

Culturas de vigilância em situação endêmica - para quê?

Mirian de Freitas Dalben



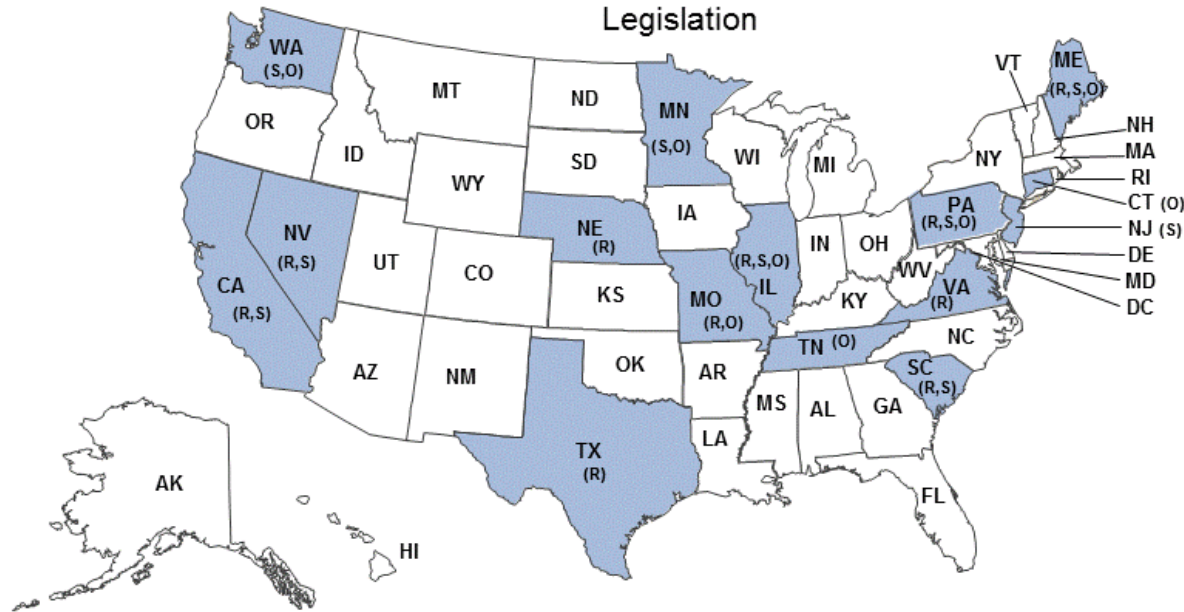
Objetivo: Minimizar a transmissão cruzada de microrganismos resistentes através da detecção de indivíduos colonizados e colocação em isolamento de contato

Vigilância ativa
Pressão de colonização

Situação atual

MRSA Laws

Highlighted States have Enacted MRSA Legislation



■ Enacted MRSA Law

R – Reporting Laws or Bills

S – Screening Laws or Bills

O – Other Laws or Bills (e.g., studies, pilots, other infection control requirements)

Eficácia : reduz a transmissão e infecção ?

Qualidade do teste disponível

Implementação

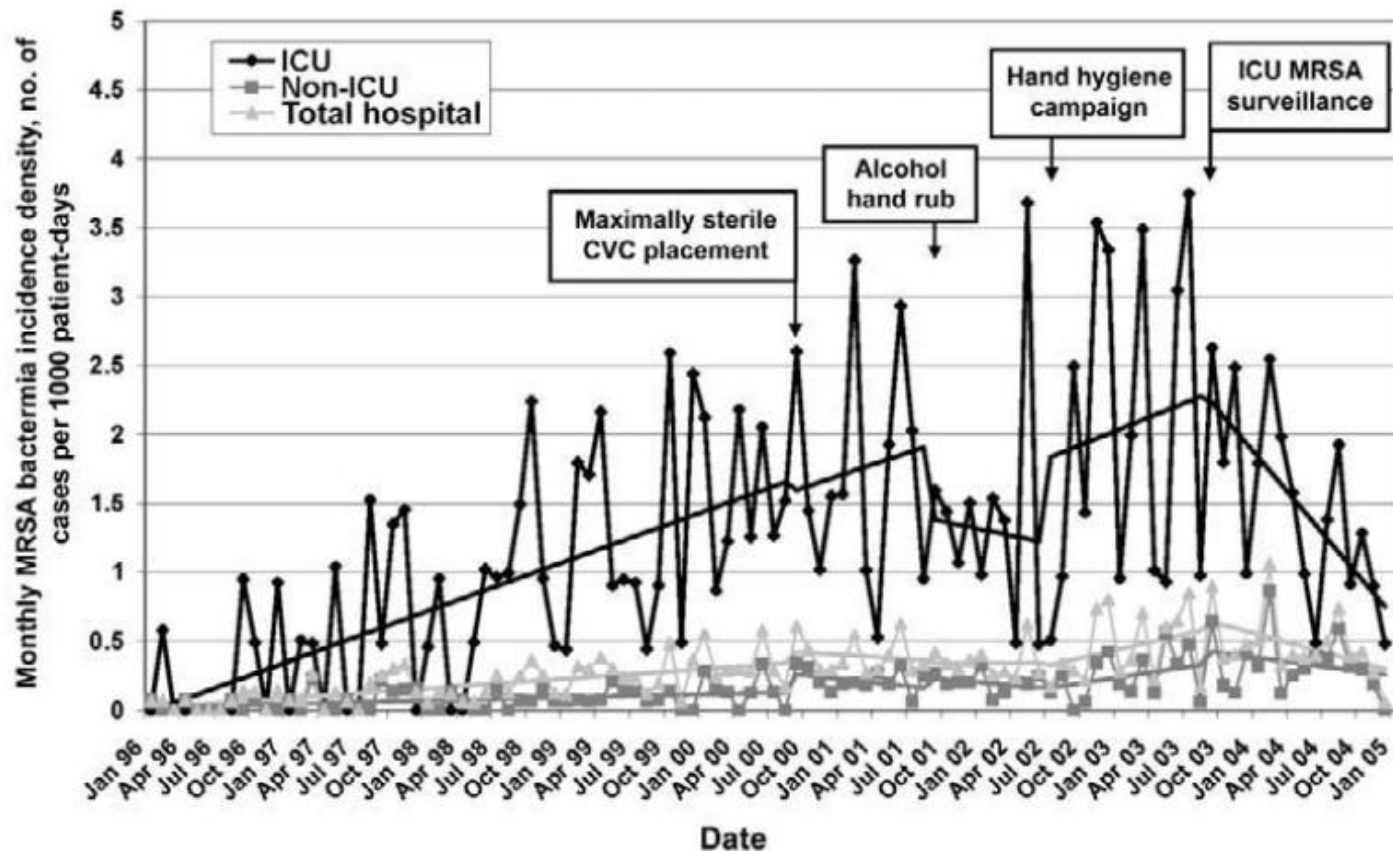


Eficácia : reduz a transmissão e infecção ?



Impact of Routine Intensive Care Unit Surveillance Cultures and Resultant Barrier Precautions on Hospital-Wide Methicillin-Resistant *Staphylococcus aureus* Bacteremia

Susan S. Huang,^{1,2} Deborah S. Yokoe,¹ Virginia L. Hinrichsen,² Laura S. Spurchise,² Rupak Datta,² Irina Miroshnik,² and Richard Platt^{1,2}



800 leitos
80 leitos de UTI

Epidemiologic measure, location	Dec 2004 model projection of MRSA bacteremia in absence of surveillance ^a	Dec 2004 actual value of MRSA bacteremia	Total decrease in bacteremia ^b
ICU			
Prevalence density	4.1	1.6	-2.5 (61)
Incidence density	2.5	1.0	-1.5 (60)
Hospital-associated incidence density	2.8	0.7	-2.1 (75)
Non-ICU			
Prevalence density	1.2	0.6	-0.6 (48)
Incidence density	0.9	0.5	-0.4 (46)
Hospital-associated incidence density	0.5	0.3	-0.2 (40)
Hospital wide			
Prevalence density	1.4	0.6	-0.8 (54)
Incidence density	1.1	0.5	-0.6 (52)
Hospital-associated incidence density	0.9	0.3	-0.6 (67)
Prevalence	7.1	3.2	-3.9 (55)
Incidence	5.6	2.6	-3.0 (54)
Hospital-associated incidence	4.6	1.5	-3.1 (67)

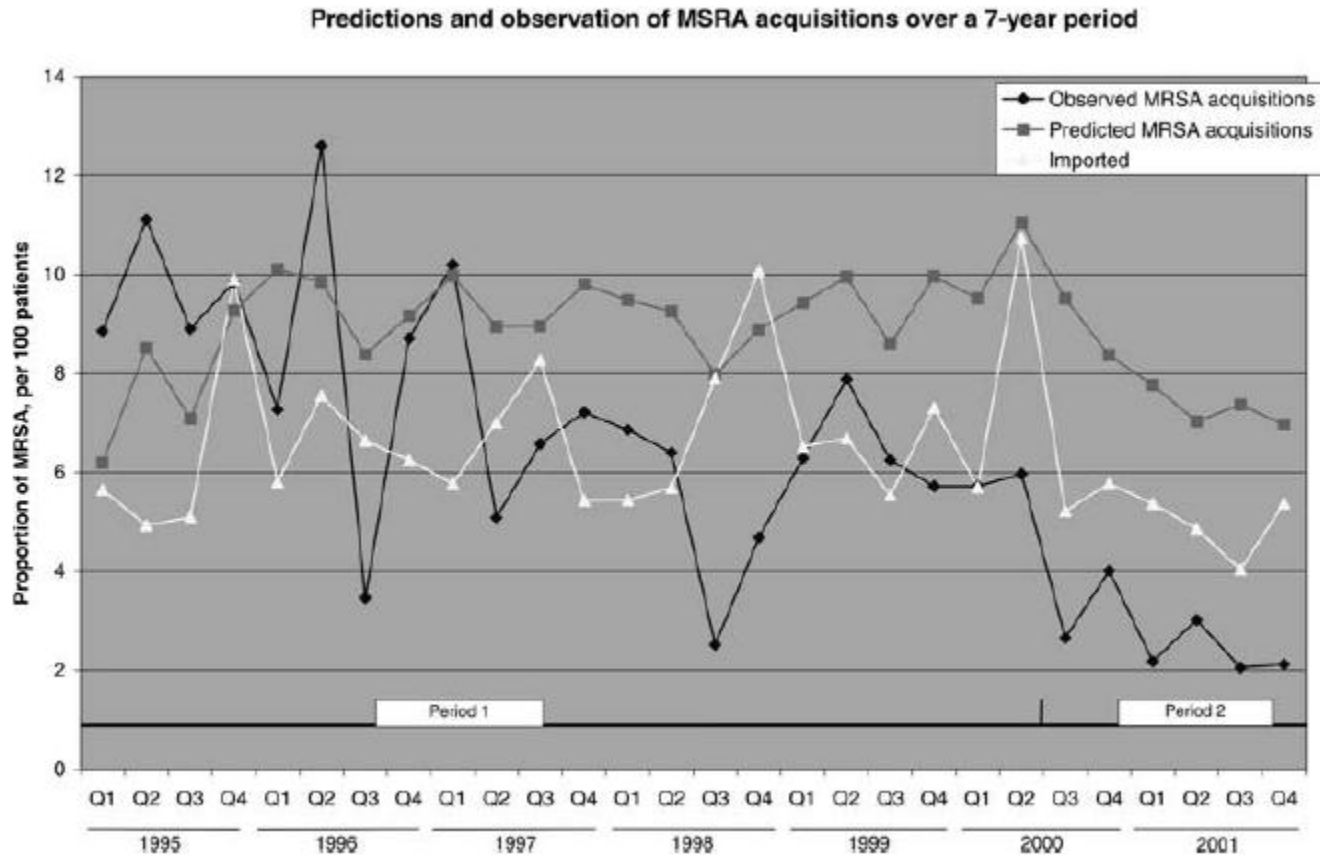
NOTE. The 16-month time period covered in this analysis is 1 September 2003–31 December 2004. ICU, intensive care unit.

^a Time series model projection of the value of MRSA bacteremia in December 2004 in the absence of MRSA surveillance based on secular trends prior to the institution of routine surveillance.

^b Total decrease in MRSA bacteremia at the end of the intervention period for routine surveillance. Value is calculated as the difference (and percent decrease) between the time series model's projected value in the absence of routine surveillance minus the actual value in December 2004.

Redução na transmissão de 43 por 1000 pacientes-dia para 23 por 1000 pacientes-dia

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



Active surveillance testing and decontamination strategies in intensive care units to reduce methicillin-resistant *Staphylococcus aureus* infections

Asok Kurup, MRCP,^a Nidhi Chlebicka, MBBS,^a Kwee Yuen Tan, BSc,^b Eileen Xueqin Chen, PhD,^c Lynette Oon, FRCPA,^c Tan Ai Ling, FRCPA,^c Moi Lin Ling, FRCPA,^b and Jenny Low Guek Hong, MRCP^a Singapore

Isolamento de contato + descolonização

11 vezes mais detecção de MRSA em culturas de vigilância do que em culturas clínicas (21% X 1,8%)

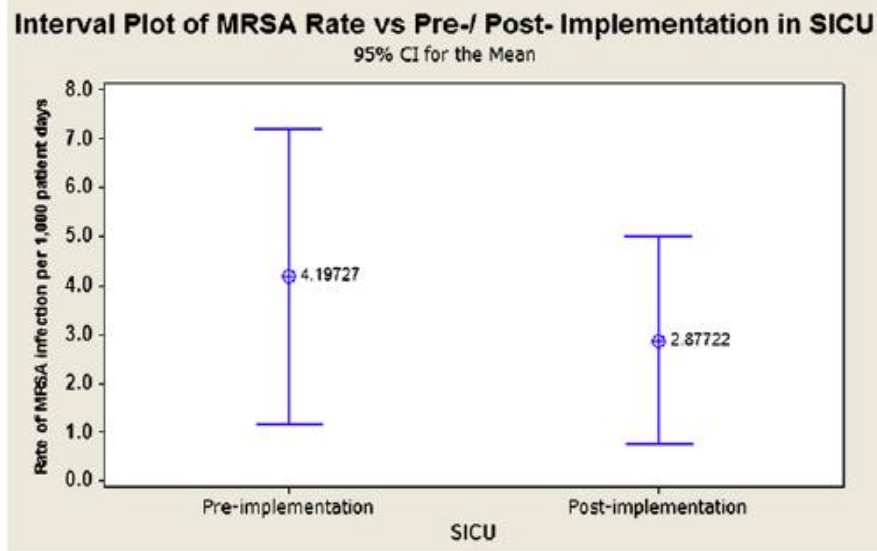


Fig 1. Comparison chart for SICU MRSA infection rate preintervention and postintervention.

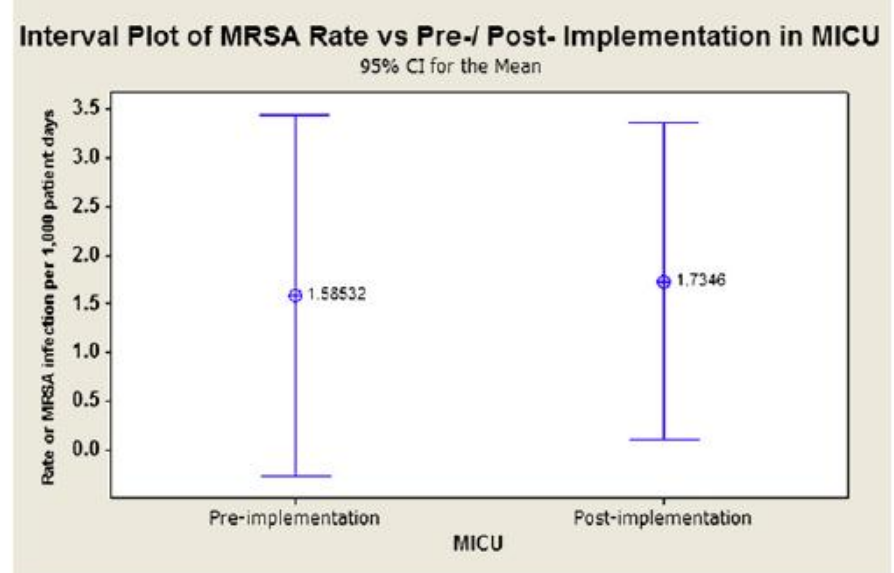


Fig 2. Comparison chart for MICU MRSA infection rate preintervention and postintervention.

TRENDS IN METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS* (MRSA) BLOODSTREAM INFECTIONS: EFFECT OF THE MRSA “SEARCH AND ISOLATE” STRATEGY IN A HOSPITAL IN ITALY WITH HYPERENDEMIC MRSA

TABLE 1
INCIDENCE RATE OF METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS* BACTEREMIA PER DEPARTMENT PER 1,000 ADMISSIONS*

Department	January 1996– June 1997 (Period Pre)	July 1997– December 1999 (Period A)	January 2000– December 2001 (Period B)	Decrease Pre vs A (P)	RR Pre to A (CI ₉₅)	Decrease Pre vs B (P)	RR Pre to B (CI ₉₅)
Overall	0.64	0.42	0.30	34% (.13)	0.66 (0.39–1.13)	53% (.02)	0.46 (0.25–0.87)
ICU	6.07	2.66	0.66	56% (.26)	0.44 (0.11–1.76)	89% (.03)	0.11 (0.01–0.98)
Medical wards	0.59	0.43	0.36	27% (.38)	0.73 (0.36–1.49)	39% (.32)	0.61 (0.27–1.37)
Surgical wards	0.51	0.27	0.21	47% (.31)	0.53 (0.2–1.43)	59% (.21)	0.41 (0.13–1.35)

RR - relative risk; CI₉₅ - 95% confidence interval; ICU - intensive care unit.

*Period Pre corresponds to the preintervention phase, period A represents the first period after the introduction of the control program, and period B represents the last 2 years of the study period, when the program was well known throughout the hospital. Comparisons between period Pre and periods A and B are reported as both reduction in percentage, with P value in parentheses, and RR.

Cultura de vigilância à admissão ou
semanal?

Use of Active Surveillance Cultures to Detect Asymptomatic Colonization With Carbapenem-Resistant *Klebsiella pneumoniae* in Intensive Care Unit Patients

David Calfee, MD, MS; Stephen G. Jenkins, PhD

TABLE. Dates That Components of a Carbapenem-Resistant *Klebsiella pneumoniae* Surveillance Culture Program Were Introduced in 6 Intensive Care Units (ICUs)

ICU	ICU admission surveillance cultures initiated	Weekly surveillance cultures initiated
1	January 2005	January 2005
2	November 2005	October 2006
3	November 2005	October 2006
4	November 2005	NA
5	November 2005	NA
6	November 2005	NA

NOTE. NA, not applicable.

- Colonização por KPC foi mais detectada em UTI onde a cultura era realizada semanalmente
semanalmente (58%) X na admissão (15%)
 $p < .001$
- A vigilância ativa evitou 1396 dias de exposição a KPC+.

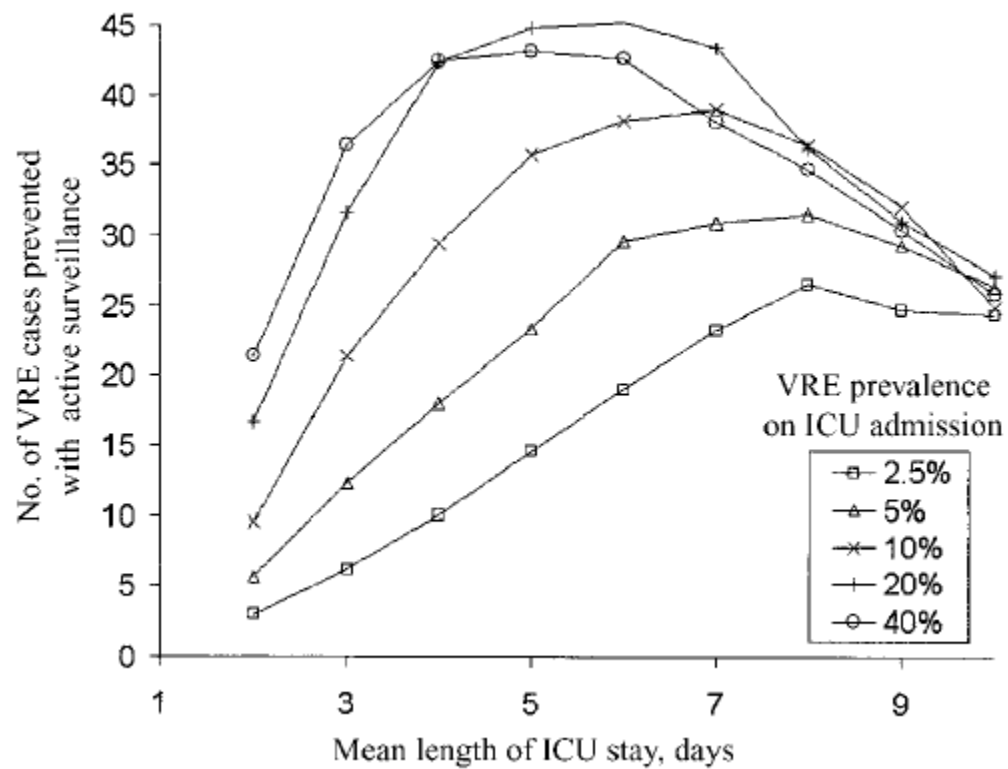
Colocar o paciente em isolamento até a cultura sair ou esperar a cultura sair e colocar em isolamento?

Projected Benefits of Active Surveillance for Vancomycin-Resistant Enterococci in Intensive Care Units

Table 2. Estimated number of incident vancomycin-resistant enterococci (VRE) acquisitions and absolute number and proportion of cases prevented in 1 year with 3 competing infection-control strategies, after 1000 model simulations.

Infection control strategy	Average no. of incident VRE acquisitions	Estimated no. of incident cases of VRE colonization/infection prevented, compared with no surveillance strategy	Reduction of cases of VRE colonization/infection, compared with no surveillance strategy, %
No surveillance	118
Passive surveillance only	113	5	4.2
Active surveillance			
Patients isolated after culture results are determined to be positive	72.2	45.8	39
Immediate isolation and removal of patient after culture results are determined to be negative	41.1	76.9	65

NOTE. Each strategy is compared with a setting where no surveillance is in place.



CID 2004:38 (15 April)

PNAS | July 6, 2004 | vol. 101 | no. 27 | 10223-10228

5620-5625 | PNAS | April 4, 2006 | vol. 103 | no. 14

- Pressão de colonização (BONTEN e cols, 1998)

Enterococo resistente a vancomicina



↑ 1% na pressão de colonização

↑ 3,2% no risco de aquisição do VRE

! Pressão de Colonização > 50% !

- Colonização por *S. aureus* resistente a oxacilina (MRSA) em UTI

Pressão de colonização = fator de risco independente

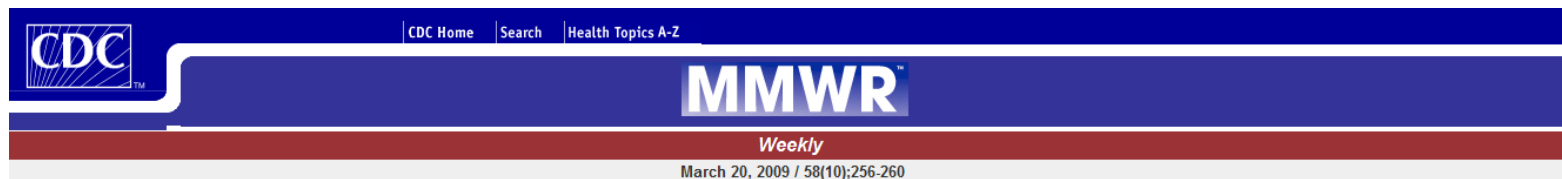
PC ↑
 10%
 31 – 40%
 >40%

1 ↑ RR
 4,9
 5,8

(Merriner e cols., 2000)

Williams e cols., 2009)

- SHEA (The Society of Healthcare Epidemiology of America)
 (Calfee e cols, 2008)



Guidance for Control of Infections with Carbapenem-Resistant or Carbapenemase-Producing *Enterobacteriaceae* in Acute Care Facilities

Qualidade do teste disponível: sensível?



Swab cultures across three different body sites among carriers of carbapenem-resistant *P. aeruginosa* and *Acinetobacter* species: a poor surveillance strategy

Table I Positivity rate of surveillance cultures from different sites for *Acinetobacter* spp. and carbapenem-resistant *P. aeruginosa* among colonised patients (carriers)

Surveillance site	No. of positive cultures	Positivity rate	95% CI
<i>Acinetobacter</i> spp. ^a			
Oropharynx	48	47%	37–56
Rectum	40	39%	29–48
Axillae	28	27%	19–36
<i>Pseudomonas aeruginosa</i> ^b			
Oropharynx	12	38%	21–54
Axillae	11	34%	18–51
Rectum	15	47%	30–64

CI, confidence interval.

^a 103 sets collected from carriers.

^b 32 sets cultured from carriers.

- 1070 coletas
- *Acinetobacter*
Sem orofaringe: 37% perda
Sem retal: 27% perda
Sem axilar: 19% perda
- *Pseudomonas*
Sem orofaringe: 22% perda
Sem retal: 37% perda
Sem axilar: 22% perda

Implementação



- Viabilidade de leitos
- Disponibilidade de pessoal
- Manejo dos malefícios do isolamento
- Custos

Active Screening in High-Risk Units Is an Effective and Cost-Avoidant Method to Reduce the Rate of Methicillin-Resistant *Staphylococcus aureus* Infection in the Hospital

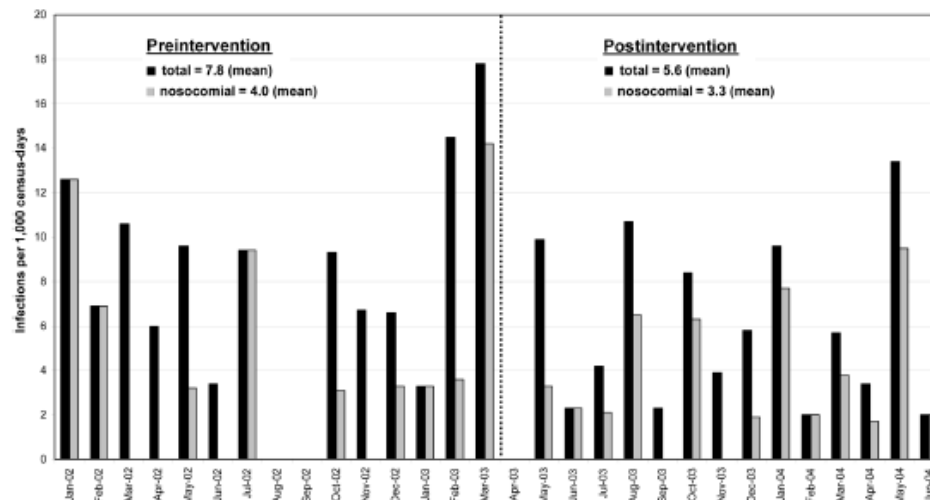
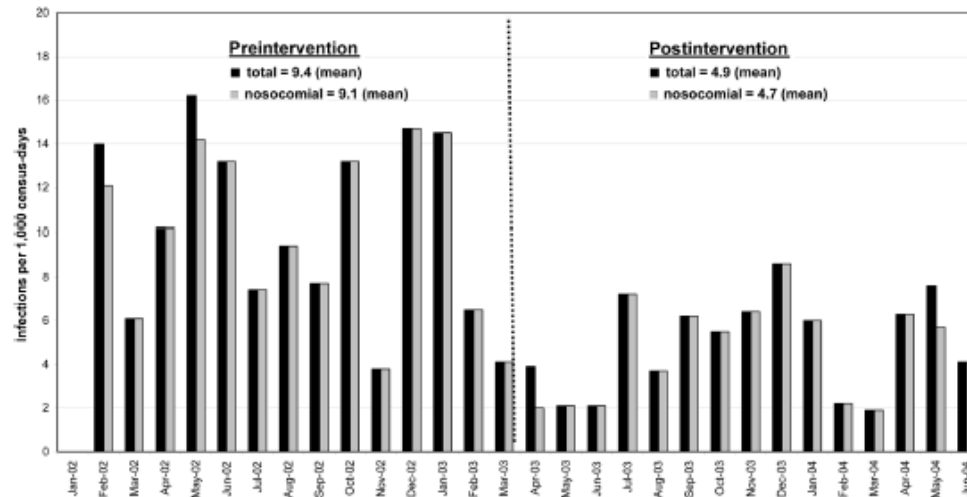


TABLE 2. Cost Analysis of the Methicillin-Resistant *Staphylococcus aureus* (MRSA) Screening Program at Denver Health Medical Center (Denver, CO)

Variable	Value
Cost of screening per month	
Swabs	
Cost per swab	\$0.25
Mean number of patients swabbed	330
Total	\$82.50
Microbiologic analysis	
Mean number MRSA-positive swabs	11
Cost per MRSA-positive swab	\$5.50
Mean number MRSA-negative swabs	229
Cost for MRSA-negative swab	\$1.24
Total	\$337.36
Total screening cost	\$419.86
Cost of isolation per month	
Cost of 1 pair of gloves	\$0.08
Cost of 1 gown	\$0.10
Cost of 60 s of nursing time	\$0.47
Estimated no. of patient contacts per day	100
Estimated cost per patient per day	\$65.00
Mean total excess isolation-days	47
Excess isolation cost	\$3,055.00
Cost avoidance per month	
Averted no. of ICU infections	2.5
Excess cost of 1 MRSA infection	\$9,275.00
Cost savings of averted cases	\$23,188.00
Less excess isolation cost	\$3,055.00
Less total screening cost	\$419.86
Overall cost avoidance for ICUs	\$19,714.00

COST-EFFECTIVENESS OF PERIRECTAL SURVEILLANCE CULTURES FOR CONTROLLING VANCOMYCIN-RESISTANT *ENTEROCOCCUS*

TABLE 1
CRITERIA USED TO IDENTIFY PATIENTS AT INCREASED RISK FOR ACQUISITION OF VANCOMYCIN-RESISTANT *ENTEROCOCCUS*

Unit Type	Length of Stay	Other Requirement
ICU	≥ 4 days	None
Selected high-risk wards	≥ 5 days	Plus antibiotics
All other wards	≥ 6 days	Plus antibiotics
Any	≥ 3 weeks	None
Any	Any	Co-colonization with other resistant flora (ie, MRSA)
Any	Any	Roommate of newly identified VRE-colonized patient

ICU = intensive care unit; MRSA = methicillin-resistant *Staphylococcus aureus*; VRE = vancomycin-resistant *Enterococcus*.

TABLE 3

TOTAL COST OF ACTIVE SURVEILLANCE CULTURES FOR VANCOMYCIN-RESISTANT *ENTEROCOCCUS*

Itemization	Cost	No. of Cultures	Total Cost
Initial laboratory supply cost per culture	\$1.76	10,400	\$18,304
Extra laboratory supply cost per positive culture	\$7.76	193	\$1,498
Technologists' time			
10 minutes per negative culture	\$2.83	10,207*	\$28,886
15 minutes per positive culture	\$4.25	193†	\$820
Nurses' time‡			
20 hours per week	\$400 per week	104 weeks	\$41,600
Total cost of identification			\$91,108

*Estimated number of negative cultures.

†Number of positive cultures.

‡Estimated time for identifying and swabbing patients.

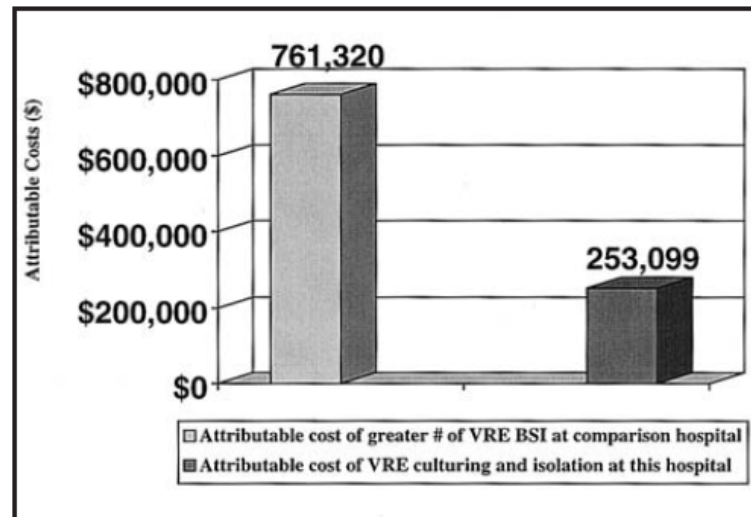
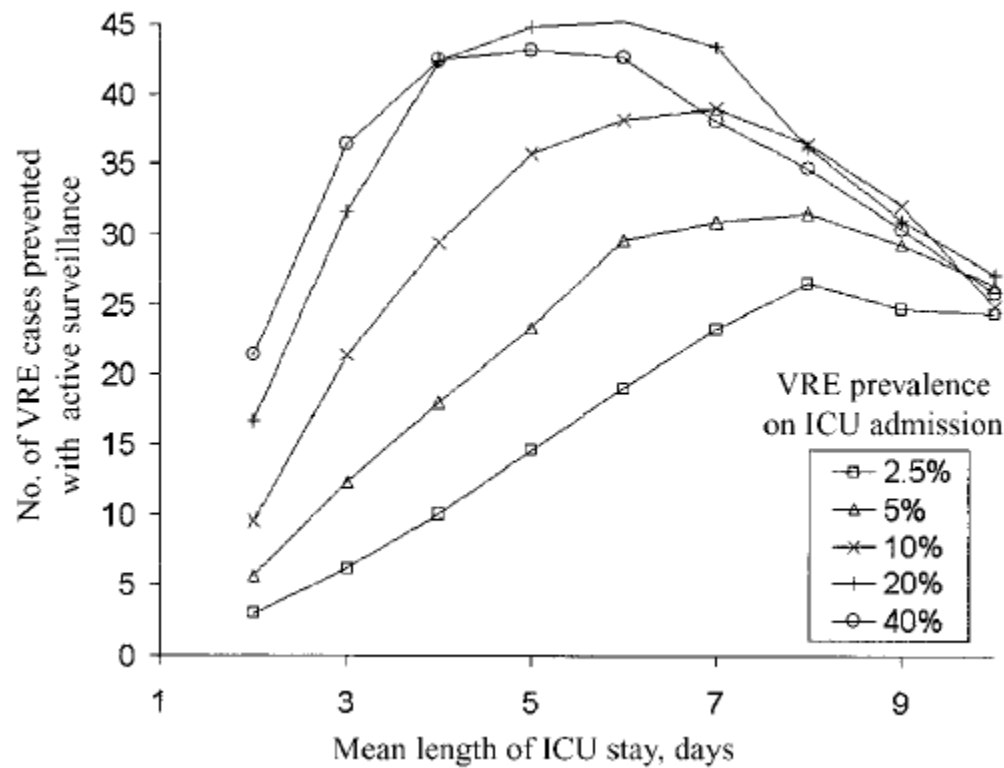


FIGURE. An estimate of the attributable cost of 28 additional vancomycin-resistant *Enterococcus* (VRE) bacteremias at the comparison hospital not using active surveillance cultures to control the spread of VRE throughout the hospital (ie, 29 at that hospital as compared with 1 at this hospital during the 2-year study period), and an estimate of the attributable cost of surveillance cultures and resulting contact isolation at this hospital. BSI = blood-stream infection.





AVALIAR SITUAÇÃO EPIDEMIOLÓGICA LOCAL

CID 2004:38 (15 April)

DIRECIONAR CULTURAS DE VIGILÂNCIA PARA SUBGRUPOS DE RISCO

PNP.S | July 5 2004 | vol. 103 | no. 27 | 0022-01228

5620-5625 | PNAS | April 4 2006 | vol. 103 | no. 14



- If CRE or carbapenemase-producing *Klebsiella* spp. or *E. coli* are detected from one or more clinical cultures **OR** if the point prevalence survey reveals unrecognized colonization, the facility should investigate for possible transmission by:
 - Conducting active surveillance testing of patients with epidemiologic links to a patient with CRE infection (e.g., patients in the same unit or who have been cared for by the same health-care personnel).
 - Continue active surveillance periodically (e.g., weekly) until no new cases of colonization or infection suggesting cross-transmission are identified.
 - If transmission of CRE is not identified after repeated active surveillance testing, consider altering the surveillance strategy by performing periodic point prevalence surveys in high-risk units.