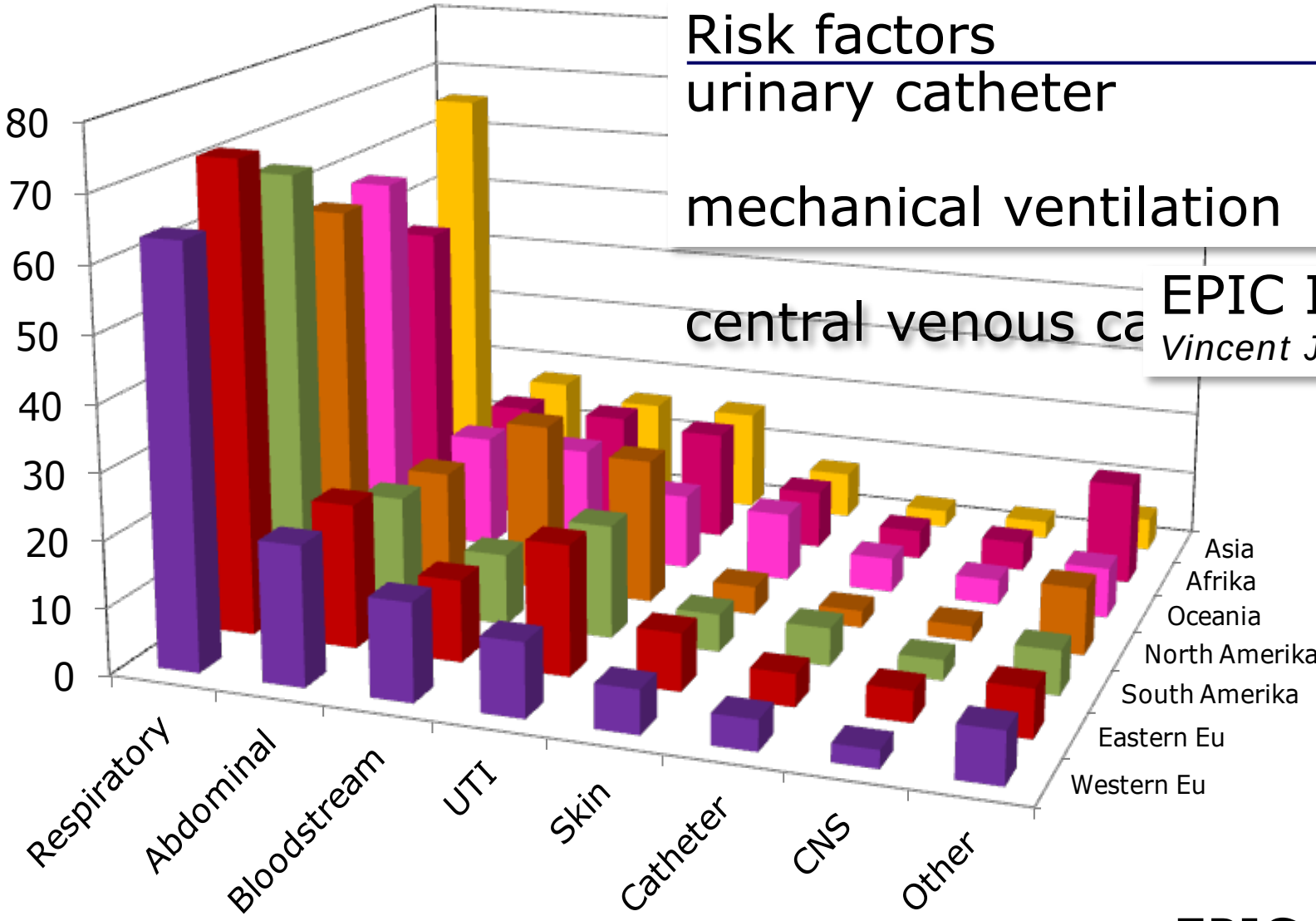


Service de
Médecine Intensive
www.chuv.ch/soinsintensifs

Where reality surpasses fiction

SERVICE | PATIENTS | ENSEIGNEMENT | RECHERCHE | EMPLOI | SOUTENIR LA RECHERCHE

ICUs, the world of infection



Risk factors	OR
urinary catheter	1.41
mechanical ventilation	2.07
central venous ca	

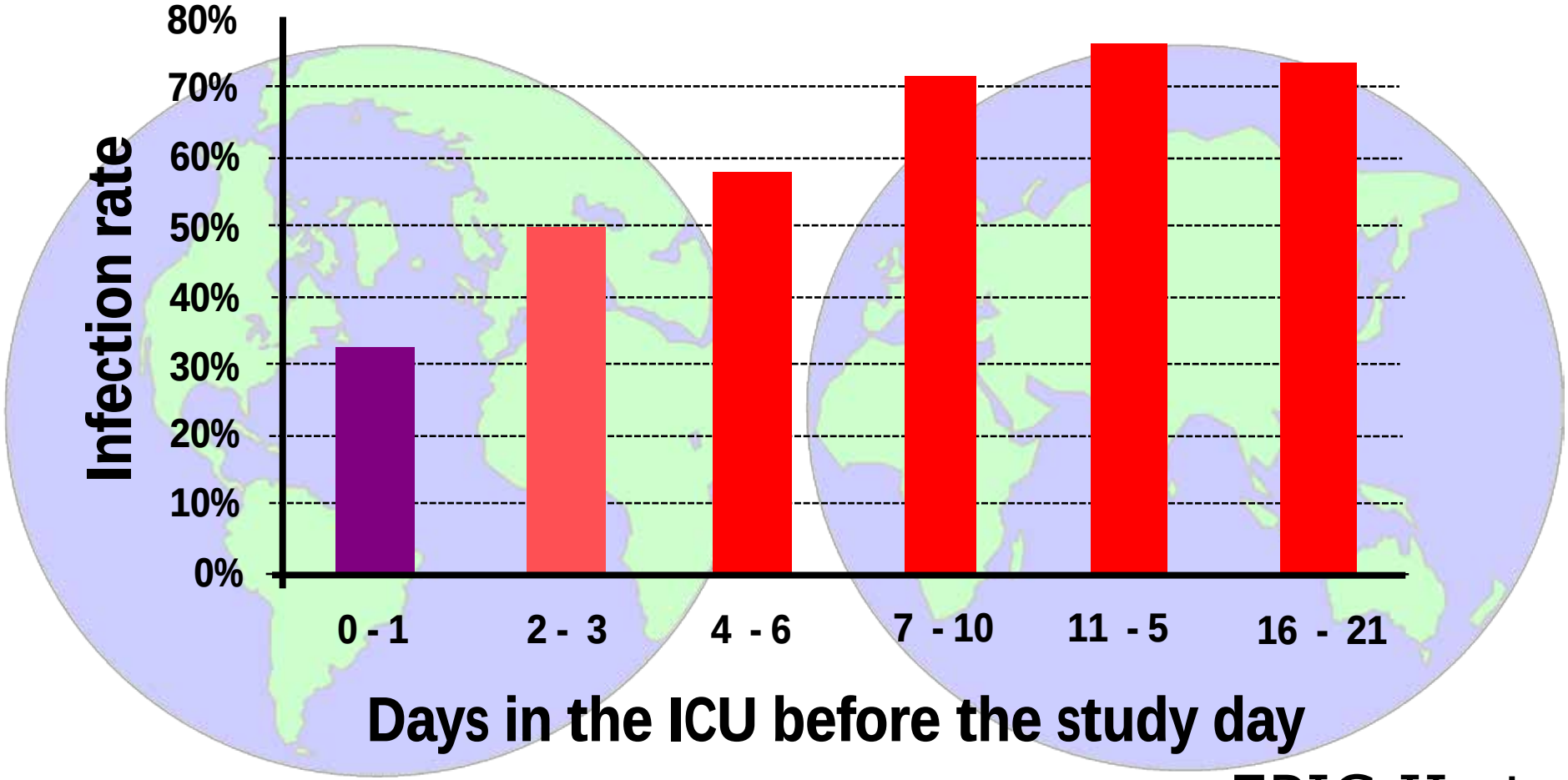
EPIC I study
Vincent JAMA 1995

Prevalence of infection among 14'414 patients (1'265 ICU)
51% with infection

EPIC II study
Vincent JAMA 2009

The world of nosocomial infections

1’265 worldwide ICU
14’414 patients



EPIC II study
Vincent JAMA 2009

The world of nosocomial infections

Including MSSA and MRSA

	All	Western Europe	Eastern Europe	Central/ South America	North America	Oceania	Africa	Asia
No. (%)	7087 (51.4)	3683 (49)	426 (56.4)	1290 (60.3)	607 (48.4)	285 (48.2)	89 (46.1)	707 (52.6)
Microorganisms								
Positive isolates	4947 (69.8)	2678 (72.7)	357 (83.8)[b]	719 (55.7)[b]	457 (75.3)	204 (71.6)	54 (60.7)	478 (67.6)[b]
Gram-positive	2315 (46.8)	1311 (49.0)	185 (51.8)	273 (38.0)[b]	252 (55.1)	104 (51.0)	27 (50.0)	163 (34.1)[b]
Staphylococcus aureus	1012 (20.5)	525 (19.6)	77 (21.6)	138 (19.2)	123 (26.9)[b]	56 (27.5)[b]	16 (29.6)	77 (16.1)
MRSA	507 (10.2)	233 (8.7)	37 (10.4)	79 (11.0)	80 (17.5)[b]	19 (9.3)	11 (20.4)[b]	48 (10.0)
S epidermidis	535 (10.8)	301 (11.2)	43 (12)	67 (9.3)	56 (12.3)	17 (8.3)	8 (14.8)	43 (9.0)
Streptococcus pneumoniae	203 (4.1)	127 (4.7)	16 (4.5)	24 (3.3)	20 (4.4)	5 (2.5)	3 (5.6)	8 (1.7)[b]
VSE	352 (7.1)	250 (9.3)	35 (9.8)	17 (2.4)[b]	24 (5.3)[b]	9 (4.4)	0[b]	17 (3.6)[b]
VRE	186 (3.8)	113 (4.2)	16 (4.5)	15 (2.1)[b]	22 (4.8)	10 (4.9)	0	10 (2.1)
Other	319 (6.4)	184 (6.9)	15 (4.2)	29 (4.0)[b]	48 (10.5)	19 (9.3)	4 (7.4)	20 (4.2)
Gram-negative	3077 (62.2)	1573 (58.7)	258 (72.3)[b]	510 (70.9)[b]	228 (49.9)[b]	122 (59.8)	31 (57.4)	355 (74.3)[b]

EPIC II study

Vincent JAMA 2009

The world of nosocomial infections

Increased mortality associated with meticillin-resistant *Staphylococcus aureus* (MRSA) infection in the Intensive Care Unit: results from the EPIC II study

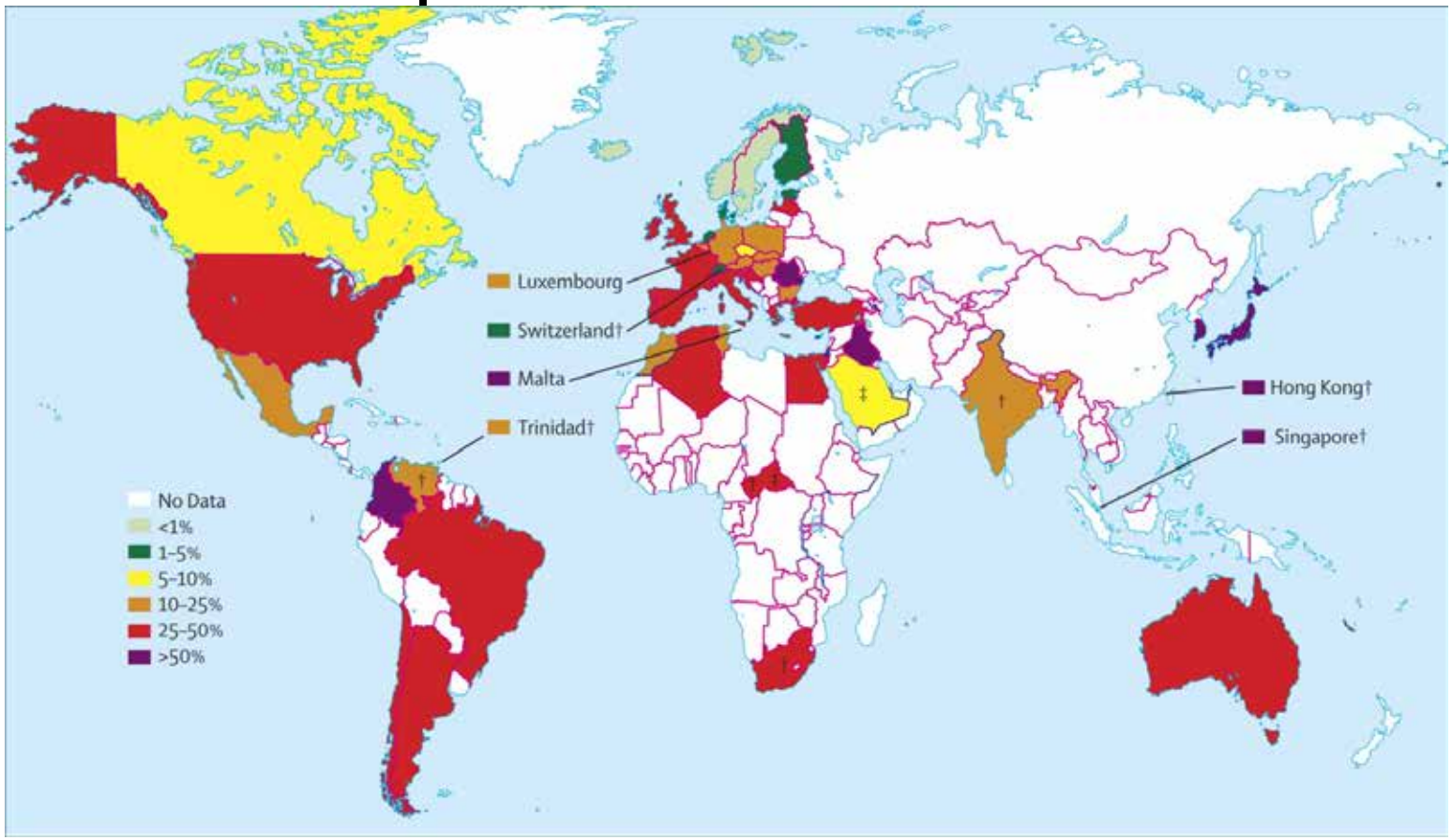
Håkan Hanberger[a], Sten Walther[b], Marc Leone[c], Philip S. Barie[d], Jordi Rello[e], Jeffrey Lipman[f], John C. Marshall[g], Antonio Anzueto[h], Yasser Sakr[i], Peter Pickkers[j], Peter Felleiter[k], Milo Engoren[l], Jean-Louis Vincent[m,*], EPIC II Group of Investigators

Variable	OR (95% CI)	*P*-value
Age (per year)	1.01 (1.00–1.03)	0.01
Type of admission		
Surgery: elective	Ref.	
Medical	1.70 (0.91–3.19)	0.10
Surgery: emergency	1.52 (0.87–2.65)	0.14
Trauma	1.46 (0.52–4.11)	0.48
Source of admission		
Operating room/recovery	Ref.	
Emergency department/ambulance	0.50 (0.28–0.88)	0.02
Hospital ward	0.96 (0.57–1.60)	0.87
Other hospital	0.82 (0.46–1.47)	0.51
Other	1.21 (0.41–3.58)	0.73
SAPS II score (per point)	1.05 (1.04–1.07)	<0.001
Co-morbid conditions		
Chronic renal failure	1.84 (1.16–2.94)	0.01
Type of microorganism		
Pseudomonas spp.	1.73 (1.09–2.74)	0.02
Acinetobacter spp.	2.63 (1.34–5.17)	<0.01
MRSA	1.46 (1.03–2.06)	0.03

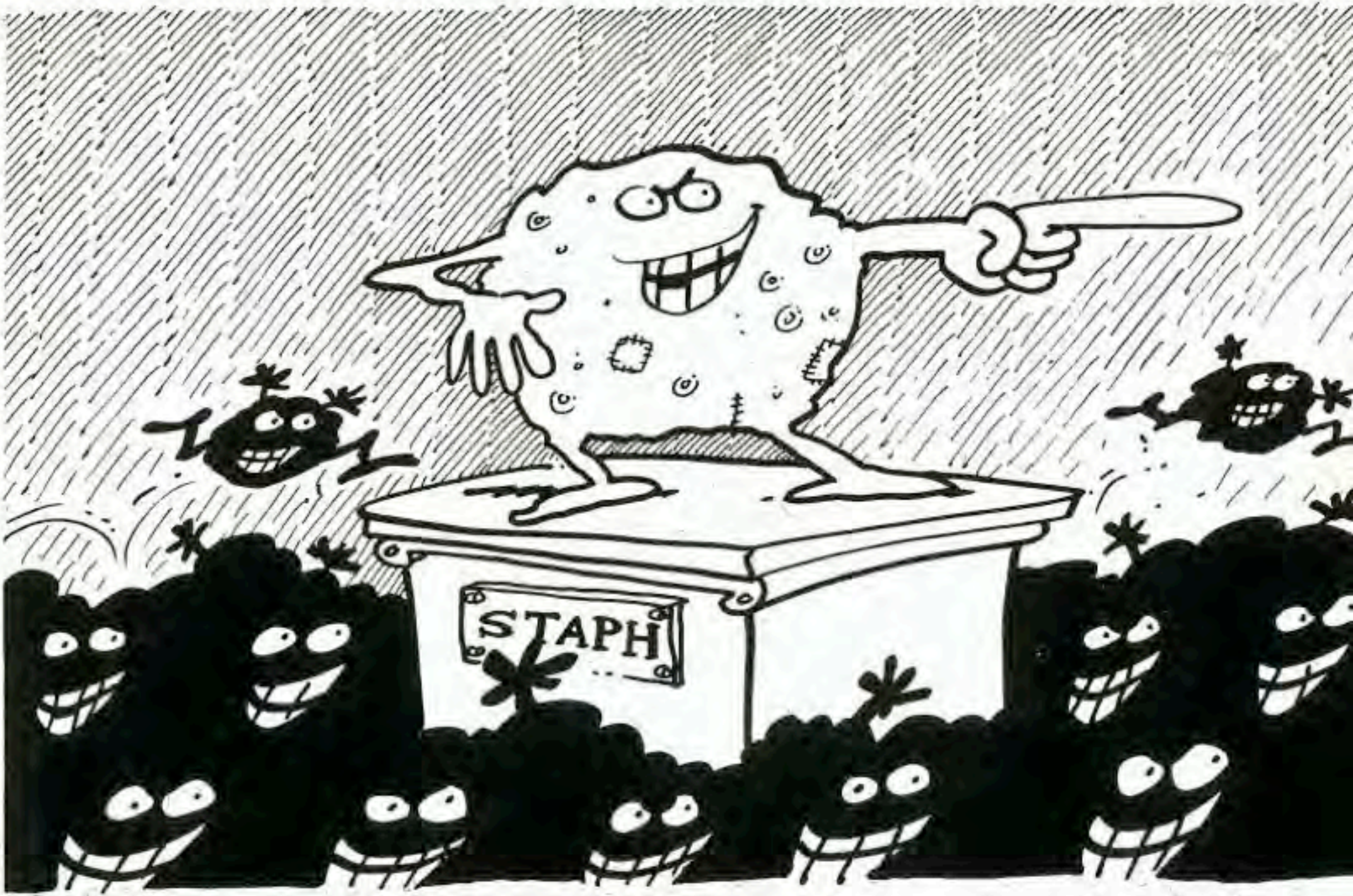
International Journal of Antimicrobial Agents 38 (2011) 331–335

The world of nosocomial infections

Emergence and resurgence of MRSA as a public-health threat



Grundmann M, Aires-de-Sousa M, Boyce J, Tiemersma E Lancet 2006; 368:874-85

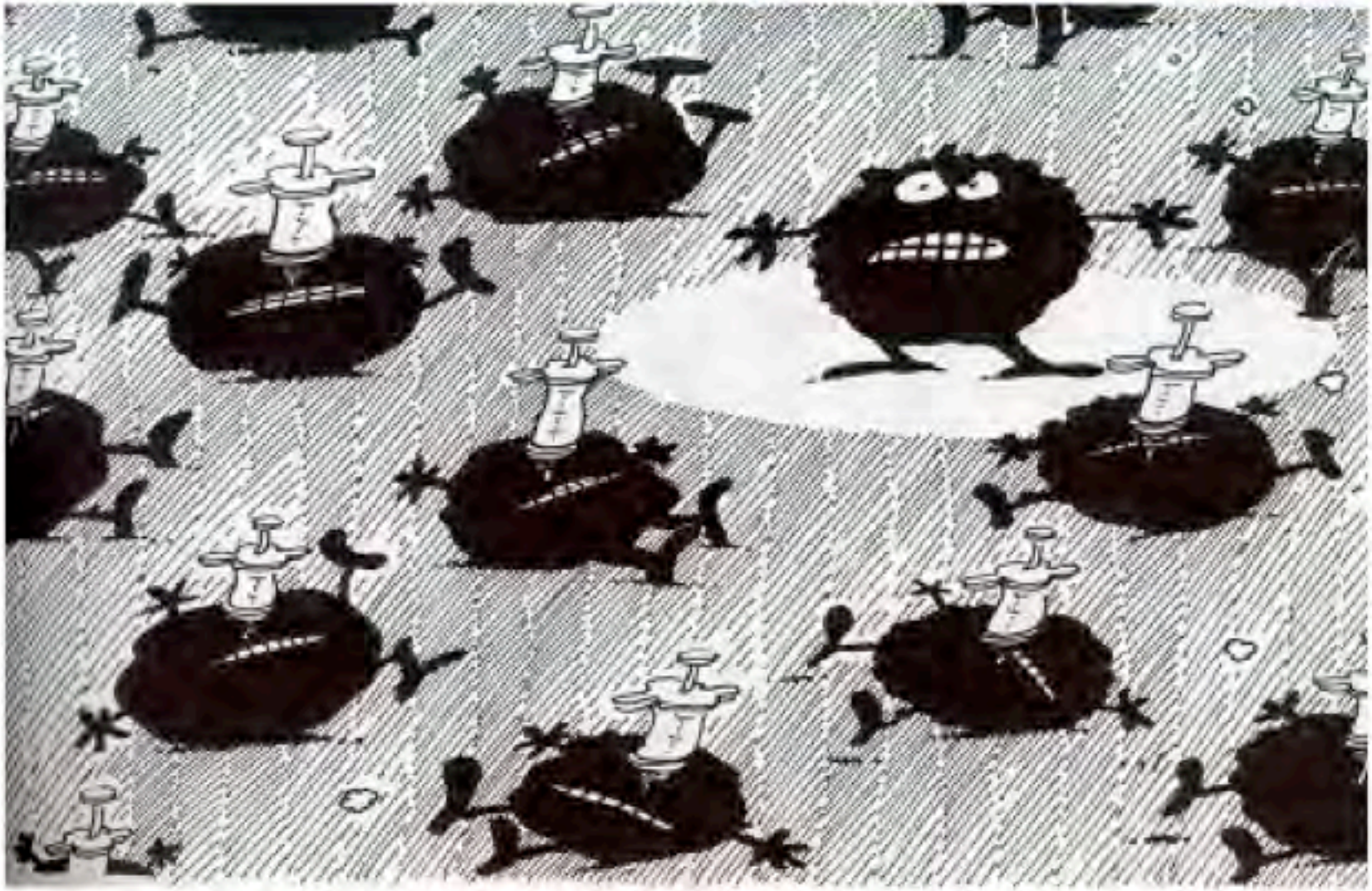

STAPH

HA-MRSA ≠ CA-MRSA ≠ LA-MRSA

MRSA	Definition and/or salient features
HA-MRSA	Identified >48 h after admission to a healthcare facility, or MRSA identified in an individual with history of MRSA infection or colonisation, admission to a healthcare facility, dialysis, surgery or insertion of indwelling devices in the past year
CA-MRSA	Identified in the outpatient setting or within 48 h following hospital admission in an individual with no medical history of MRSA infection or colonisation, admission to a healthcare facility, dialysis, surgery or insertion of indwelling devices in the past year
LA-MRSA	No formal definition. Usually belong to CC398 lineage in Europe but often CC9 in Asia. Acquired via occupational contact with livestock

Bal AM et al. Journal of Global Antimicrobnial Resistance 2016; 6:95-101

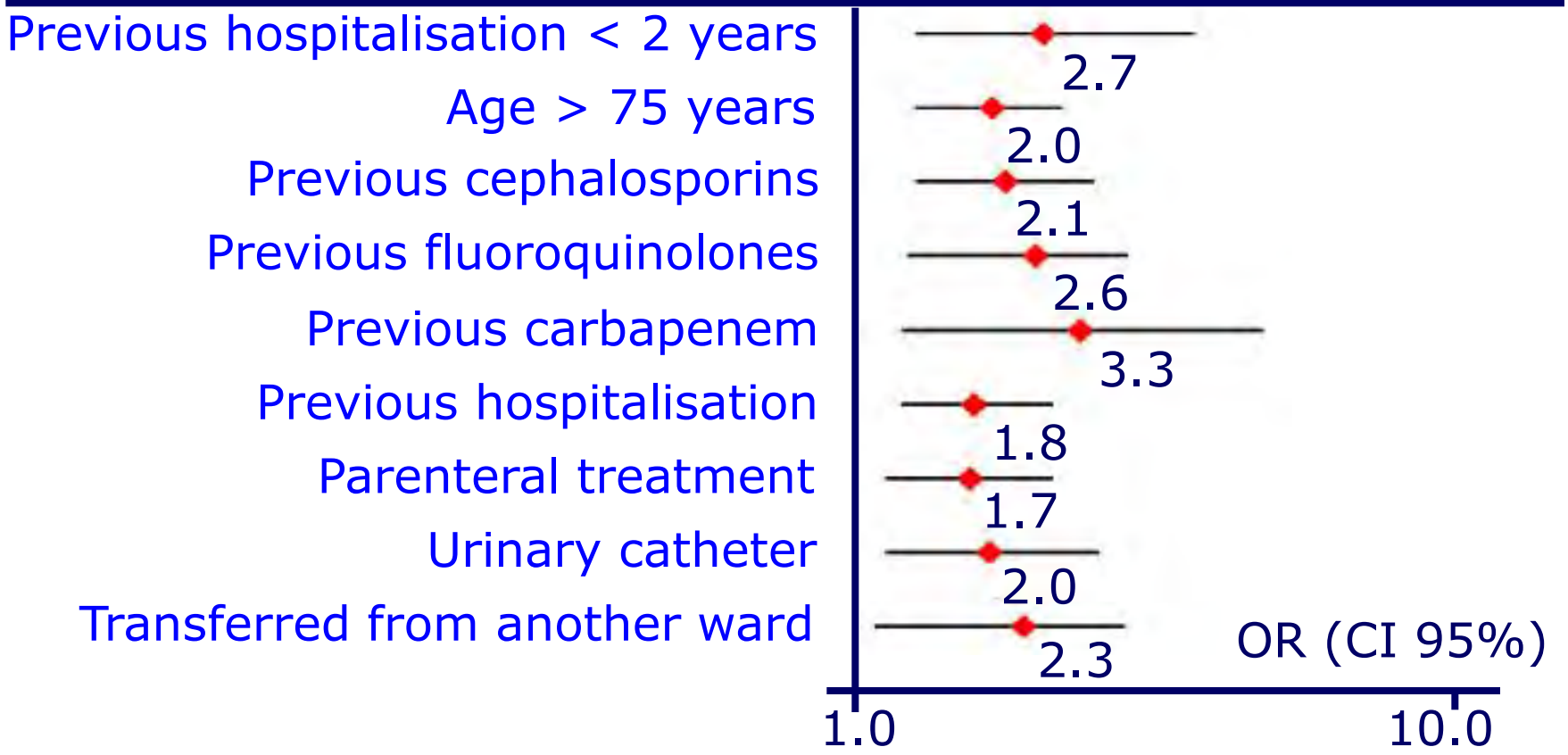
Risk factors for HA-MRSA



Risk factors for HA-MRSA

10,072 pts screened within 24 hrs of admission (90%) over 8 months
355 cases (3.5%) including 204 new cases (2.0%)

Risk factors at admission identified in new cases by multivariate analysis



Harbarth S et al. Am J Med 06

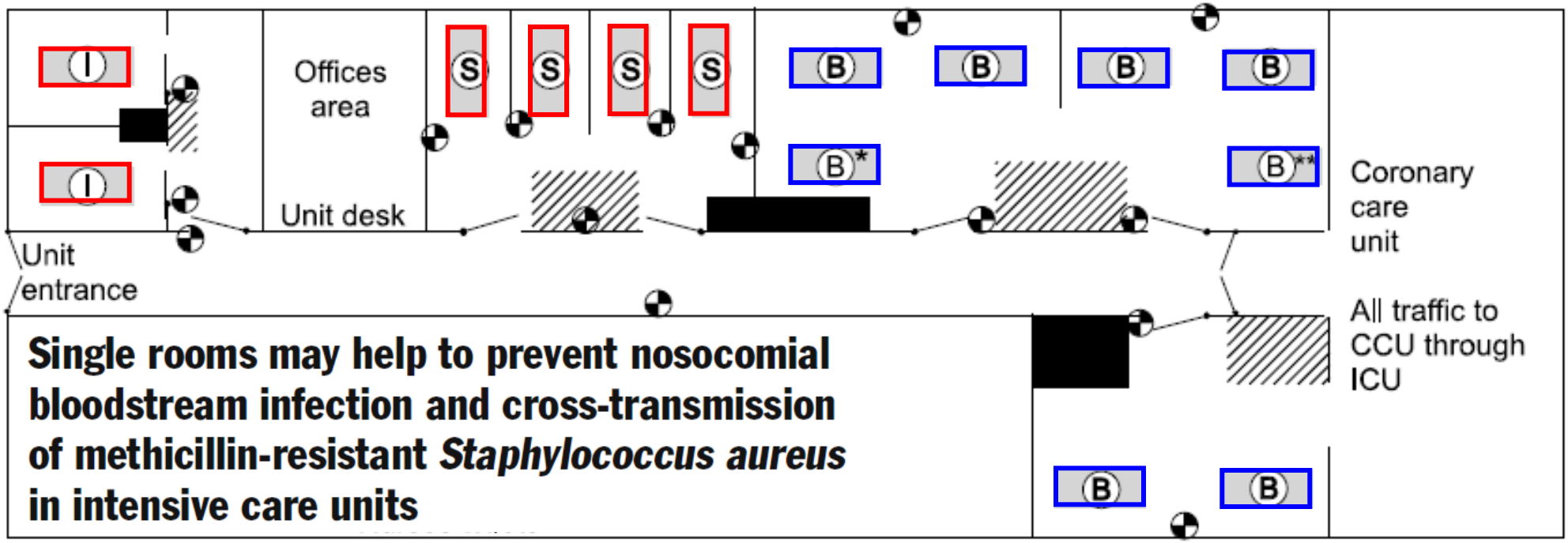
Intensive Care Med (2007) 33:836–840
DOI 10.1007/s00134-007-0559-5

BRIEF REPORT

David Bracco
Marc-Jacques Dubois
Redouane Bouali
Philippe Eggimann

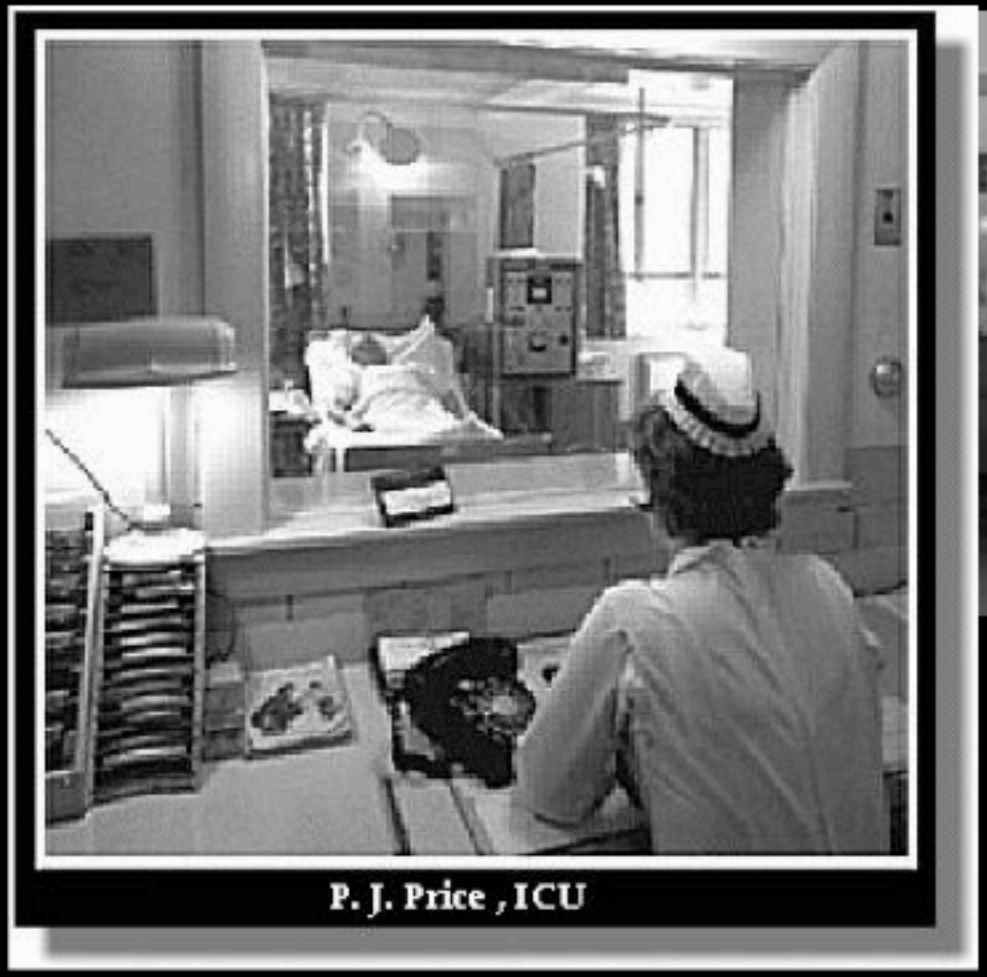
Single rooms may help to prevent nosocomial bloodstream infection and cross-transmission of methicillin-resistant *Staphylococcus aureus* in intensive care units

	Multivariate analysis Effect [OR (95% CI)]	*p* value
Risk of MRSA acquisition		
Outcome (ICU dead)	1.04 (0.57–1.84)	NS
Mechanical ventilation	0.82 (0.58–1.18)	NS
Days with MV (per day)	1.28 (1.20–1.36)	<0.001
Parenteral nutrition	2.95 (1.17–7.52)	0.02
Type of bed (single room or cubicles vs. bays)	0.65 (0.42–0.98)	<0.05



?? How did we reach that ??

At that time,…



ICU and defibrillator in the 50's

Anything was easy !

Patients >>> nurses

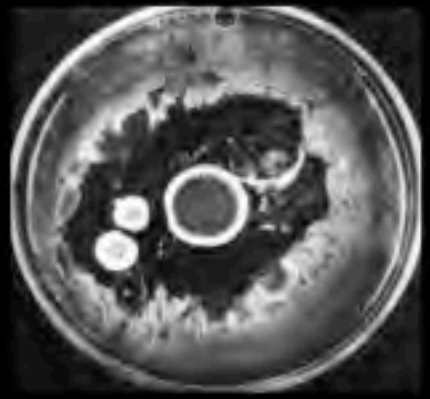
Pandemia of poliomyelitis in the 50's

So easy !!

1928:
Alexander Fleming

1940:
Ernst Chain

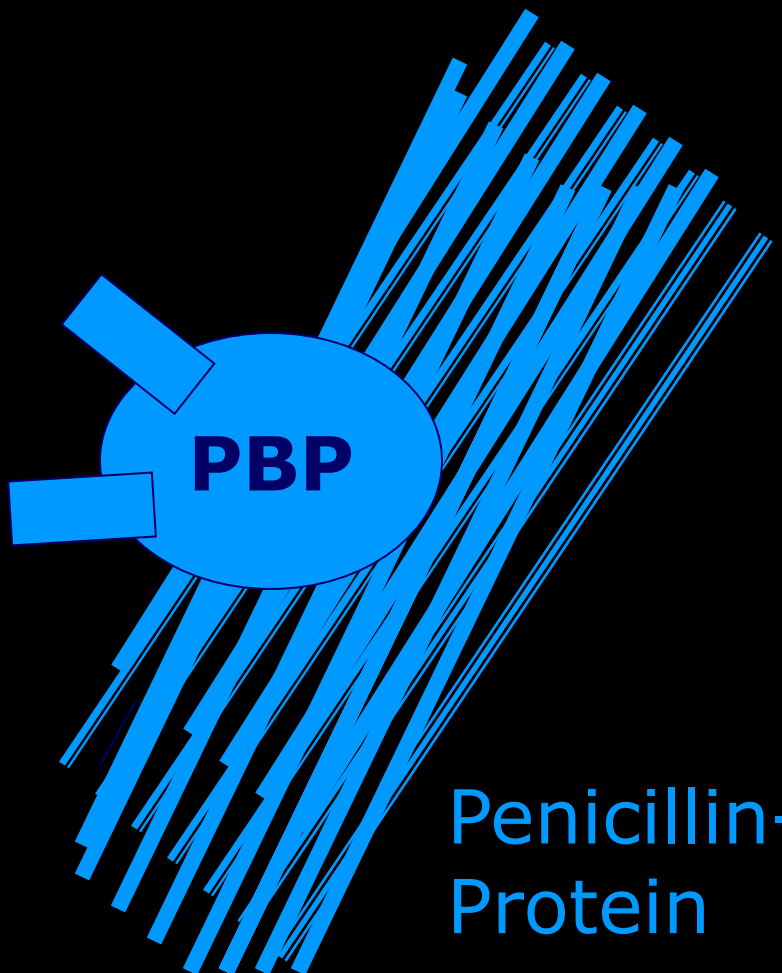
1940:
Hrward Foley



43-year-old Oxford policeman who had nicked the corner of his mouth shaving.
->Facial and orbital cellulitis -> improvement ->relapse and death

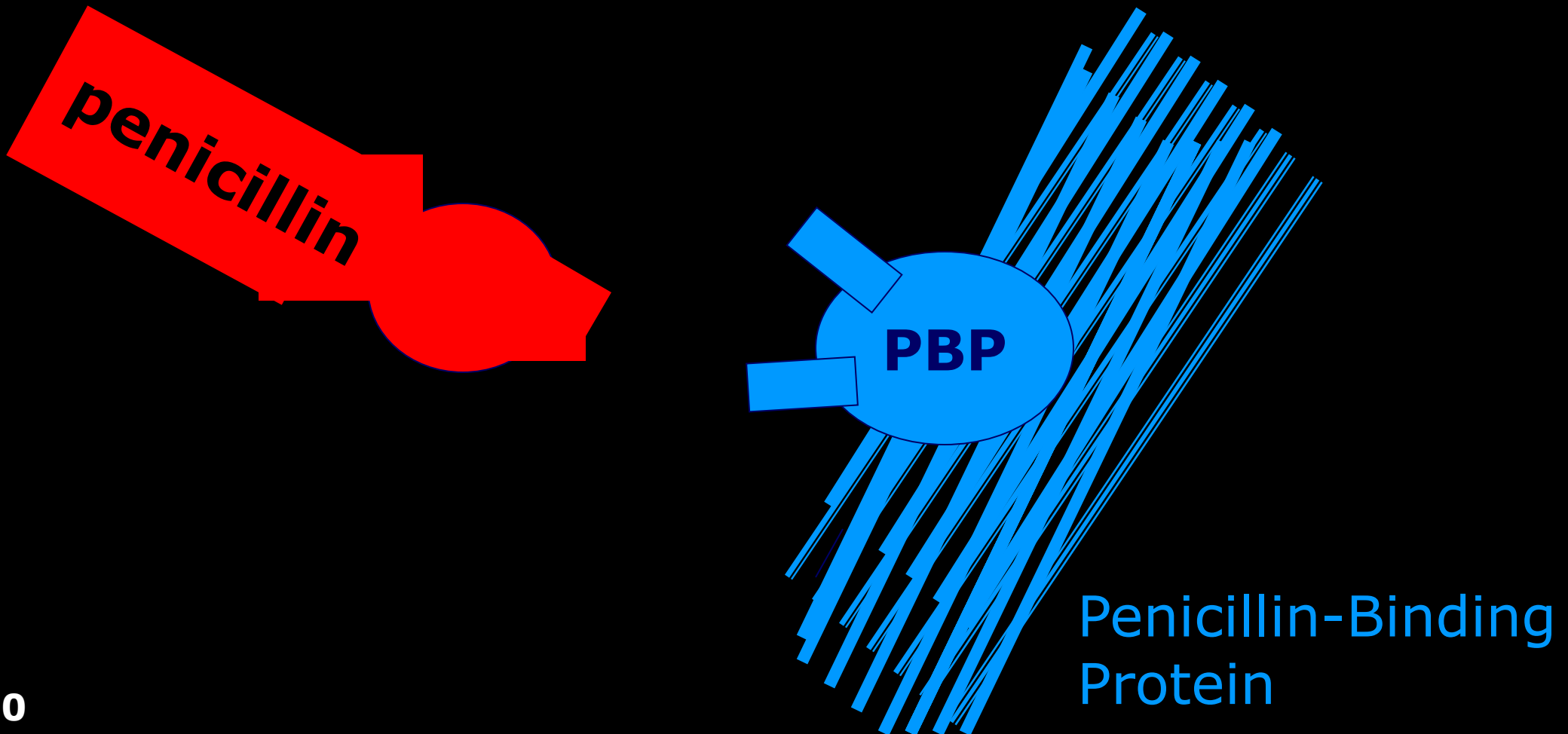
So easy !!!

penicillin

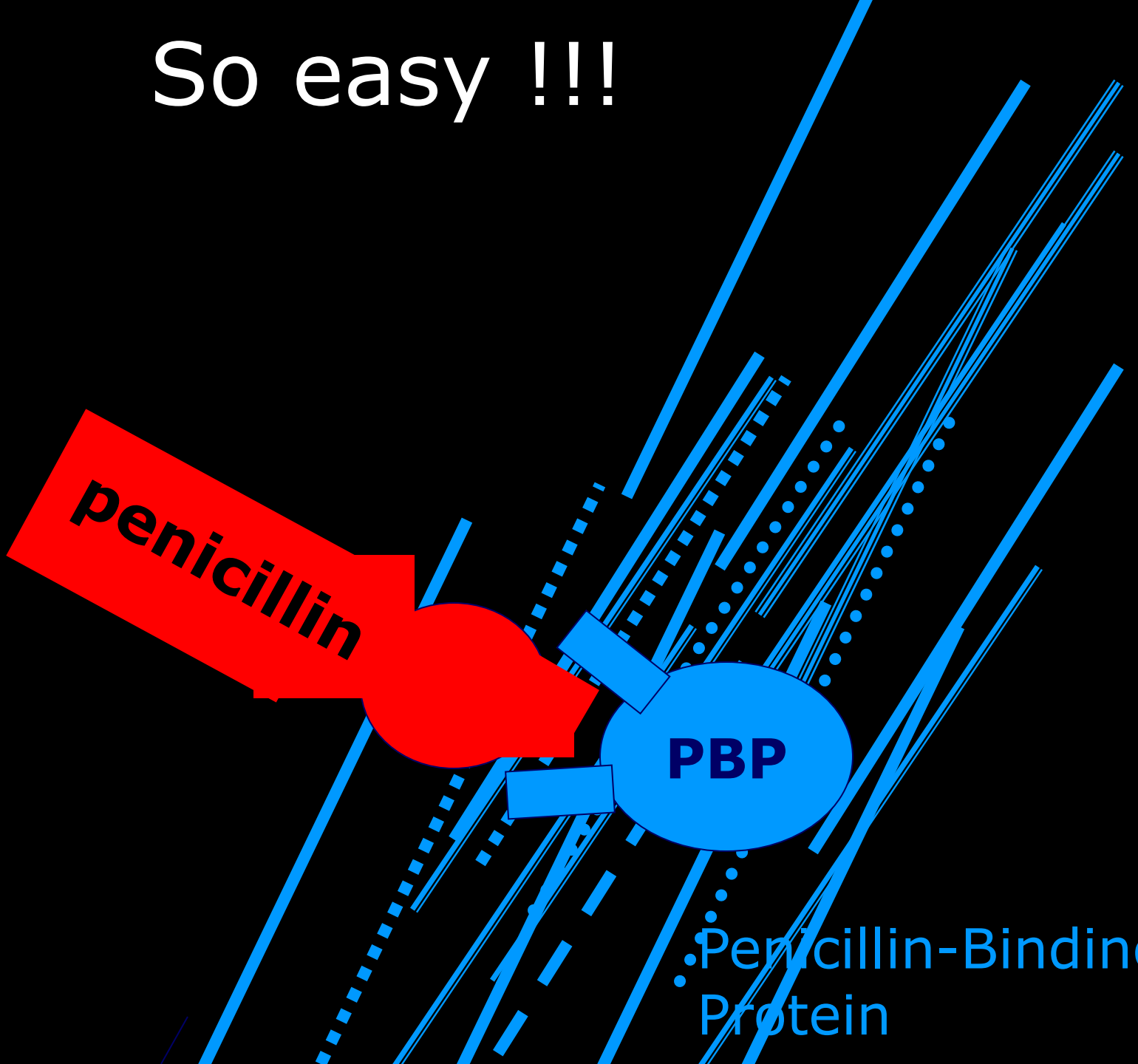


Penicillin-Binding Protein

So easy !!!



So easy !!!



Maybe too easy !!

Publicity in the 50's

INFECTIONS ➔ ANTIBIOTICS

INFECTIONS ➔ ANTIBIOTICS ➔ RESISTANCE

No. 3713. DEC. 28, 1940 NATURE

LETTERS TO THE EDITORS

The Editors do not hold themselves responsible for opinions expressed by their cor
They cannot undertake to return, or to correspond with the writers of, rejected
intended for this or any other part of NATURE. *No notice is taken of anonymous com*

IN THE PRESENT CIRCUMSTANCES, PROOFS OF "LETTERS" WILL NOT BE SE
CORRESPONDENTS OUTSIDE GREAT BRITAIN.

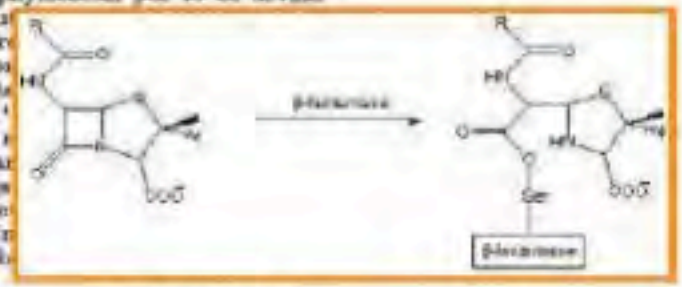
An Enzyme from Bacteria able to Destroy Penicillin

FLEMING[1] noted that the growth of *B. coli* and a number of other bacteria belonging to the coli-typhoid group was not inhibited by penicillin. This observation has been confirmed. Further work has been done to find the cause of the resistance of these organisms to the action of penicillin.

An extract of *B. coli* was made by crushing a suspension of the organisms in the bacterial crushing mill of Booth and Green[2]. This extract was found to contain a substance destroying the growth-inhibiting property of penicillin. The destruction took place on incubating the penicillin preparation with the bacterial extract at 37°, or at room temperature for a longer time. The following is a typical experiment showing the penicillin-destroying effect of *B. coli* extracts. A solution of 1 mgm. penicillin in 0·8 c.c. of water was incubated with 0·2 c.c. of centrifuged and dialysed bacterial extract at 37° for 2 hours, in the presence of ether, and a control solution of penicillin of equal concentration was incubated without enzyme for the same time. (The penicillin used was extracted from cultures of *Penicillium notatum* by a method to be described in detail later. It possessed a degree of purity similar to that of the samples used in the chemotherapeutic experiments recorded in a preliminary report[3].) The growth-inhibiting activity of the solutions was then tested quantitatively on agar plates against *Staphylococcus aureus*. The penicillin solution incubated with the enzyme had entirely lost its growth-inhibiting activity, whereas the control solution had retained its full strength.

The conclusion that the active substance in an *B. coli*, it was not necessary to
in the bacterial mill in order to
from it; the latter appeared in
The enzyme was also found in
organism sensitive to the action o
less so than *Staphylococcus aureus*.
or absence of the enzyme in a
be the sole factor determining
sensitivity to penicillin.

The tissue extracts and tissue autolysates that have been tested were found to be without action on the growth-inhibiting power of penicillin. Prof. A. D. Gardner has found staphylococcal pus to be devoid of inhibiting action, bu
inhibition by the pus fr
The bacteriostatic actio
is known to be inhibit
constituents and pus.
activity of penicillin is
ditions gives this substa
the sulphonamide drug
point of view. The fac
contain an enzyme acti
possibility that this sub
in their metabolism.



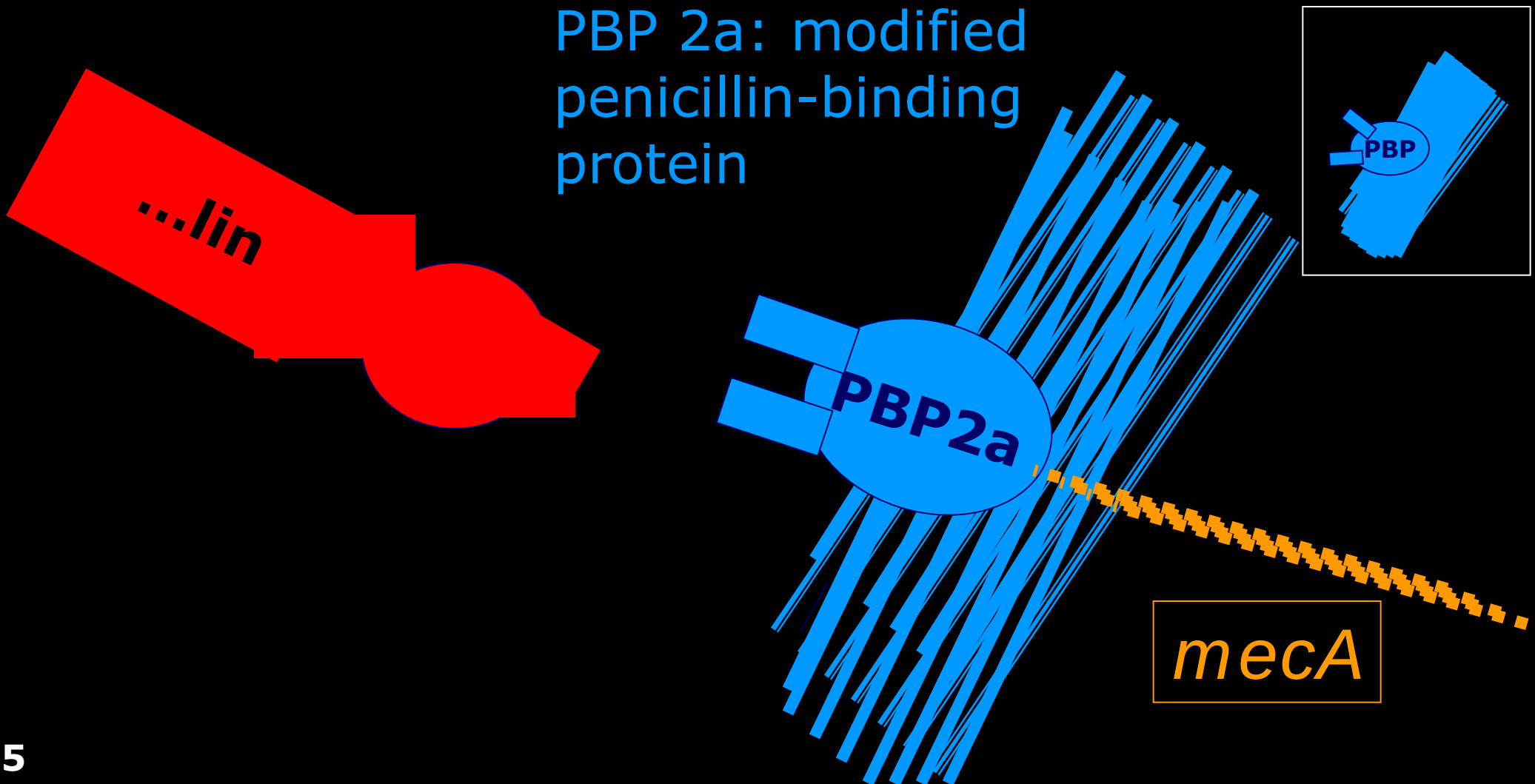
E. P. ABRAHAM.
E. CHAIN.

Sir William Dunn School of Pathology,
Oxford.
Dec. 5.

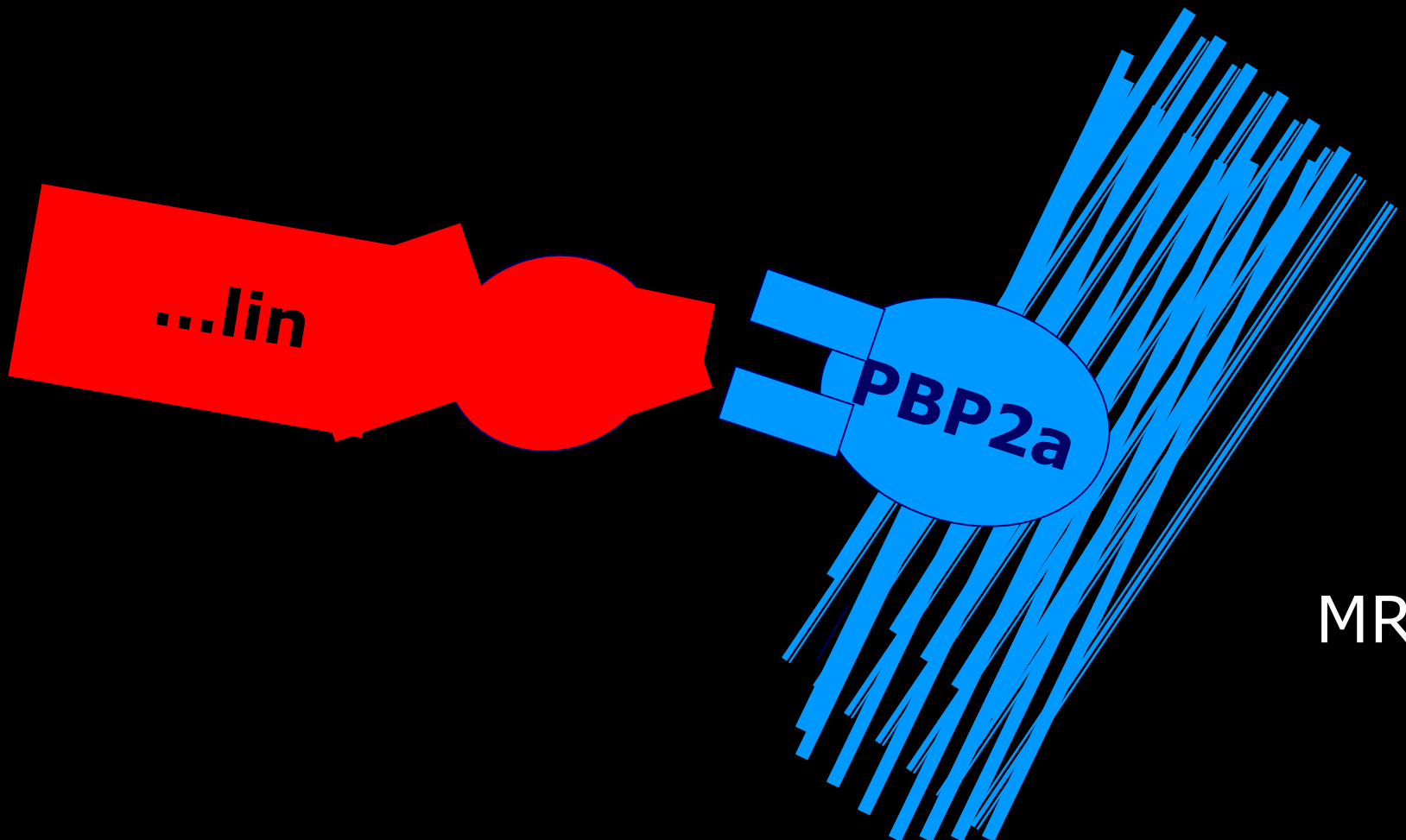
[1] Fleming, A., *Brit. J. Exp. Path.*, **10**, 226 (1929).
[2] Booth, V. H., and Green, D. E., *Biochem. J.*, **30**, 555 (1936).
[3] Chain, E., Florey, H. W., Gardner, A. D., Heatley, N. G., Jennings, M. A., Orr-Ewing, J., and Sanders, A. G., *Lancet*, **239** (1940).
[4] Maclean, C., *J. Exp. Med.*, **70**, 317 (1939).

INFECTIONS â ANTIBIOTICS â RESISTANCE

PBP 2a: modified penicillin-binding protein

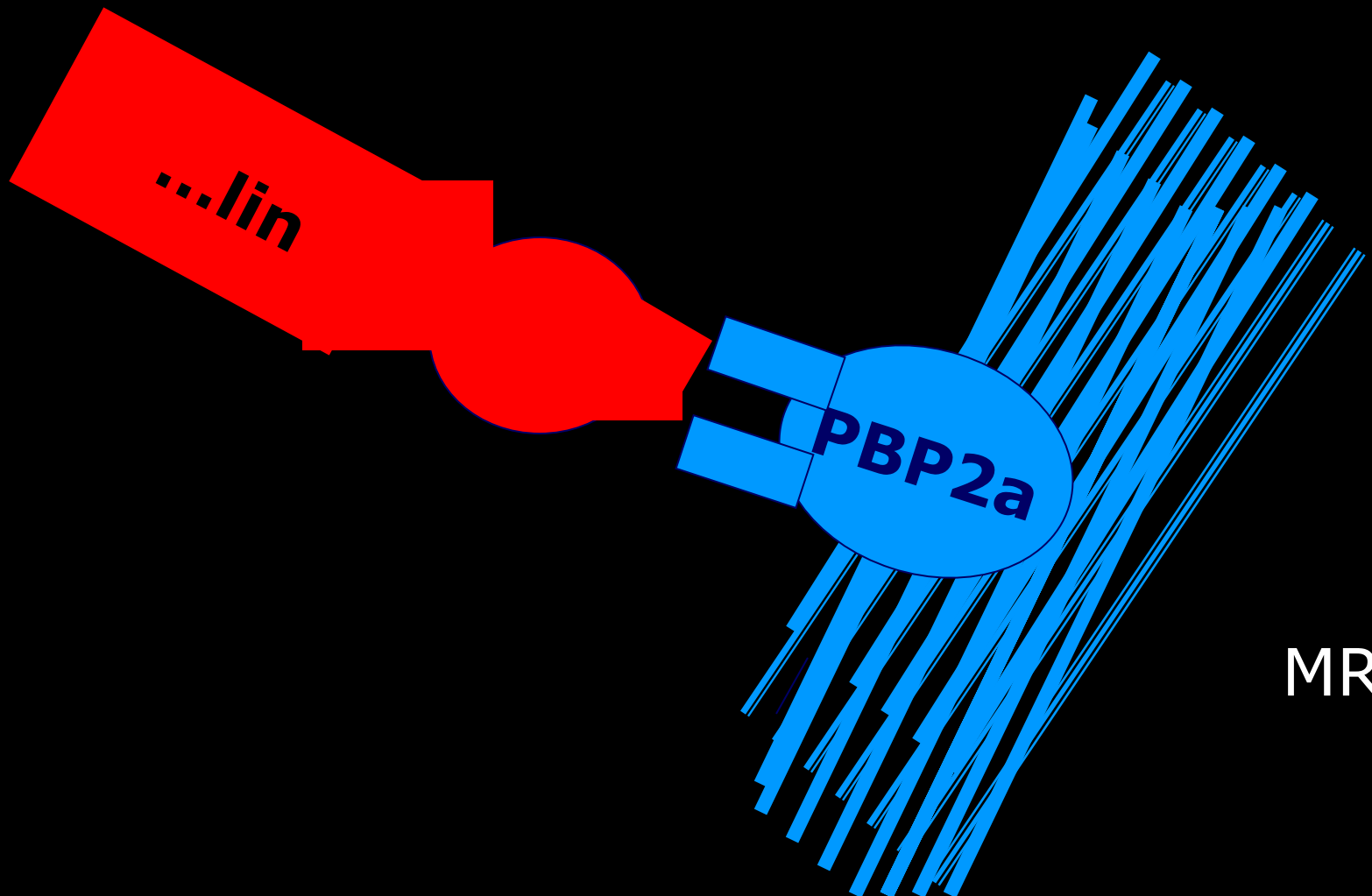


Methicillin-resistant *Staphylococcus aureus*



MRSA

Methicillin-resistant *Staphylococcus aureus*



MRSA

INFECTIONS â ANTIBIOTICS â RESISTANCE

INFECTION BY PENICILLIN-RESISTANT STAPHYLOCOCCI

MARY BARBER
M.D. Lond.

MARY ROZWADOWSKA-DOWZENKO
M.D. Warsaw

From the Bacteriology Department, Postgraduate Medical School of London

MANY studies have been carried out on the incidence of penicillin-resistant strains of *Staph. pyogenes* in cases of infection. Until 1944 few such strains were encountered. Since then, however, the incidence has been increasing rapidly, particularly in hospitals. Studies in which more than 10% of all strains tested were found to be resistant to penicillin have been recorded by Spink et al. (1944), Bondi and Dietz (1945), Gallardo (1945), Plough (1945), Harley et al. (1946), Barber (1947a and b), and Simpson (1947). In a previous report one of us (Barber 1947b) showed that in less than a year the incidence of penicillin-resistant strains of *Staph. pyogenes* giving rise to infection in this hospital had gone up from 14·1 to 38%. The work reported here shows that this increase is continuing.

All pus swabs received in the laboratory during this investigation have been plated directly on to plain blood-agar plates and penicillin-ditch plates, the ditch containing 10 units

of these patients the mixture was present in a single specimen, and 8 gave only a few penicillin-resistant colonies. From 3 the first specimen received yielded only penicillin-sensitive staphylococci, but from later specimens penicillin-resistant strains were isolated. These 3 patients will be referred to again in connexion with the source of resistant strains. The results according to type of infection were as follows :

Type of infection	*Total patients*	*Patients yielding penicillin-resistant strains*
Septicæmia	2	2
Boils, abscesses, &c.	23	8
Superficial skin lesions	12	8
Infected operation wounds	12	10
Pulmonary	10	7
Conjunctivitis	22	11
Aural	5	3
Nasopharyngeal	6	5
Umbilical of newborn	3	3
Urinary	3	1
Vaginal	2	1
Total	**100**	**59**

The 2 patients with septicæmia both died, in spite of intensive penicillin treatment.

One was a newborn infant in whom the infection appeared to enter via the umbilical cord. The infant had had no penicillin before the infection.

The other was a patient with bilateral cortical necrosis of both kidneys following toxæmia of pregnancy and treated with the artificial kidney. Penicillin treatment was started when the patient was put on the artificial kidney, and

INFECTIONS â ANTIBIOTICS â RESISTANCE

INFECTION BY PENICILLIN-RESISTANT STAPHYLOCOCCI

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All pus swabs received in the laboratory during this investigation have been plated directly on to plain blood-agar plates and penicillin-ditch plates, the ditch containing 10 units

The penicillin sensitivity of *Staph. pyogenes* in relation to previous recent treatment with penicillin was as follows :

	Penicillin	*No penicillin*
Penicillin-sensitive strains only ..	4	37
Penicillin-resistant strains isolated	29	30

of these patients the mixture was present in a single specimen, and 8 gave only a few penicillin-resistant colonies. From 3 the first specimen received yielded only penicillin-sensitive staphylococci, but from later specimens penicillin-resistant strains were isolated. These 3 patients will be referred to again in connexion with the source of resistant strains. The results according to type of infection were as follows :

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.. ..	..	10
.. ..	..	7
.. ..	..	11
.. ..	..	3
.. ..	..	5
.. ..	..	3
.. ..	..	1
.. ..	..	1
		59

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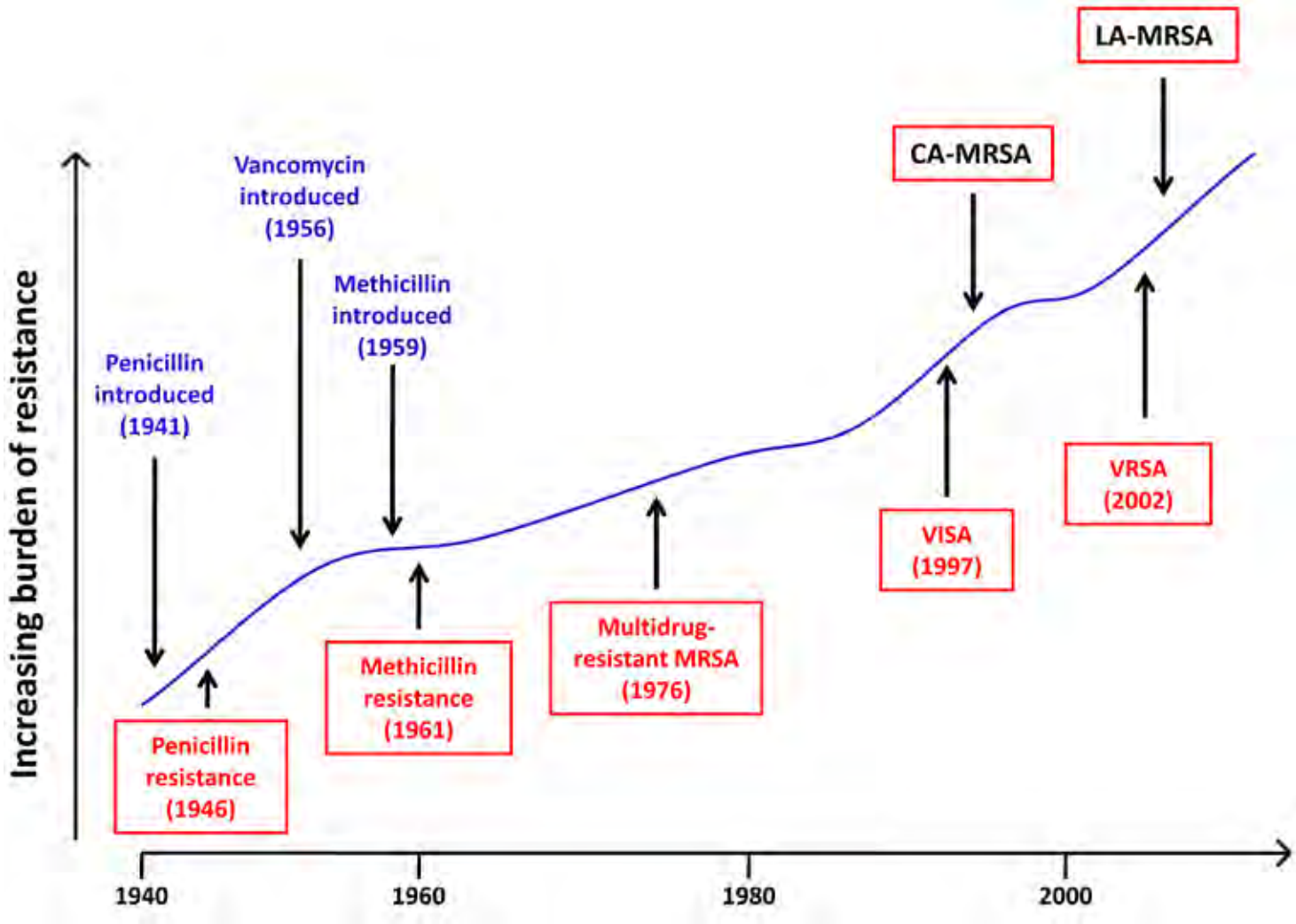
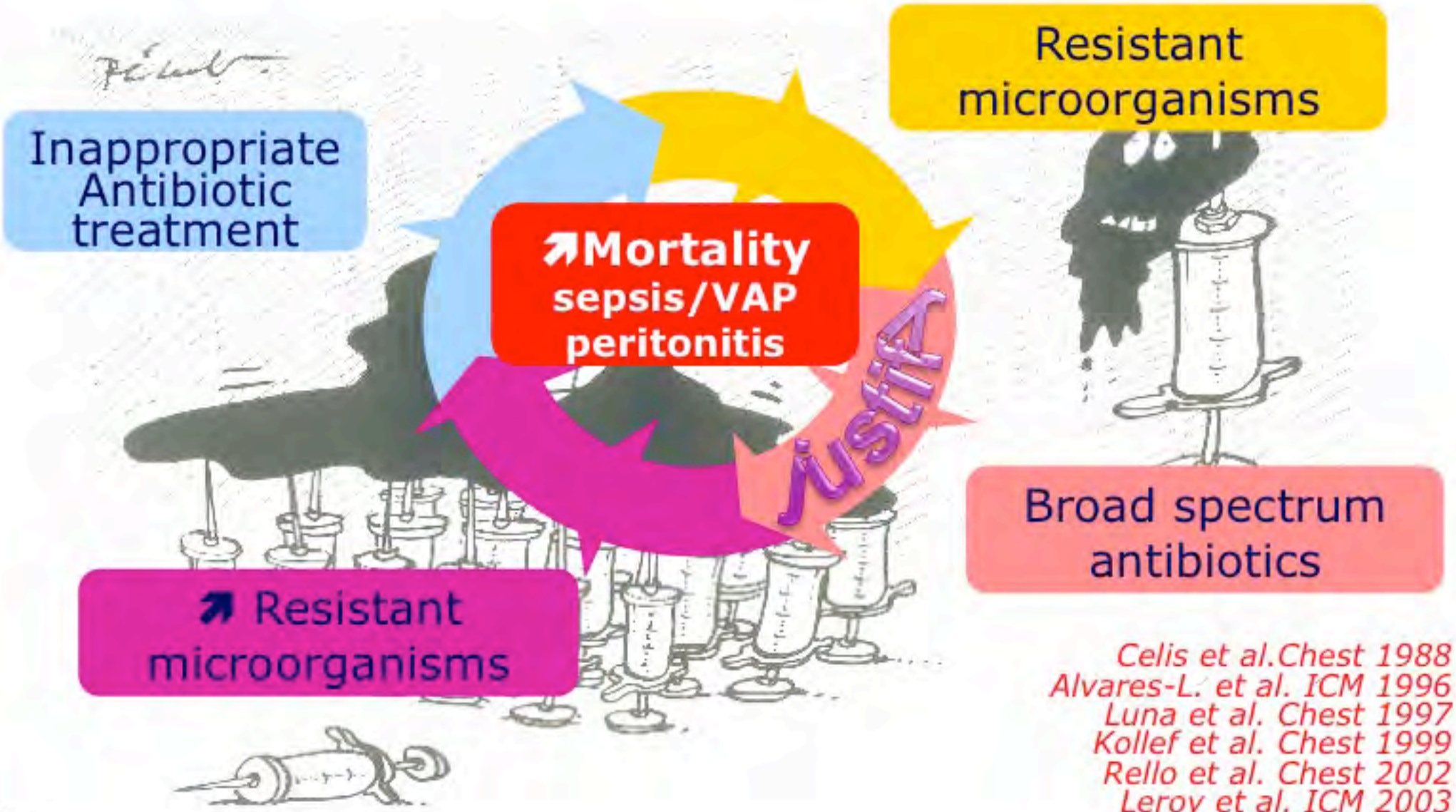
INFECTIONS â ANTIBIOTICS â RESISTANCE



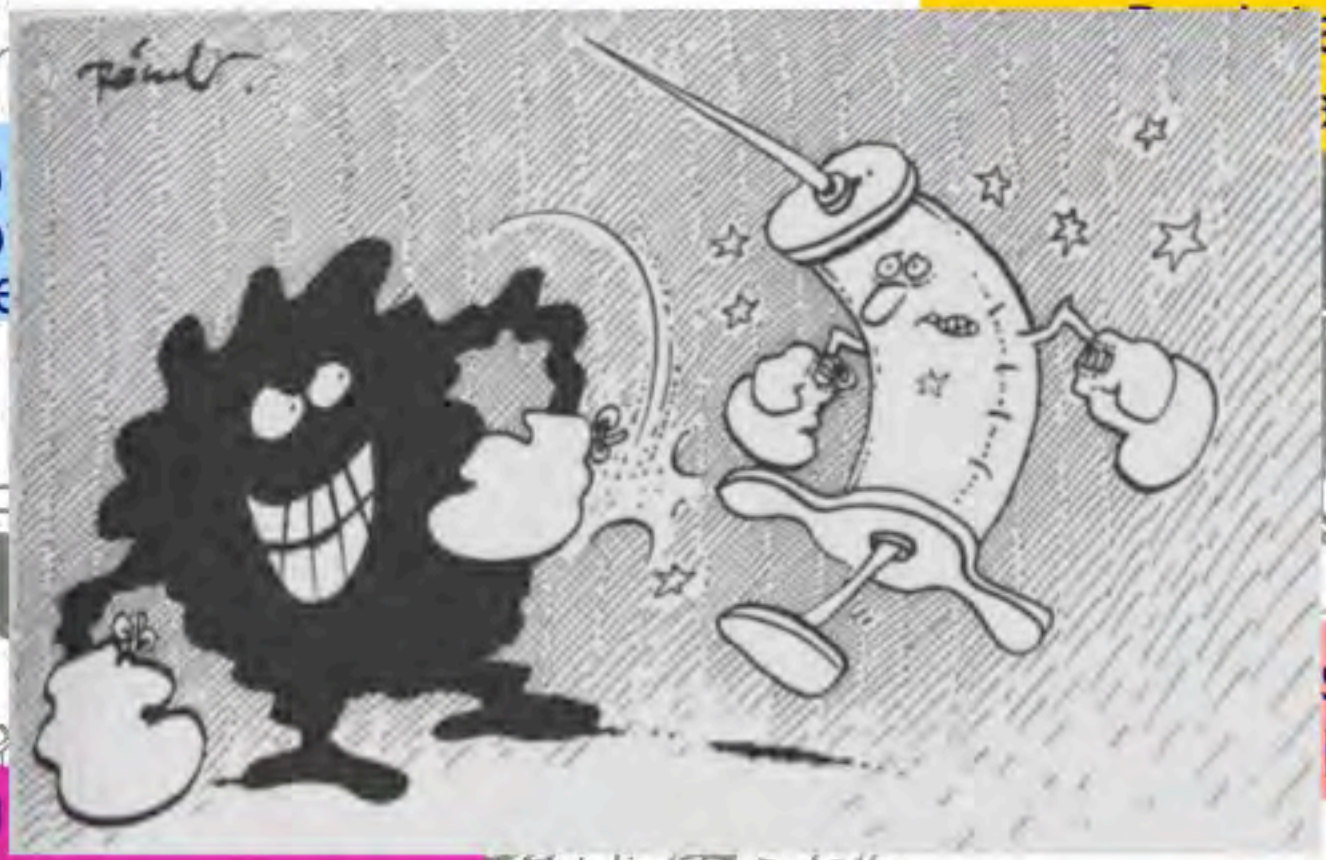
Schmidt T et al. Antimicrobial Resistance in Staphylococci at the Human– Animal Interface. In: Immunology and Microbiology "Antimicrobial Resistance – An Open Challenge". Edited by Maria Cristina Ossiprandi, ISBN 978-953-51-2222-7, Published: November 26, 2015. http://www.intechopen.com/books/antimicrobial-resistance-an-open-challenge/antimicrobial-resistance-in-staphylococci-at-the-human-animal-interface

INFECTIONS ➔ ANTIBIOTICS ➔ RESISTANCE



Celis et al.Chest 1988
Alvares-L. et al. ICM 1996
Luna et al. Chest 1997
Kollef et al. Chest 1999
Rello et al. Chest 2002
Leroy et al. ICM 2003
Clec'h et al. ICM 2004

INFECTIONS ➔ ANTIBIOTICS ➔ RESISTANCE



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Celis et al.Chest 1988
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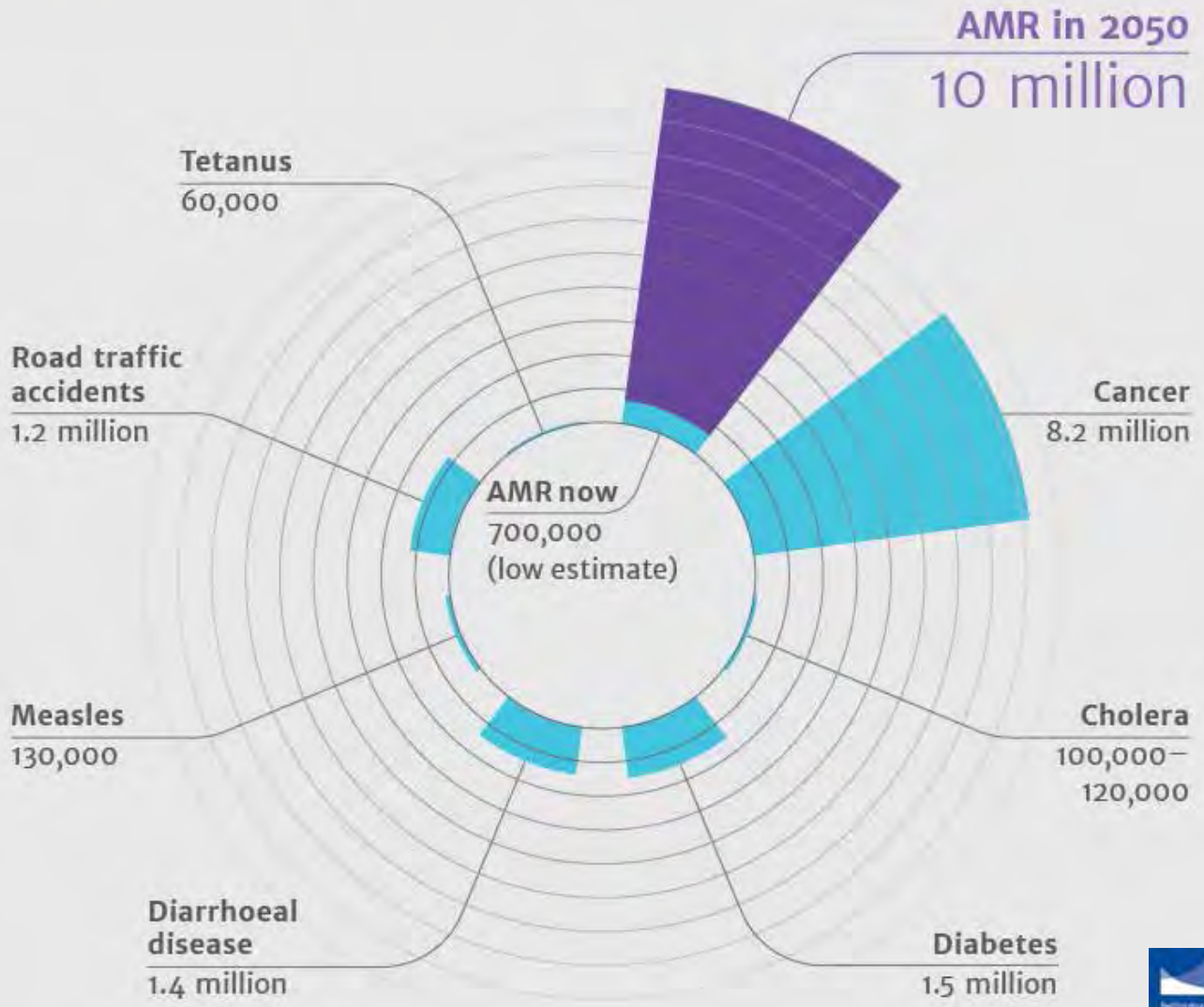
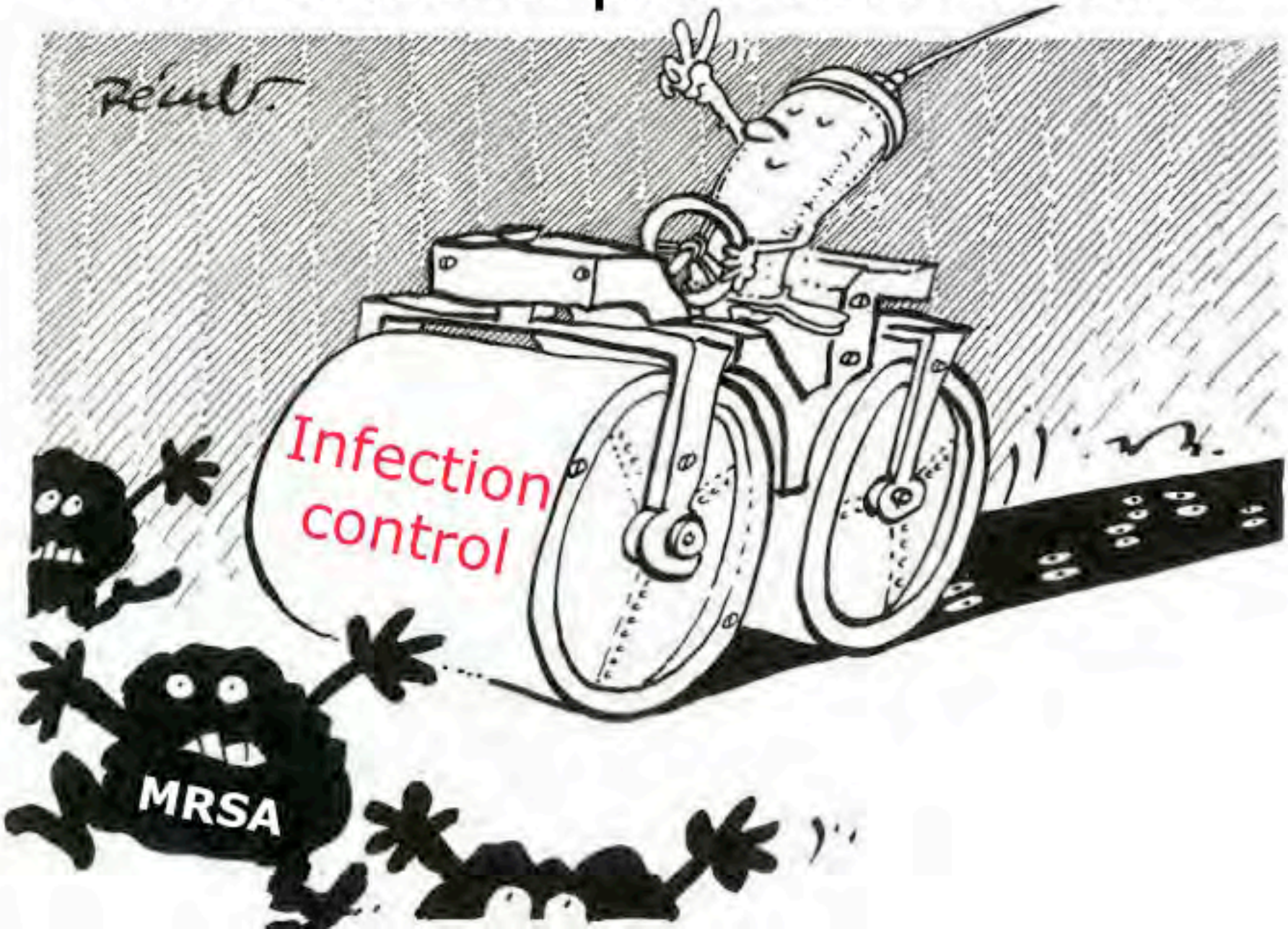
Luna et al. Chest 1997
Kollef et al. Chest 1999
Rello et al. Chest 2002
Leroy et al. ICM 2003
Clec'h et al. ICM 2004

Deaths attributable to AMR every year compared to other major causes of death



Welcome to the post-antibiotic era

We should prevent them !

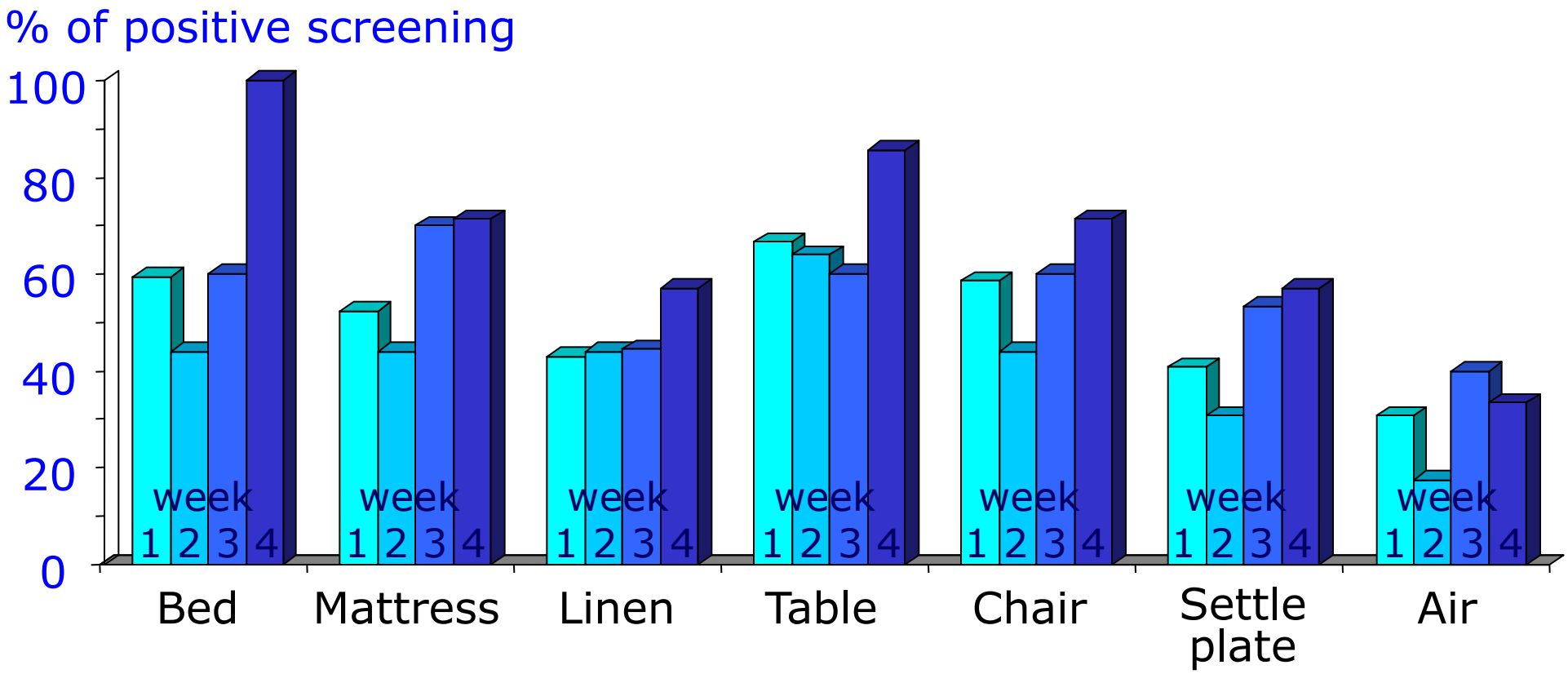


Because MRSA is now everywhere !!!

Because MRSA is now everywhere !!!

Environemental reservoir of MRSA in isolation rooms

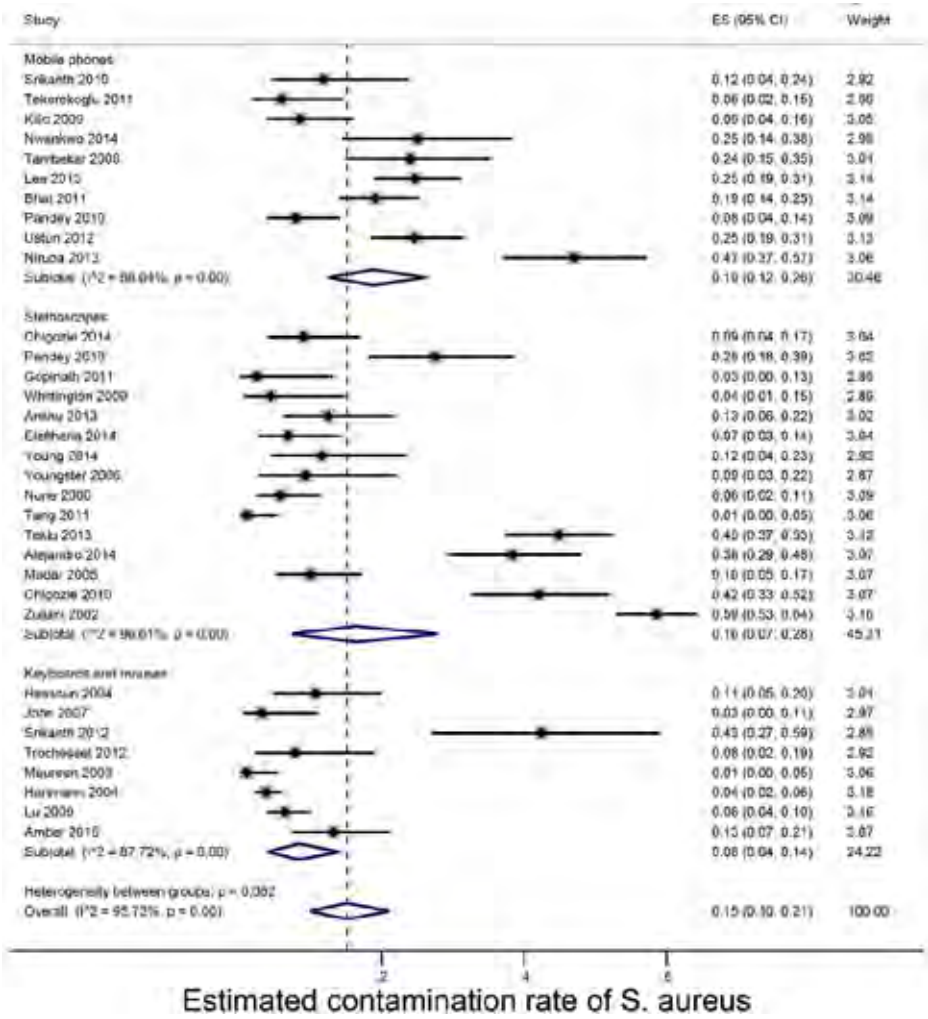
25 MRSA positive patients isolated in single-rooms



Sexton T et al. J Hosp Infect 06; 62:187-94

A meta-analysis of the rates of *Staphylococcus aureus* and methicillin-resistant *S aureus* contamination on the surfaces of environmental objects that health care workers frequently touch

Dongxin Lin MSc [a], Qianting Ou MSc [a], Jialing Lin MSc [a], Yang Peng MSc [b], Zhenjiang Yao PhD [a,*]

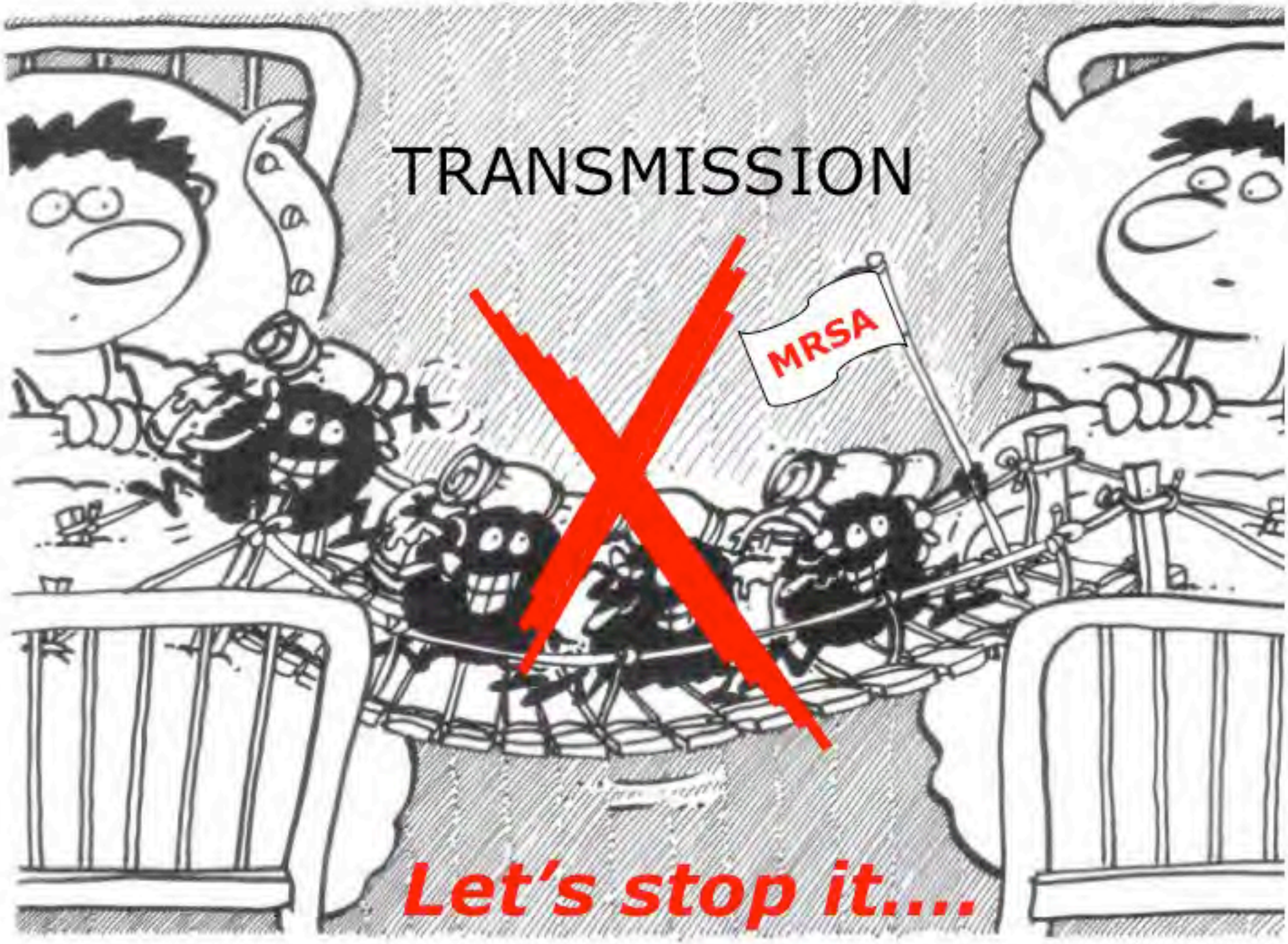


TRANSMISSION RATES

19%

16%

8%


TRANSMISSION
MRSA
Let's stop it....

Strategies for infection control

General measures
Surveillance
Isolation precautions

Antibiotic control
Restriction of use, guidelines, rotation
Selective digestive decontamination

Specific measures
Specifically targeted against VAP
Specifically targeted against BSI
Specifically targeted against ….

Intensive Care Med (2012) 38:1930–1945
DOI 10.1007/s00134-012-2695-9

SPECIAL ARTICLE

Alexis Tabah
Despoina Koulenti
Kevin Laupland
Benoit Misset
Jordi Valles
Frederico Bruzzi de Carvalho
José Artur Paiva
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Stijn Blot
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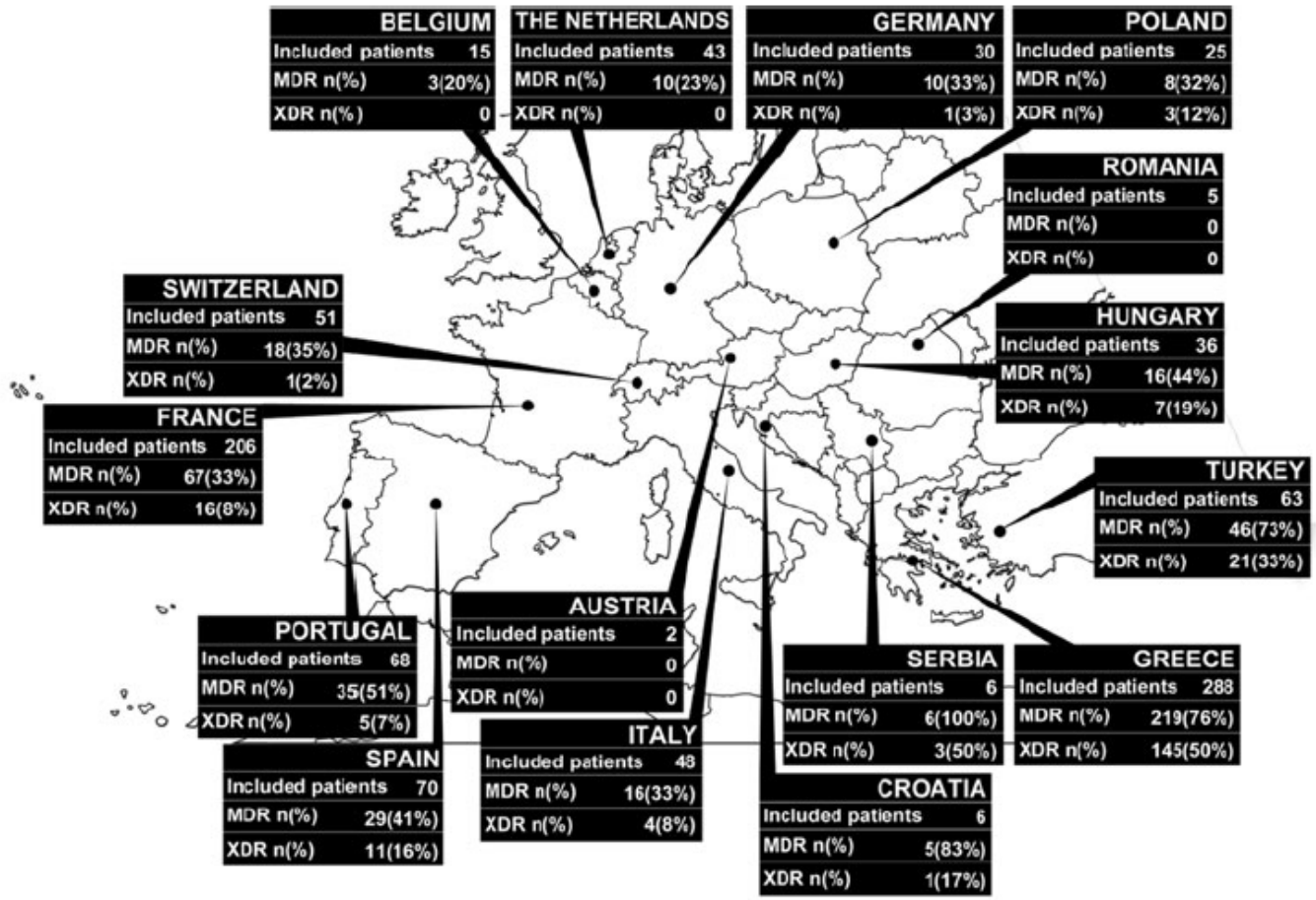
Characteristics and determinants of outcome of hospital-acquired bloodstream infections in intensive care units: the EUROBACT International Cohort Study



Intensive Care Med (2012) 38:1930–1945
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Characteristics and determinants of outcome of hospital-acquired bloodstream infections in intensive care units: the EUROBACT International Cohort Study

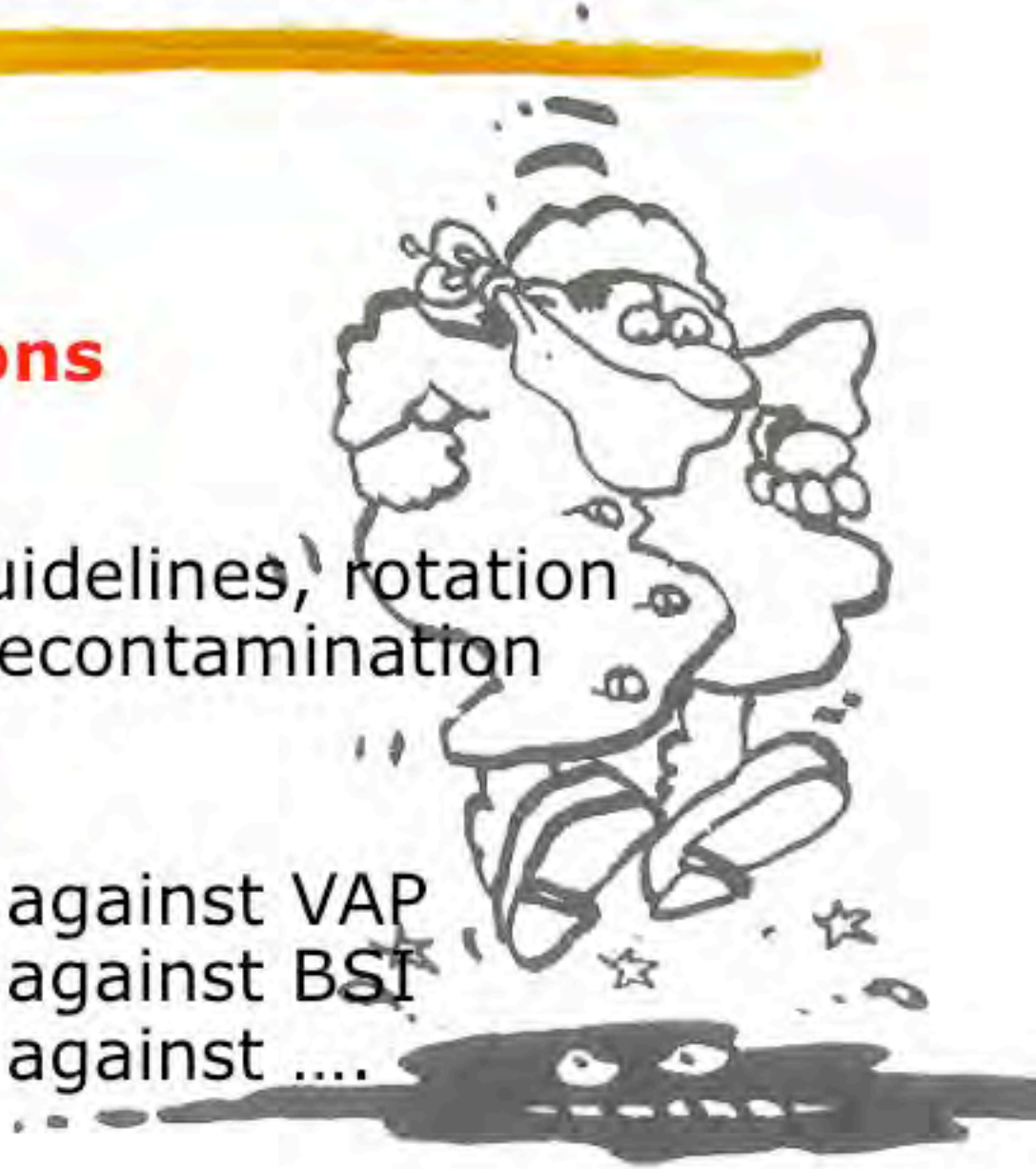
	Susceptible, *n* (%)	MDR,[a] *n* (%)	XDR,[a] *n* (%)	PDR,[a] *n* (%)	Total
Gram-negative					759 (57.6 %)
Acinetobacter spp.	13 (8.1 %)	147 (91.9 %)	114 (71.3 %)	1 (0.6 %)	160 (12.2 %)
Klebsiella spp.	46 (29.5 %)	110 (70.5 %)	76 (48.7 %)	3 (1.9 %)	156 (11.9 %)
Pseudomonas spp.	95 (63.3 %)	55 (36.7 %)	41 (27.3 %)	1 (0.7 %)	150 (11.4 %)
Escherichia coli	57 (58.2 %)	41 (41.8 %)	5 (5.1 %)	0 (0 %)	98 (7.4 %)
Enterobacter spp.	48 (54.6 %)	40 (45.5 %)	17 (19.3 %)	0 (0 %)	88 (6.7 %)
Other gram-negative	69 (64.5 %)	38 (35.5 %)	15 (14.0 %)	0 (0 %)	107 (8.1 %)
Gram-positive					440 (33.4 %)
Enterococcus spp	103 (71.5 %)	41 (28.5 %)	2 (1.4 %)	0 (0 %)	144 (10.9 %)
Coagulase-negative staphylococci and other staphylococci	141 (100 %)	0 (0 %)	0 (0 %)	0 (0 %)	141 (10.7 %)
Staphylococcus aureus	60 (50.4 %)	59 (49.6 %)	0 (0 %)	0 (0 %)	119 (9 %)
Other gram-positive	36 (100 %)	0 (0 %)	0 (0 %)	0 (0 %)	36 (2.7 %)
Anaerobes					20 (1.5 %)
Bacteroides spp.	13 (100 %)	0 (0 %)	0 (0 %)	0 (0 %)	13 (1 %)
Other anaerobes	7 (100 %)	0 (0 %)	0 (0 %)	0 (0 %)	7 (0.5 %)
Fungi					98 (7.4 %)
Candida albicans	0 (0 %)	56 (100 %)	0 (0 %)	0 (0 %)	56 (4.3 %)
Candida non-*albicans*	0 (0 %)	39 (100 %)	0 (0 %)	0 (0 %)	39 (3 %)
Other	0 (0 %)	3 (100 %)	0 (0 %)	0 (0 %)	3 (0.2 %)
Total (patient)[b]	570 (49.3 %)	586 (50.7 %)	254 (22 %)	5 (0.43 %)	1,156
Total (micro-organisms)	688 (52.2 %)	629 (47.8 %)	270 (20.5 %)	5 (0.38 %)	1,317

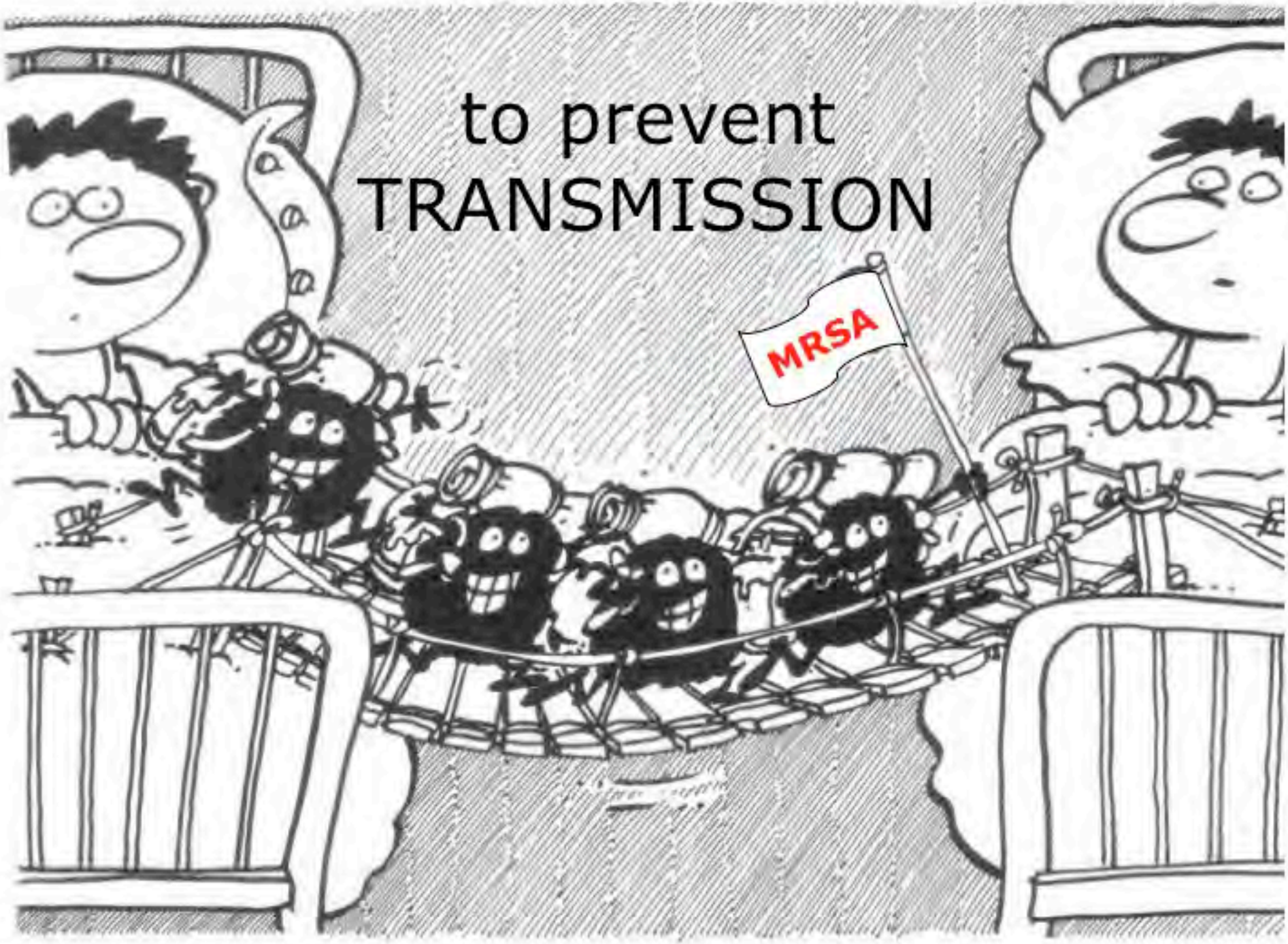
Strategies for infection control

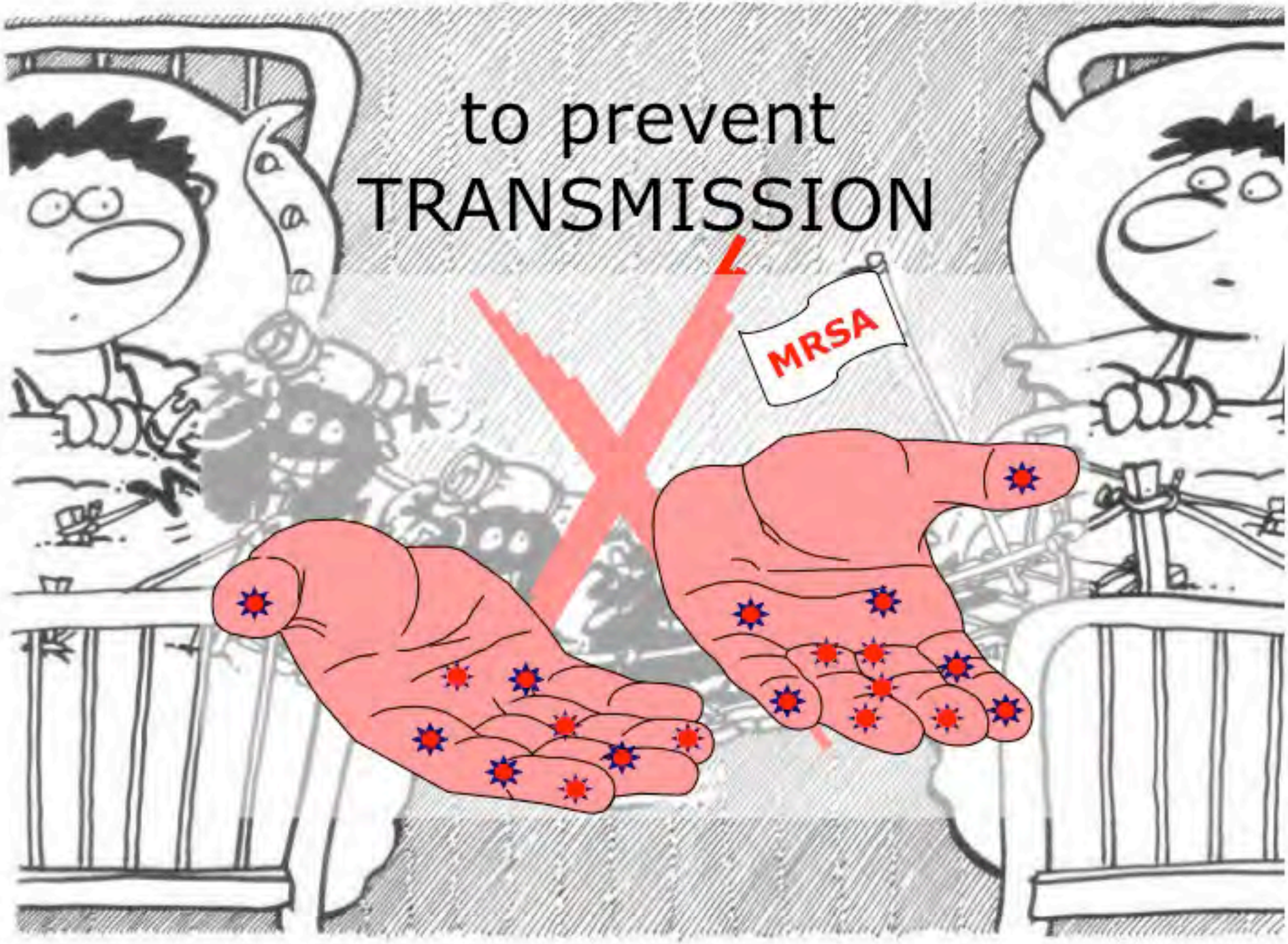
General measures
Surveillance
Isolation precautions

Antibiotic control
Restriction of use, guidelines, rotation
Selective digestive decontamination

Specific measures
Specifically targeted against VAP
Specifically targeted against BSI
Specifically targeted against ....




to prevent
TRANSMISSION
MRSA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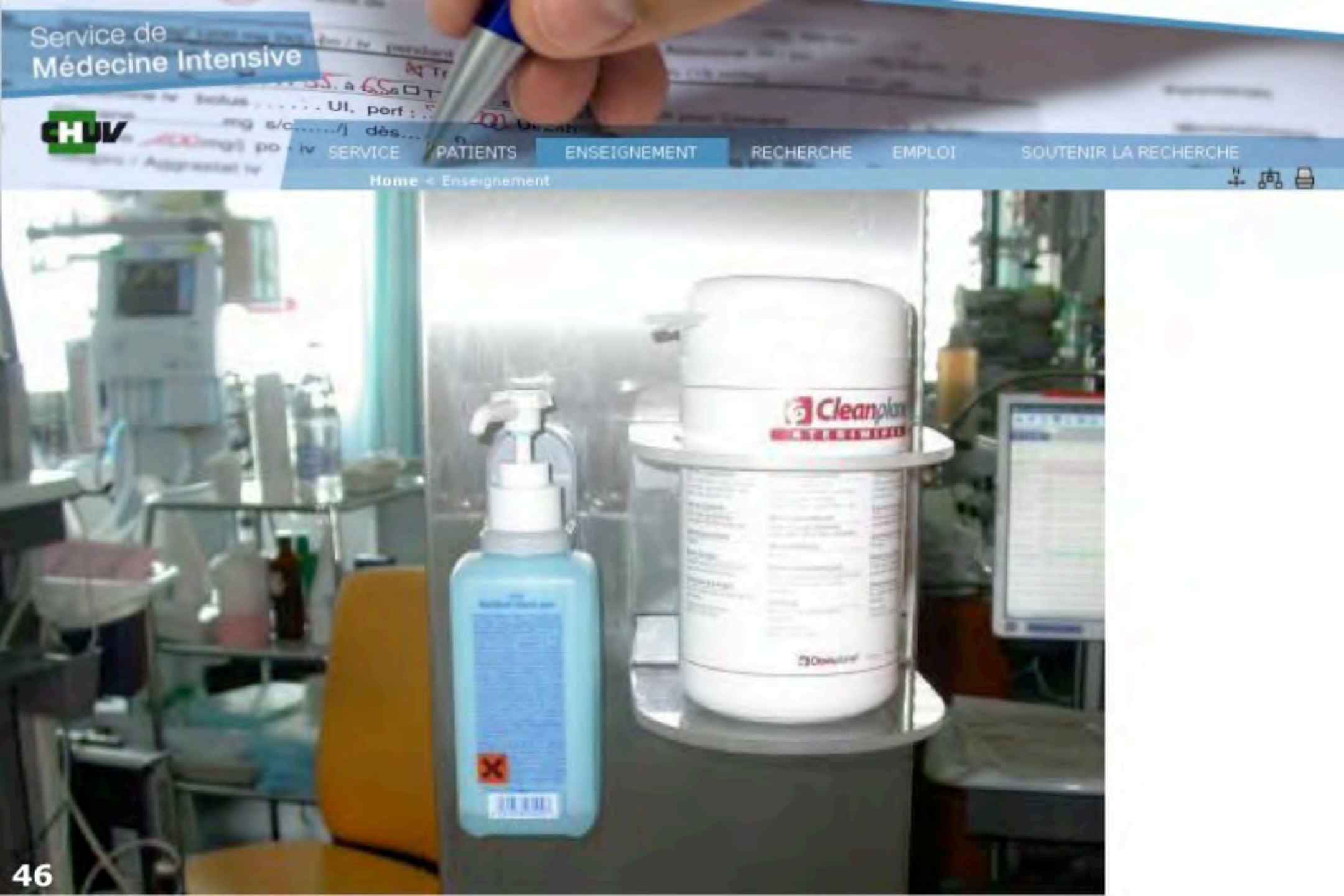

Cleanplan

Infection control

Service de Médecine Intensive

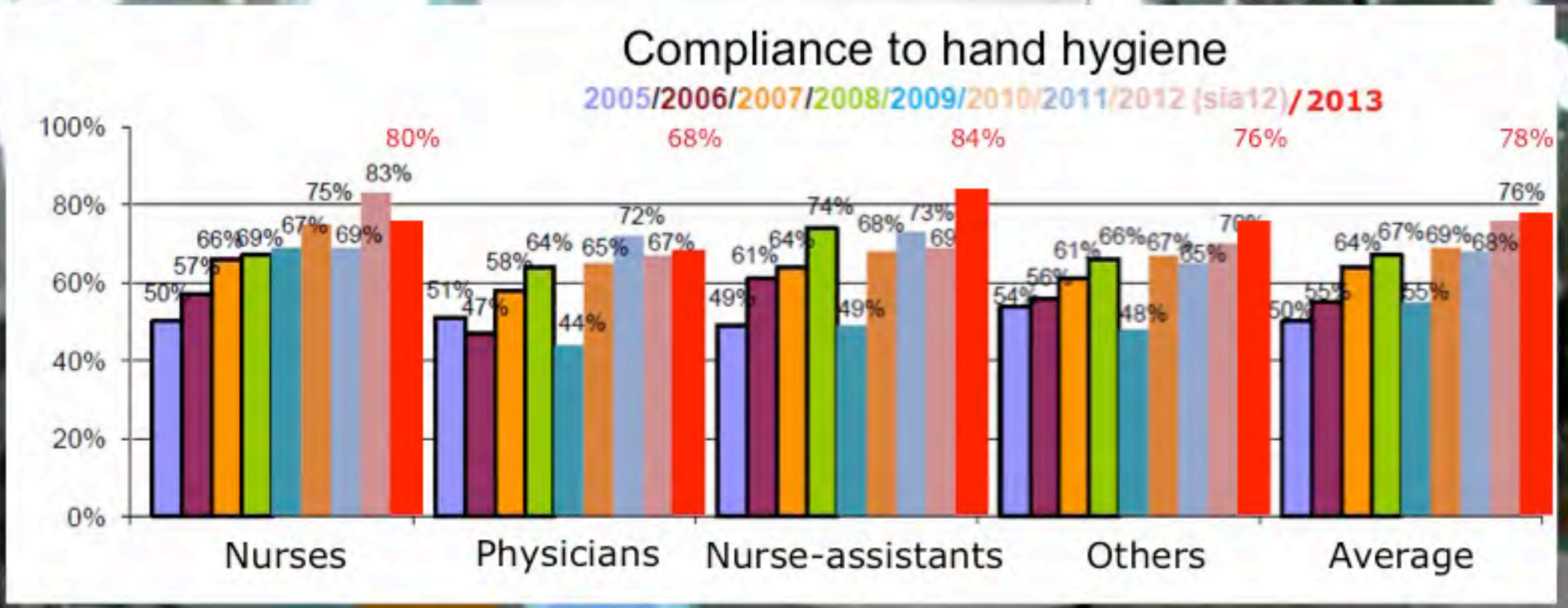
CHUV

SERVICE | PATIENTS | ENSEIGNEMENT | RECHERCHE | EMPLOI | SOUTENIR LA RECHERCHE

Home < Enseignement

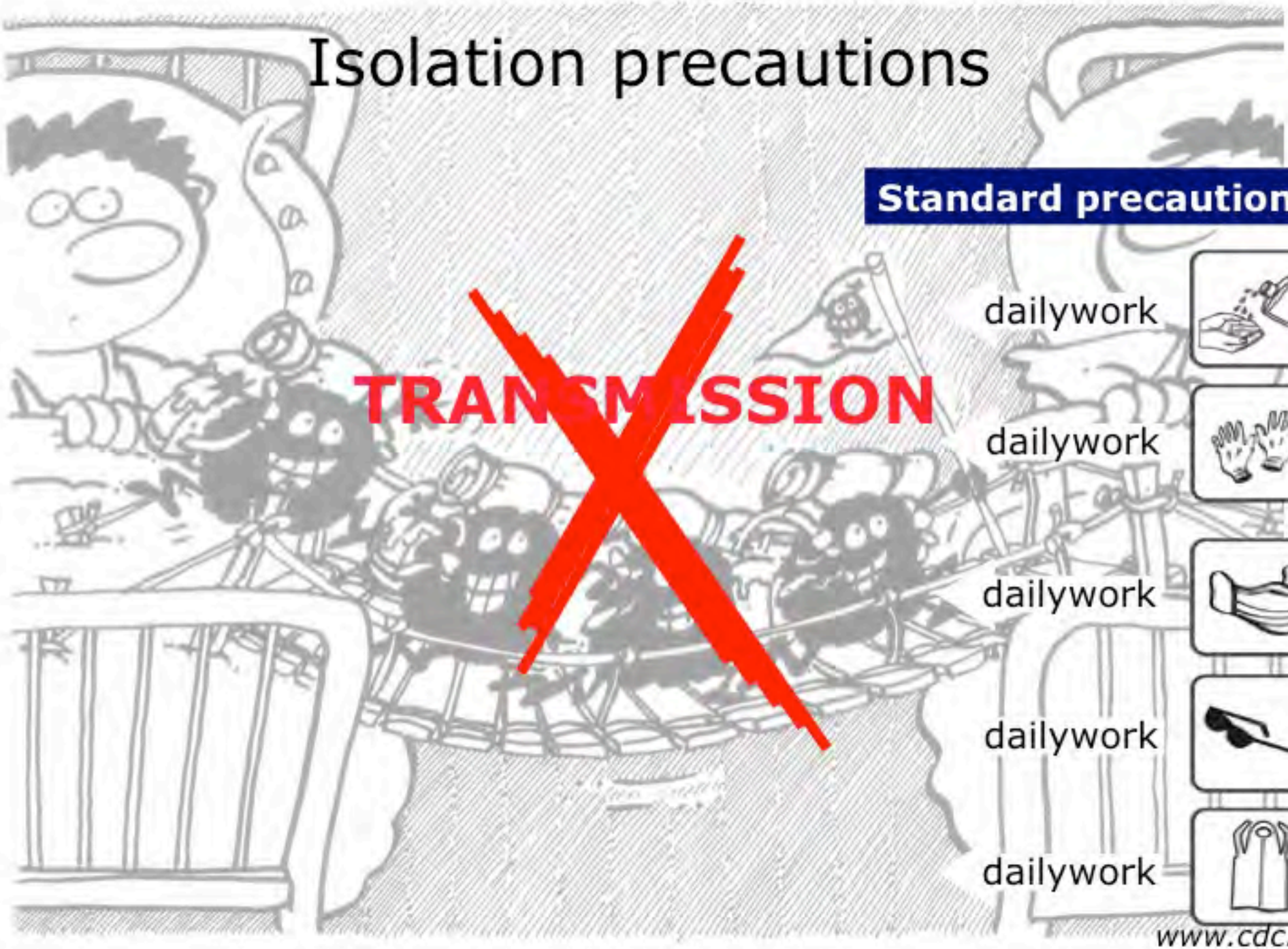
Your 5 Moments for Hand Hygiene

Hand hygiene



53 dispenders for 14 beds !

Isolation precautions



Isolation precautions

Transmission-based precautions

exceptions

exceptions

exceptions

exceptions

exceptions

Standard precautions

dailywork

dailywork

dailywork

dailywork

dailywork

www.cdc.gov

Strategies for infection control

General measures
Surveillance = screening
Isolation precautions

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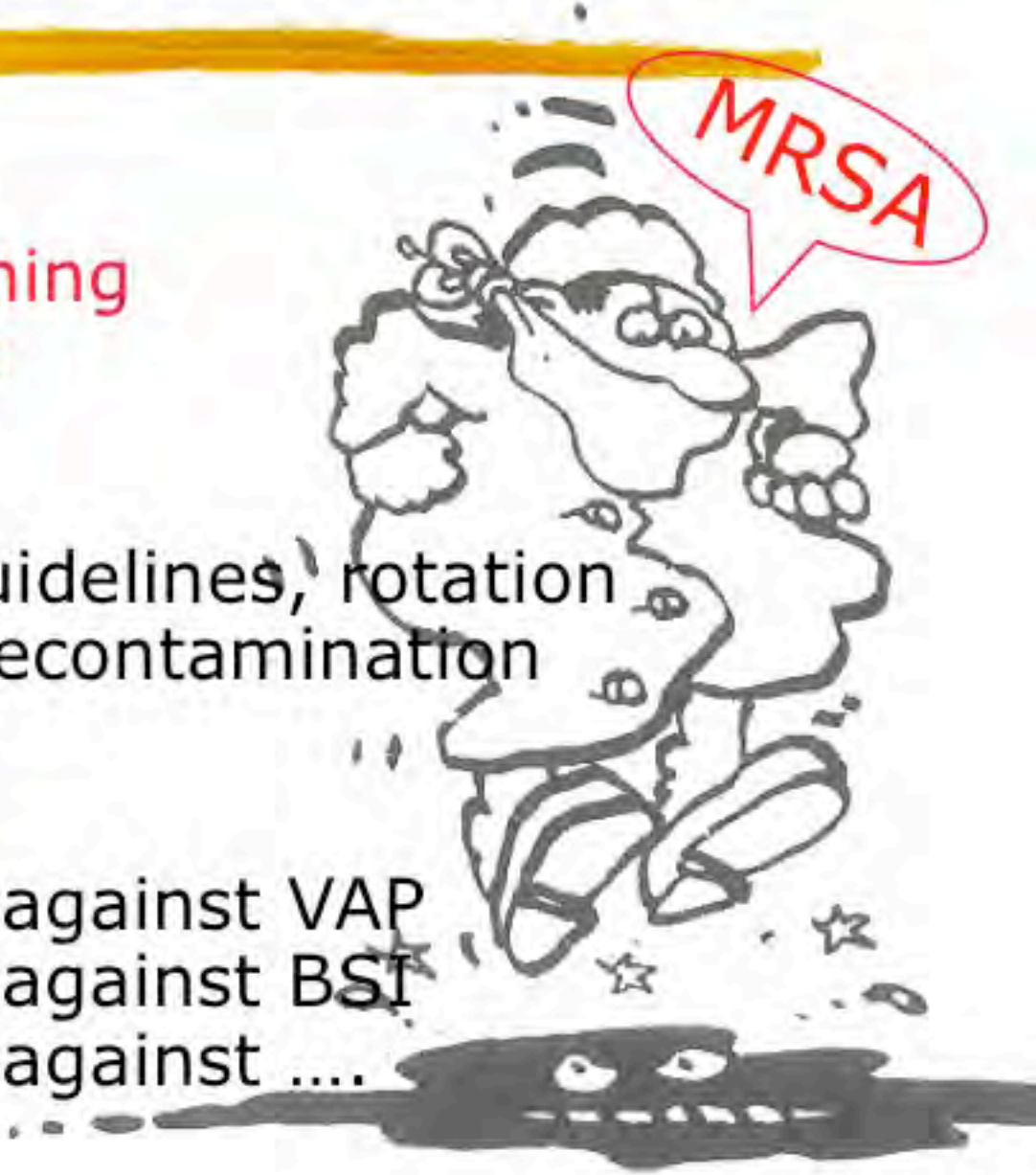


Isolation precautions

Transmission-based precautions

exceptions

FOR MRSA

Standard precautions

dailywork 

dailywork 

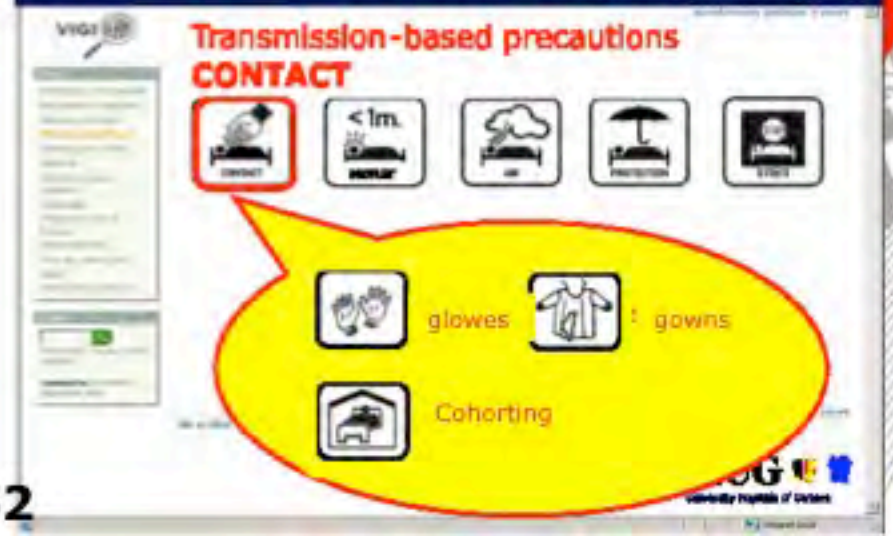
dailywork 

dailywork 

dailywork 

www.cdc.gov

Hospital-wide education program



Efficacy of screening + isolation

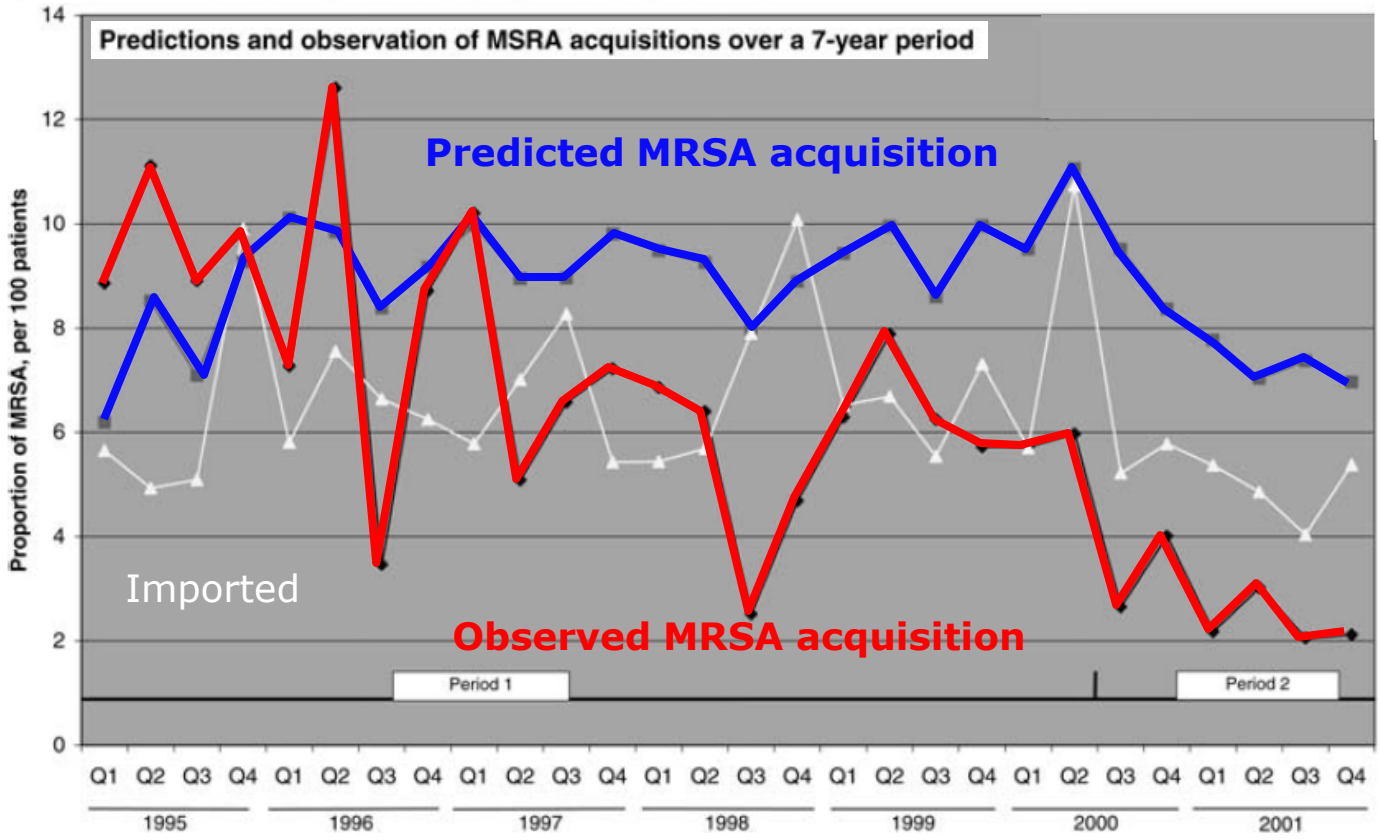
Intensive Care Med (2005) 31:1051–1057
DOI 10.1007/s00134-005-2679-0

ORIGINAL

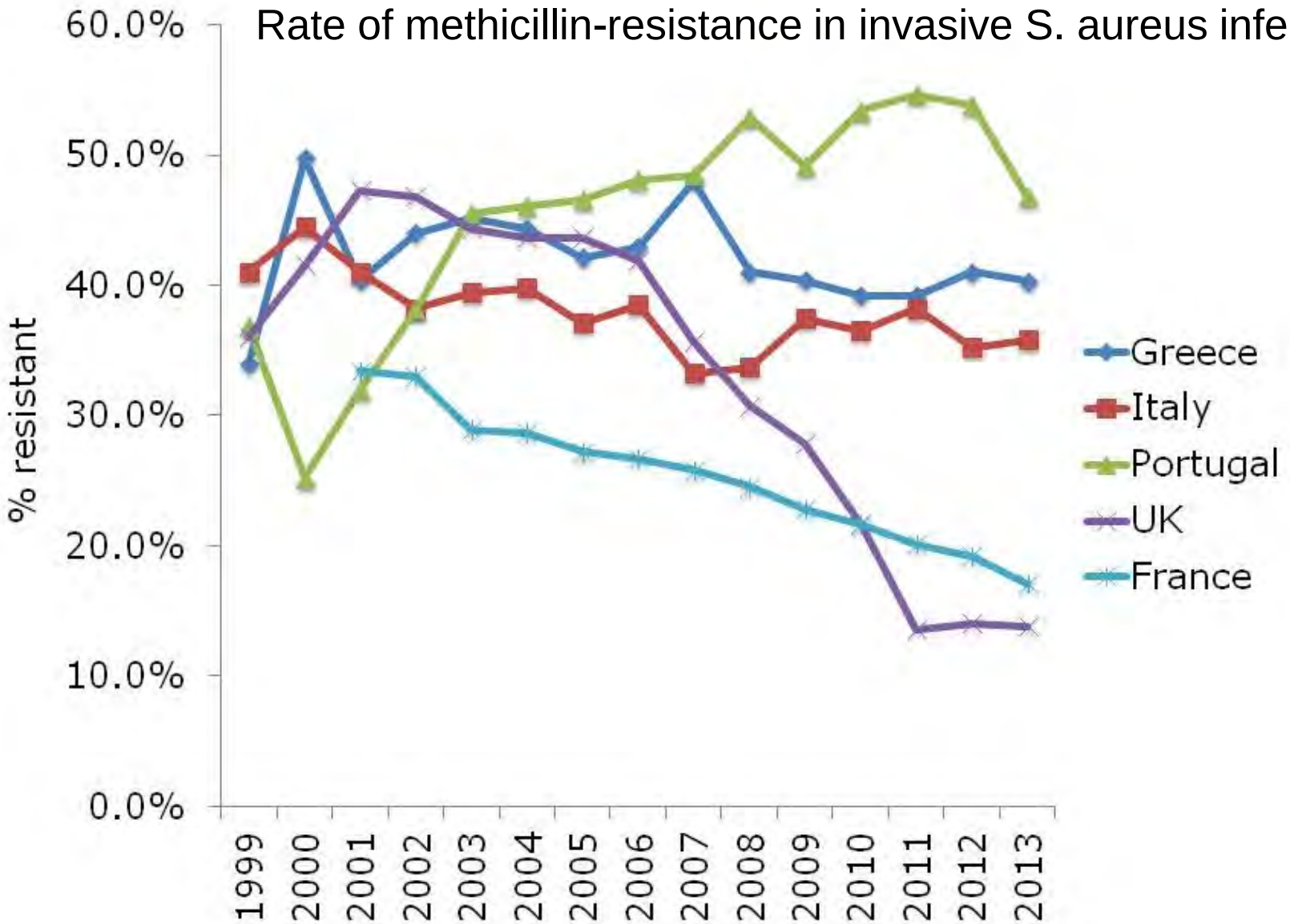
Jean-Christophe Lucet
Xavier Paoletti
Isabelle Lolom
Catherine Paugam-Burtz
Jean-Louis Trouillet
Jean-François Timsit
Claude Deblangy
Antoine Andremont
Bernard Regnier

Successful long-term program for controlling methicillin-resistant *Staphylococcus aureus* in intensive care units

- à Screening
- à Standard precautions
  - OH-handrub
- à Contact precautions
  - preemptive isolation

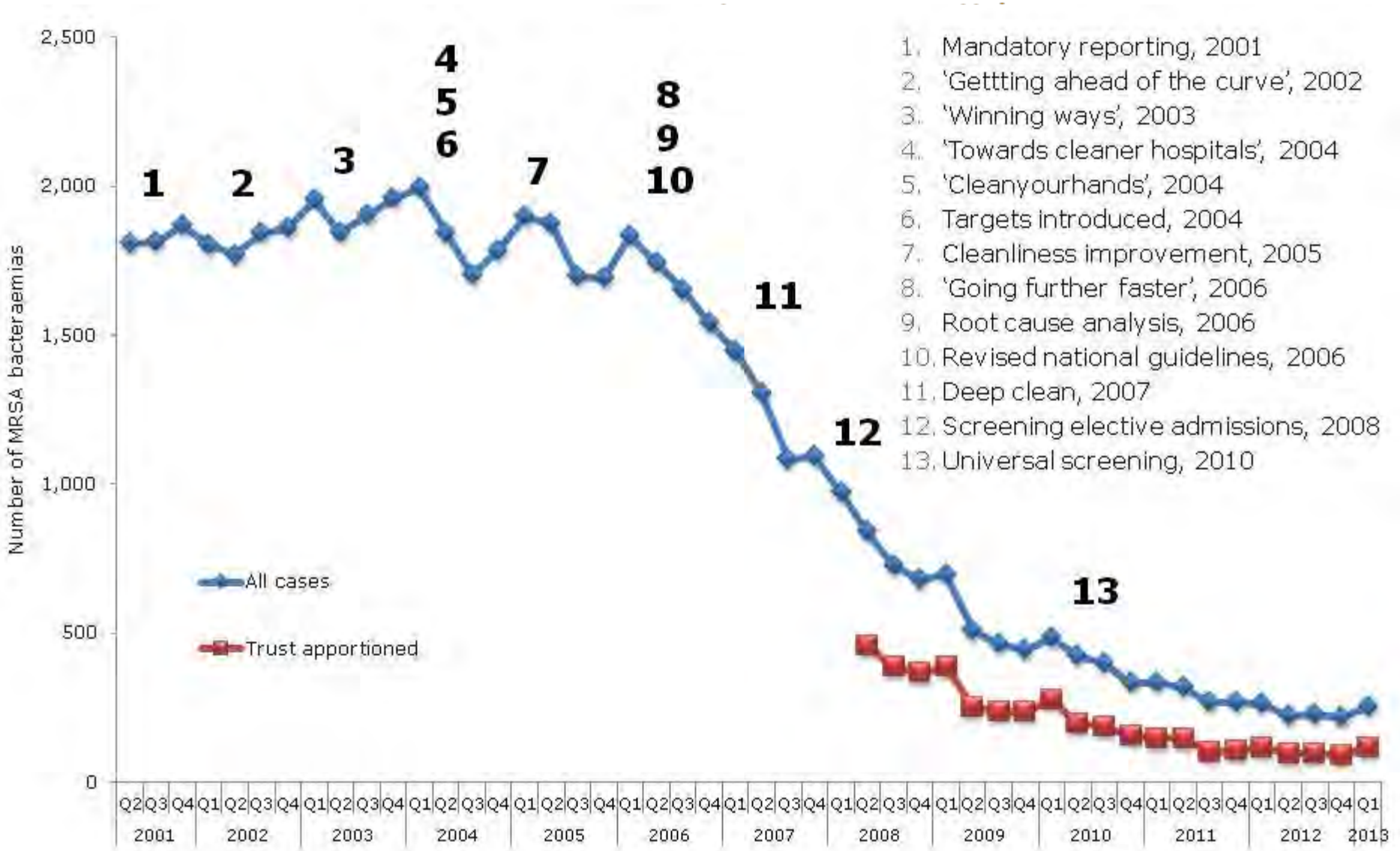


Efficacy of screening + isolation



http://reflectionsipc.com/category/mrsa/page/2/

Efficacy of screening + isolation



 https://reflectionsipc.files.wordpress.com/2015/03/mrsa-bacteraemia-whats-made-the-differecnce.jpg

Doubts on screening + isolation

Interventions to reduce colonisation and transmission of antimicrobial-resistant bacteria in intensive care units: an interrupted time series study and cluster randomised trial

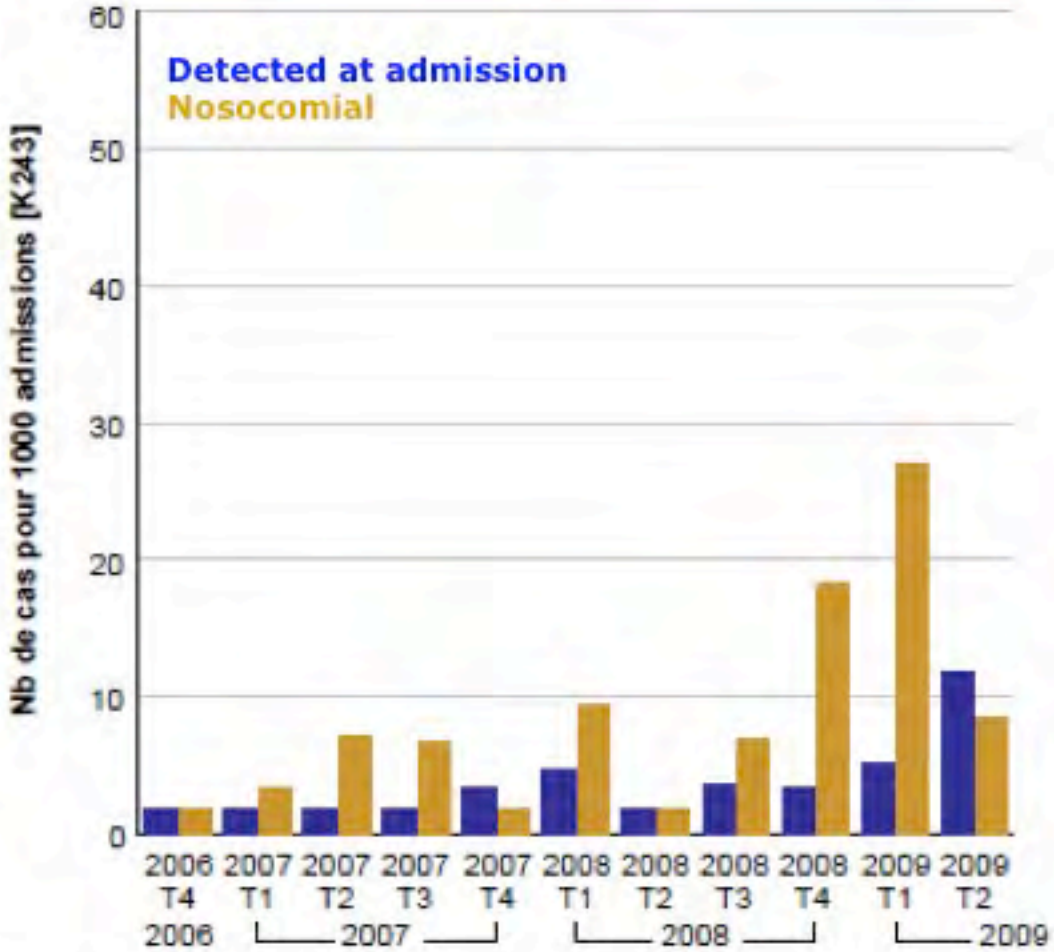
Lennie P G Derde, Ben S Cooper, Herman Goossens, Surbhi Malhotra-Kumar, Rob J L Willems, Marek Gniadkowski, Waleria Hryniewicz, Joanna Empel, Mirjam J D Dautzenberg, Djillali Annane, Irene Aragão, Annie Chalfine, Uga Dumpis, Francisco Esteves, Helen Giamarellou, Igor Muzlovic, Giuseppe Nardi, George L Petrikkos, Viktorija Tomic, Antonio Torres Marti, Pascal Stammet, Christian Brun-Buisson, Marc J M Bonten*, on behalf of the MOSAR WP3 Study Team*

Interpretation Improved hand hygiene plus unit-wide chlorhexidine body-washing reduced acquisition of antimicrobial-resistant bacteria, particularly MRSA. In the context of a sustained high level of compliance to hand hygiene and chlorhexidine bathings, screening and isolation of carriers do not reduce acquisition rates of multidrug-resistant bacteria, whether or not screening is done with rapid testing or conventional testing.

Lancet Infect Dis 2014; 14: 31-39

MRSA outbreak in 35-bed ICU

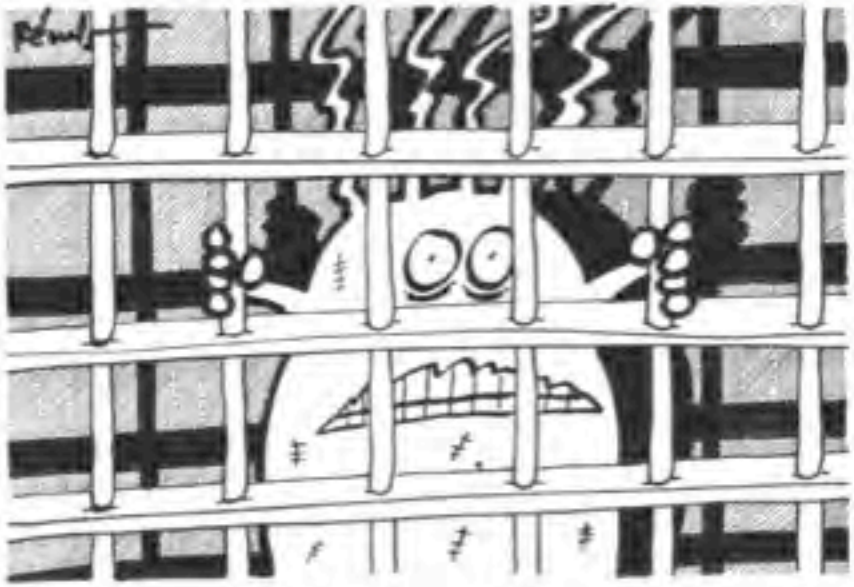
Service de détection: SIA - Médecine intensive adulte (SMIA)

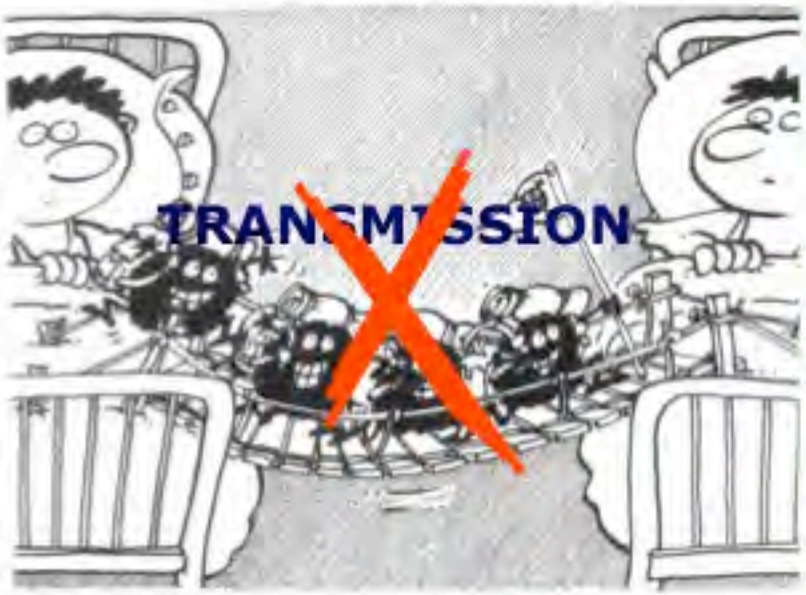


Tissot F.
SMPH

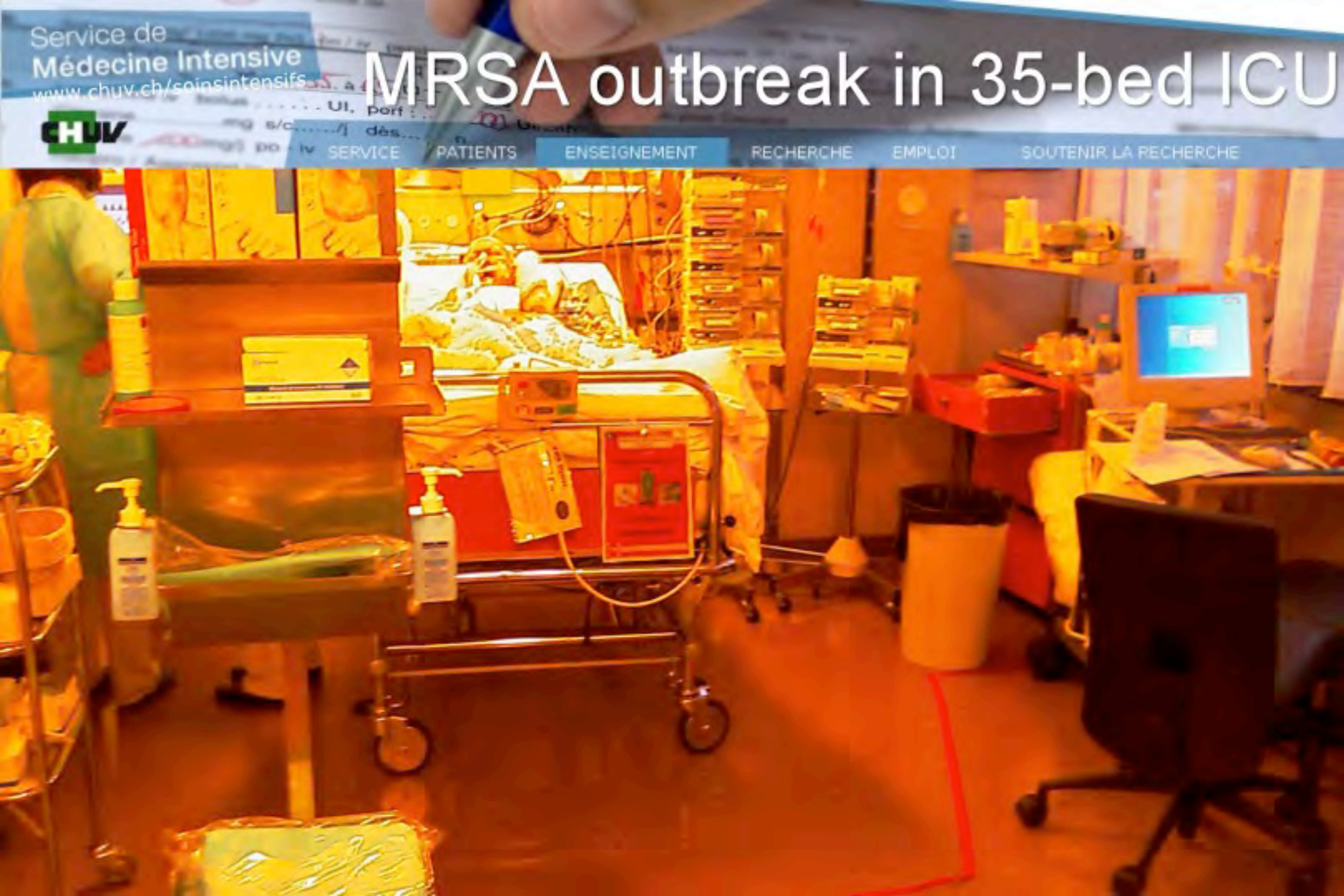
MRSA outbreak in 35-bed ICU

The objective is not to isolate!



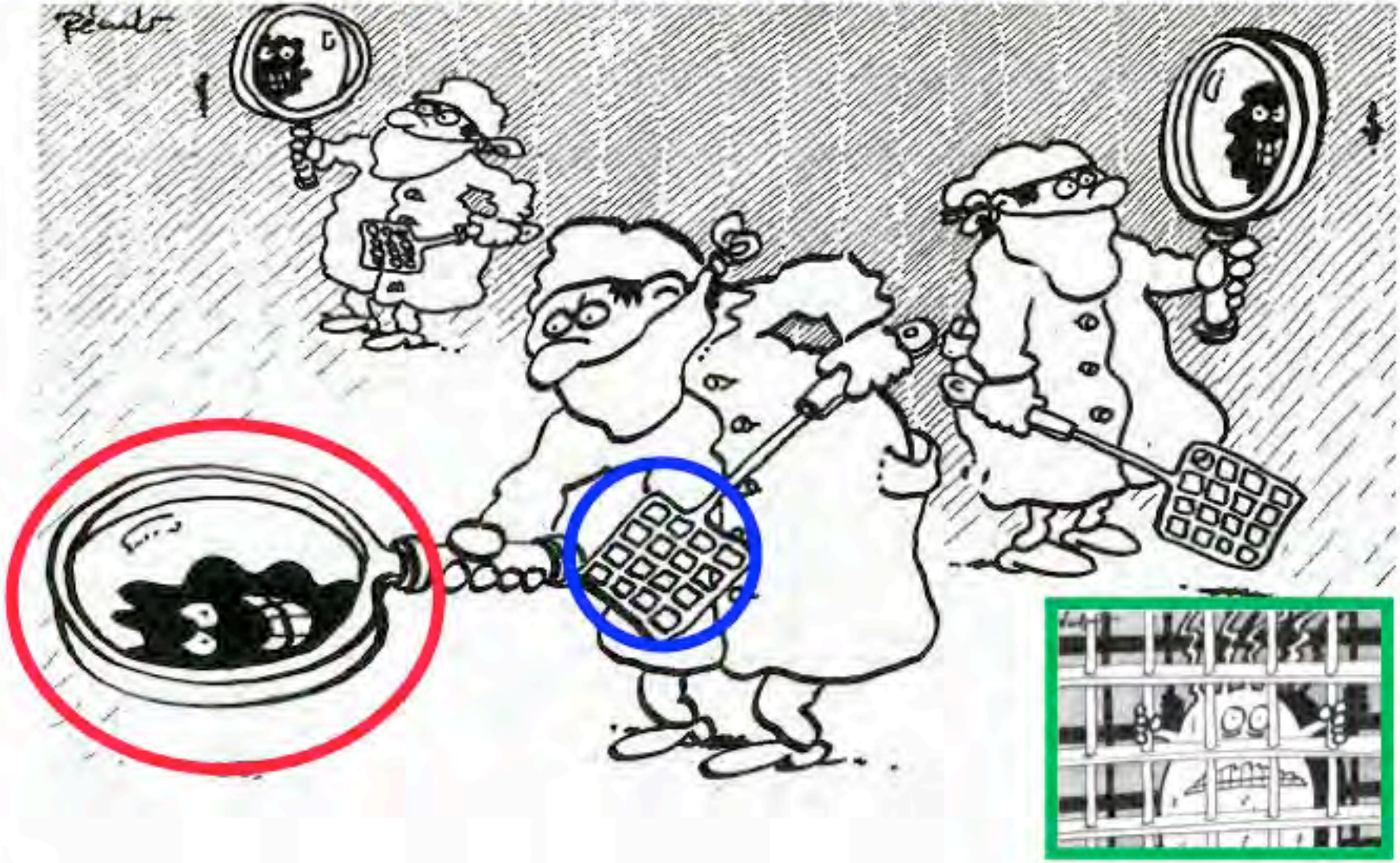


But to prevent the transmission of microorganisms

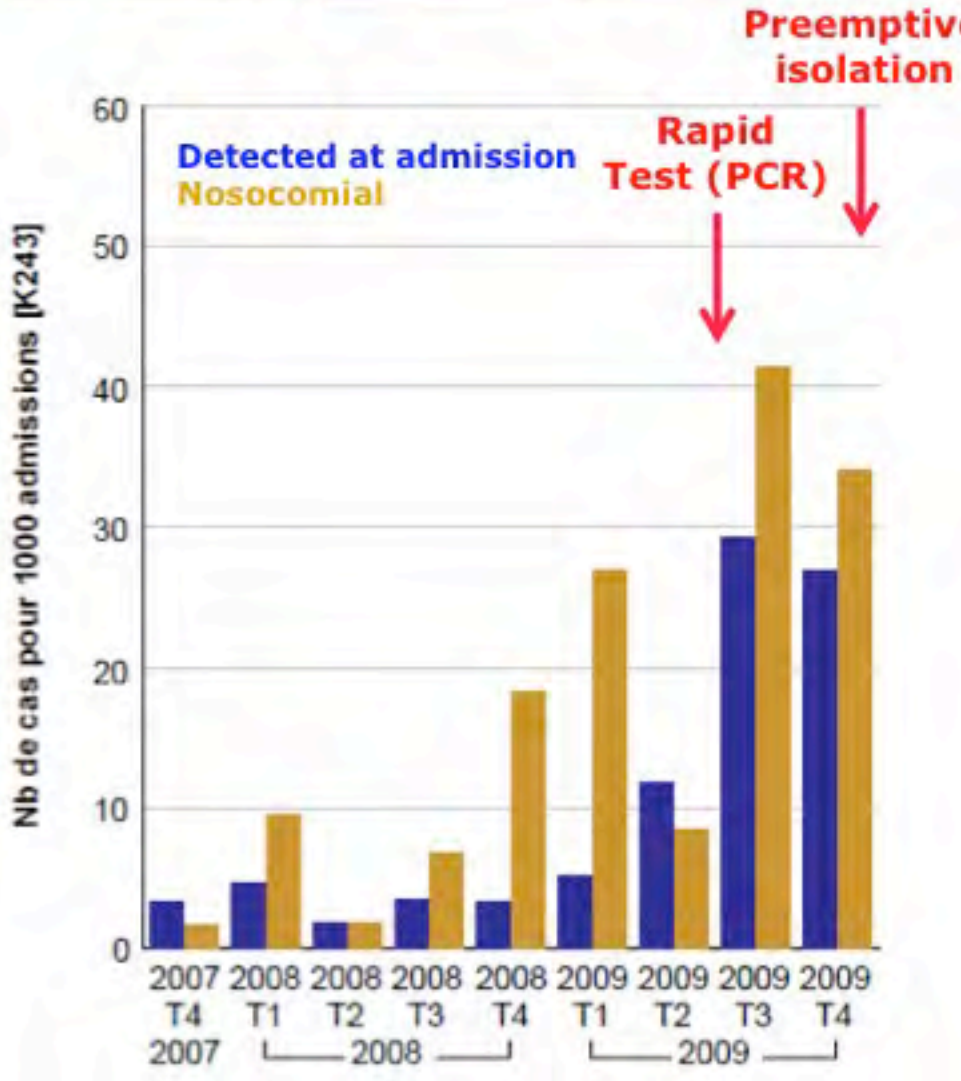


MRSA outbreak in 35-bed ICU

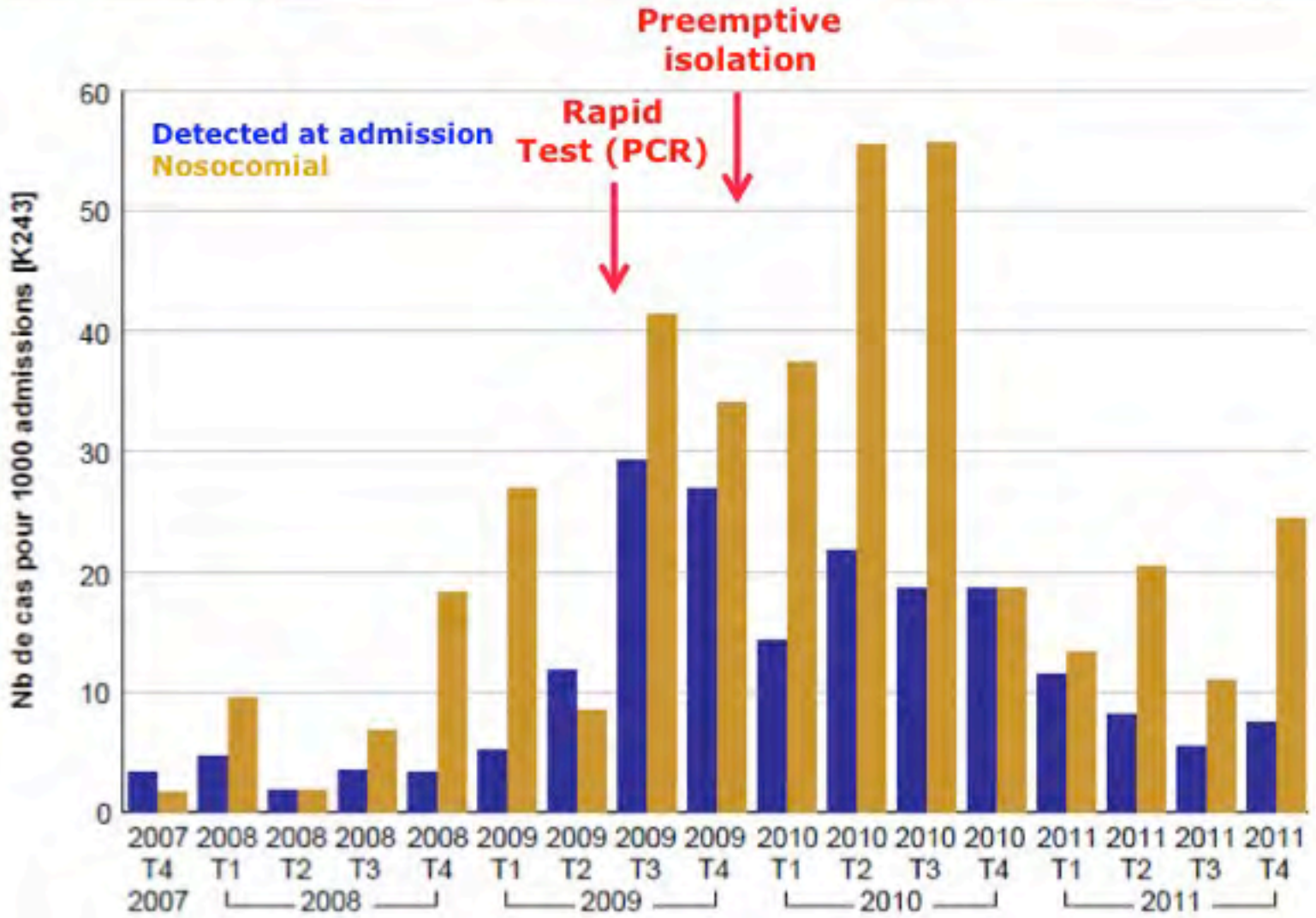
Screening + preemptive isolation + decolonization may control MRSA



MRSA outbreak in 35-bed ICU



MRSA outbreak in 35-bed ICU



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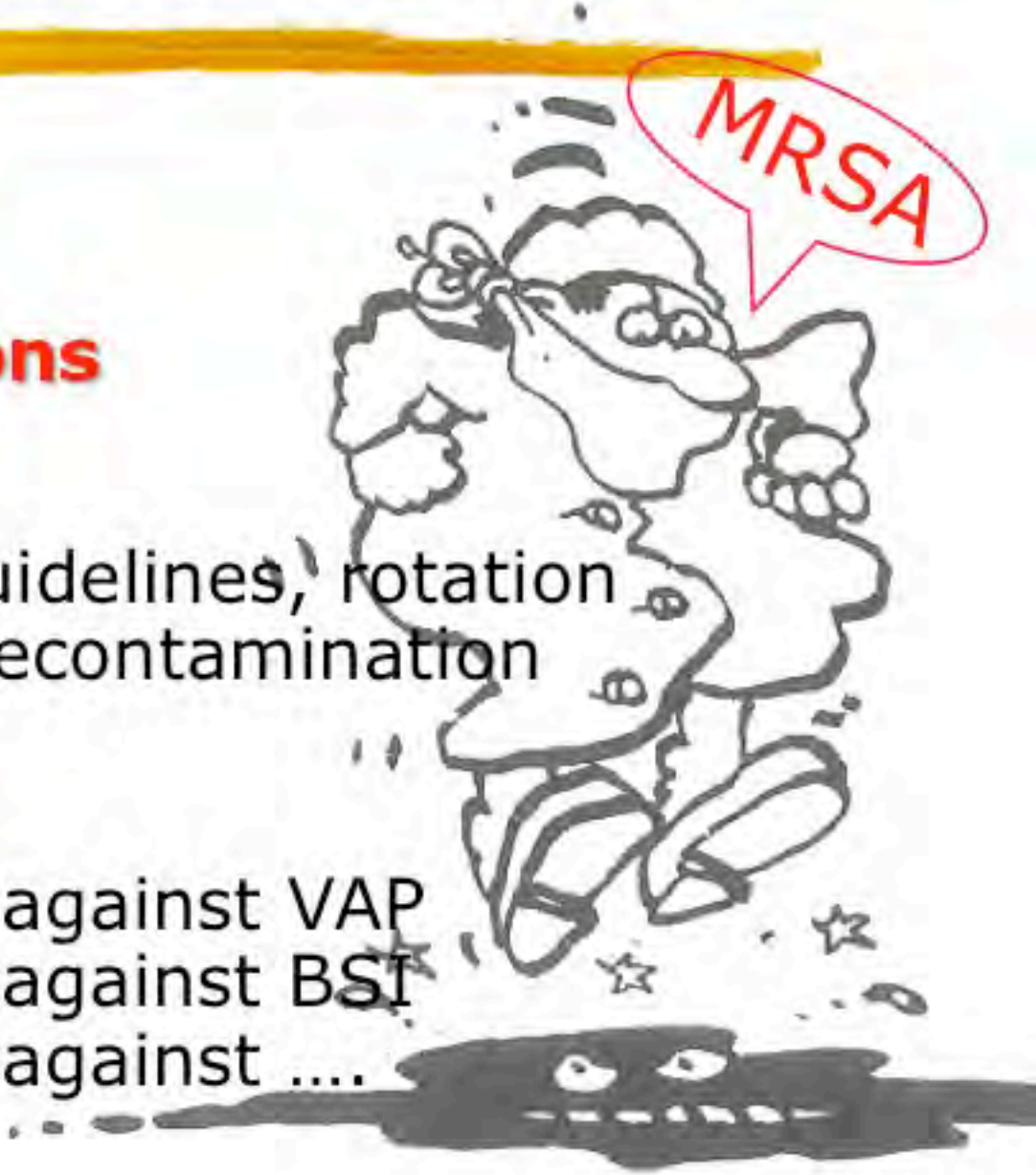


CHX washing

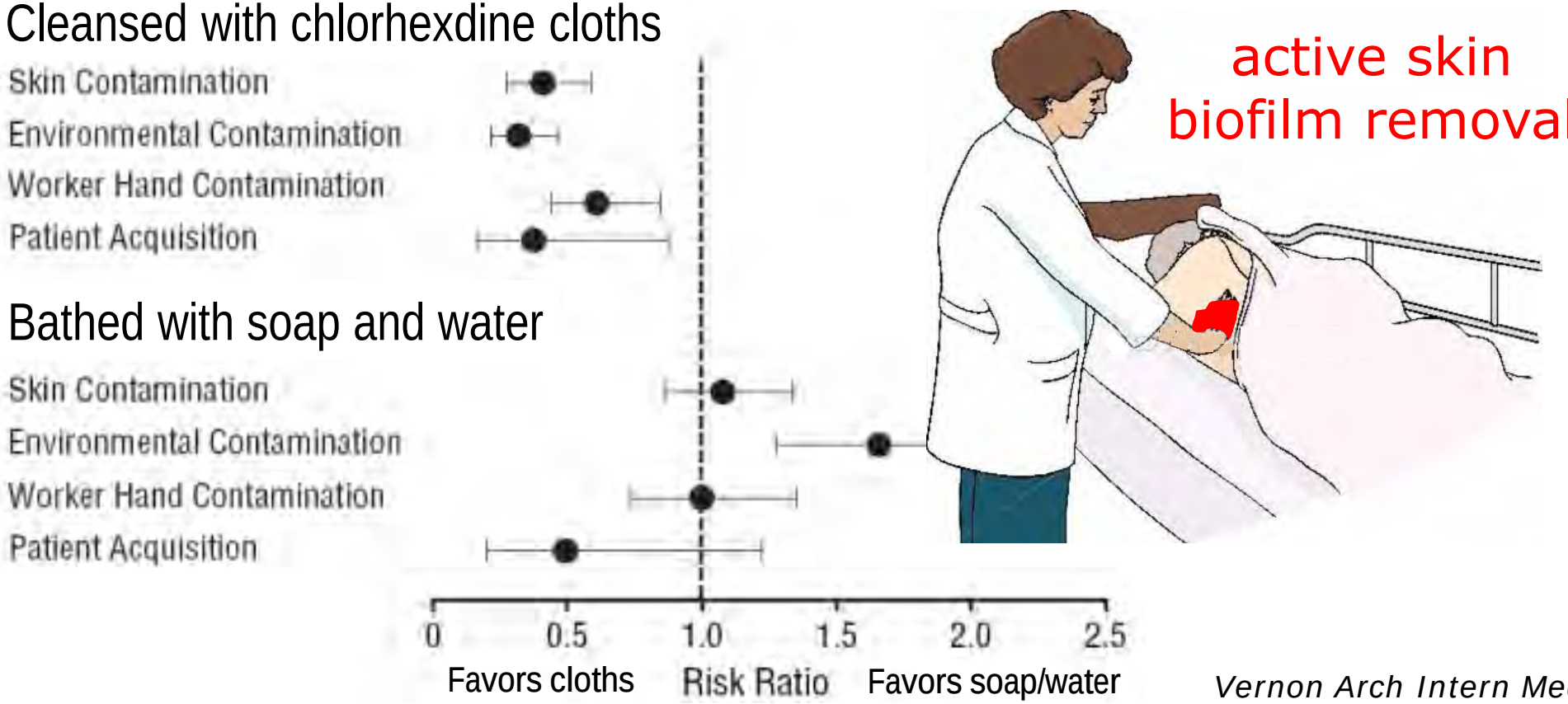
?

active skin
biofilm removal

CHX washing à source control

Chlorhexidine Gluconate to Cleanse Patients in a Medical Intensive Care Unit

Source Control to Reduce the Bioburden of Vancomycin-Resistant Enterococci

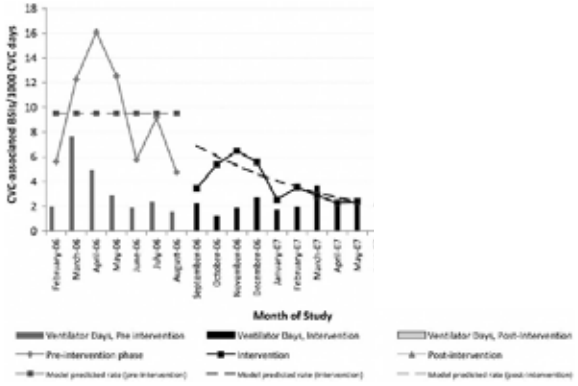


Vernon Arch Intern Med 06

CHX washing à source control

Prevention of Bloodstream Infections by Use of Daily Chlorhexidine Baths for Patients at a Long-Term Acute Care Hospital

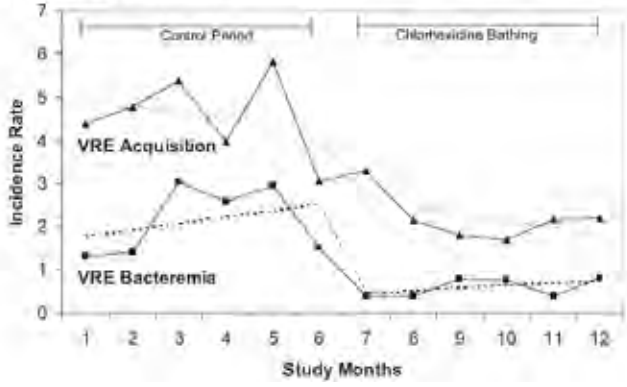
L. Silvia Munoz-Price, MD; Bala Hota, MD, MPH; Alexander Stemer, MD; Robert A. Weinstein, MD



INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY NOVEMBER 2009, VOL. 30, NO. 11

The effect of daily bathing with chlorhexidine on the acquisition of methicillin-resistant *Staphylococcus aureus*, vancomycin-resistant *Enterococcus*, and healthcare-associated bloodstream infections: Results of a quasi-experimental multicenter trial*

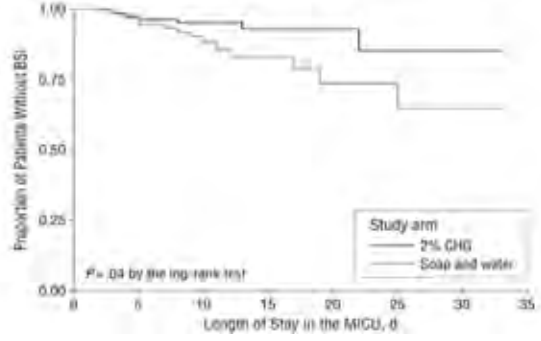
Michael W. Climo, MD; Kent A. Sepkowitz, MD; Gianna Zuccotti, MD, MPH; Victoria J. Fraser, MD; David K. Warren, MD; Trish M. Perl, MD, MSc; Kathleen Speck; John A. Jernigan, MD; Jaime R. Robles, PhD; Edward S. Wong, MD



Effectiveness of Chlorhexidine Bathing to Reduce Catheter-Associated Bloodstream Infections in Medical Intensive Care Unit Patients

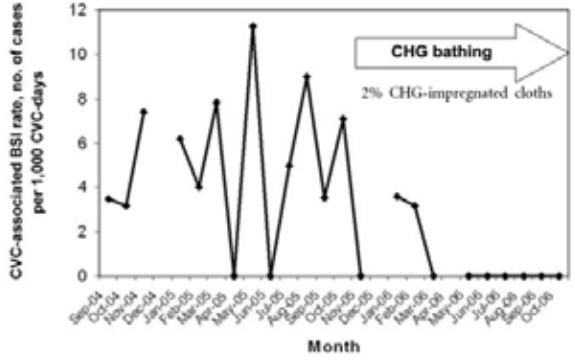
Susan C. Bleasdale, MD; William E. Trick, MD; Ines M. Gonzalez, MD; Rosie D. Lyles, MD; Mary K. Hayden, MD; Robert A. Weinstein, MD

Arch Intern Med. 2007;167(19):2073-2079



Effectiveness of Routine Patient Cleansing with Chlorhexidine Gluconate for Infection Prevention in the Medical Intensive Care Unit

Kyle J. Popovich, MD; Bala Hota, MD, MPH; Robert Hayes, BA; Robert A. Weinstein, MD; Mary K. Hayden, MD



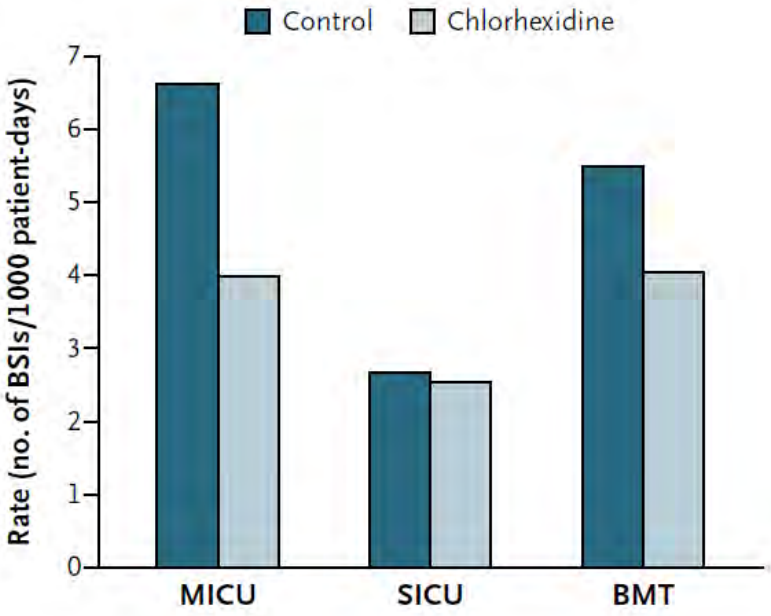
INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY OCTOBER 2009, VOL. 30, NO. 10

CHX washing à source control

The NEW ENGLAND JOURNAL of MEDICINE

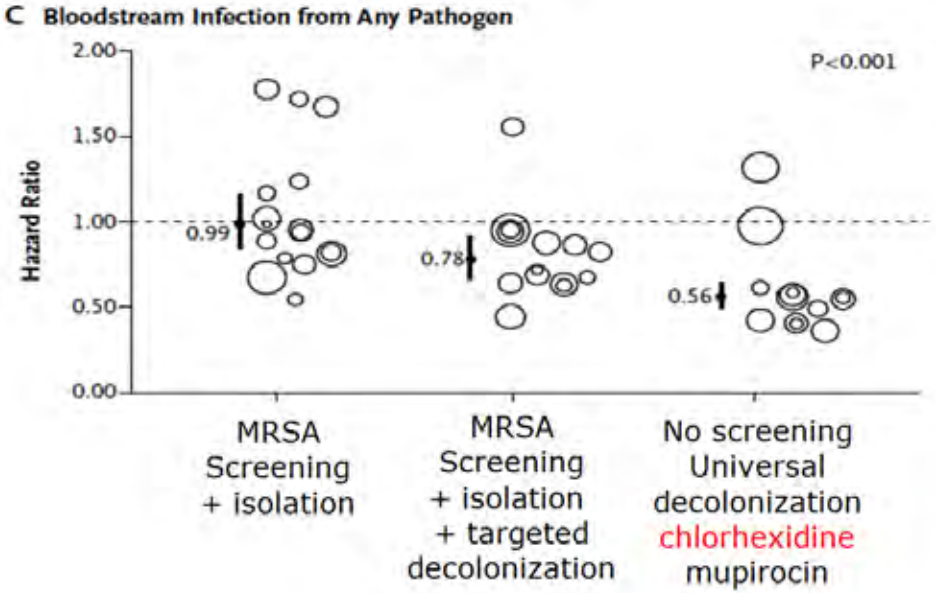
Effect of Daily Chlorhexidine Bathing on Hospital-Acquired Infection

Michael W. Climo, M.D., Deborah S. Yokoe, M.D., M.P.H., David K. Warren, M.D., Trish M. Perl, M.D., Maureen Bolon, M.D., Loreen A. Herwaldt, M.D., Robert A. Weinstein, M.D., Kent A. Sepkowitz, M.D., John A. Jernigan, M.D., Kakotan Sanogo, M.S., and Edward S. Wong, M.D.



Targeted versus Universal Decolonization to Prevent ICU Infection

Susan S. Huang, M.D., M.P.H., Edward Septimus, M.D., Ken Kleinman, Sc.D., Julia Moody, M.S., Jason Hickok, M.B.A., R.N., Taliser R. Avery, M.S., Julie Lankiewicz, M.P.H., Adrijana Gombosev, B.S., Leah Terpstra, B.A., Fallon Hartford, M.S., Mary K. Hayden, M.D., John A. Jernigan, M.D., Robert A. Weinstein, M.D., Victoria J. Fraser, M.D., Katherine Haffenreffer, B.S., Eric Cui, B.S., Rebecca E. Kaganov, B.A., Karen Lolans, B.S., Jonathan B. Perlin, M.D., Ph.D., and Richard Platt, M.D., for the CDC Prevention Epicenters Program and the AHRQ DECIDE Network and Healthcare-Associated Infections Program*



This article was published on May 29,

Quand l'ergonomie joue un tour à la toilette !

C. Joseph[1], V. Plouhinec[1], MJ. Thévenin[2], Ph. Maravic[1], Ph. Eggimann[1] (christine.joseph@chuv.ch)
Service de Médecine Intensive Adulte[1], Service Médecine Préventive Hospitalière[2] CHUV, Lausanne, Suisse.

INTRODUCTION

La toilette : Un moment privilégié entre le patient et le soignant (détente, rafraîchissement), d'observation (état de la peau), d'évaluation sensitivomoteur (perception, toucher, stimuler), de communication et d'échange (ressenti, douleur, angoisse). Une configuration architecturale (1 lavabo par chambre de 2 à 3 lits) complique sa réalisation et favorise le risque de transmission de germes.

METHODE

Test de 4 types de lingettes (incontinence) et de gants (toilette) à usage unique. Questionnaire unique. Nombre de toilettes avec chaque produit.

RESULTATS

1) UN SEUL GESTE: lave, hydrate, et stimule
2) GAIN DE TEMPS: 10 min/toilette (équivalent à 1 EPT/an)
3) Observation continue du patient, sans interruptions
4) Gain de temps (pas de rinçage, ni de séchage, produit hydratant)
5) Meilleur respect des principes d'hygiène lors de la toilette
6) ↓ dangers: glissade, éclaboussures
7) Amélioration de nos pratiques
8) Diminution des trajets au lavabo

Evaluation de 4 lingettes et gants à usage unique au SMIA

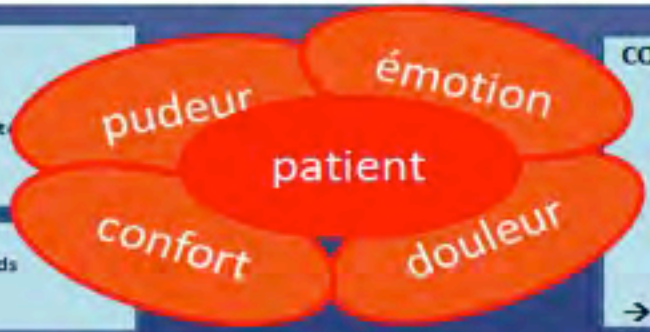
	Produit 1 (n=61)	Produit 2 (n=58)	Produit 3 (n=34)	Produit 4 (n=14)	Total (n=165)
Satisfaction globale					
+++	51 (84%)	25 (45%)	9 (27%)	11 (79%)	96 (58%)
+	3 (5%)	26 (46%)	24 (70%)	3 (21%)	56 (34%)
-	6 (10%)	5 (9%)	1 (3%)	0	12 (7%)
---	1 (1%)	0	0	0	1 (0.5%)
Confort du soignant					
+++	47 (77%)	31 (55%)	6 (18%)	8 (58%)	92 (55%)
+	8 (14%)	24 (43%)	28 (82%)	5 (37%)	65 (38%)
-	5 (8%)	1 (2%)	0	1 (7%)	7 (7%)
---	1 (1%)	0	0	0	1 (0.5%)
Confort du patient					
Non évalué (sédaté)	13	36	31	5	85
+++	17 (36%)	5 (25%)	0	5 (56%)	27 (34%)
+	16 (34%)	10 (50%)	3 (100%)	4 (44%)	33 (42%)
-	13 (29%)	5 (25%)	0	0	18 (23%)
---	1 (1%)	0	0	0	1 (1%)
Odeur du produit					
Non évalué (sédaté)	9	0	0	2	11
+++	22 (42%)	52 (93%)	13 (38%)	10 (84%)	97 (63%)
+	24 (46%)	4 (7%)	21 (62%)	1 (8%)	50 (32%)
-	6 (12%)	0	0	1 (8%)	7 (5%)
---	0	0	0	0	0
Réaction cutanée					
Oui	0	0	0	0	0
non	61 (100%)	56 (100%)	34 (100%)	14 (100%)	165 (100%)

AVANTAGES : Gain ergonomique majeur (rapide et simple)

- Gain de temps : 10 min/toilette → 1 EPT/an
- Gain d'hygiène: ↓ opportunités de transmission des germes
- Gain d'efficacité: ↓ de va et vient, réduction du bruit, intimité
- Gain en confort: odeur et texture agréables
- Gain en sécurité: ↓ glissade, éclaboussure des pansements

INCONVENIENTS

- Température: malgré microonde, les derniers gants sont froids
- Pas possible de réchauffer un paquet utilisé (hygiène)
- Gants parfois pas assez humides. Gaspillage ?



CONCLUSIONS:

Satisfaction des soignants

Disparition des préjugés sur la « toilette sans eau »

Satisfaction des patients

Patients conscients apprécient: (toucher et odeur agréable), diminution des douleurs et des éclaboussures. long terme ?

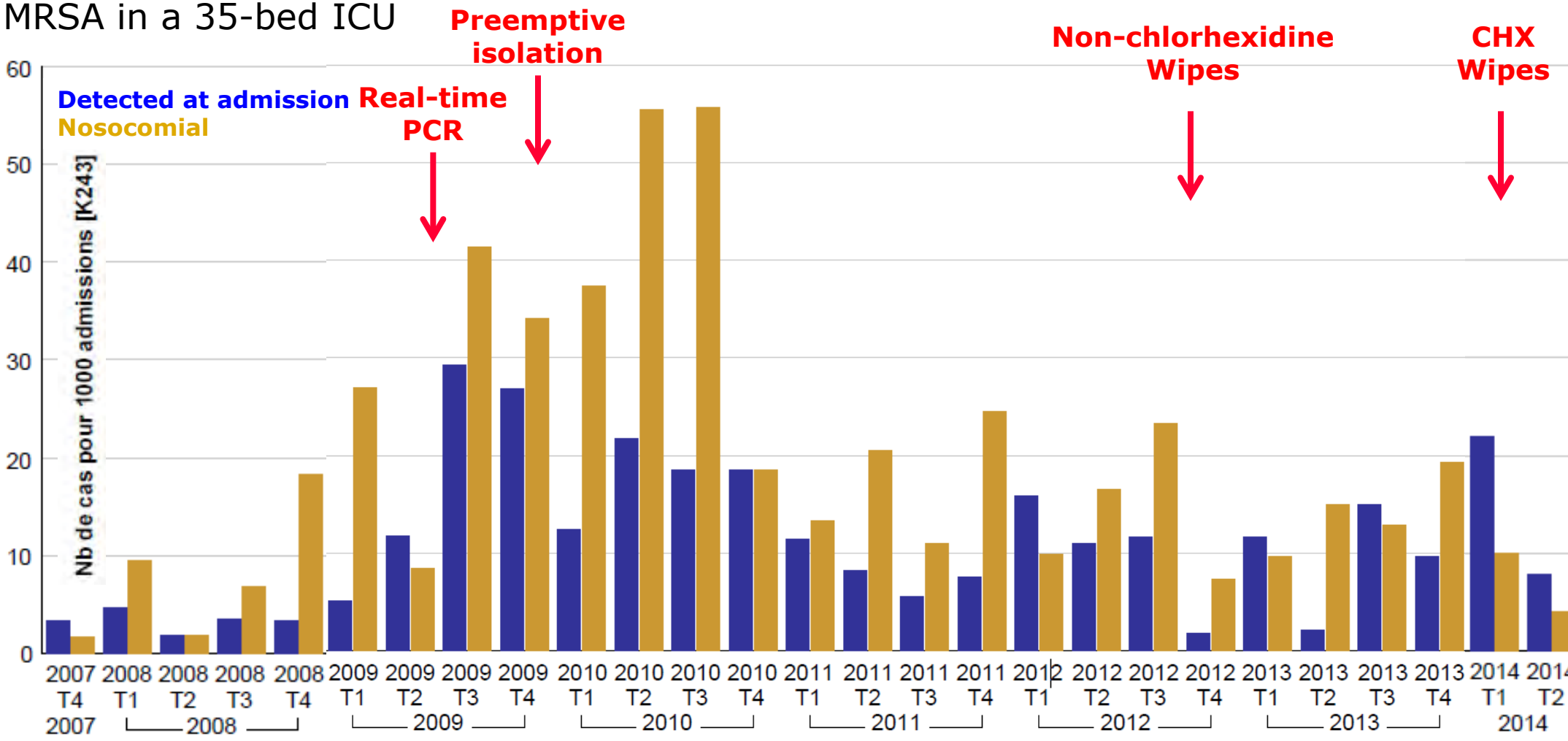
Satisfaction de l'administrateur ?

Moins cher et plus efficace !

→ **NOUS INTRODUISONS LES LINGETTES A USAGE UNIQUE**

CHX washing à source control

MRSA in a 35-bed ICU



CHX washing à source control

Insights into bacterial colonization of intensive care patients' skin: the effect of chlorhexidine daily bathing

N. Cassir · L. Papazian · P.-E. Fournier · D. Raoult · B. La Scola

Table 1 Comparison of the number of different species identified per site

Site	Chlorhexidine group, $N=10$, Median (IQR)	Water and soap group, $N=10$, Median (IQR)	P value
Nares	3.3 (3–4.75)	4 (3.25–4.75)	0.68
Axillary vault	0.5 (0–1.65)	5 (3.25–6)	<0.001[a]
Inguinal crease	3 (2–3)	5 (4–5)	0.04[a]
Manubrium	2 (1.25–2)	3 (3–4)	<0.001[a]
Back	1 (1–2)	2 (1–2)	0.20
All sites	17 (12.25–23)	33 (25.25–37.5)	0.004[a]

Eur J Clin Microbiol Infect Dis (2015) 34:999–1004

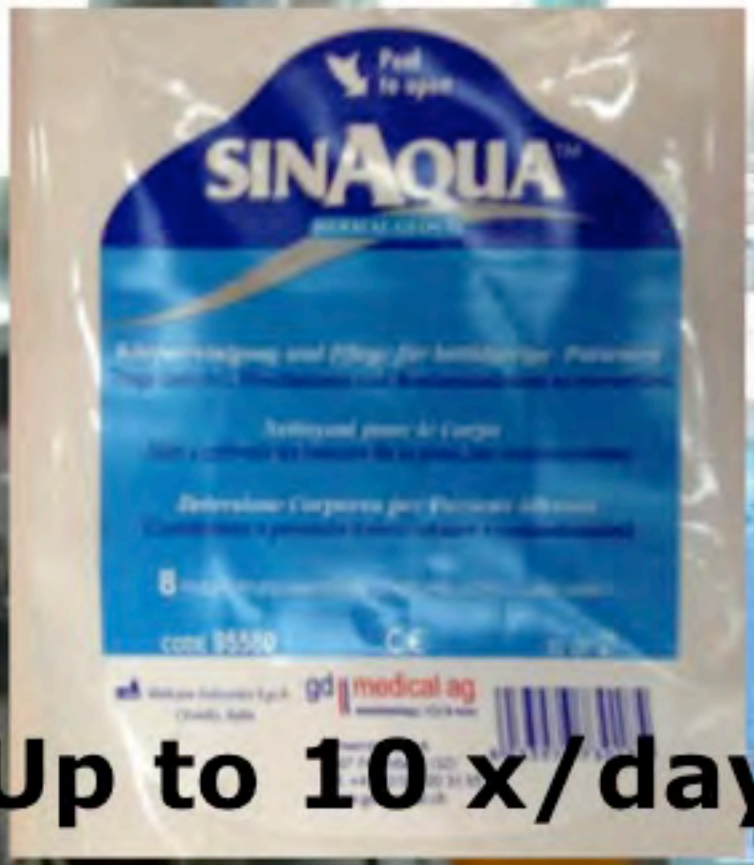
Service de
Médecine Intensive

Screening + CHX bathing
Isolation

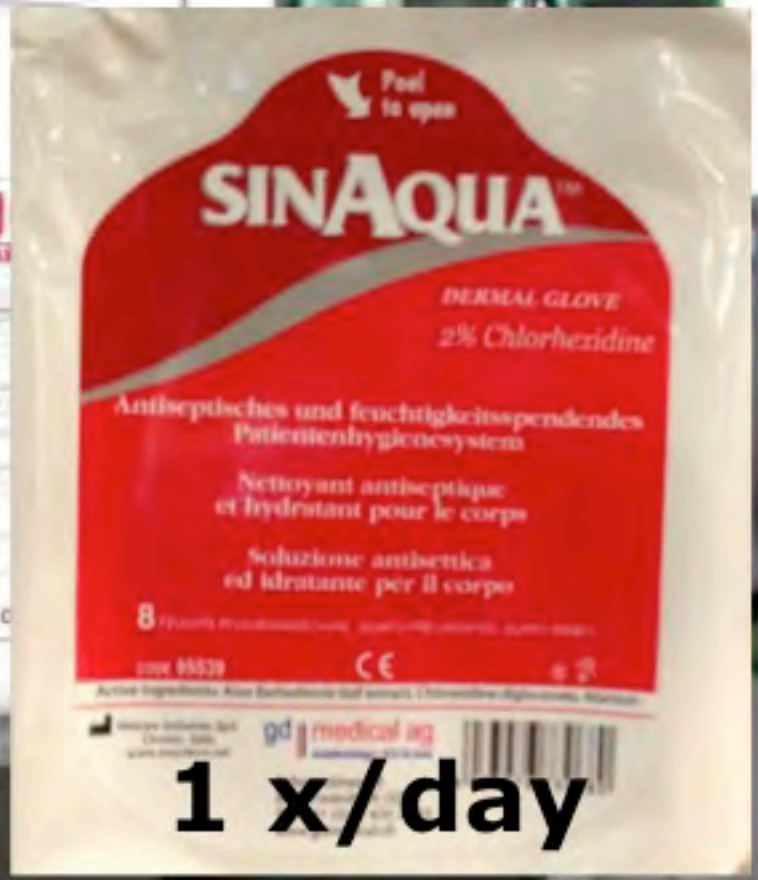
CHUV

SERVICE | PATIENTS | ENSEIGNEMENT | RECHERCHE | EMPLOI | SOUTENIR LA RECHERCHE

2014

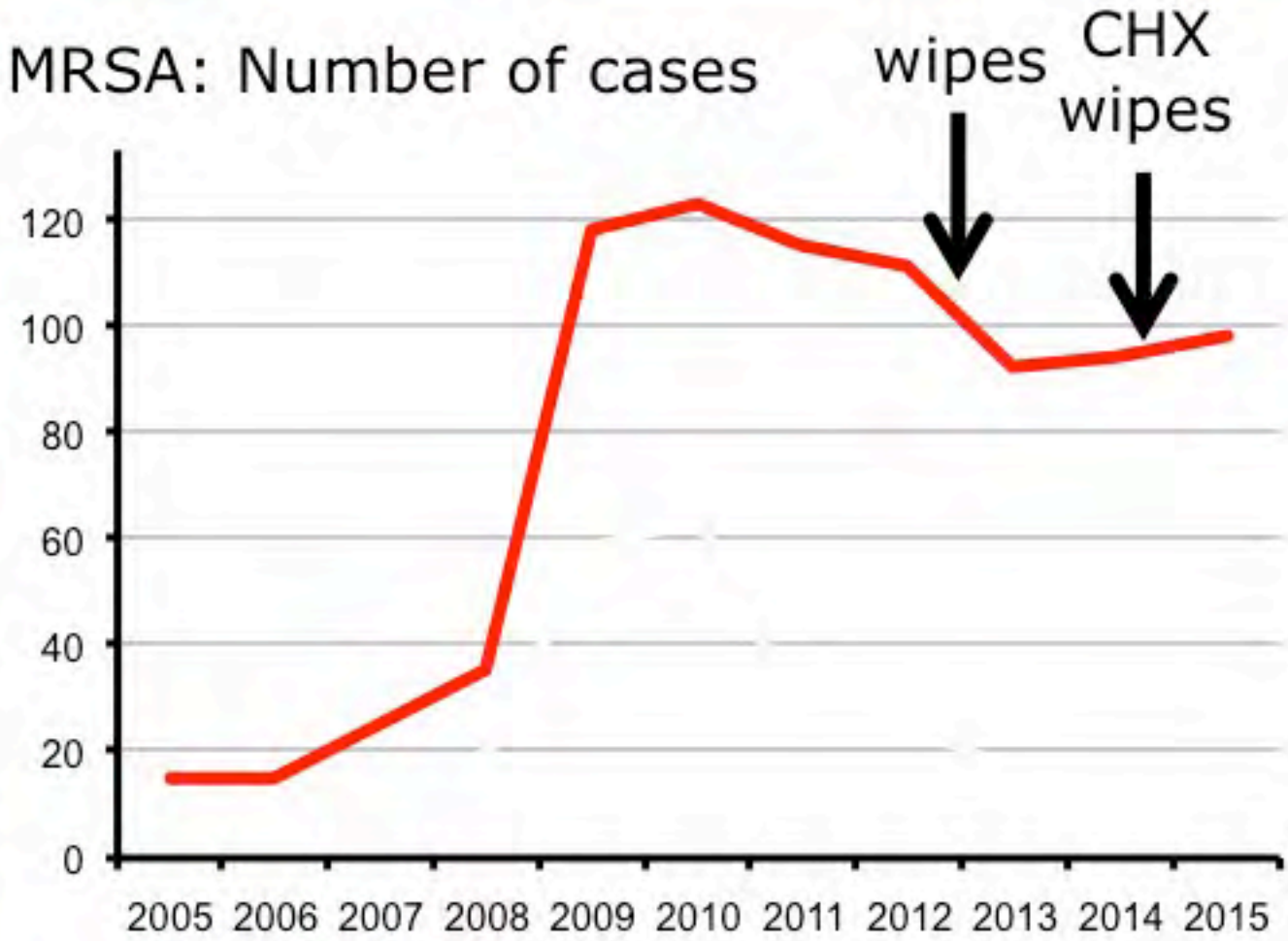


Up to 10 x/day



1 x/day

Screening + CHX bathing
Isolation

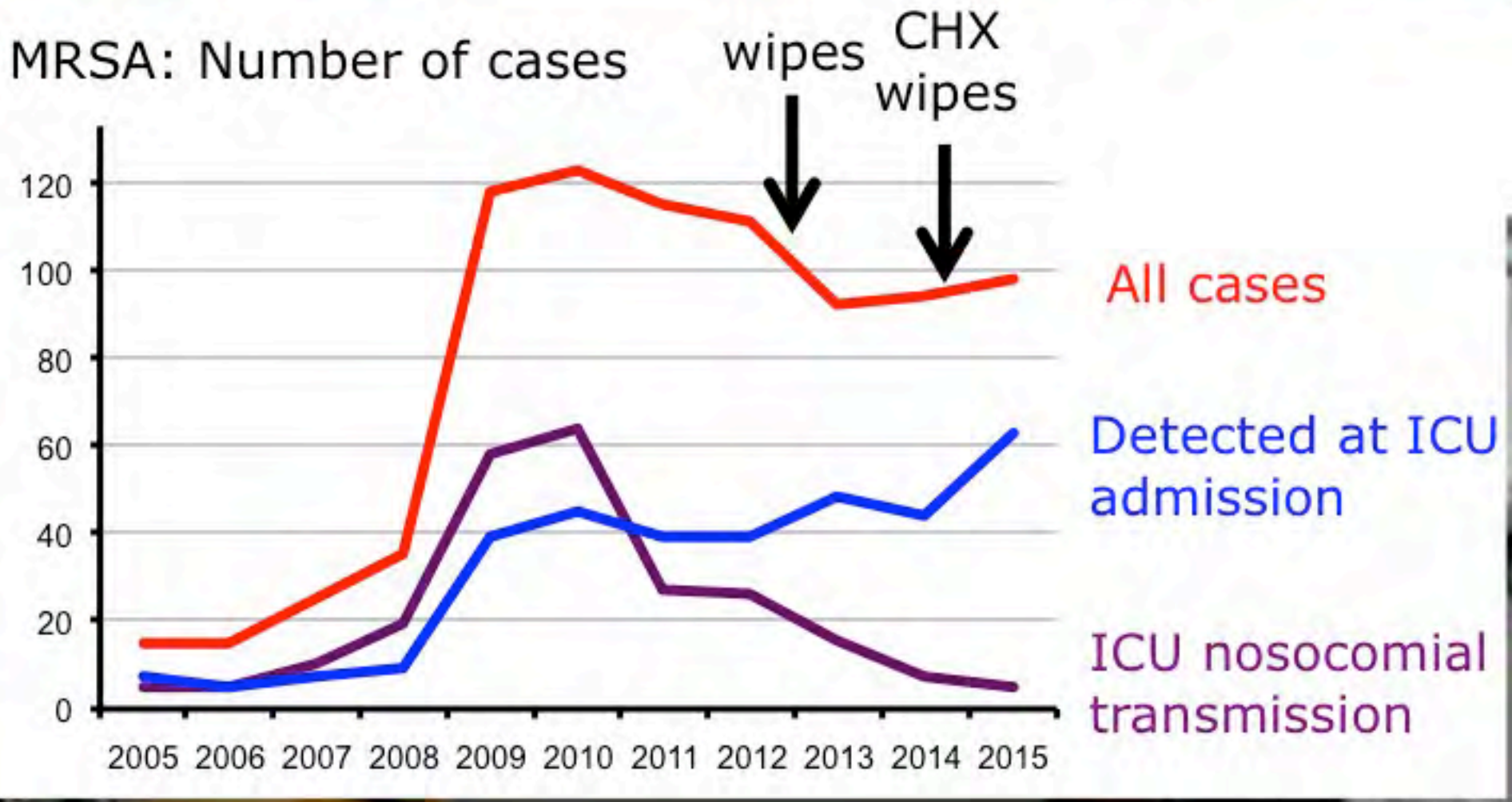


Service de Médecine Intensive

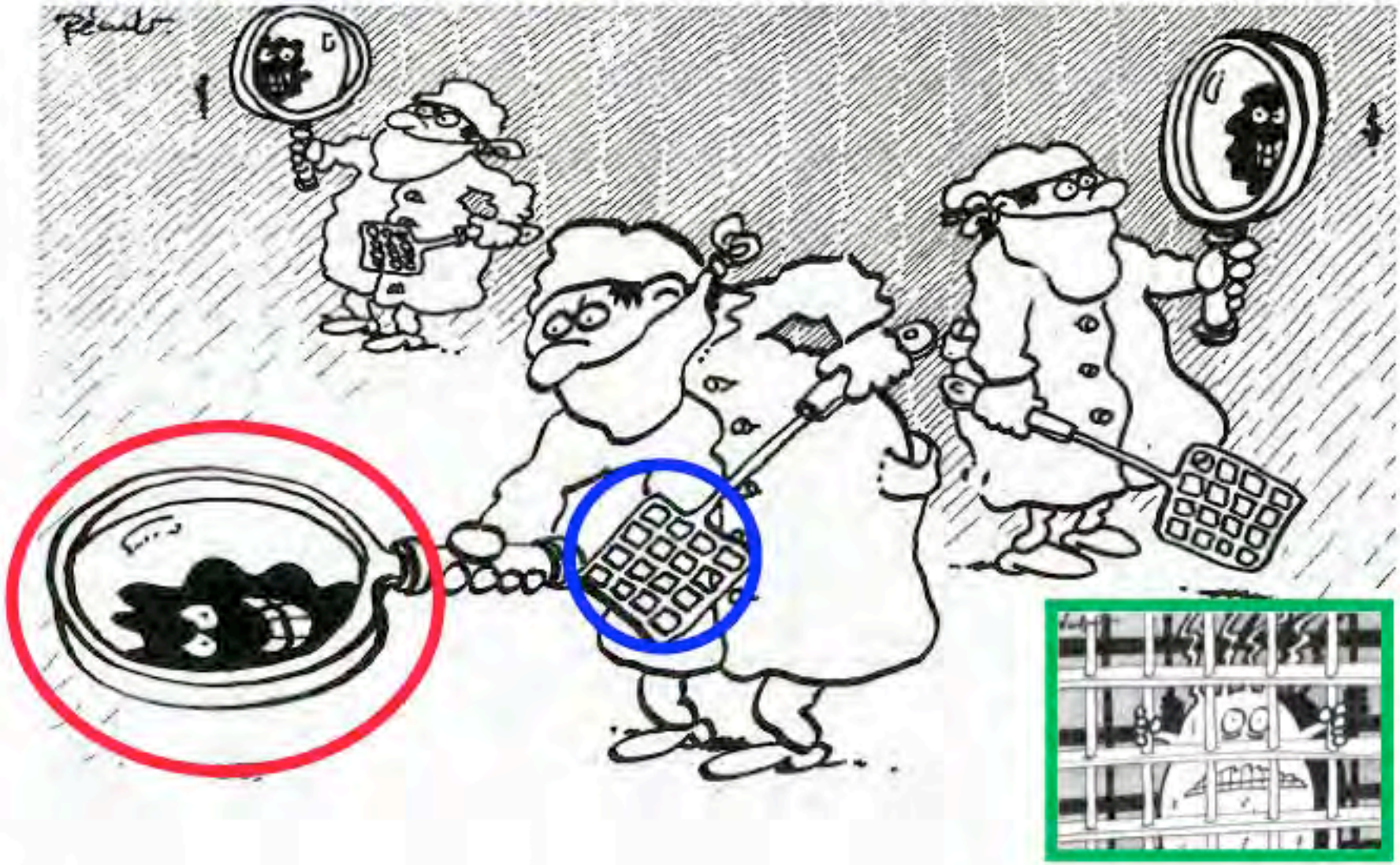
Screening + CHX bathing
Isolation

CHUV

SERVICE PATIENTS ENSEIGNEMENT RECHERCHE EMPLOI SOUTENIR LA RECHERCHE



Screening + preemptive isolation + CHX bathing may control MRSA



Strategies for infection control

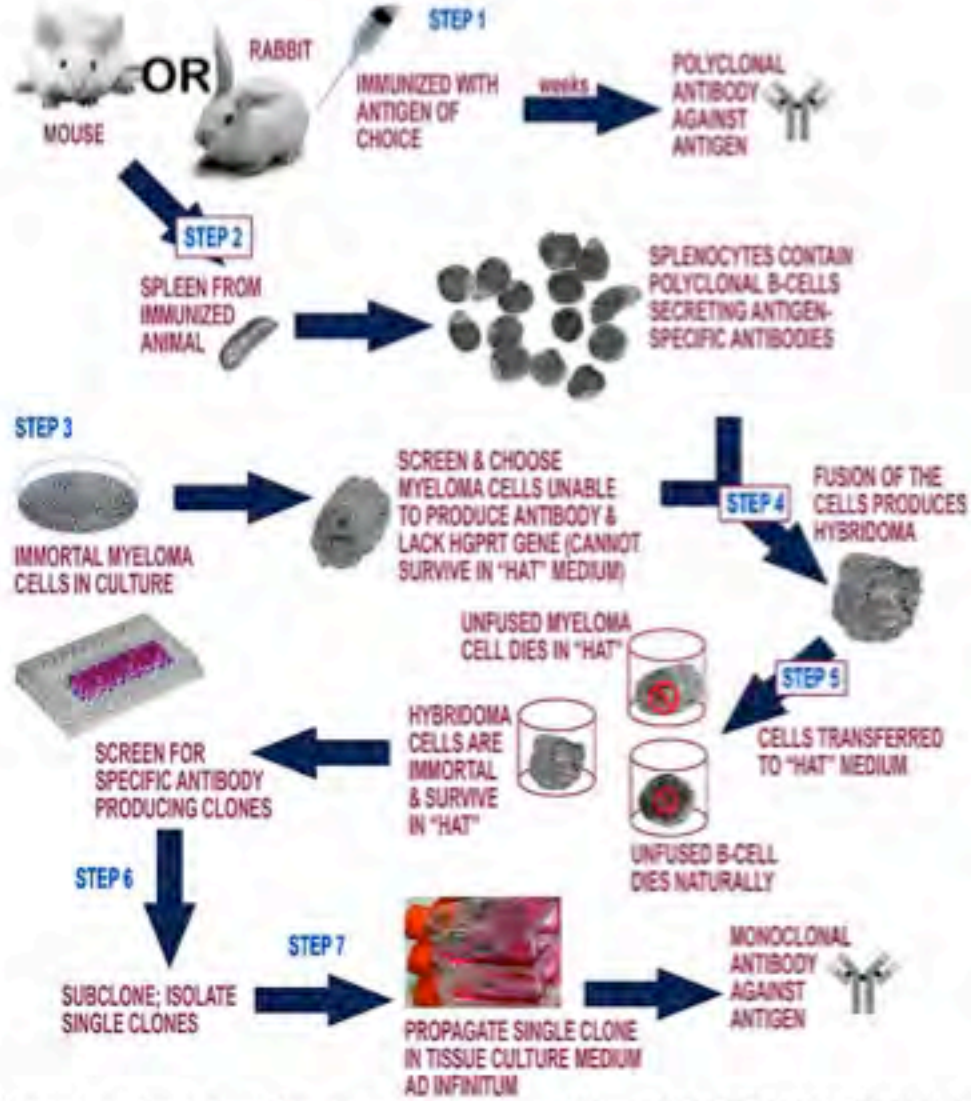
General measures
Surveillance
Isolation precautions

Antibiotic control
Combination therapy
SDD; probiotics
Stewardship (guidelines; deescalation)
New strategies (TDM/aerosols/mAb/phages)

Specific strategies
Specifically targeted against VAP
Specifically targeted against BSI
Specifically targeted against ….

Eggimann et al. Swiss Fedical Forum 2015

mAb



http://www.scilogs.com/in_scientio_veritas/files/MOUSE-MAb-SMALL.jpg

mAb

The SAATELLITE and EVADE Clinical Studies Within the COMBACTE Consortium: A Public–Private Collaborative Effort in Designing and Performing Clinical Trials for Novel Antibacterial Drugs to Prevent Nosocomial Pneumonia

Bruno François,[1] Jean Chastre,[2] Philippe Eggiman,[3] Pierre-François Laterre,[4] Antoni Torres,[5] Miguel Sanchez,[6] Mark T. Esser,[7] Brian Bishop,[7] Marc Bonten,[8] Herman Goosens,[9] and Hasan S. Jafri[7]

The Innovative Medicines Initiative–funded COMBACTE consortium fosters academic-industry partnership in pioneering studies to combat serious bacterial infections. We describe how this partnership is advancing the development of 2 monoclonal antibodies, MEDI4893 and MEDI3902, for the prevention of nosocomial pneumonia.

Anti-Pseudomonas

Anti-MSSA/MRSA

Clinical Infectious Diseases® 2016;63(S2):S46–51

To summarize

Prevention and Control of Methicillin-Resistant *Staphylococcus aureus* in Acute Care Settings

Andie S. Lee, MB BS, DTM&H, MSc[a,*], Benedikt Huttner, MD, MS[b,c], Stephan Harbarth, MD, MS[b]

KEY POINTS

- Methicillin-resistant *Staphylococcus aureus* (MRSA) is an important cause of health care–associated infections and is endemic in many health care facilities worldwide.
- Decreasing rates of invasive MRSA infections have been reported in many countries over recent years, often following implementation of concerted and coordinated multifaceted interventions at a national level.
- Despite these successes, the optimal approach to MRSA control remains controversial, particularly with regards to MRSA screening, isolation, decolonization, and environmental cleaning.
- Over the last decade, new data from robust large-scale studies have emerged, particularly with regards to MRSA screening and decolonization (targeted and universal) strategies.
- Flexibility to adapt and institute evidence-based measures in the context of local epidemiology, infrastructure, and resources is essential for successful MRSA control.

Infect Dis Clin N Am 30 (2016) 931–952

The world of nosocomial infections

Emergence and resurgence of MRSA as a public-health threat

Prevention and Control of Methicillin-Resistant *Staphylococcus aureus* in Care Settings

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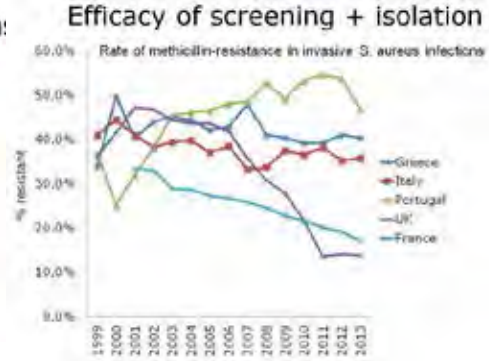

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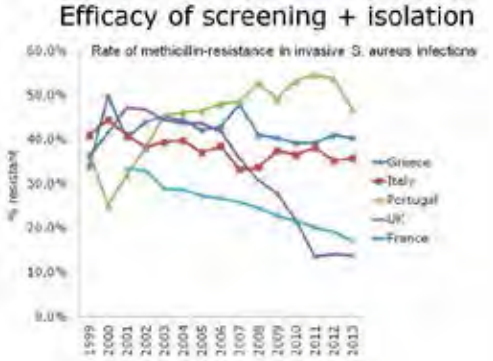

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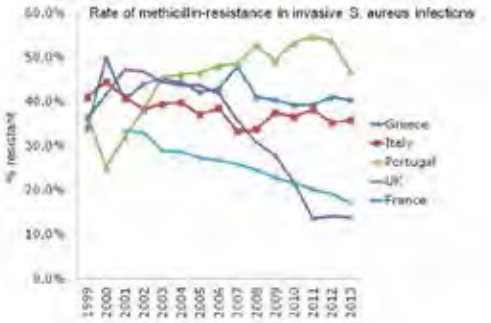
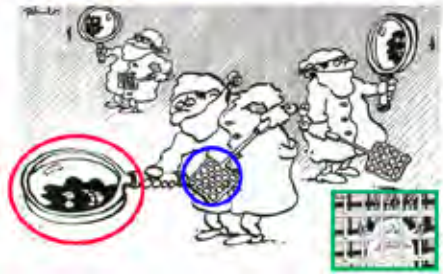
Efficacy of screening + isolation



Doubts on screening + isolation

Screening + preemptive isolation + CHX bathing may control MRSA



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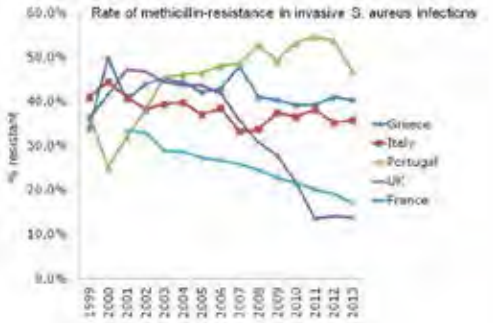

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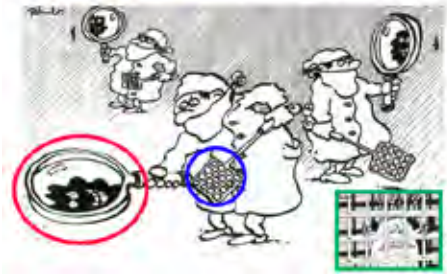

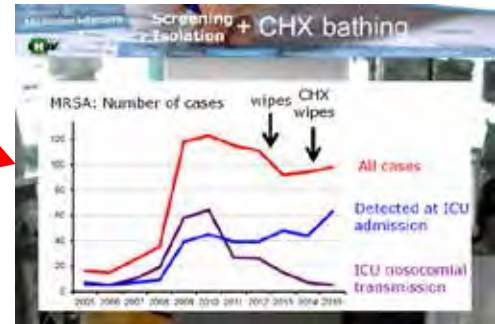

Thank you for your attention

and for the invitation

www.webbertraining.com/schedulep1.php

March 29, 2017	*(South Pacific Teleclass)* **CATHETER-ASSOCIATED URINARY TRACT INFECTION PREVENTION IN THE CONTINUUM OF ACUTE CARE** Speaker: **Jan Gralton**, Australian Commission on Safety and Quality in Healthcare
March 30, 2017	**SCREENING FOR *STAPHYLOCOCCUS AUREUS* BEFORE SURGERY ... WHY BOTHER** Speaker: **Dr. Hilary Humphreys**, The Royal College of Surgeons in Ireland
April 6, 2017	**TECHNOLOGIC INNOVATIONS TO PREVENT CATHETER-RELATED BLOODSTREAM INFECTIONS** Speaker: **Prof. Mark Rupp**, University of Nebraska Medical Center
April 25, 2017	*(FREE European Teleclass ... Denver Russell Memorial Teleclass Lecture)* **DO'S AND DONT'S FOR HOSPITAL CLEANING** Speaker: **Dr. Stephanie Dancer**, Health Protection Scotland
April 27, 2017	**COST ANALYSIS OF UNIVERSAL SCREENING VS. RISK FACTOR-BASED SCREENING FOR MRSA** Speaker: **Dr. Virginia Roth**, University of Ottawa
	(FREE ... WHO Teleclass - Europe)

Thanks to Teleclass Education

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