Modelli innovativi di gestione delle infezioni da germi MDR *in ambito ospedaliero ed extra-ospedaliero*

SITA
Società Italiana di Terapia Antinfettiva Antibatterica Antivirale Antifungina

13° CONGRESSO NAZIONALE
PADOVA | 23-24 novembre 2023

Marianna Meschiari

Clinic of Infectious Diseases

University of Modena and Reggio Emilia

UNIVERSITAS STUDIORUM MUTINENSIS ET REGIENSIS 1175

UNIMORE
UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA

UNIMORE
UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA

Disclosure

- **Scientific boards, travel expenses, research grants**
  - MSD
  - Angelini
  - Pfizer
  - ViiV
  - Shionogi
  - Menarini
  - BioMérieux

AMR
we may be in the darkest hour before the dawn

The 3 most critical public health issues of our time are climate change and environmental destruction, pandemics, and antimicrobial resistance.

The top 3 action items most urgently required :

1) the need for antibiotics: the major problem is that we **often use antibiotics as a substitute for infection control,** water, and sanitation rather than as a corollary to these.

2)Providing access to new drugs and vaccines

3)Change behavior and social norms

We often prefer tackling problems after they've become a serious threat.

Sometimes, we think it's the job of somebody else..

Consideration by Ramanan Laxminarayan is the Founder and *President of the One Health Trust*, founded as the Center for Disease Dynamics, Economics & Policy
Antimicrobial Stewardship & Healthcare Epidemiology (2023), 3, e204, 1–3

AR-ISS 2022:
sorveglianza nazionale dell'Antibiotico-Resistenza

- *Staphylococcus aureus* (33,5% vs 30,5% del 2022),
- Per *Enterococcus faecium (*11,1% al 30,7% nel 2022).
- *Escherichia coli ESBL (*24,4% vs 24,2% nel 2022)
- *Klebsiella pneumoniae R*-carbapenemi (33,2% vs 25%)
- *Pseudomonas aeruginosa* (da 17,2% vs 16,4% nel 2022)
- stabile in *Acinetobacter* spp. (88,5%).

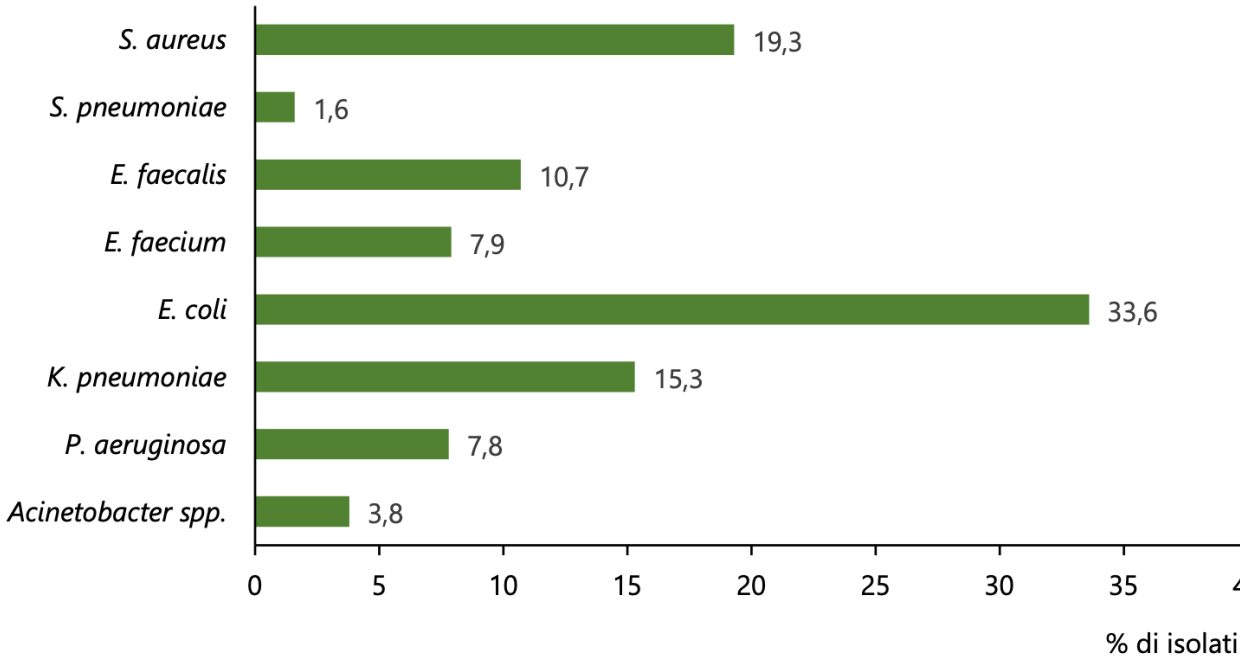
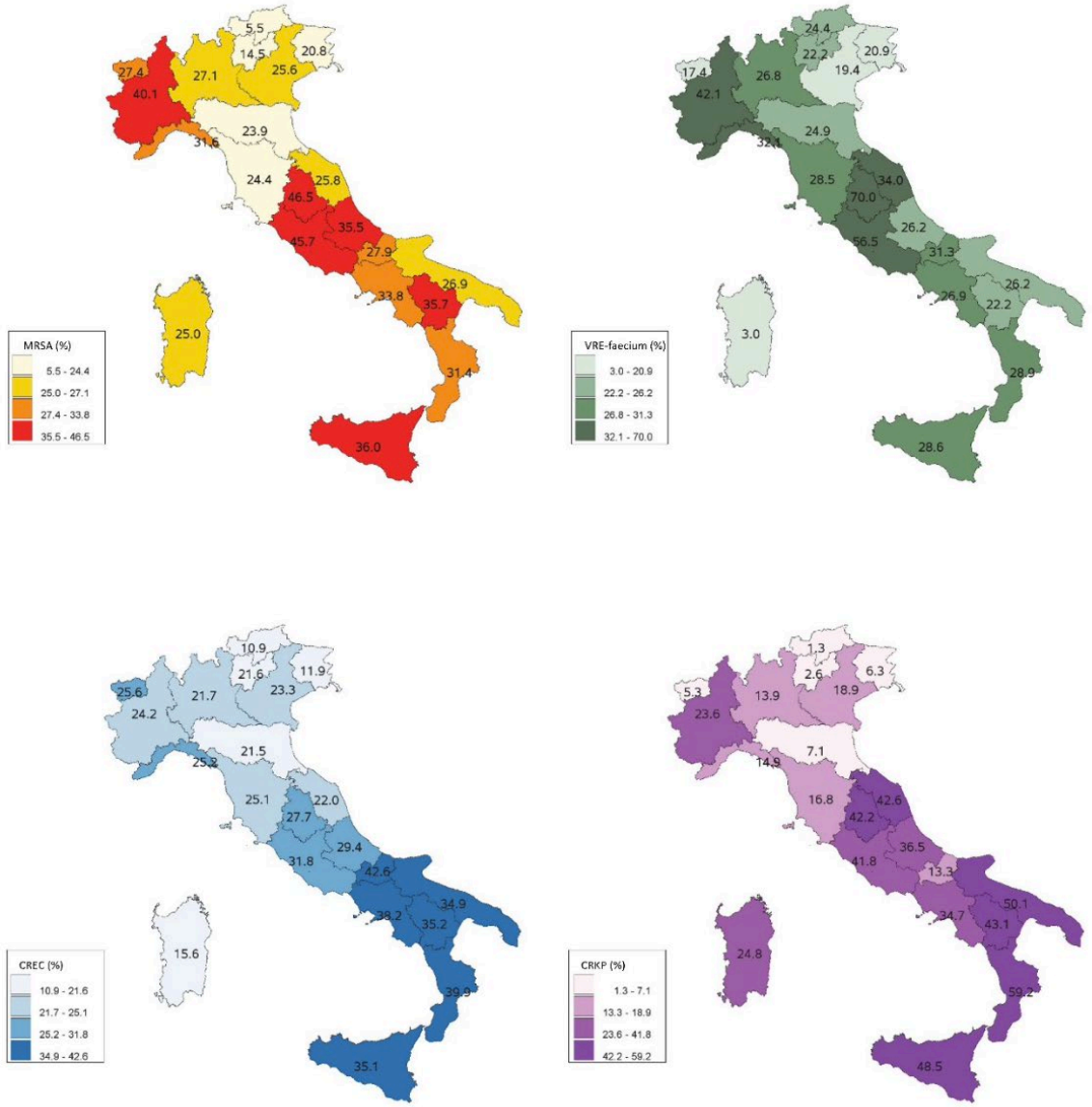
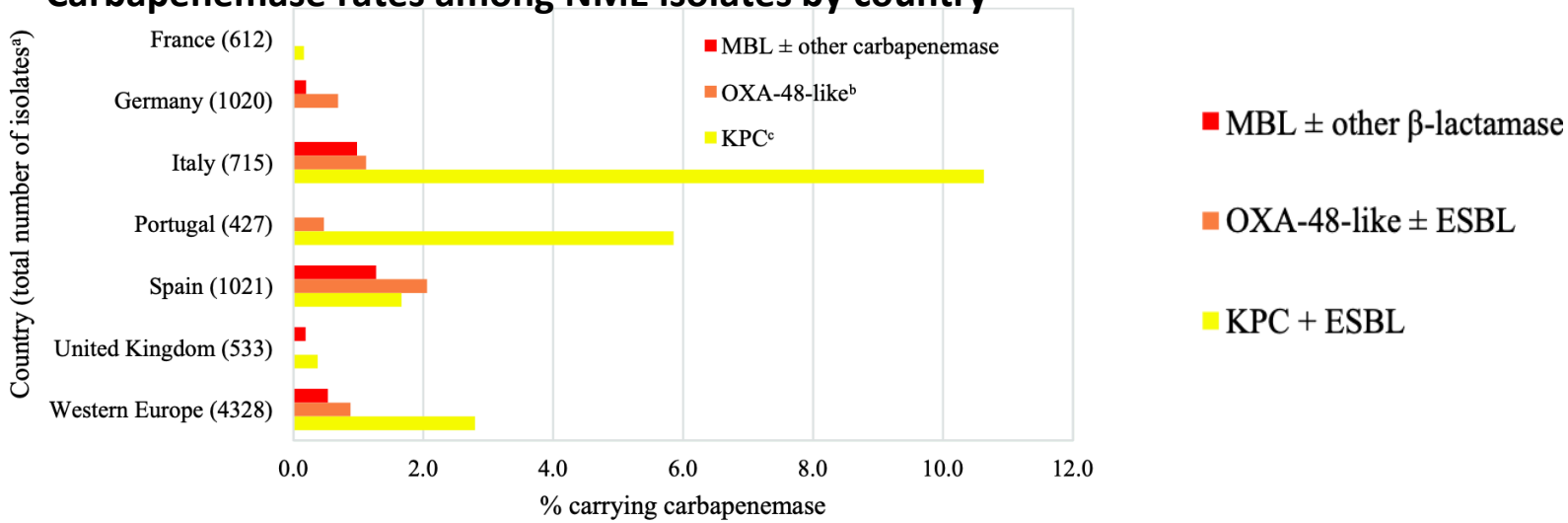


Figura 1. Percentuale di isolati per patogeno, Italia 2022

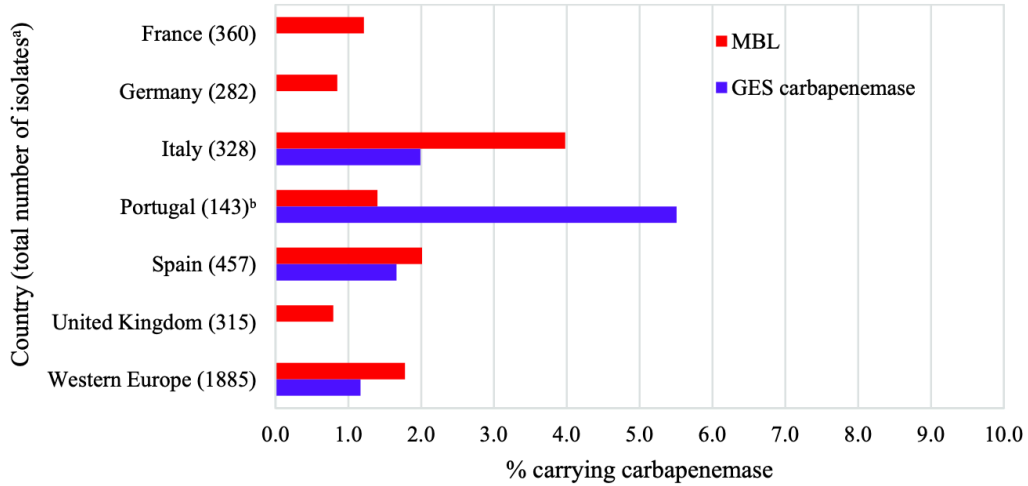


Piperacillin/ tazobactam-resistant and meropenem-resistant non-Morganellaceae Enterobacterales (NME) and *Pseudomonas aeruginosa* collected from patients with lower respiratory tract infections in Europe: SMART 2018–20

Carbapenemase rates among NME isolates by country



Carbapenemase rates among *P. aeruginosa* isolates, by country



Karlowsky JA, JAC Antimicrob Resist. 2023 Jan 20;5(1):dlad003.

Comparison of EuSCAPE and EURECA surveys of carbapenem resistant *K.pneumoniae*

a

Clonal complex

- 258
- 11
- 101
- 307
- 15
- 147
- 14
- 405
- 37
- 45
- 17

Carbapenemase genes

- $bla_{KPC\text{-}like}$
- $bla_{NDM\text{-}like}$
- $bla_{VIM\text{-}like}$
- $bla_{OXA\text{-}48\text{-}like}$
- $bla_{IMP\text{-}like}$
- Two carbapenemase genes

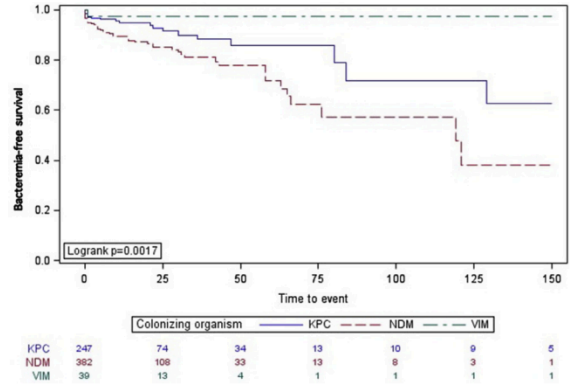
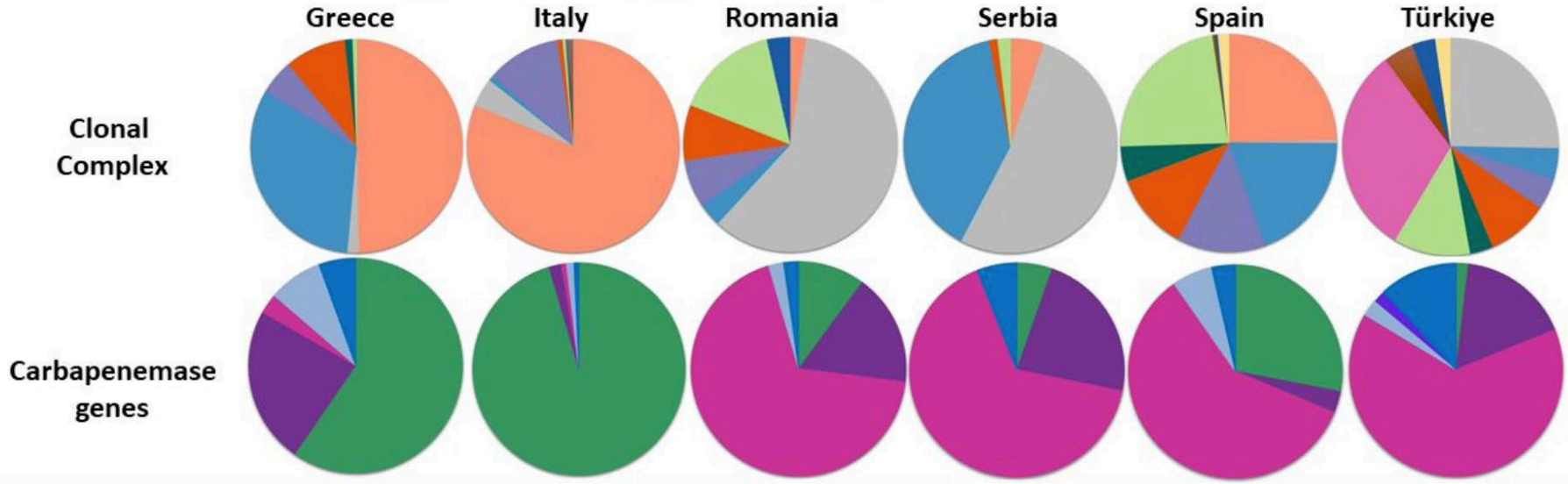


Fig. 2. Kaplan–Meier curves of event (bacteraemia)-free survival among the three study groups (KPC versus VIM versus NDMrectal carriers). Red line: NDM-group. Blue line: KPC-group. Green line: VIM-group.

b



NDM-Kp was associated with increased risk of BSI compared with KPC-Kp.

This finding seems to be strongly related to the high-risk clone **ST147**.

Budia Silvia et al; bioRxiv preprint doi: https://doi.org/10.1101/2023.09.05.556311; this version posted September 5, 2023
Falcone M, Clin Microbiol Infect. 2022 Feb;28(2):298.e1-298.e7. doi: 10.1016/j.cmi.2021.06.031.

Risk for MDR GNB carriers developing an infection

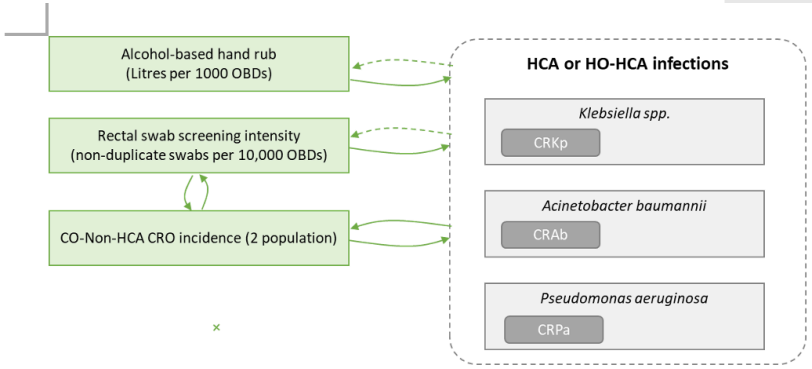
Carriers	BSI
ESBL	3-25%
CRE	3-17%
CR Acinetobacter	40%
DTR P.aeruginosa	43%
MRSA	15-30%
VRE	8%

Adapted from Milstone et al., Clin Infect Dis. 2011 Nov;53(9):853-9
Williems et al. Lancet Infect Dis 2023; 23: 719–31

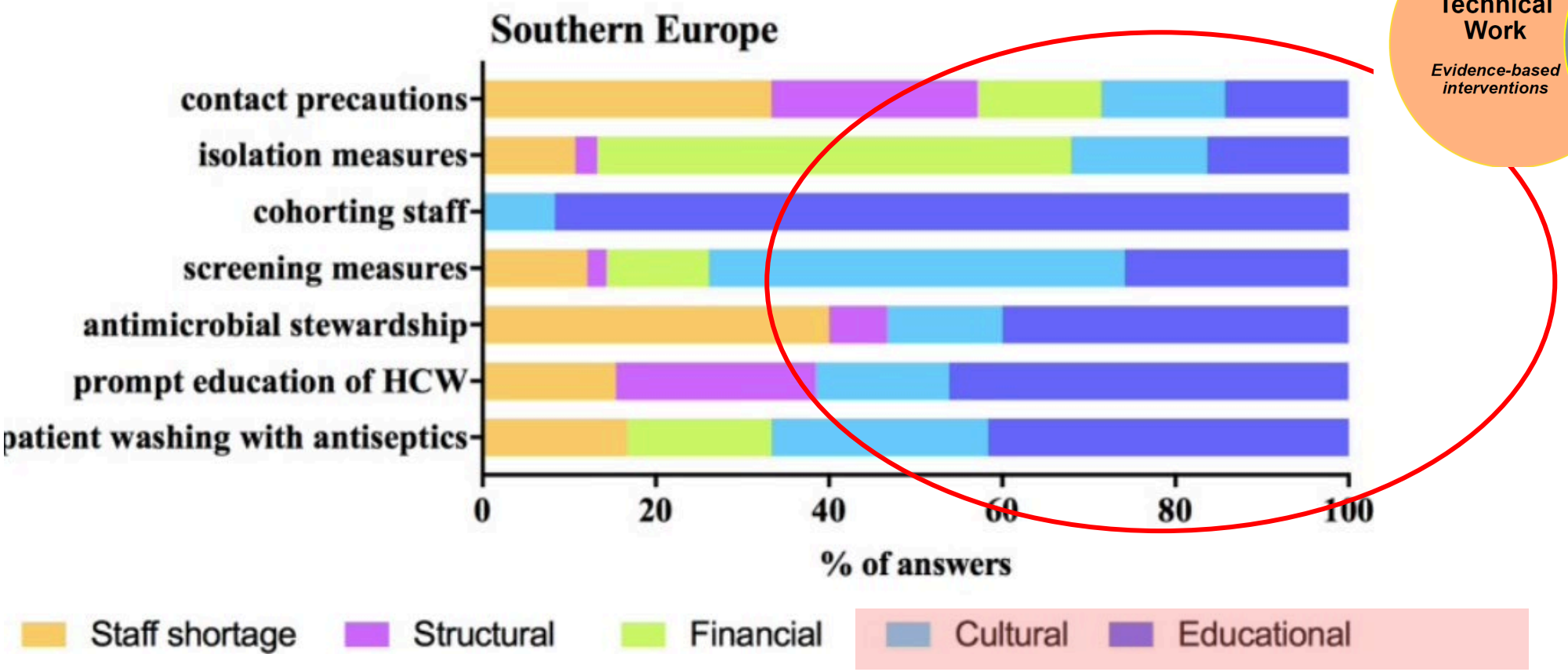
Means of transmission for pathogen guide IPC strategies

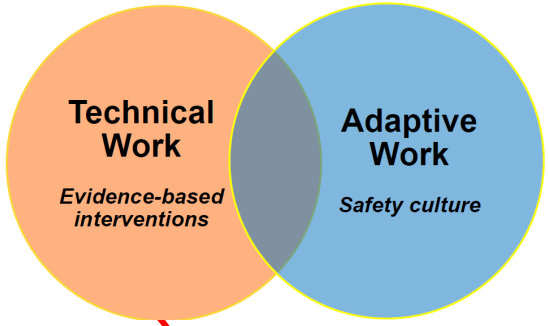
Courtesy of Dr. José María López Lozano
Chief. Preventive Medicine/ Infection Control Unit,
Hospital Vega Baja Orihuela-Alicante
And Meschiari personal opinion

Mechanism of Trasmission	MRSA	VRE	E.Coli ESBL+	KPC	CRPA	CRAB
CLONAL	Very important	Very important	Occasional only	Very important	mixed	mixed
Patient as source	Very important	Very important	Occasional only	Very important	Occasional only	Very important
Enviromental source	Occasional only	Important	Occasional only	Occasional only	Very important	Very important
Antibiotic use	Occasional only	Occasional only	Very important	Very important	Very important	???



Compliance to Infection Prevention and Control (IPC) measures

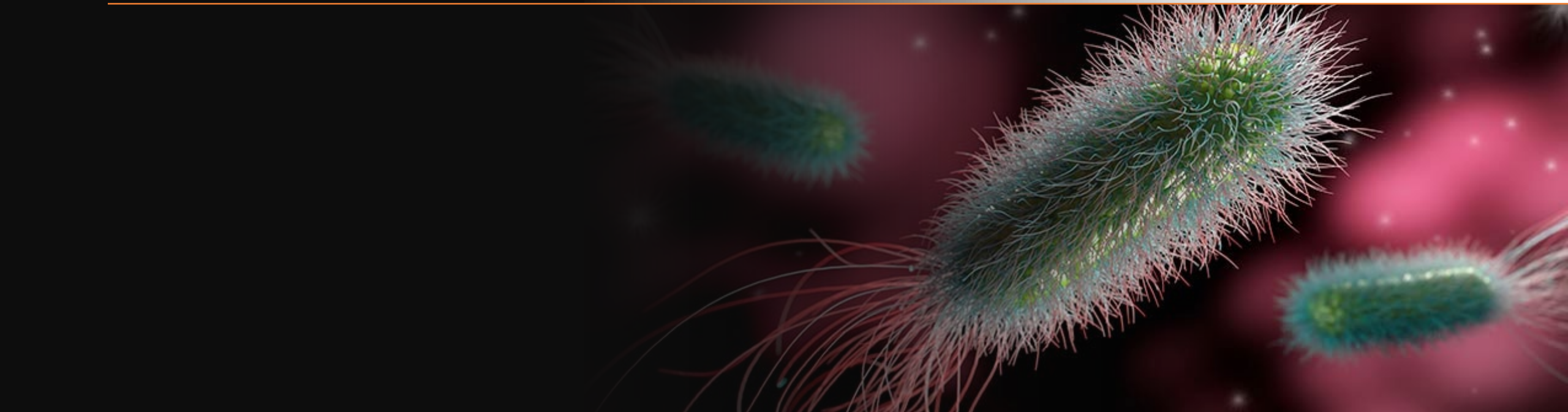




Multimodal IPC strategies appear to be highly effective, the implementation of a **"bundle"** is the best approach **.**

EUCIC StopNegative group; Analysis of the challenges in implementing guidelines to prevent the spread of multidrug-resistant gram-negatives in Europe. BMJ Open. 2019 May 19;9(5):e027683.

carbapenem-resistant *Enterobacterales* (CRE) control



HOW to implement HAND HYGIENE

The first WHO global survey on infection prevention and control in health-care facilities

Sara Tomczyk, Anthony Twyman*, Marlieke E A de Kraker, Ana Paula Coutinho Rehse, Ermira Tartari, João Paulo Toledo, Alessandro Cassini, Didier Pittet, Benedetta Allegranzi*

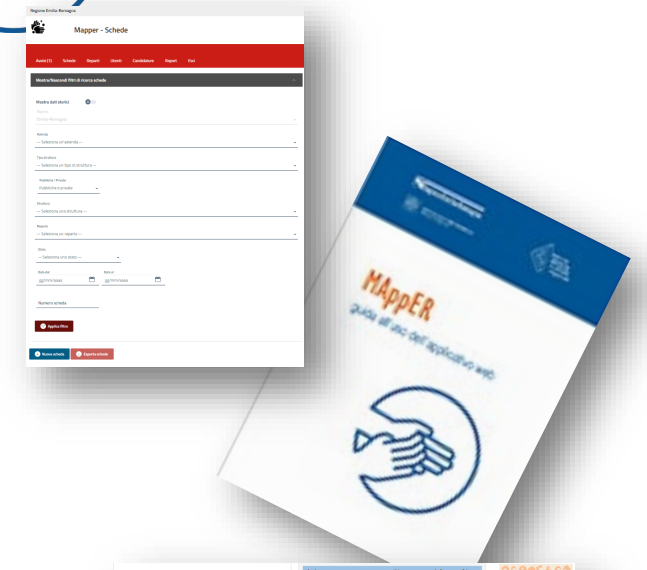
Summary

Background WHO core components for infection prevention and control (IPC) are important building blocks for effective IPC programmes. To our knowledge, we did the first WHO global survey to assess implementation of these programmes in health-care facilities.

Lancet Infect Dis 2022
Published Online
February 21, 2022
https://doi.org/10.1016/

1/4 of hospitals in low-income countries had access to **hand hygiene stations at points of care**

MAppER



Web App

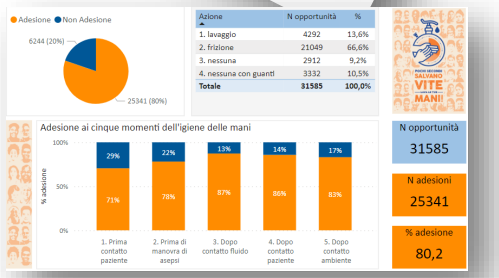
- **Utilizzabile su tutti i dispositivi** mobili **connessi** ad **internet** (via browser) – nessuna barriera di sistema operativo.
- **Centralizzazione** dei **dati**, in tempo reale.

Piattaforma regionale

- **Feedback** con i dati **regionali** per il confronto tra istituzioni.
- **Supporto** centrale **all'uso** (formazione degli operatori e supporto tecnico).

Feedback

- **Immediato su App** – restituzione dei risultati dell'osservazione in tempo reale all'equipe valutata.
- **Dashboard/Report Aziendale** che permette di selezionare e aggregare dati per creare **descrittive personalizzate** – **monitoraggio** delle rilevazioni in **tempo reale**; **feedback** a livello di unità (reparto, ospedale, azienda) anche **nel tempo** (valutazione dei trend).



SCREENING STATEGIES: WHO HOW AND WHEN?

Real life questions: Multidrug-resistant Gram negatives

1. Should I screen my patient before surgery (all vs specific one)?
2. Should I implement target screening versus universal screening?
3. How I define high endemic setting?
4. When I should perform the screening?

ESCMID PUBLICATIONS 10.1111/1469-0691.12427

ESCMID guidelines for the management of the infection control measures to reduce transmission of multidrug-resistant Gram-negative bacteria in hospitalized patients

E. Tacconelli[1], M. A. Cataldo[2], S. J. Dancer[3], G. De Angelis[4], M. Falcone[5], U. Frank[6], G. Kahlmeter[7], A. Pan[8,9], N. Petrosillo[2], J. Rodríguez-Baño[10,11,12], N. Singh[13], M. Venditti[5], D. S. Yokoe[14] and B. Cookson[15]

Clin Microbiol Infect 2014; 20 (Suppl. 1): 1–55

RECTAL SCREENING: who & when

Target Screening «Patients»

Universal Screening Target to high-risk areas

Screening strategy	CPE burden: No cases	Sporadic cases	Local transmission established or CPE endemic
Admission **from** high-risk settings*	Y	Y	Y
Admission **to** high-risk units†	Y	Y	Y
Single or periodic point prevalence surveys	C	C	Y
Screening of contacts‡ of confirmed cases	n/a	Y	Y
Opportunistic screening (e.g. all faecal specimens)	C	C	Y

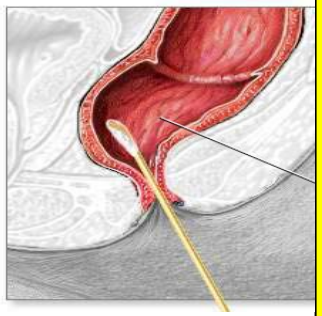
Y = Screen. C = Consult infection prevention and control team. n/a = Not applicable.

Patient-level:
- more "accurate" (detects more)
- Screening patients of low-risk areas has a very high rate of neg. results even when risk factors are considered
- Time-consuming (surveys etc.)

Specialty-level
- Pragmatic, easier to implement, less time-consuming
- Usually high-risk areas are hubs of transmissions
- Detects only 50% of the CPE burden, however, perhaps the most IPC relevant?

Universal Screening for CROs
In all high-risk areas

- Without risk factor check list at admission
- Starting to perform "rectal colonization" **point prevalence survey**



Rectal screening

- **At admission**
- **Weekly**

If positive, patients are considered positive for a year from the first isolation or at least for the length of the patient's hospital stay.

The median time to intestinal clearance was **179** (IQR 26–502)

Vella V, et al. J Hosp Infect.Journal of Infection 84 (2022) 119–130
Recommendations for the control of carbapenemase-producing Enterobacterales (CPE)
Australian Commission on Safety and Quality in Health Care 2021
S. Basri et al. Duration of intestinal colonization; Antimicrobial Resistance & Infection Control 2023, 12(Suppl 1):O49

Systematic review: Screening for MDR Gram-negative bacteria

Syst. review on screening

- **50%** used screening of **high-risk areas**
  - 14% used screening of high-risk patients only in high-risk areas
- **11%** used screening of **high-risk patients**
- **10%** used **complete admission screening** for all patients

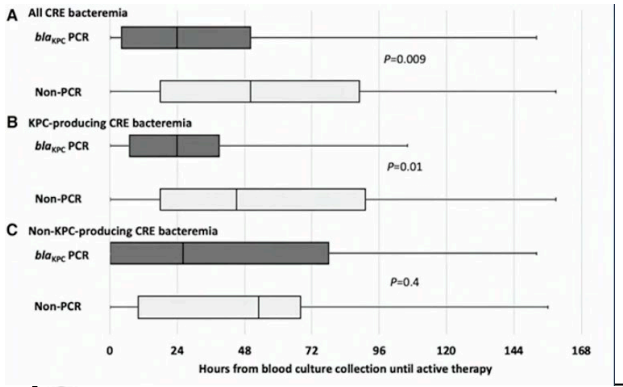
Syst. review on screening

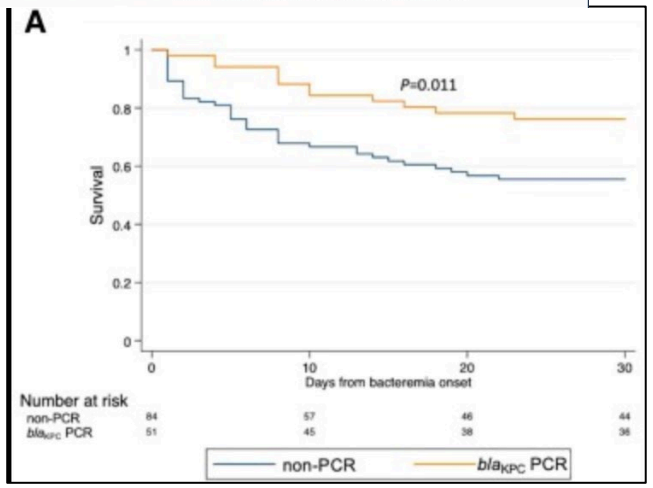
- Overall prevalence was 13.8% *(typical variations according to regions)*
  - **Highest for E. coli 9% and P. aeruginosa 7.5%**
  - **Klebsiella only 4%**
- Patients who acquired MDR-GN during hospitalisation was **9.4%**
  - **Highest risk of acquisition** was for **Klebsiella 26%, Pseudomonas 18%** and **E. coli 15%**
- Risk of **progression to infection among colonised** patients was **11%** with higher values reported for **Klebsiella** 18%

Journal of Infection 84 (2022) 119–130

What is the best screening strategy?

Impact of a Rapid Molecular Test for Klebsiella pneumoniae Carbapenemase and Ceftazidime-Avibactam Use on Outcomes After Bacteremia Caused by Carbapenem-Resistant Enterobacterales





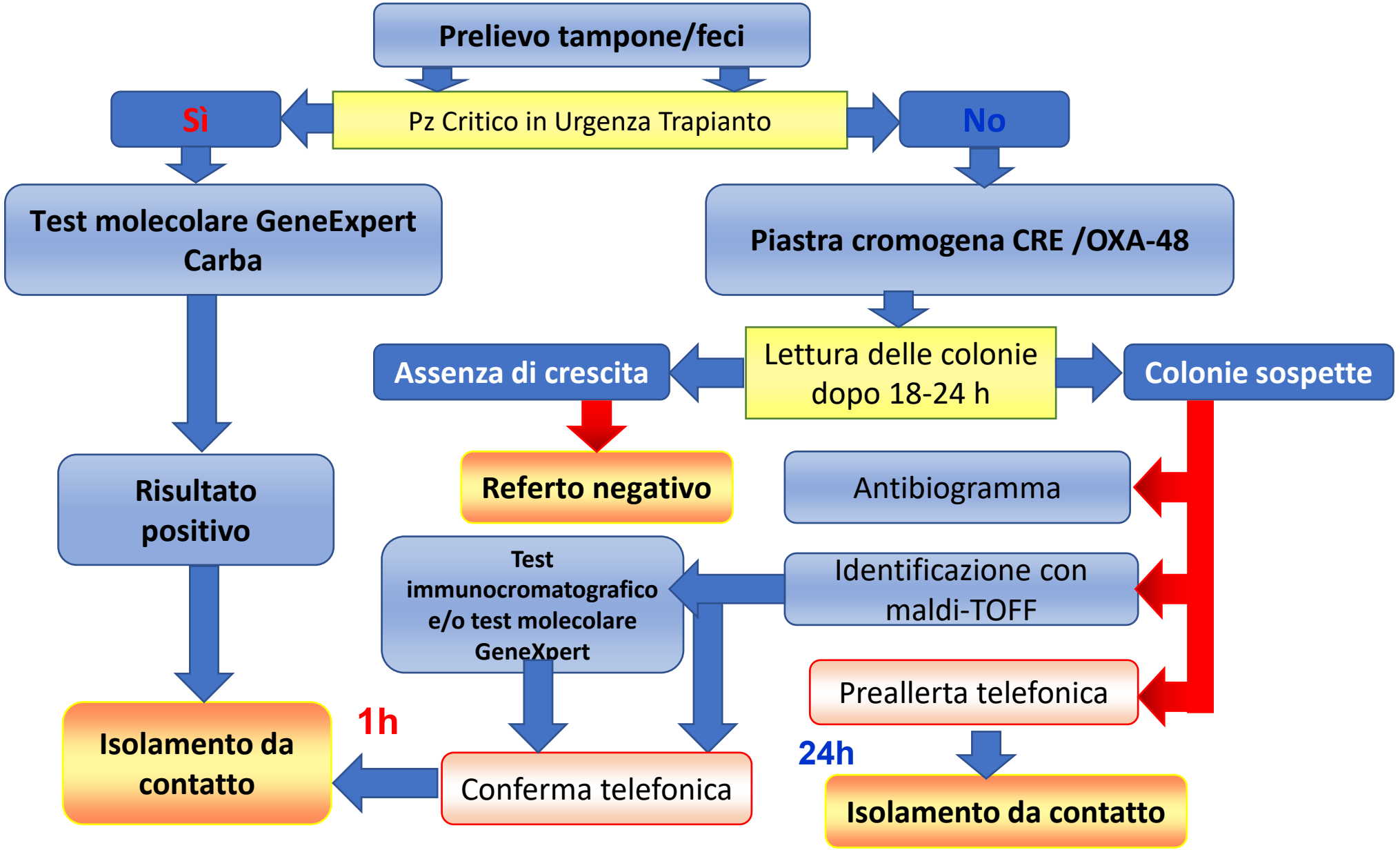
Satlin MJ, Clin Infect Dis. 2022 Dec 19;75(12):2066-2075.
Di Pilato V, Clin Microbiol Infect. 2023 Apr;29(4):537.e1-537.e8.

Should I have used rapid test for screening and infection diagnosis?

Conclusions: It depends on the target***

- prevalence of colonization,
- types of circulating carbapenemases,
- wards with higher incidence
- access to Clinical Microbiology laboratory
- screening of carriers vs infections
- overall costs

Workflow CRE rectal Screening



ADDICTIONAL SCREENING STATEGIES

SERVIZIO SANITARIO REGIONALE
EMILIA-ROMAGNA
Azienda Ospedaliero - Universitaria di Modena

SUPPORT SCREENING STRATEGIES FOR MDR Carriers IN OUR HOSPITAL LEVEL

CRE universally (high risk Units) on rectal swab/ faeces on admission

ESBL-R-E: for patients awaiting liver transplantation or

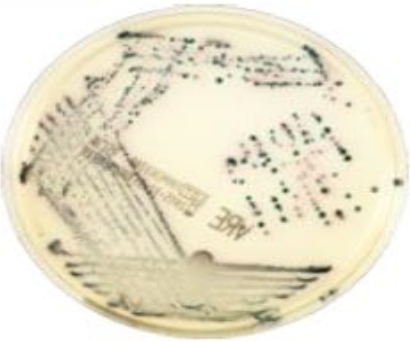
for pre-reception colorectal surgery

FQR-R-E for haematological in-patients and those waiting for a bone marrow transplant

ESBL

CARB

MRSA



VRE

Righi E, Clin Microbiol Infect. 2023 Apr;29(4):463-479.
Satlin et al; Clinical Infectious Diseases® 2021;73(7):1257–65

Randomised controlled trials of digestive decolonisation for ESBL/ or CRE *Enterobacterales*

Study	Microorganism(s)	Patient profile	Intervention	Comparator
Saidel-Odes 2012	Carba-R K.pneu.	Hospitalised	COL+GEN, 7 days	Placebo
Huttner 2013	ESBL-Enterob. (75% E.coli)	Hospitalised	COL+ NEO, 10 days	Placebo
Stoma 2018	MDR/XDR GNs (60% Enterob.)	Haematological	COL, 14 days	No intervention
Fariñas 2021	ESBL, AmpC, CP Enterob. (50% E.coli)	SOT recipients	COL+NEO; 14 days	No intervention

Short-term period, having no long-term sustainable effects!

Some more basic research and weel-design clinical studies are needed for other options:
Phages, CRISPR-car system)

Saidel-Odes L et al; Infect Control Hosp Epidemiol. 2012 Jan;33(1):14-9
Huttner B, J Antimicrob Chemother. 2013 Oct;68(10):2375-82.
Stoma I, Mediterr J Hematol Infect Dis. 2018 May 1;10(1):e2018030.
Fariñas MC, Clin Microbiol Infect. 2021 Jun;27(6):856-863. doi: 10.1016/j.cmi.

Decolonisation strategies: SDD & SOD

35 years after the first publication...

Intensive Care Med (2018) 44:1165–1168
https://doi.org/10.1007/s00134-018-5183-z

EDITORIAL

Antipathy against SDD is justified: Yes

Jean-François Timsit[1,2*] and Matteo Bassetti[3,4]

Intensive Care Med (2018) 44:1169–1173
https://doi.org/10.1007/s00134-018-5144-6

EDITORIAL

Antipathy against SDD is justified: No

Luciano Silvestri[1,2], Hendrick K. F. van Saene[3] and Julian Bion[4*]

Intensive Care Med (2018) 44:1174–1176
https://doi.org/10.1007/s00134-018-5198-5

EDITORIAL

Antipathy against SDD is justified: We are not sure

Francesco Vasques and Luciano Gattinoni*

ORIGINAL

Ecological effects of selective oral decontamination on multidrug-resistance bacteria acquired in the intensive care unit: a case–control study over 5 years

Boacheng Wang[1], Josef Briegel[1*], Wolfgang A. Krueger[2], Rika Draenert[3], Jette Jung[3,5], Alexandra Weber[3],

5034 patients were eligible

Table 6 Health-care-associated infections in both groups after propensity score matching

ICU-acquired infections during pre-vention*	with SOD ($n = 1694$)			Without SOD ($n = 1694$)			p value
	Number of cases	%	Incidence den-sity/1000 days	Number of cases	%	Incidence den-sity/1000 days	
Ventilator-associated pneumonia	243	14	10.2	302	18	14.1	< 0.01
Bacteremia	218	13	8.92	182	11	8.48	0.61
Urinary tract infections	162	10	6.79	138	8	6.43	0.64

*Days at risk with mechanical ventilation: 23,876 days with SOD, 21,467 days without SOD

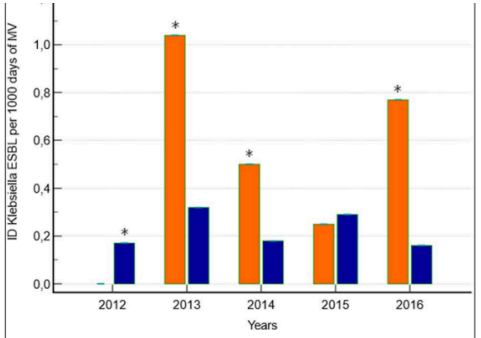


Fig. 2 Incidence densities of MDRB acquired in the ICU in patients with SOD (blue bars) and patients without SOD (orange bars).

Table 7 Incidence rate of death in the ICU in both groups

Death in the ICU*	With SOD			Without SOD			p value
	No	%	Incidence den-sity/1000 days	No	%	Incidence den-sity/1000 days	
Before propensity score matching	759/3340	23	8.8	509/1694	30	15.8	< 0.01
After propensity score matching	478/1694	28	13.2	509/1694	30	15.8	< 0.01

*Days at risk in the ICU: 86,281 and 36,167 days with SOD, respectively; 32,177 days without SOD

ICU, intensive care unit; *SOD*, selective oropharynx decontamination

Boacheng Wang et al, Intensive Care Med 2022

- The SDD regimen consists of four times daily Orabase oral paste with **2% polymyxin B, amphotericin B and tobramycin.**
- SOD: 10ml of a suspension containing *500 mg amphotericin B,* 100 mg polymyxin B and 80 mg tobramycin is administered four times daily in the gastric tube or swallowed in patients without a gastric tube.

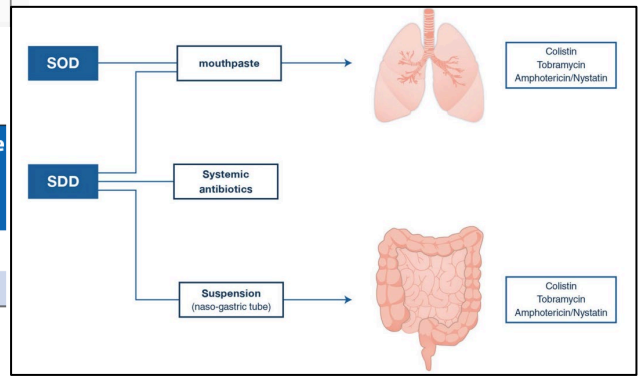
Buitinck et al. Critical Care (2019) 23:208

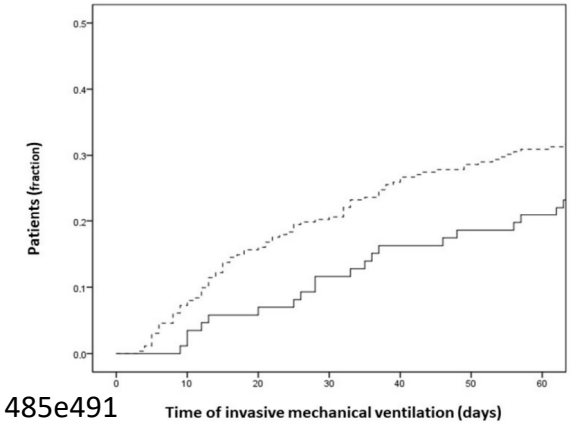
SDD digestive solution and oral paste.

ECMO
Bowel hypoperfusion
Immunocompromized
Trasplant

Role of Selective Digestive Decontamination in the Prevention of Ventilator-Associated Pneumonia in COVID-19 Patients: A Pre-Post Observational Study

Emanuela Biagioni [1], Elena Ferrari [1], Ilenia Gatto [1], Lucia Serio [1], Carlotta Farinelli [1], Irene Coloretti [1], Marta Talamonti [1], Martina Tosi [1], Marianna Meschiari [2], Roberto Tonelli [3], Claudia Venturelli [4], Cristina Mussini [2], Enrico Clini [3], Mario Sarti [4], Andrea Cossarizza [5], Stefano Busani [1] and Massimo Girardis [1,*,†] on behalf of the MO-COVID-19 Working Group





N.L. Plantinga et al. / Clinical Microbiology and Infection 26 (2020) 485e491

Dynamics of carbapenemase-producing Enterobacterales intestinal colonisation in the elderly population after hospital discharge, Italy, 2018-2020

A longitudinal study was conducted in two Italian cities (March 2018 to September 2020) **enrolling 137** patients aged ≥65 years with CPE intestinal colonisation at hospital discharge (**FU 4 months**).

28/65 patients (43.1%) remained colonised at Month 4; 16/42 (38.1%) and 5/28 (17.9%) were found colonised up to Months 8 and 12, respectively.

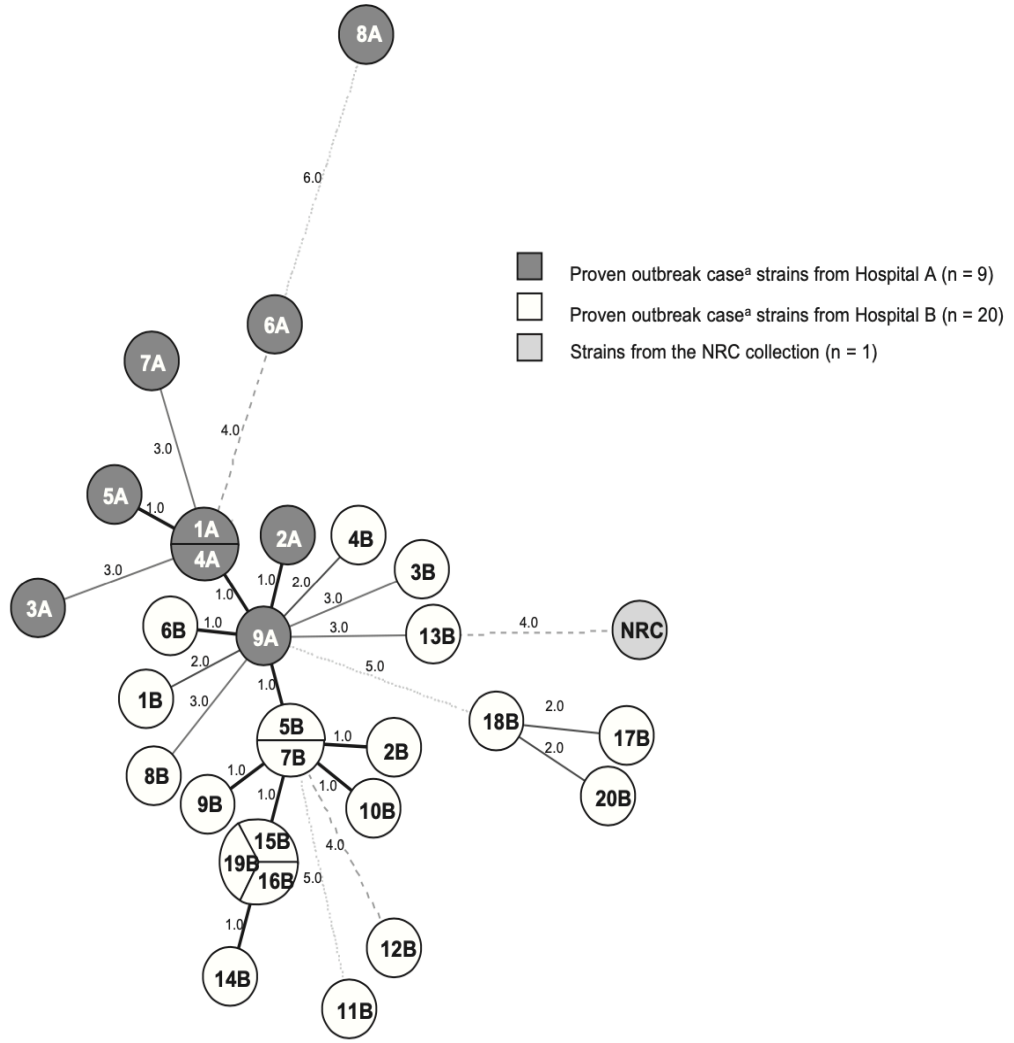
Colonisation persistence was more frequent in patients with bacteraemia or complicated urinary tract infection while in hospital and in those staying in long-term care facilities (LTCFs).

Identification of patients at **higher risk of persistent intestinal carriage after hospital discharge** can prompt control measures to limit the transmission of CPE in the community, especially in LTCF settings.

Tinelli M, Int J Antimicrob Agents. 2022 Jun;59(6):106594.

An Outpatient Clinic as a Potential Site of Transmission for an Outbreak of New Delhi Metallo-β-Lactamase– producing Klebsiella pneumoniae Sequence Type 716: *A Study Using Whole-genome Sequencing*

- They identified the outpatient clinic as the probable transmission site bridging the 2 outbreaks.
- This study highlight the importance of implementing adequate infection control measures in outpatient settings, especially as healthcare delivery moves from acute care facilities to outpatient clinics.



Clinical Infectious Diseases
MAJOR ARTICLE

An Outpatient Clinic as a Potential Site of Transmission for an Outbreak of New Delhi Metallo-β-Lactamase–producing *Klebsiella pneumoniae* Sequence Type 716: A Study Using Whole-genome Sequencing

Amélie Heinrichs,[1] Maria Angeles Argudín,[1] Ricardo De Mendonça,[1] Ariane Deplano,[1] Sandrine Roisin,[1] Magali Dodémont,[1] Julien Coussement,[1] Lorenzo Filippin,[2] Jill Dombrecht,[3] Katrien De Bruyne,[3] Te-Din Huang,[4] Philip Supply,[5] Baudouin Byl,[6,7] Youri Glupczynski,[4] and Olivier Denis[1,6]

Heinrichs A, Clin Infect Dis. 2019 Mar 5;68(6):993-1000.

Decolonisation strategies for outpatients

ORIGINAL ARTICLE FREE PREVIEW

Decolonization in Nursing Homes to Prevent Infection and Hospitalization

Loren G. Miller, M.D., M.P.H., James A. McKinnell, M.D., Raveena D. Singh, M.A., Gabrielle M. Gussin, M.S., Ken Kleinman, Sc.D., Raheeb Saavedra, A.S., Job Mendez, M.D., R.N., Tabitha D. Catuna, M.P.H., James Felix, B.S., Justin Chang, B.S., Lauren Heim, M.P.H., Ryan Franco, B.A., et al.

28,956 residents; chlorhexidine for all routine bathing and showering and administration of nasal povidone–iodine twice daily for the first 5 days after admission and then twice daily for 5 days every other week.

- Among the transfers to a hospital in the routine-care group, 62.2% (the mean across facilities) were due to infection during the baseline period and 62.6% were due to infection during the intervention period (risk ratio, 1.00; 95% confidence interval [CI], 0.96 to 1.04).
- The corresponding values in the decolonization group were 35.5% and 32.4% (risk ratio, 0.92; 95% CI, 0.88 to 0.96), for a difference in risk ratio, as compared with routine care, of **14.6%** (95% CI, 9.7 to 19.2).
- The number needed to treat was **9.7 to prevent one infection-related hospitalization** and 8.9 to prevent one hospitalization for any reason.

CONCLUSIONS

In nursing homes, universal decolonization with chlorhexidine and nasal iodophor (10% Povidone-Iodine) led to a significantly **lower risk of transfer to a hospital due to infection than routine care**.

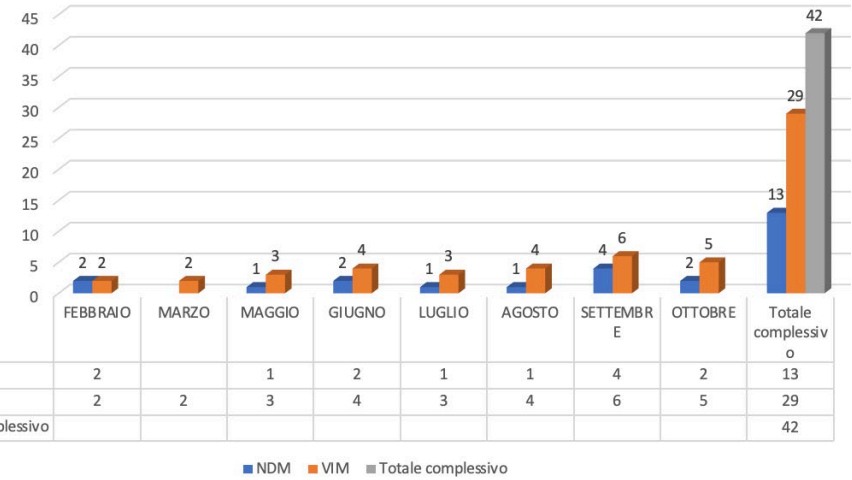
Trisha N. Peel et al, October 19, 2023; N Engl J Med 2023; 389:1488-1498

News for outbreak definition and management

Increase in Plasmid bearing multiple carbapenemases

Characterization of broad host range INCC plasmid bearing multiple carbapenemases: KPC-2, NDM-1, AND VIM-24

R. Sierra[1,*], J. C. García Betancur[2], E. de la Cadena[2], M. Roch[3], L. C. Espitia-Acero[2], M. V. Villegas[2], D. O. Andrey[1]
[1]Division of Infectious diseases, Geneva University Hospitals, Geneva, Switzerland, [2]Grupo de Investigación en Resistencia Antimicrobiana y Epidemiologia Hospitalaria, Universidad El Bosque, Bogota, Colombia, [3]Microbiology and Molecular Medicine, University of Geneva, Geneva, Switzerland
Correspondence: R. Sierra
Antimicrobial Resistance & Infection Control 2023, **12(Suppl 1):**O47



Conclusion:

- The acquisition of multiple carbapenemases is increasingly reported.
- The identification **of broad** host range plasmids with multiple carbapenemase genes represent a strong potential for horizontal antibiotic resistance spread.
- Long-read sequencing technology is allowing for refined analysis of plasmids.

Materiale biologico (data isolamento)	Sequence Type (ST)
…ione del 26/09/2023	
Feci (21/0/2023)	**ST 323**
Feci (28/06/2023)	**ST 14**
Feci (07/09/2023)	**ST 307**
…uovo Ceppo	
Tampone Rettale (19/09/2023)	**ST 54**

Carbapenemasi	n.	%
KPC	214	70.2%
OXA	32	10.5%
NDM	26	8.5%
VIM	8	2.6%
MBL non specificata	4	1.3%
multiplo*	15	4.9%
carbapenemasi non specificata	6	2.0%
Totale	**305**	**100%**

Osservatorio Regione Emilia-Romagna, 2022)

*KPC+OXA=7; KPC+VIM=2; KPC+MBL=1; NDM+OXA=4; NDM+VIM=1

CRO and plasmid transfer in hospitals

CPE and plasmid transfer in hospitals – what can we do? A rapid reflection from ICPIC 2023

ARTICLE

https://doi.org/10.1038/s41467-022-30637-5 OPEN

Whole genome sequencing reveals hidden transmission of carbapenemase-producing *Enterobacterales*

Kalisvar Marimuthu[1,2,3✉], Indumathi Venkatachalam[4], Vanessa Koh[1,2], Stephan Harbarth[5], Eli Perencevich[6,7], Benjamin Pei Zhi Cherng[3,4,8], Raymond Kok Choon Fong[9], Surinder Kaur Pada[10], Say Tat Ooi[11], Nares Smitasin[3,12], Koh Cheng Thoon[13], Paul Anantharajah Tambyah[12], Li Yang Hsu[3,14,15], Tse Hsien Koh[4,8], Partha Pratim De[2], Thean Yen Tan[9], Douglas Chan[10], Rama Narayana Deepak[11], Nancy Wen Sim Tee[12], Andrea Kwa[4,16,17], Yiying Cai[4,15], Yik-Ying Teo[14,15], Natascha May Thevasagayam[1,2], Sai Rama Sridatta Prakki[1,2], Weizhen Xu[1,2], Wei Xin Khong[2], David Henderson[18], Nicole Stoesser[19], David W. Eyre[20], Derrick Crook[19], Michelle Ang[1], Raymond Tzer Pin Lin[1,12], Angela Chow[2,14,21], Alex R. Cook[14], Jeanette Teo[12], Oon Tek Ng[1,2,21✉] & Carbapenemase-Producing Enterobacteriaceae in Singapore (CaPES) Study Group*

antibiotics MDPI

Article

Probable Three-Species In Vivo Transfer of *bla*$_{NDM-1}$ in a Single Patient in Greece: Occurrence of NDM-1-Producing *Klebsiella pneumoniae*, *Proteus mirabilis*, and *Morganella morganii*

Georgios Meletis [1,*], Andigoni Malousi [2], Areti Tychala [1], Angeliki Kassomenaki [1], Nikoletta Vlachodimou [1], Paraskevi Mantzana [1], Simeon Metallidis [3], Lemonia Skoura [1] and Efthymia Protonotariou [1]

RESEARCH LETTER – Pathogens & Pathogenicity

Horizontal transfer of the *bla*$_{NDM-1}$ gene to *Pseudomonas aeruginosa* and *Acinetobacter baumannii* in biofilms

Windy D. Tanner[1,*,†], Robyn M. Atkinson[2], Ramesh K. Goel[3], Mark A. Toleman[4], Lowell Scott Benson[5], Christina A. Porucznik[5] and James A. VanDerslice[5]

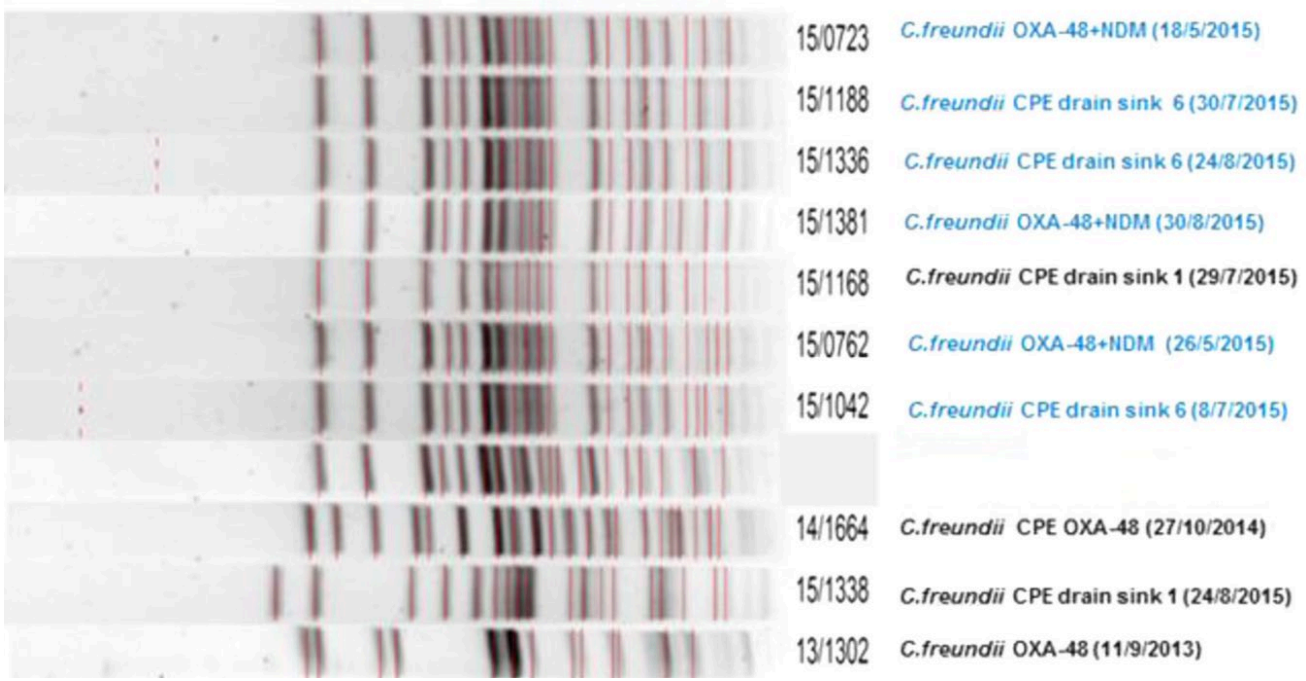
42% clonal transmission criteria vs **44.8% plasmid-mediated transmission** criteria

Possible evidences for:

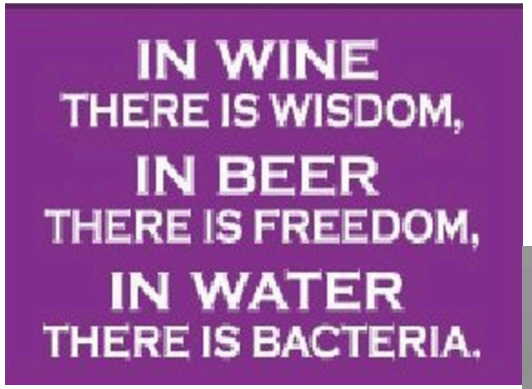
- Indirect trasmission (**no temporal overlap** in patients' admission period)
- **Biofilm transfer** of NDM-encoding plasmids to NFGNB from *Enterobacterales spp.* blaNDM-1 transconjugants.
- ***in vivo* transfer of a blaNDM-1-**containing cluster among different gram negative

Marimuthu, K., Nat Commun 13, 3052 (2022).
Antibiotics 2023, 12, 1206. https://doi.org/10.3390/antibiotics12071206

The sink as a potential source of transmission of carbapenemase-producing gram negative organisms



7,039 search results (11 included): sink removal (n=3), water filters (n=5), sink trap heating and vibration devices (n = 3), new tap devices (n = 2) and hopper covers (n=1).



G.-B. Fucini1,*, Are interventions on sinks in the ICU effective to reduce risk of infection or colonization with gramnegative bacteria? A systematic review of the literature; Antimicrobial Resistance & Infection Control 2023, 12(Suppl 1):P162

A better management of sinks and drains (or even getting rid of them completely) ***will be a vital part of the solution.***

Antimicrobial stewardship is a big factor here!

De Geyter et al. Antimicrobial Resistance and Infection Control (2017) 6:24
Bitar I, Antimicrob Agents Chemother 63:e02609-18

carbapenem-resistant *Acinetobacter baumanii* (CRAB) control

Priority role of *A. baumannii* colonization on the risk to develop CRAB infections

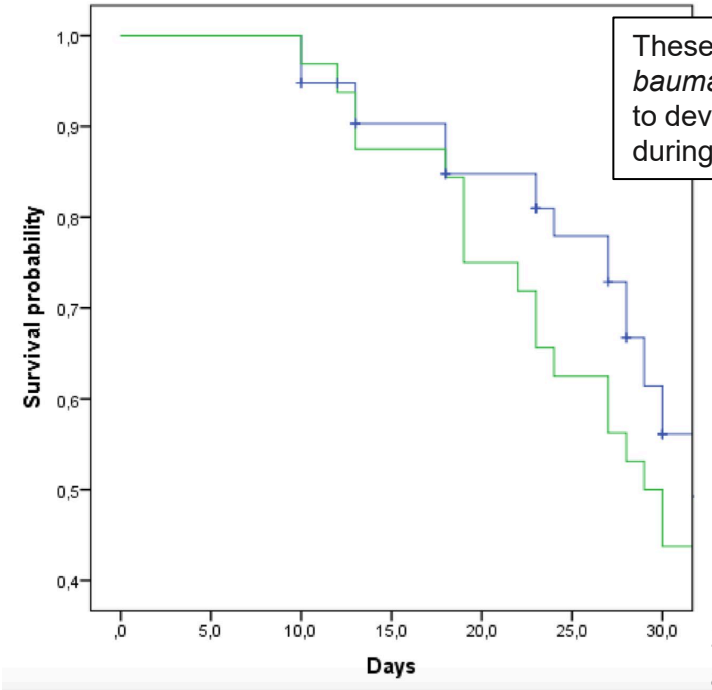
Risk factors	OR (95% CI)	*P* value
CCI	1.34 (1.02–15.2)	**0.026**
COVID-19	2.32 (1.72–15.8)	**<0.001**
Hypertension	1.87 (0.91–3.87)	0.089
SAPS II	2.5 (0.88–11.5)	0.091
Timing of ICU to colonization	1.2 (0.84–9.9)	0.122
Multisite >1	2.4 (1.2–4.90)	**0.016**
Mechanical ventilation	2.34 (1.1–5.02)	**0.024**

Infection
https://doi.org/10.1007/s15010-021-01643-4

ORIGINAL PAPER

Multidrug-resistant *Acinetobacter baumannii* infections in COVID-19 patients hospitalized in intensive care unit

Alessandro Russo[1,2] · Francesca Gavaruzzi[2] · Giancarlo Ceccarelli[2] · Cristian Borrazzo[2] · Alessandra Oliva[2] · Francesco Alessandri[3] · Eugenia Magnanimi[3] · Francesco Pugliese[3] · Mario Venditti[2]



These data highlight the role of *A. baumannii* **colonization** on the risk to develop MDR-AB infections also during COVID-19.

30-days survival in patients affected (green line) or not (blue line) by COVID-19

Cogliati Dezza F et al *JAC Antimicrob Resist*, 2023

Risk factors for CRAB colonization in hospital setting

Table 2 Univariate and multivariate analysis of risk factors and outcomes related to CRAB colonization

Variables	Univariate analysis			Multivariate analysis		
	OR	95% CI	*P* value	OR	95% CI	*P* value
Age (years)	0.99	0.97–1.01	0.767			
Sex, male	0.71	0.34–1.49	0.378			
LOS	1.02	1.01–1.04	< 0.001	1.03	1.01–1.05	0.002
ICU stay	3.2	1.46–6.99	0.004			
[a]Deaths	5.5	1.77–17.01	0.003			
Provenance of patient at admission						
Home	Ref.					
LTHCF	16.14	1.91–136	0.011			
Other hospital	0.76	0.14–3.99	0.754			
Recent hospitalization	3.02	0.98–9.34	0.054			
Charlson Comorbidity Index	1.15	0.99–1.33	0.053			
McCabe score, nonfatal vs. fatal disease and rapidly fatal disease	2.12	1.08–4.14	0.027	5.45	1.87–15.89	0.002
Major surgery ≤ 30 days before hospitalization	1.34	0.21–8.37	0.748			
Major surgery during hospitalization	1.75	0.79–3.87	0.167			
Bedridden	5.29	1.85–15.12	0.002			
Permanent devices	4.52	1.55–13.22	0.006	10.15	2.27–45.39	0.002
Presence of extrinsic risk factors						
Central vascular catheterization	10.37	3.93–27.32	< 0.001			
PICC or midline	4.52	1.55–13.22	0.006			
Urinary catheter	7.23	2.91–17.96	< 0.001	4.96	1.52–16.19	0.008
Naso-gastric tube	4.16	1.57–10.99	0.004			
PEG	11.12	1.25–98–33	0.030			
Tracheostomy	10.54	2.79–39.75	0.001			
Mechanical ventilation	3.38	1.19–9.61	0.022	40.01	4.05–395.1	0.002
Dialysis	2.07	0.40–10.70	0.385			
Corticosteroid therapy	2.75	1.20–6.29	0.016			
Antibiotics during hospitalization	8.26	1.86–36–72	0.005			
3GC	1.90	0.90–4.01	0.089			
Carbapenems	6.66	2.19–20.20	0.001	5.39	1.14–25.44	0.033
Penicillins	1.93	0.90–4.11	0.088			
Fluoroquinolones	2.09	0.86–5.08	0.101			
Glycopeptides	3.5	1.44–8.48	0.006			
Polytherapy	4.65	2.13–10.14	< 0.001			

Meschiari *et al.*
Antimicrob Resist Infect Control (2021) 10:69
https://doi.org/10.1186/s13756-021-00919-6

Antimicrobial Resistance and Infection Control

RESEARCH Open Access

Risk factors for nosocomial rectal colonization with carbapenem-resistant *Acinetobacter baumannii* in hospital: a matched case–control study

Geriatric department
Devices (UCs and CVCs)
A fatal disease
A longer LOS

Internal medicine department
Partial disabilities or bedridden status
Prolonged hospitalization,
Previous admission to the ICU (+MV)
Permanent devices, and catheters
Current antibiotic therapy (antibiotic polytherapy)

ICU
McCabe Score (a fatal or rapidly fatal disease)
Use of t3GC and carbapenems (OR: 15 and 33)

Implement IPC as a Bundle

Meschiari *et al.*
Antimicrob Resist Infect Control (2021) 10:123
https://doi.org/10.1186/s13756-021-00990-z

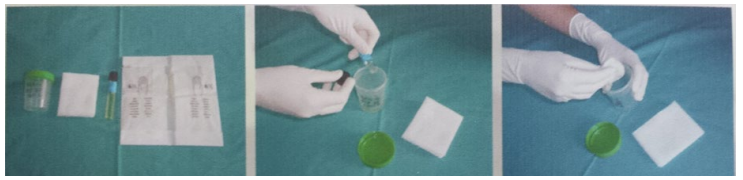
Antimicrobial Resistance and Infection Control

RESEARCH Open Access

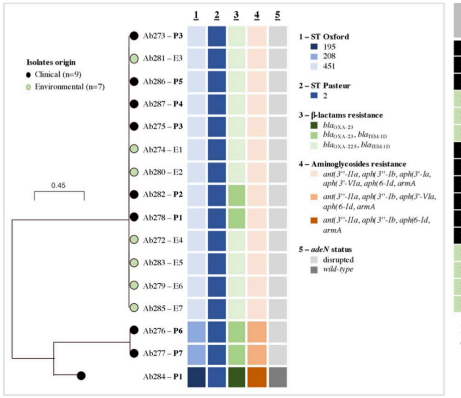
A five-component infection control bundle to permanently eliminate a carbapenem-resistant *Acinetobacter baumannii* spreading in an intensive care unit

Marianna Meschiari[1*], José-María Lòpez-Lozano[2], Vincenzo Di Pilato[3], Carola Gimenez-Esparza[4], Elena Vecchi[5], Erica Bacca[1], Gabriella Orlando[1], Erica Franceschini[1], Mario Sarti[6], Monica Pecorari[7], Antonella Grottola[7], Claudia Venturelli[6], Stefano Busani[8], Lucia Serio[8], Massimo Girardis[8], Gian Maria Rossolini[9,10,11], Inge C. Gyssens[12], Dominique L. Monnet[13] and Cristina Mussini[1]

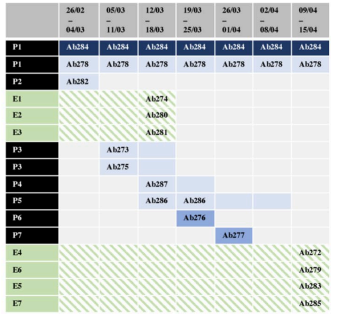
1. **Active surveillance**: Extended screening.
2. **Contact precaution** measures for all patients until discharge, independently of CRAB status
3. **Environmental sampling**
4. **Cycling radical cleaning** and disinfection of all rooms, areas and patients
5. **Rapid Genotyping**



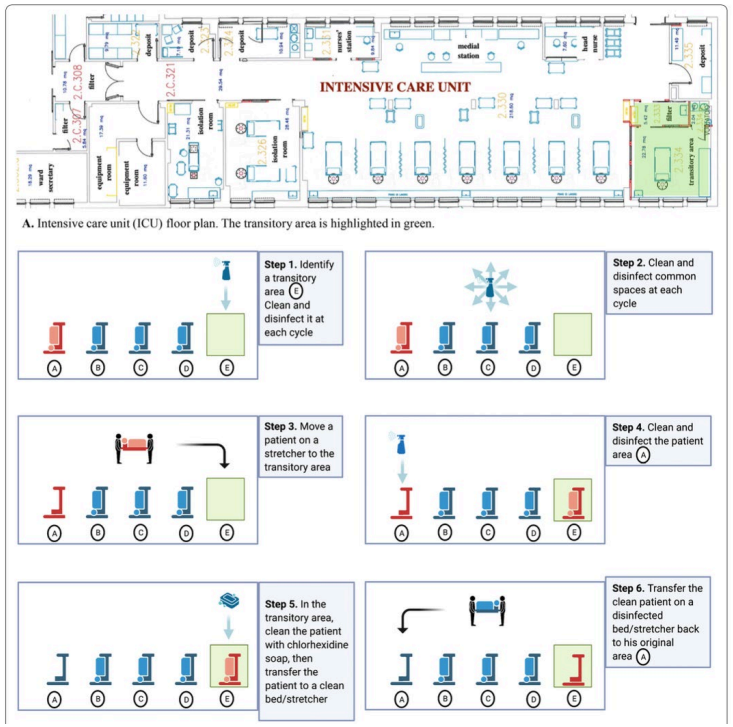
Cycling Radical Disinfection



A. WGS of CRAB isolates. Labels were configured to represent patient (P1-7) and environmental (E1-7) samples



B. Timeline, ICU occupancy of seven patients with CRAB and environmental samples taken during the same study period



A. Intensive care unit (ICU) floor plan. The transitory area is highlighted in green.

Infection Control and Hospital Epidemiology , Vol. 20, No. 7 (July 1999), pp. 458- 460

Organismo	Muestras clínicas				
	Heces/ Rectal	Perineal	Faringe	Nasal	Otras
Staphylococcus aureus resistente a meticilina	+[a]	+++	+++	++++	++[b]
Enterococcus spp. resistente a glucopéptidos	++++	++++	(+)	-	++
Enterobacterias productoras de BLEE	++++	++++	+	-	++
Acinetobacter baumannii multirresistente	++++	++	++++[c]	-	+++[d, e]
Pseudomonas aeruginosa resistente a carbapenemas por producción de MBL	+	+++	++++[c]	-	+++[d]

CRAB multi-site Active surveillance

Universal screening on admissions for CRAB by rectal swabs and repeated weekly, adding **3 more sites** (axilla, groin and endotracheal), for all the patients admitted in ICU (for more than 24 hours)

A recently published program by Valencia-Martìn et al. found a sensitivity of 96% combining rectal and pharyngeal swabs compared to 78% of rectal swab only

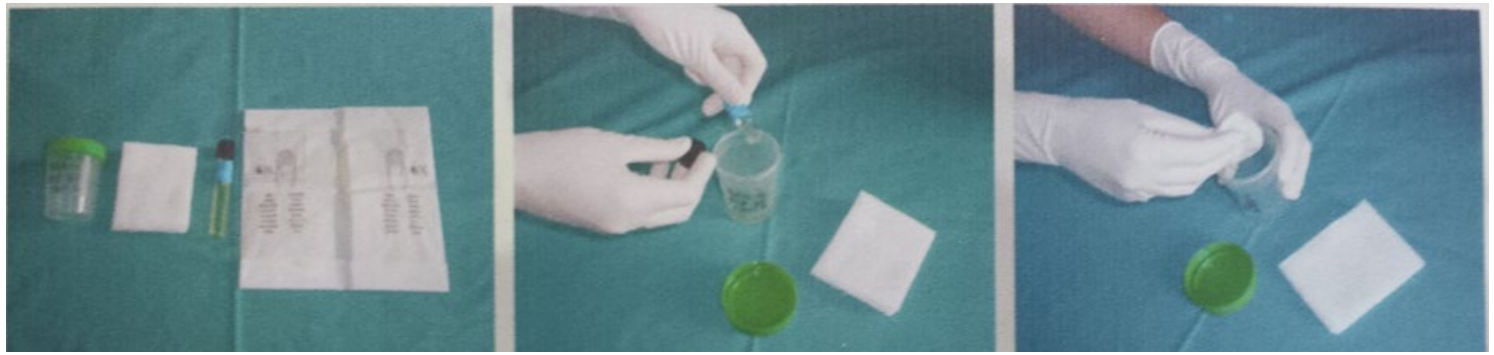
	Muestras clínicas				
Organismo	**Heces/ Rectal**	**Perineal**	**Faringe**	**Nasal**	**Otras**
Staphylococcus aureus resistente a meticilina	+[a]	+++	+++	++++	++[b]
Enterococcus spp. resistente a glucopéptidos	++++	++++	(+)	-	++
Enterobacterias productoras de BLEE	++++	++++	+	-	++
Acinetobacter baumannii multirresistente	++++	++	++++[c]	-	+++[d, e]
Pseudomonas aeruginosa resistente a carbapenemas por producción de MBL	+	+++	++++[c]	-	+++[d]

In our study the best performance was obtained by skin samples (100%), followed by the rectal samples (86%).

Valencia-Martín R, Gonzalez-Galan V, Alvarez-Marín R, Cazalla-Foncueva AM, Aldabó T, Gil-Navarro MV, et al.

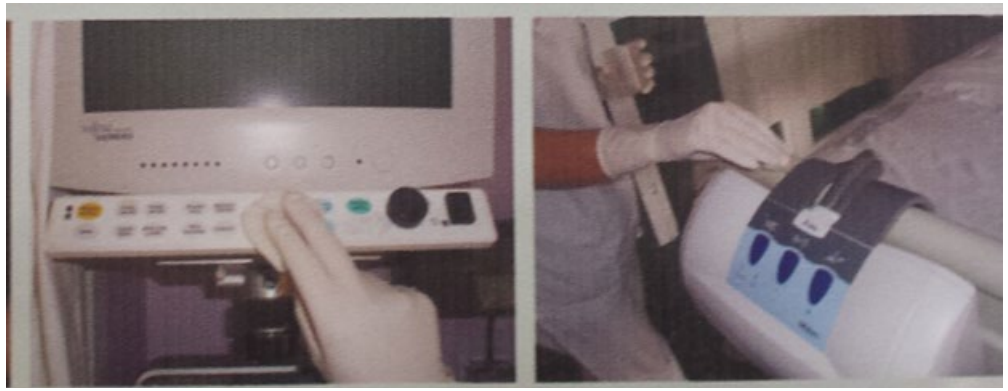
A multimodal intervention program to control a long-term Acinetobacter baumannii endemic in a tertiary care hospital. Antimicrob Resist Infect Control. 2019;8:199.

Enhanced Environmental Sampling



Courtesy of Dr. José María López Lozano
Chief. Preventive Medicine/ Infection Control Unit
Hospital Vega Baja Orihuela-Alicante

by pre-moistened thioglycolate or **Brain Heart Infusion Broth (BHI)** sterile gauze pads



POSITIVE ENVIRONMENTAL CULTURES FOR MULTIDRUG-RESISTANT *ACINETOBACTER BAUMANNII* COMPARING MOISTENED SWABS VERSUS MOISTENED GAUZE PADS

By using BHI pre-moistened sterile gauze pads, more than 50% of our environmental samples were positive for CRAB.
BHI moistened sterile gauze technique was a more sensitive method for CRAB detection (40% positives vs 0%; P<0.05).

Environmental sampling of Acinetobacter baumannii: moistened swabs versus moistened sterile gauze pads

X Corbella, M Pujol, M J Argerich, J Ayats, M Sendra, C Peña, J Ariza

	Total	
	S	G
Colonized or infected patients/total patients*	16/46	
Items in a cleaned room		
Monitor	1/5	1/5
BPG	0/4	1/4
Lamp	0/6	0/6
Mattress	0/5	1/5
Window blind	0/5	0/5
Total	1/25	3/25
Items in use in the unit		
Table	2/5	4/5
Cupboard	0/8	2/8
ECG	0/3	1/3
Cart	2/4	4/4
Crane	0/3	2/3
Telephone	0/1	1/1
BGM	0/1	1/1
Total	4/25	15/25
	5/50	18/50

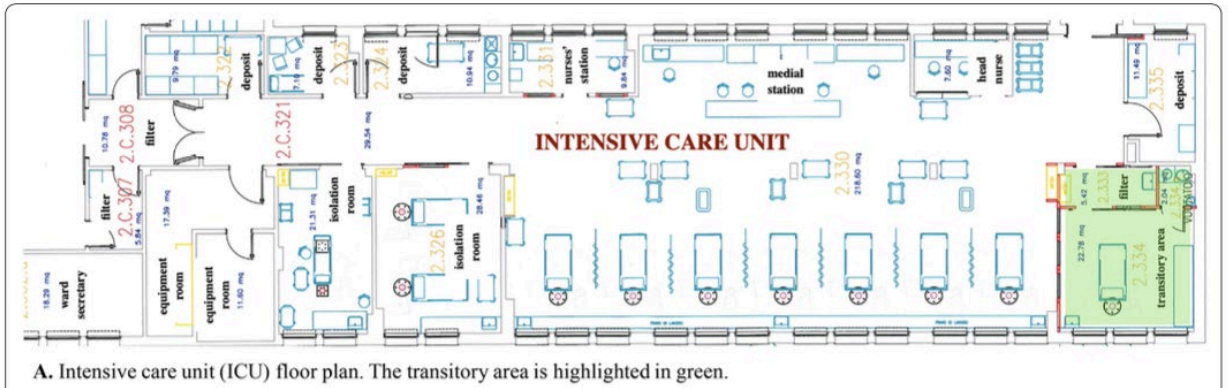
Infection Control and Hospital Epidemiology , Vol. 20, No. 7 (July 1999), pp. 458- 460

Cycling Radical Disinfection

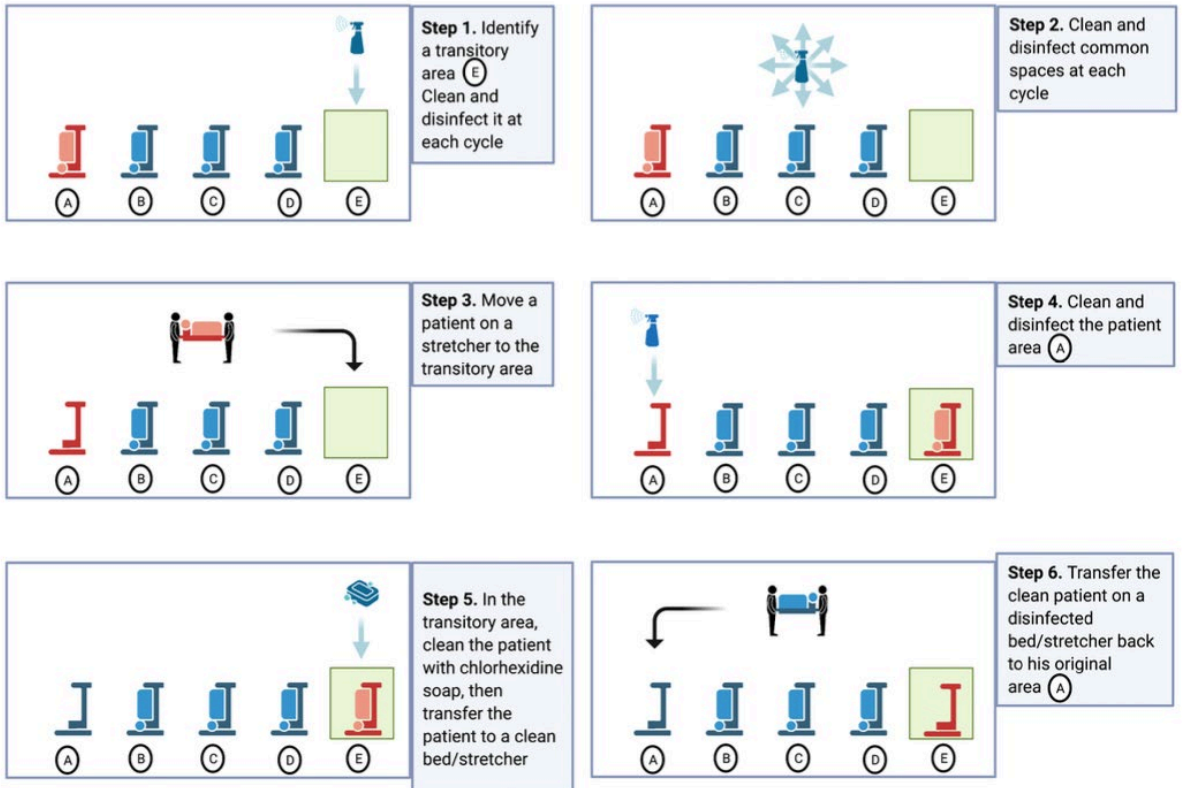
Reinforced
'search and destroy' strategies
both on the environment
and on the patient..

×**High level disinfection**
×**Using hypochlorite 10%**

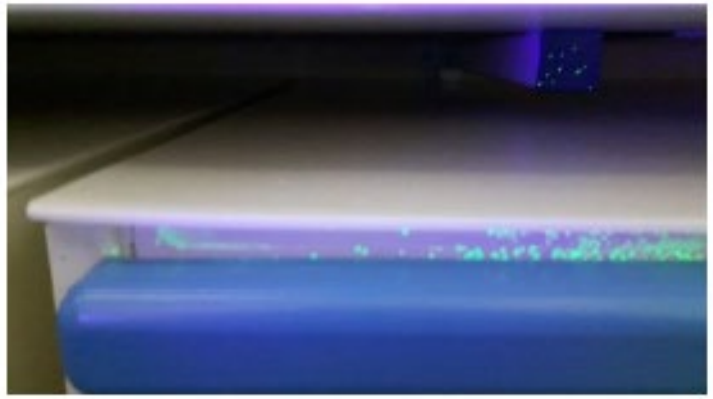
- Do **not perform simultaneous disinfection** in several areas of the ICU



A. Intensive care unit (ICU) floor plan. The transitory area is highlighted in green.



Radical Disinfection with fluorescent markers



How to evaluate the effectiveness ?

By using fluorescein spray on the cleaned surfaces and checking with an UV torch.
The evidence of fluorescent spots indicates the surface has not been cleaned

HHS Public Access
Author manuscript
Infect Control Hosp Epidemiol. Author manuscript; available in PMC 2019 August 12.

Published in final edited form as:
Infect Control Hosp Epidemiol. 2017 November ; 38(11): 1371–1373. doi:10.1017/ice.2017.205.

Self-monitoring by Environmental Services May Not Accurately Measure Thoroughness of Hospital Room Cleaning

FLUORESCENT MARKERS placed on surfaces:
~30%difference between EVS supervisors & validation

Rooms and Surfaces Tested	EVS, n/N (%)	Validation, n/N (%)	*P* Value
Total surfaces cleaned	264/320 (82.5)	153/292 (52.4)	<.001
Top 6 surfaces monitored			
Bathroom handrail by toilet	17/23 (73.9)	6/14 (42.9)	.062
Room/Bathroom door knob	19/21 (90.5)	3/13 (23.1)	<.001
Room/Bathroom light switch	20/21 (95.2)	5/21 (23.8)	<.001
Toilet seat	21/23 (91.3)	10/15 (66.7)	.059
Room sink	21/26 (80.8)	25/32 (78.1)	.806
Chair arm/seat	40/51 (78.4)	12/21 (57.1)	.069

Knelson et al. Infect Control Hosp Epidemiol. Author manuscript; available in PMC 2019 August 12.

Review

Is It Possible to Eradicate Carbapenem-Resistant *Acinetobacter baumannii* (CRAB) from Endemic Hospitals?

Filippo Medioli [1], Erica Bacca [1], Matteo Faltoni [1], Giulia Jole Burastero [1], Sara Volpi [1], Marianna Menozzi [1], Gabriella Orlando [1], Andrea Bedini [1], Erica Franceschini [1], Cristina Mussini [2] and Marianna Meschiari [1,*]

Antibiotics **2022**, *11*, 1015. https://doi.org/10.3390/antibiotics11081015

CRAB Horizontal Decolonisation strategies

J Hosp Infect. 2019 Nov;103(3):284-292. doi: 10.1016/j.jhin.2019.08.004. Epub 2019 Aug 9.

Effect of chlorhexidine bathing on colonization or infection with Acinetobacter baumannii: a systematic review and meta-analysis.

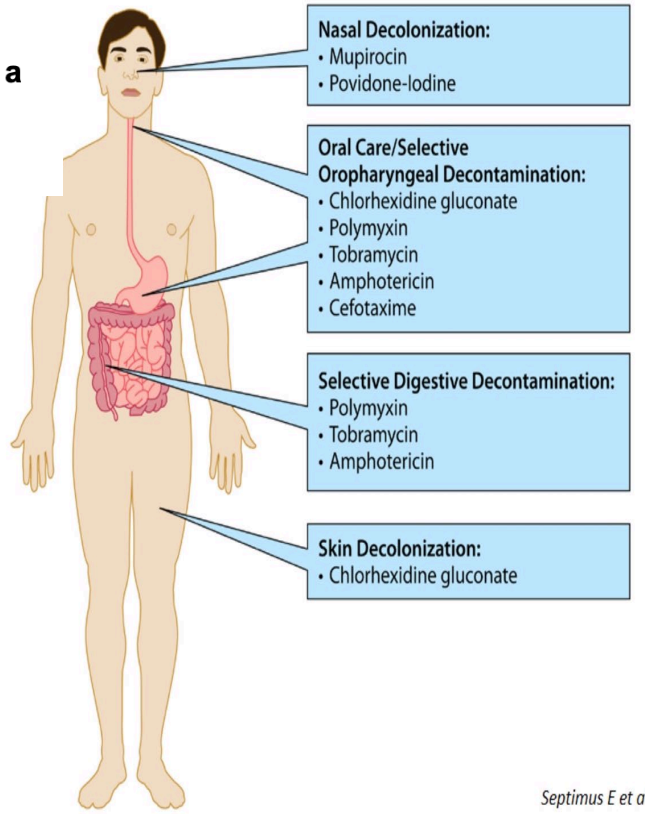
Fan CY[1], Lee WT[2], Hsu TC[3], Lee CH[1], Wang SP[4], Chen WS[5], Huang CH[3], Lee CC[6].

Horizontal

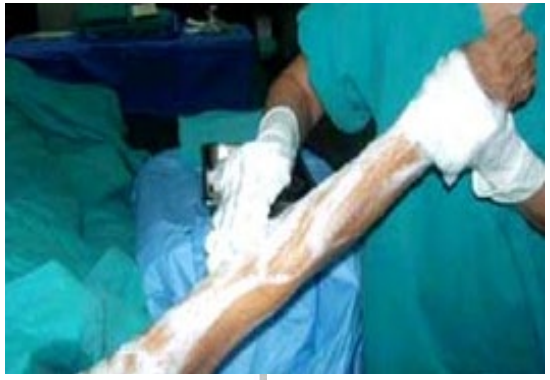
- Chlorhexidine bathing
- Digestive and oropharyngeal decontamination
- Mechanical bowel preparation and oral antibiotics

Vertical

- *S. aureus*
- VRE
- Multidrug-resistant gram-bacteria



Septimus E et al. Clin Microbiol Rev 2016;29:201–22



Dale *et al. Trials* (2019) 20:603
https://doi.org/10.1186/s13063-019-3673-0

Trials

STUDY PROTOCOL Open Access

Protocol for a multi-centered, stepped wedge, cluster randomized controlled trial of the de-adoption of oral chlorhexidine prophylaxis and implementation of an oral care bundle for mechanically ventilated critically ill patients: the CHORAL study

Craig M. Dale[1,2,3], Louise Rose[4,5,1,3], Sarah Carbone[1], Orla M. Smith[6,7,1], Lisa Burry[8,9,10], Eddy Fan[10,11], Andre Carlos Kajdacsy-Balla Amaral[4,10,3], Victoria A. McCredie[10,11], Ruxandra Pinto[4], Carlos R. Quiñonez[12], Susan Sutherland[13], Damon C. Scales[4,10,3] and Brian H. Cuthbertson[4,10,3*]

Among mechanically ventilated ICU patients, no benefit was observed for de-adoption of chlorhexidine and implementation of an oral care bundle on ICU mortality, IVACs, oral procedural pain, or time to extubation.

Dale CM; Intensive Care Med. 2021 Nov;47(11):1295-1302.

Decolonisation strategies outside ICU

Chlorhexidine versus routine bathing to prevent multidrug-resistant organisms and all-cause bloodstream infections in general medical and surgical units (ABATE Infection trial): a cluster-randomised trial

Susan S Huang, Edward Septimus, Ken Kleinman, Julia Moody, Jason Hickok, Lauren Heim, Adrijana Gombosev, Taliser R Avery, Katherine Haffenreffer, Lauren Shimelman, Mary K Hayden, Robert A Weinstein, Caren Spencer-Smith, Rebecca E Kaganov, Michael V Murphy, Tyler Forehand, Julie Lankiewicz, Micaela H Coady, Lena Portillo, Jalpa Sarup-Patel, John A Jernigan, Jonathan B Perlin, Richard Platt, for the ABATE Infection trial team

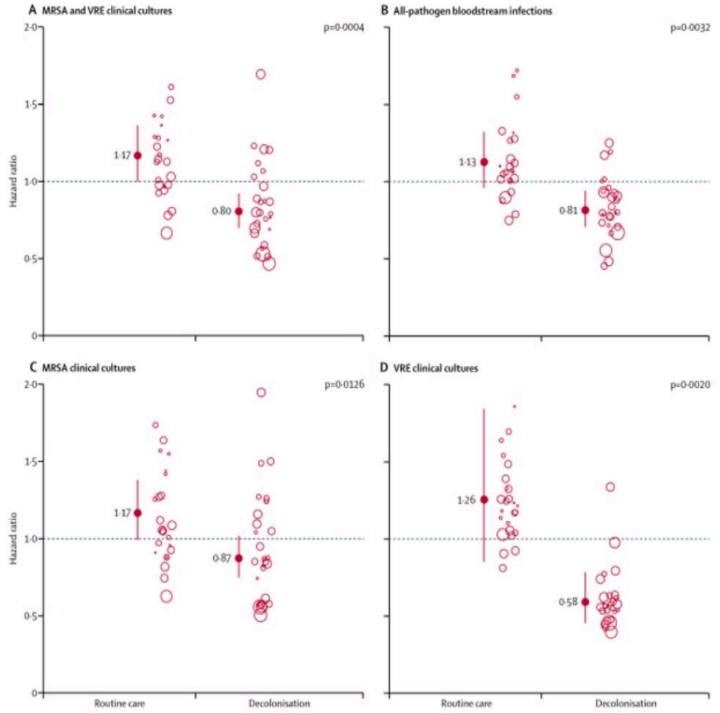
Summary

Background Universal skin and nasal decolonisation reduces multidrug-resistant pathogens and bloodstream infections in intensive care units. The effect of universal decolonisation on pathogens and infections in non-critical-care units is unknown. The aim of the ABATE Infection trial was to evaluate the use of chlorhexidine bathing in non-critical-care units, with an intervention similar to one that was found to reduce multidrug-resistant organisms

Lancet 2019; 393: 1205–15

Published Online March 5, 2019 http://dx.doi.org/10.1016/S0140-6736(18)32593-5

Lancet 2019; 393: 1205–15



- Insufficient data to support routine use of patient bathing with chlorhexidine in general medical and surgical units
- Potential benefit for patients with medical devices

Vancomycin Resistant Enterococci (VRE) control

VRE: risk factors for colonization

Highrisk patients

- **neutropenic patients**

  (HR 4,9 (95%CI 1,2–20,4); DiazGranados et al., *JID* 2005)

- **hemato-oncological patients**

  (OR 15,0 (95%CI 1,6-138,9); Worth et al., *Eur Jr Hematology* 2007)

- **liver-Tx patients**

  (Inf. OR 3,6 (95%CI 2.01–6.47); Death OR 2,1 (95%CI 1.27–3.54); Russell et al., *Am Jr Tr* 2008) (OR 13,8 (95%CI 3.2–59.9; P < 0,001); McNeil et al.; *CID* 2006)

- **hemodialysis patients**

  (OR 3,9 (95%CI 1.1—13.8); p<0,03); Askarian et al. *Int Jr Infectious Diseases* 2008)

  (OR 1,8 (95%CI 1.4–2.3; P < 0,01); Tacconelli et al. *CID* 2004)

VRE: risk factors for colonization in high risk patients

Meschiari *et al. Antimicrobial Resistance & Infection Control* (2023) 12:126
https://doi.org/10.1186/s13756-023-01332-x

Antimicrobial Resistance & Infection Control

RESEARCH Open Access

Vancomycin resistant enterococcus risk factors for hospital colonization in hematological patients: a matched case-control study

Marianna Meschiari[1*], Shaniko Kaleci[2], Martina Del Monte[1], Andrea Dessilani[1], Antonella Santoro[1], Francesco Scialpi[1], Erica Franceschini[1], Gabriella Orlando[1], Adriana Cervo[1], Morselli Monica[6], Fabio Forghieri[6], Claudia Venturelli[3], Enrico Ricchizzi[4], Johanna Chester[5], Mario Sarti[3], Giovanni Guaraldi[1], Mario Luppi[6] and Cristina Mussini[1]

Table 4: Outcomes of patients colonized with VRE compared with those of controls.

	Total (n=166)	Cases. n=83 (50%)	Controls. n=83 (50%)	p-value
VRE infection	11 (6.6)	11 (13.3)	0 (0.0)	**0.001**
BSI	8 (4.8)	8 (9.6)	0 (0.0)	
UTI	2 (1.2)	2 (2.4)	0 (0.0)	
IAI	1 (0.6)	1 (1.2)	0 (0.0)	
No VRE infection	155 (93.4)	72 (86.7)	83 (100.0)	
Time from VRE colonization to VRE infection *days, mean ± SD (range)*		30.2, 26.8(0-72)		
CDI	8 (4.8)	7 (8.4)	1 (1.2)	**0.030**
30-day mortality, *n/N (%)*				
Overall *	10/166 (6.0)	4 (4.8)	6 (7.2)	0.514
VRE infection	0/11 (0.0)	0/11 (0.0)	0/0 (0.0)	-
No VRE infection	10/155 (6.4)	4/72 (5.6)	6/83 (7.2)	0.672
90-day mortality, *n/N (%)*	20 /166 (12.0)	8 (9.6)	12 (14.5)	0.340

VRE: vancomycin resistant Enterococcus, BSI: bloodstream infection, UTI: urinary tract infection, IAI: intra-abdominal infection, CDI: *Clostridioides difficile* infection.

*comparison between 30 day mortality of cases with or without VRE infection, p_0.448

Table 5: Multivariate analysis of risk factors for VRE nosocomial rectal colonization in hematological patients.

	OR	95% CI	p-value
Any use of vancomycin	3.5	(1.15 – 10.87)	**0.027**
Use of third generation cephalosporins	7.7	(0.87 – 67.99)	0.067
Bone marrow transplant	2.3	(0.65 – 8.08)	0.200
Altered bowel habits	3.1	(1.07 – 8.94)	**0.036**
Hospitalization in the previous 6 months	2.3	(0.93 – 5.43)	0.170

OR: odds ratio, CI: confidence interval.

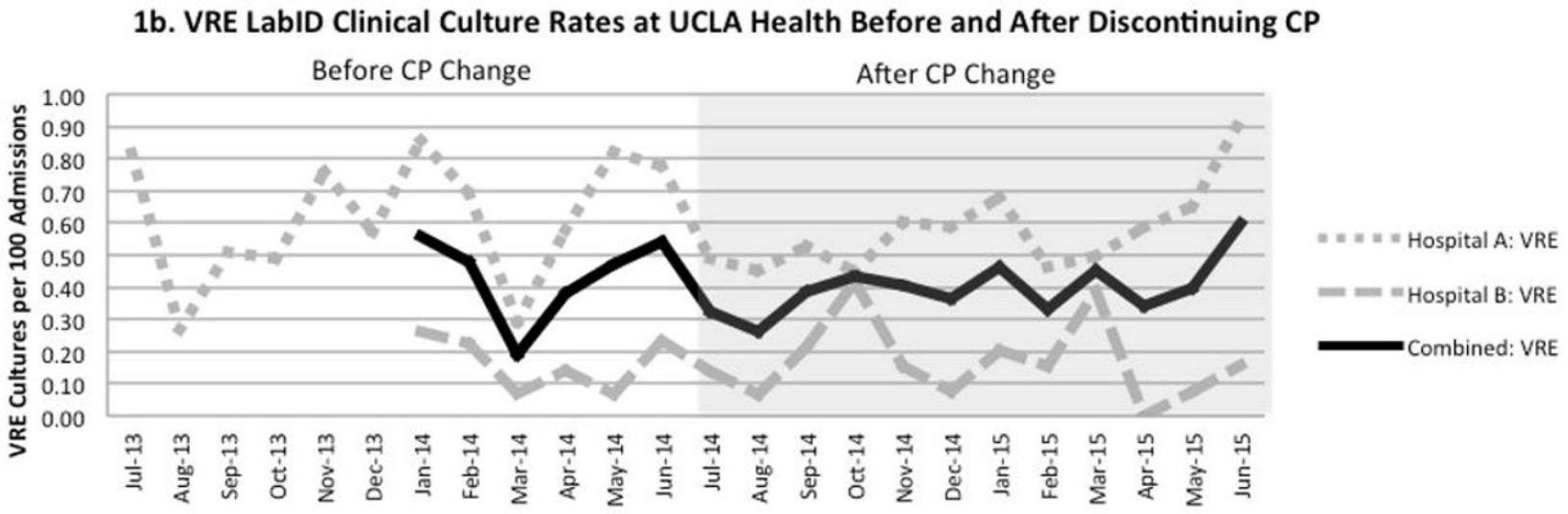
Conclusions

- Antimicrobial stewardship strategies to reduce inappropriate Gram-positive coverage in hematological patients is urgently required, as independent risk factors for VRE nosocomial colonization identified in this study include any use of vancomycin and altered bowel habits.
- VRE colonization and infection did not influence 30- and 90-day mortality.
- There was a strong correlation between CDI and VRE, which deserves further investigation to target new therapeutic approaches.

Meschiari M, Antimicrob Resist Infect Control. 2023 Nov 13;12(1):126

Elimination of Routine Contact Precautions for VRE

Martin EM, Russell D, Rubin Z, Humphries R, Grogan TR, Elashoff D, Uslan DZ.
Elimination of Routine Contact Precautions for Endemic Methicillin-Resistant Staphylococcus aureus and Vancomycin-Resistant Enterococcus: A Retrospective Quasi-Experimental Study.
Infect Control Hosp Epidemiol. 2016 Nov;37(11):1323-1330. doi: 10.1017/ice.2016.156. Epub 2016 Jul 26.
PMID: 27457254; PMCID: PMC6783805.



Given the increase in CHG bathing shortly before discontinuing CP, it is not possible to separate the impact of these two interventions.

Infect Control Hosp Epidemiol. 2016 Nov;37(11):1323-1330. doi: 10.1017/ice.2016.156.

IPC strategies are dynamic: change MDR policies overtime

Infection Control & Hospital Epidemiology (2021), 1–8
doi:10.1017/ice.2021.457

Original Article

Discontinuing MRSA and VRE contact precautions: Defining hospital characteristics and infection prevention practices predicting safe de-escalation

Elise M. Martin MD, MS[1,2], Bonnie Colaianne MSN, RN, CNL, CIC, FAPIC[3], Christine Bridge MHMS, MBA[3], Andrew Bilderback MS[3], Colleen Tanner MSN, RN[4], Suzanne Wagester MSN, RN[3], Mohamed Yassin MD[2,5], Raymond Pontzer MD[6] and Graham M. Snyder MD, SM[1,2]

Clinical Infectious Diseases

SUPPLEMENT ARTICLE

Clinical Infectious Diseases® 2021;72(S1):S42–9

Effectiveness of Contact Precautions to Prevent Transmission of Methicillin-Resistant *Staphylococcus aureus* and Vancomycin-Resistant Enterococci in Intensive Care Units

Karim Khader,[1,2] Alun Thomas,[2] W. Charles Huskins,[3] Vanessa Stevens,[1,2] Lindsay T. Keegan,[1,2] Lindsay Visnovsky,[1,2] and Matthew H. Samore[1,2]; for the Centers for Disease Control and Prevention (CDC) Prevention Epicenter Program and for the CDC Modeling Infectious Diseases in Healthcare Program

To define **conditions in which contact precautions can be safely discontinued** for methicillin-resistant Staphylococcus aureus **(MRSA)** and vancomycin-resistant Enterococcus **(VRE).**

DESIGN:

Interrupted time series in 15 acute-care hospitals. Inpatients.

INTERVENTION:

Contact precautions: discontinued in 12 intervention hospitals/continued at 3 non-intervention hospitals.

Discontinuing contact precautions for VRE did not result in increased HAI rates, suggesting that contact precautions can be safely removed from diverse hospitals, including community hospitals and those with lower proportions of private rooms. Good hand hygiene and low baseline HAI rates may be conditions permissive of safe removal of contact precautions.

To predict conditions when contact precautions may be safely discontinued, selected baseline hospital characteristics and infection prevention practices were correlated with HAI rate changes, stratified by hospital.

Bundles application:
Hospital-level-adapted procedures

SERVIZIO SANITARIO REGIONALE
EMILIA-ROMAGNA
Azienda Ospedaliero - Universitaria di Modena

PREVENZIONE E CONTROLLO DELLA DIFFUSIONE DI ACINETOBACTER BAUMANNII MULTIRESISTENTE | **IO 59** Rev. 0 / 2022 Pag. 1/10

SOMMARIO

SERVIZIO SANITARIO REGIONALE
EMILIA-ROMAGNA
Azienda Ospedaliero - Universitaria di Modena

GESTIONE DEI PAZIENTI (adulti e bambini, neonati esclusi) CON ISOLAMENTO DI MRSA IN CAMPIONI CLINICI: MISURE DI ISOLAMENTO, DECOLONIZZAZIONE E SOSPENSIONE DELLE MISURE DI ISOLAMENTO | **IO 47** Rev. 0 / 2023 Pag 1/7

SOMMARIO

SERVIZIO SANITARIO REGIONALE
EMILIA-ROMAGNA
Azienda Ospedaliero - Universitaria di Modena

RACCOMANDAZIONI PER LA PREVENZIONE E IL CONTROLLO DELL'INFEZIONE DA *CANDIDA AURIS* | **IO 24** Rev. 0 / 2022 Pag. 1/8

SOMMARIO

Oggetto: Programma per la sorveglianza ed il controllo degli enterococchi resistenti a vancomicina (VRE)

Nuove indicazioni per strategie di prevenzione VRE: aggiornamento attività di screening rettale e sospensione attività di isolamento con decorrenza a partire dal 1 febbraio 2023 anno 2023 AOU di Modena (Stabilimenti Policlinico e Ospedale Civile Baggiovara) Nell'ambito delle misure di prevenzione e controllo del rischio infettivo, con particolare riferimento ai germi multiresistenti, in AOU di Modena è attivo un programma di screening volto a identificare pazienti portatori di Enterococchi resistenti alla a vancomicina (VRE) per messa in atto di strategie mirate di prevenzione per prevenire ulteriore trasmissione nosocomiale. Lo screening attivo nell'ambito di un programma poiè ampio di prevenzione delle infezioni ha lo scopo di ridurre i tassi di colonizzazione e conseguentemente le infezioni da VRE.

Lo screening **universale all'ingresso e settimanale** rimarrà nei seguenti reparti:

Contents lists available at ScienceDirect

American Journal of Infection Control

journal homepage: www.ajicjournal.org

APIC/SHEA/SIDP Antimicrobial Stewardship Position Paper

Antimicrobial stewardship and infection prevention—leveraging the synergy: A position paper update

Antimicrobial Stewardship and Infection Prevention-Leveraging the Synergy: A Position Paper Update Infect Control Hosp Epidemiol . 2018 Apr;39(4):467-472. doi: 10.1017/ice.2018.33.

- The vital work of IPC and AS programs **cannot be performed independently.**
- IPC and AS requires interdependent and coordinated action across multiple and overlapping disciplines and clinical settings.
- Deliberate strategic relationship-building actions will be required of IPC and AS program leaders to bring groups together to achieve the larger purpose of keeping patients safe from infection and ensuring that effective antibiotic therapy is available for **future generations**.

STD+ASP+ ENV+SCT							
0.05 (.01, 0.38)	STD+ENV +SCT						
0.04 (.01, 0.16)	0.76 (.19, 3.13)	STD+ASP+ ENV					
0.04 (.01, 0.27)	0.75 (.12, 4.87)	0.99 (.27, 3.66)	STD+ASP+ DCL				
0.02 (.00, 0.13)	0.48 (.17, 1.41)	0.63 (.25, 1.58)	0.64 (.14, 2.96)	STD+ENV			
0.02 (.00, 0.11)	0.38 (.07, 1.93)	0.50 (.18, 1.37)	0.50 (.13, 2.02)	0.79 (.23, 2.68)	STD+DCL		
0.02 (.00, 0.08)	0.31 (.07, 1.45)	**0.40 (.18, 0.90)**	0.41 (.15, 1.15)	0.64 (.21, 1.95)	0.81 (.32, 2.04)	STD+ASP	
0.01 (.00, 0.04)	**0.17 (.04, 0.72)**	**0.22 (.10, 0.46)**	**0.22 (.07, 0.74)**	**0.34 (.13, 0.94)**	**0.44 (.22, 0.88)**	0.54 (.29, 1.00)	STD

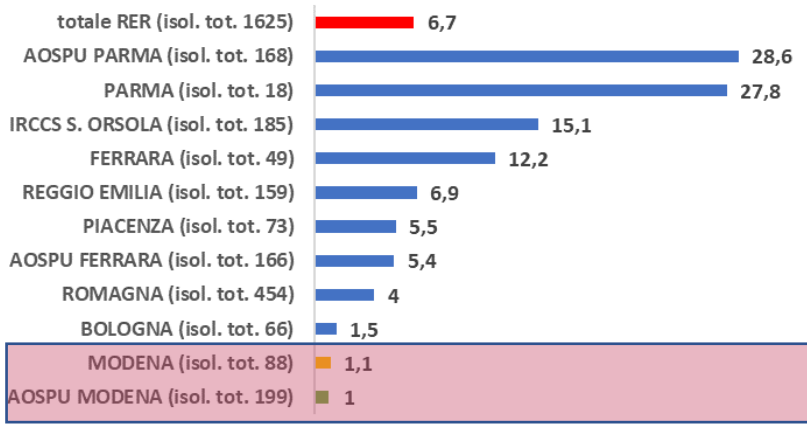
Clinical Infectious Diseases

SUPPLEMENT ARTICLE

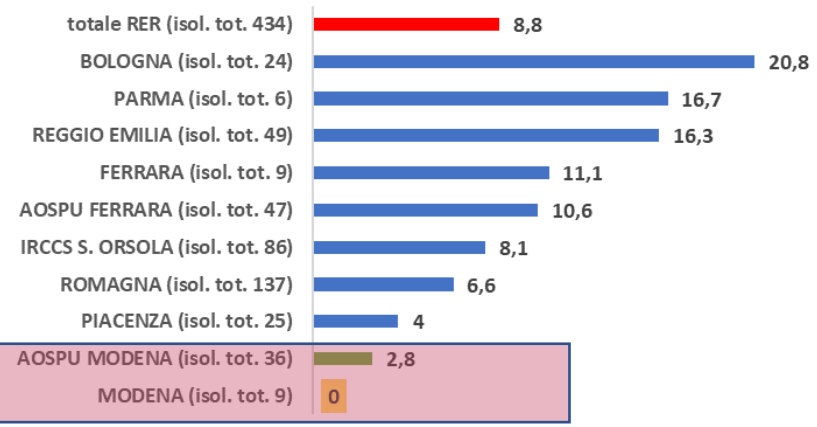
Prevention and Control of Multidrug-Resistant Gram-Negative Bacteria in Adult Intensive Care Units: A Systematic Review and Network Meta-analysis

Nattawat Teerawattanapong,[1] Kirati Kengkla,[2] Piyameth Dilokthornsakul,[3] Surasak Saokaew,[2,3,4] Anucha Apisarnthanarak,[5] and Nathorn Chaiyakunapruk[3,4,6,7]

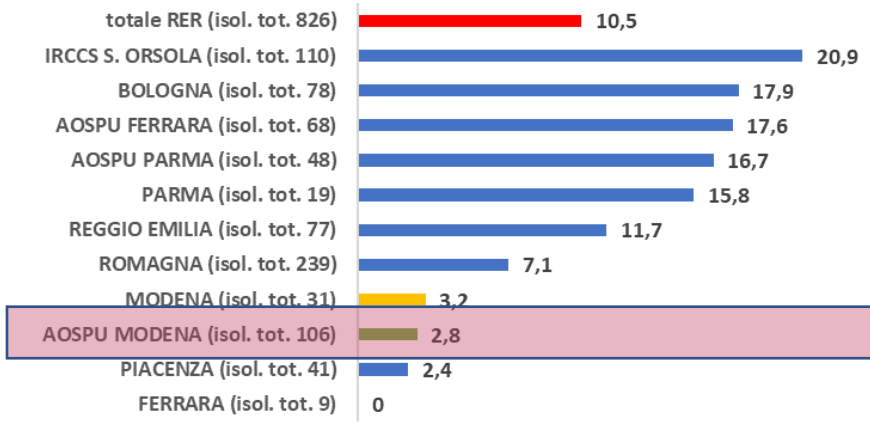
K. pneumoniae da sangue: % CR anno 2022



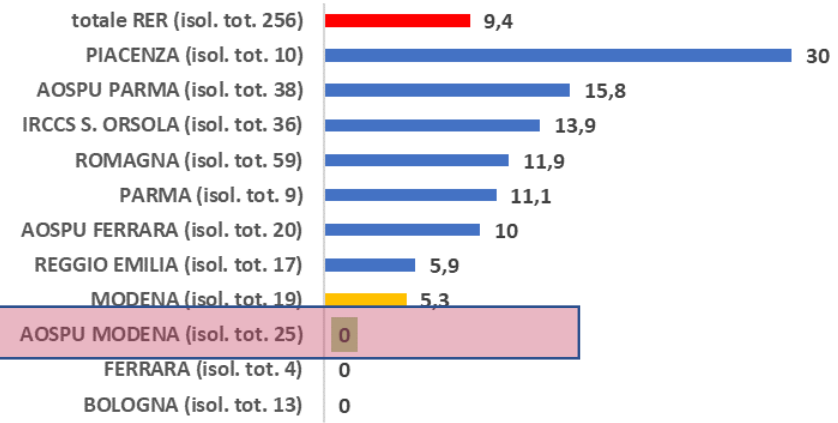
K. pneumoniae da sangue: % CR 1° quad. 2023



P. aeruginosa da sangue: % CR anno 2022



P. aeruginosa da sangue: % CR 1° quad. 2023



Conclusions

- We need mechanisms for development of **evidence based recommendations tailored on local epidemiology** not only for AS but also *for diagnostics and infection control practices*
- The **community burden** of CRE and other MDR-GNB has been little assessed in the literature, (just focusing on long-term care facilities) and new measures are needed to address plasmid-mediated transmission in and outside hospital setting
- WE need for Effective communication strategies (tailored to specific target audiences)
- IPC professionals need to apply behaviour change to be effective in their role
- IPC Implementation must be integrated with tailored on patient care practices (champions task)

Progetto
INSIEME

***I**talian **N**ational project for contrast antibiotic resistance a cooperation between **S**imit **E** (&) **M**inistry of h**E**alth*

con l'obiettivo di finalizzare e rendere operative le strategie di contrasto alle infezioni correlate all'assistenza

- Azienda Ospedaliera di Padova,
- Ospedale S. Paolo, Milano,
- Azienda Ospedaliera Universitaria di Pisa
- Ospedale Policlinico Tor Vergata, Roma
- Ospedale S.M.Goretti, Latina,
- Presidio Ospedaliero Pescara
- Azienda Ospedaliera Universitaria Luigi Vanvitelli, Napoli
- Azienda Ospedaliera Specialistica dei Colli, (Cotugno, CTO, Monaldi), Napoli,
- Azienda Ospedaliera Universitaria Policlinico di Catania
- Policlinico "Gaetano Martino" di Messina
- Ospedale ARNAS CIVICO di Palermo
- Azienda Ospedaliera Universitaria Policlinico Riuniti di Foggia
- Ospedale Amedeo di Savoia di Torino
- Azienda Socio-Sanitaria Territoriale di Cremona

Questionario per valutare l'attività per il contrasto dell'antibiotico-resistenza negli ospedali per acuti

Realizzato dai membri del Progetto **INSIEME (Italian National project for contrast antibiotic resistance a cooperation between SImit E & Ministry of hEalth)**

mariannameschiari1209@gmail.com Cambia account

Non condiviso

* Indica una domanda obbligatoria

https://forms.gle/CfuwFGSWxLV636p66

Acknowledgements:

Infectious Diseases

Cristina Mussini

Andrea Bedini

Gabriella Orlando

Cinzia Puzzolante

Marianna Menozzi

Erica Franceschini

Adriana Cervo

Antonella Santoro

Pharmacy

Laura Cancian

Emilia Esposito

Infection Control

Sara Scannavini

Giliola Bianchini

Patrizia Albinelli

Monica Barbieri

Patrizia Scanavini

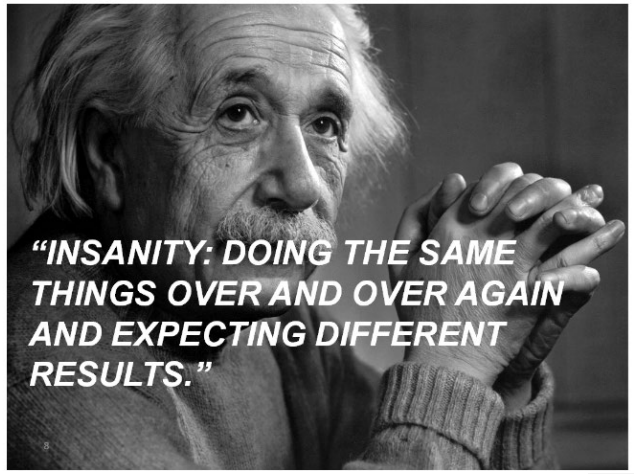
Cinzia Brazioli

Orsolina Manzi

Microbiology

Mario Sarti

Venturelli Claudia



…and all the colleagues in the different wards!!!