Hamilton Health Sciences

McMaster University
Inspiring Innovation and Discovery

MRSA and VRE

Dominik Mertz, MD, MSc

Medical Director Infection Prevention and Control,
Hamilton Health Sciences

Assistant Professor, Department of Medicine, Clinical Epidemiology and Biostatistics, and Pathology and Laboratory Medicine, McMaster University

CHEDOKE · CHILDREN'S · GENERAL · JURAVINSKI · McMASTER · ST. PETER'S

Objectives

1) **MRSA and VRE epidemiology**
2) Contact precautions for MRSA
   - The rationale
   - The evidence
3) Approach to VRE in Ontario
   - Current landscape
   - PHO study findings
4) Duration of MRSA/VRE carriage

MRSA Epidemiology

Table 2.3 Number of MRSA colonization and incidence rates per 1,000 patient admissions

	Rate per 1,000 patient admissions by region							
	Western		*Central*		*Eastern*		*Overall*	
	No.cases	Rate	No.cases	Rate	No.cases	Rate	No.cases	Rate
2009	1,118	3.94	3,090	9.24	311	4.36	4,519	6.55
2010	1,222	3.59	3,765	9.48	381	4.58	5,368	6.54
2011	1,634	4.82	3,740	9.89	439	4.70	5,813	7.17
2012	1,582	4.54	3,516	9.14	320	3.89	5,418	6.64
2013	1,481	4.72	3,035	7.80	339	3.43	4,855	6.13
*Note: 2014 data are **preliminary**. Data included are from **January 1, 2014** to **June 30, 2014**. For all years, only sites that submitted both numerator and denominator data are included in the rate calculations.*								
2014	740	4.50	1,361	6.53	155	3.03	2,256	5.32

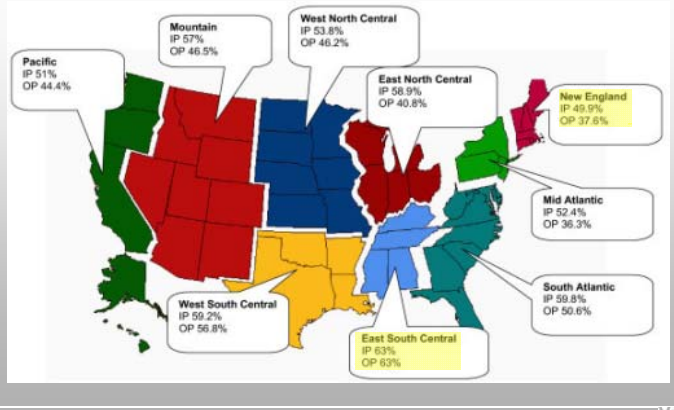
Ontario (central with QC): highest rates, but rates decreasing Canada-wide

PHAC ARO Surveillance Summary Report Jan 1 2009 – June 30 2014

MRSA Epidemiology

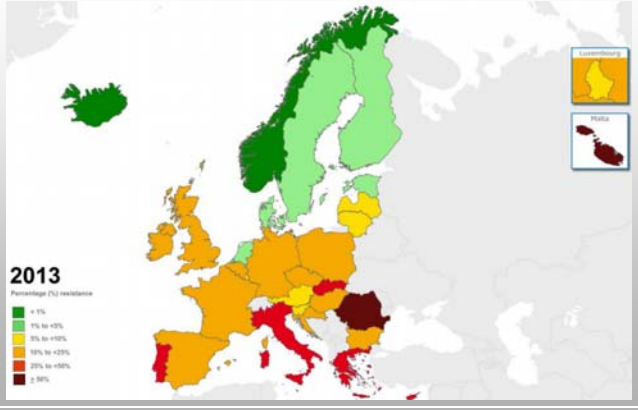
Gram Positive Organisms	No. of Isolates	Ampicillin	Cloxacillin	Cefazolin	Clindamycin	Erythromycin	TMP/SMX	Ciprofloxacin	Tetracycline	Rifampin (not to be used as monotherapy)	Vancomycin	Nitrofurantoin (urine only)
Staphylococcus aureus (includes MSSA and MRSA)	474		78	78	See MSSA and MRSA							
Methicillin Sensitive S. aureus (MSSA)	371		100		75	72	99	84	99	100	100	
Methicillin resistant S.aureus(MRSA)	111		0		36 (110)	9	98	5 (110)	98 (110)	100	100 (110)	

MRSA Epidemiology



NIH. https://openi.nlm.nih.gov/detailedresult.php?img=1397857_1476-0711-5-2-4&req=4

MRSA Epidemiology



European CDC. http://ecdc.europa.eu/en/eaad/Documents/antibiotics-resistance-EU-data-2014.pdf

VRE Epidemiology

Table 3.3 Number of VRE colonizations and incidence rates per 1,000 patient admissions*

	Rate per 1,000 patient admissions by region							
	Western		Central		Eastern		Overall	
	No.cases	Rate	No.cases	Rate	No.cases	Rate	No.cases	Rate
2009	960	3.31	2,615	7.81	0	0	3,575	5.10
2010	1,291	3.72	2,905	7.31	2	0.02	4,198	5.12
2011	2,324	7.72	3,165	8.47	26	0.28	5,889	7.67
2012	2,146	6.86	2,314	9.08	45	0.55	4,505	6.93
2013	1,435	7.22	2,483	8.79	37	0.45	3,955	7.02
Note: 2014 data are **preliminary**. Data included are from **January 1, 2014** to **June 30, 2014**. For all years, only sites that submitted both numerator and denominator data are included in the rate calculations.								
2014	594	6.01	1,127	6.64	8	0.19	1,729	5.55

* As of January 2011, some CNISP hospitals no longer collect data on VRE colonizations. Therefore the number of colonizations as of 2011 represents a subset of CNISP hospitals that continue to collect and submit colonization data. The number of hospitals that continue to collect data on VRE colonizations has continued to decline every year.

Ontario (central with QC): highest rates, but rates decreasing
Canada-wide

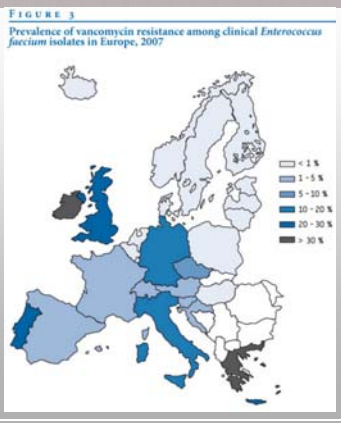
PHAC ARO Surveillance Summary Report Jan 1 2009 – June 30 2014

VRE Epidemiology

Gram Positive Organisms	No. of Isolates	Ampicillin	Clonacillin	Cefazolin	Clindamycin	Erythromycin	TMP/SMX	Ciprofloxacin	Tetracycline	Rifampin (not to be used as monotherapy)	Vancomycin	Nitrofurantoin (urine only)
Staphylococcus aureus (includes MSSA and MRSA)	474		78	78	See MSSA and MRSA							
Methicillin Sensitive S. aureus (MSSA)	371		100		75	72	99	84	99	100	100	
Methicillin resistant S.aureus(MRSA)	111		0		36 (110)	9	98	5 (110)	98 (110)	100	100 (110)	
Enterococcus spp	541	79						58*	27* (538)		95	83*

VRE Epidemiology

FIGURE 3
Prevalence of vancomycin resistance among clinical *Enterococcus faecium* isolates in Europe, 2007



Werner et al. Eurosurveillance 2008; 13(47):3

Objectives

1) MRSA and VRE epidemiology
2) **Contact precautions for MRSA**
   - The rationale
   - The evidence
3) Approach to VRE in Ontario
   - Current landscape
   - PHO study findings
4) Duration of MRSA/VRE carriage

Rationale for CP

Routine practice:

- Hand hygiene according to the 4 moments
- Gloves if contact with blood or other potentially infectious material, mucous membranes, and non-intact skin
- Mouth, nose and eye protection with procedures that generate splashes or sprays
- Gown to prevent soiling or contamination of clothing when contact with blood, secretions or body fluids are anticipated

→ Should control the spread of MRSA/VRE… in most instances

Rationale for CP

Contact precautions (CP) = routine practice plus:

- Placement: single room preferred
- Gloving: when touching patient or the patient's environment
- Gown: upon entry into the room

→ Should definitely control the spread of MRSA… in most instances

CP for MRSA - evidence

CDC recommends CP for 'epidemiologically important AROs'

- Is MRSA of epidemiologic importance?
  - MRSA associated with higher mortality and longer length of stay resulting in an increase in costs (~$9,000 incremental costs)
  - Incremental cost to prevent a MRSA case: $20
- Downside of CP:
  - Delay in care, less contact with HCW, safety, patient dissatisfaction and depression… (?)

→Does $20 to prevent one transmission has a positive impact on patients outcome?

CDC. Siegel et al. http://www.cdc.gov/hicpac/pdf/isolation/Isolation2007.pdf
PIDAC. https://www.publichealthontario.ca/en/eRepository/PIDAC-IPC_Annex_A_Screening_Testing_Surveillance_AROs_2013.pdf

CP for MRSA - evidence

Epidemic/outbreak setting:

American Journal of Epidemiology
Copyright © 1996 by The Johns Hopkins University School of Hygiene and Public Health
All rights reserved
Vol. 143, No. 5
Printed in U.S.A.

Effectiveness of Contact Isolation during a Hospital Outbreak of Methicillin-resistant *Staphylococcus aureus*

John A. Jernigan,[1] Maureen G. Titus,[1] Dieter H. M. Gröschel,[1] Sandra I. Getchell-White,[1] and Barry M. Farr[1]

TABLE 3. Rates of transmission in an outbreak of methicillin-resistant *Staphylococcus aureus* in a neonatal intensive care unit, Charlottesville, Virginia, July 18, 1991–January 30, 1992

	Source of transmission	
	Isolated	Unisolated
Transmissions	5	10
Patient-days	558	71.5
Rate of transmission	0.0090	0.140*

* Relative risk = 15.6, 95% confidence interval 5.3–45.6, $p < 0.0001$.

CP for MRSA - evidence

Endemic setting?

Original Investigation

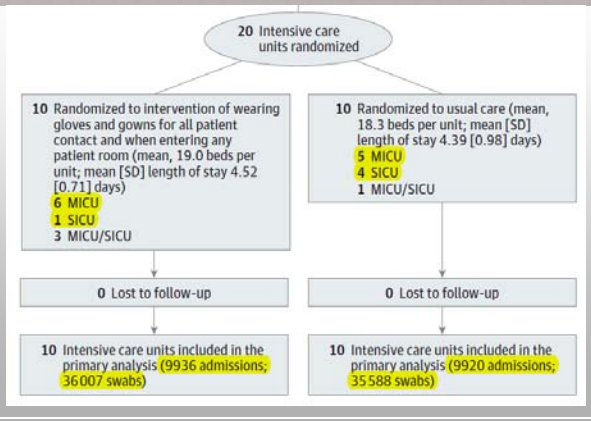
Universal Glove and Gown Use and Acquisition of Antibiotic-Resistant Bacteria in the ICU
A Randomized Trial

Anthony D. Harris, MD, MPH; Lisa Pineles, MA; Beverly Belton, RN, MSN; J. Kristie Johnson, PhD; Michelle Shardell, PhD; Mark Loeb, MD, MSc; Robin Newhouse, RN, PhD; Louise Dembry, MD, MS, MBA; Barbara Braun, PhD; Eli N. Perencevich, MD, MS; Kendall K. Hall, MD, MS; Daniel J. Morgan, MD, MS; and the Benefits of Universal Glove and Gown (BUGG) Investigators

- Cluster RCT in 20 medical and surgical ICUs in 20 US hospitals
- Intervention: gloves and gowns for all patient contacts
- Outcome: acquisition of MRSA or VRE based on surveillance cultures at admission and discharge from ICU

Harris et al. JAMA. 2013; 310(15):1571-80

CP for MRSA - evidence



Harris et al. JAMA. 2013; 310(15):1571-80

CP for MRSA - evidence

Results:

Table 2. Rates at Risk of Acquisition of Antibiotic-Resistant Bacteria per 1000 Patient-Days

	Intensive Care Units							
	Intervention			Control				
	No. of Acquisitions	Patient-Days at Risk	Mean Rate (95% CI)[a]	No. of Acquisitions	Patient-Days at Risk	Mean Rate (95% CI)[a]	Difference (95% CI)[b]	P Value[c]
[redacted]								
MRSA								
Study period	199	30 454.5	6.00 (4.63 to 7.78)	191	30 024.0	5.94 (4.59 to 7.67)		
Baseline	77	7841.0	10.03 (8.05 to 12.50)	59	9182.0	6.98 (4.50 to 10.83)		
Change[d]			−4.03 (−6.50 to −1.56)			−1.04 (−3.37 to 1.28)	−2.98 (−5.58 to −0.38)	.046

Harris et al. JAMA. 2013; 310(15):1571-80

CP for MRSA - evidence

Results:

Table 3. Average Hand-Hygiene Compliance and Health Care Worker Visits per Hour

	Intensive Care Units							
	Intervention			Control				
	No. of Events	No. of Observations[a]	Mean (95% CI), %[b]	No. of Events	No. of Observations[a]	Mean (95% CI), %[b]	Mean Difference (95% CI), %[c]	P Value[d]
Hand-hygiene compliance, %								
Room entry	1563	2828	56.1 (47.2 to 66.7)	1644	3231	50.2 (41.4 to 60.9)	5.91 (−6.91 to 18.7)	.42
Room exit	2027	2649	78.3 (72.1 to 85.0)	2080	3266	62.9 (54.4 to 72.8)	15.4 (8.99 to 21.8)	.02
Health care–worker visits	3213	756.5	4.28 (3.95 to 4.64)	3775	716.5	5.24 (4.46 to 6.16)*	−0.96 (−1.71 to −0.21)	.02

Other compliance data:

- 95% of admission and 85% of ICU discharge screens performed
- Compliance with gloves 86%, gowns 85%
- 11% of admission in CP in control group

Harris et al. JAMA. 2013; 310(15):1571-80

CP for MRSA - evidence

Results:

Table 3. Average Hand-Hygiene Compliance and Health Care Worker Visits per Hour

	No. of Events	Mean Difference (95% CI), %[c]	P Value[d]
Hand-hygiene compliance, %			
Room entry	156	1 (−6.91 to 18.7)	.42
Room exit	2027	4 (8.99 to 21.8)	.02
Health care–worker visits	3213	−0.96 (−1.71 to −0.21)	.02

Evidence that CP prevent MRSA acquisition in an ICU setting with high compliance to CP

Other complian

- 95% of admiss and 85% of ICU discharge screens performed
- Compliance with gloves 86%, gowns 85%
- 11% of admission in CP in control group

Harris et al. JAMA. 2013; 310(15):1571-80

CP for MRSA - evidence

Endemic:

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Veterans Affairs Initiative to Prevent Methicillin-Resistant *Staphylococcus aureus* Infections

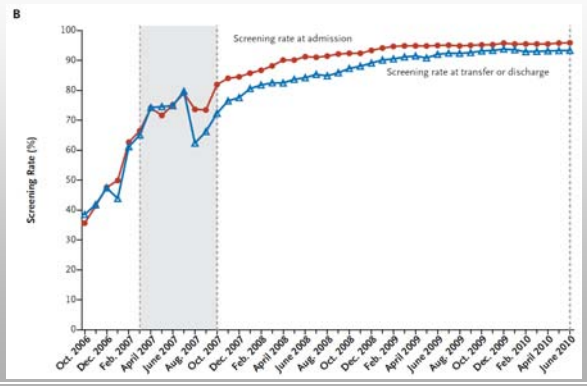
Rajiv Jain, M.D., Stephen M. Kralovic, M.D., M.P.H., Martin E. Evans, M.D.,

- Observational study in VA hospitals
- MRSA bundle: universal nasal admission screening, CP for MRSA carriers, hand hygiene
- 1,934,598 admissions with 8,318,675 patient days

Jain et al. NEJM. 2011; 364:15

CP for MRSA - evidence

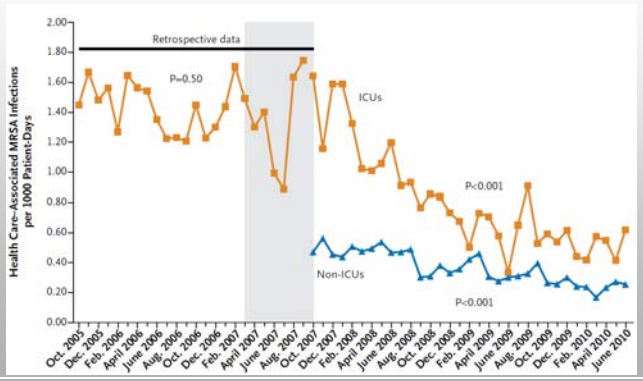
Results:



Jain et al. NEJM. 2011; 364:15

CP for MRSA - evidence

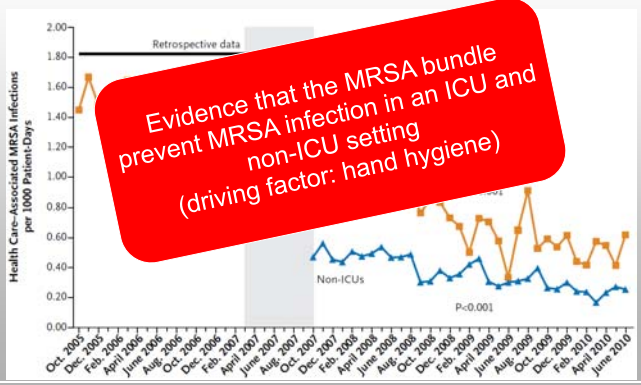
Results:



Jain et al. NEJM. 2011; 364:15

CP for MRSA - evidence

Results:



Evidence that the MRSA bundle prevent MRSA infection in an ICU and non-ICU setting (driving factor: hand hygiene)

Jain et al. NEJM. 2011; 364:15
Gurieva et al. Clin Infect Di. 2012; 54(11):1618-20

CP for MRSA - evidence

Endemic:

The Impact of Discontinuing Contact Precautions for VRE and MRSA on Device-Associated Infections

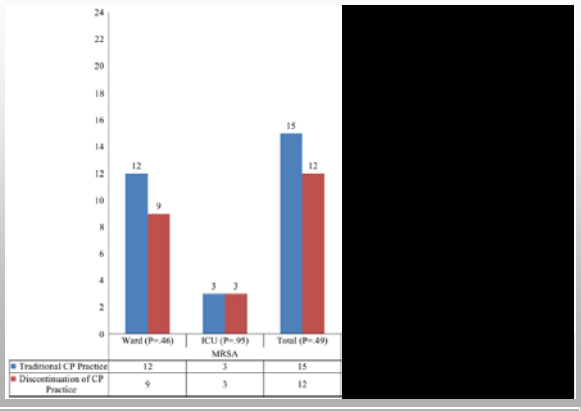
Michael B. Edmond, MD, MPH, MPA;[1] Nadia Masroor, BS;[2] Michael P. Stevens, MD, MPH;[2] Janis Ober MSN, RN, CIC;[2] Gonzalo Bearman, MD, MPH[2]

- Quasi-experimental single-site study:
  - Before 4/13: CP for MRSA/VRE
  - After 4/13: no CP for MRSA/VRE, emphasis on horizontal measures (hand hygiene, CHX bathing, bare-below elbow protocol)
- Outcome: MRSA and VRE device-associated infections

Edmond et al. Infect Contr Hosp Epidemiol. 2015; 36(8): 978-980

CP for MRSA - evidence

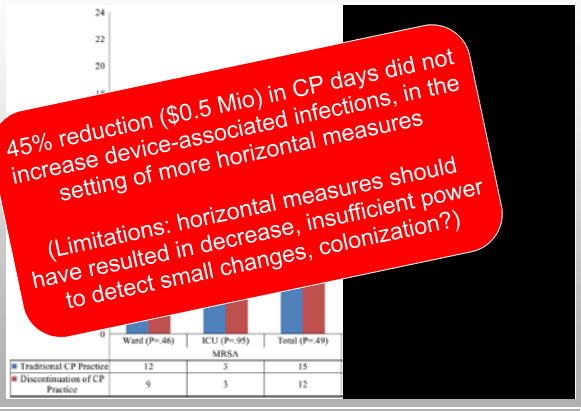
Results:



Edmond et al. Infect Contr Hosp Epidemiol. 2015; 36(8): 978-980

CP for MRSA - evidence

Results:



Edmond et al. Infect Contr Hosp Epidemiol. 2015; 36(8): 978-980

CP for MRSA - summary

- Better quality evidence is in support for CP for MRSA
  - Reduction in MRSA transmissions
  - No significant increase in adverse effects
  - Likely cost beneficial
- Lower quality evidence not supporting CP for MRSA in the endemic setting and suggesting more adverse effects
- PIDAC clearly recommends CP for MRSA

Objectives

1) MRSA and VRE epidemiology
2) Contact precautions for MRSA
   - The rationale
   - The evidence
3) **Approach to VRE in Ontario**
   - Current landscape
   - PHO study findings
4) Duration of MRSA/VRE carriage

VRE landscape

Summer 2012: 4 Ontario tertiary-care teaching hospitals decided to no longer screen and isolate for VRE with the following rationale:

1) Few clinical infections despite increase in colonization rates
2) Adverse effects from CP
3) Impact of patient flow
4) Significant costs related to VRE
5) Transfer of resistance from VRE to MRSA have not been realized
6) Several antibiotics are now available to treat VRE
7) VRE control not sustainable and lack of evidence that patient safety is improved by these measures while detracting resources for other IPAC activities
8) Routine practice have improved significantly since VRE first appeared

OAHPP, PIDAC. Review of literature for evidence-based best practices for VRE control. http://www.publichealthontario.ca/en/eRepository/PIDAC-IPC_VRE_Evidence-based_Review_2012_Eng.pdf

VRE landscape

Summer 2012: 4 Ontario tertiary-care teaching hospitals decided to no longer screen and isolate for VRE with the following rationale:

1) Few clinical infections despite increase in colonization rates
2) Adverse effects from CP
3) Impac
4) Sign
5) Tran ed
6) Seve
7) VRE afety is impr er IPAC
8) Rout peared

PIDAC:
The highest risk for VRE infections is in immunocompromised patients.
Increased VRE burden in the system increases the risk for these vulnerable patients.

OAHPP, PIDAC. Review of literature for evidence-based best practices for VRE control. http://www.publichealthontario.ca/en/eRepository/PIDAC-IPC_VRE_Evidence-based_Review_2012_Eng.pdf

VRE landscape

Summer 2012: 4 Ontario tertiary-care teaching hospitals decided to no longer screen and isolate for VRE with the following rationale:

1) Few clinical infections despite increase in colonization rates
2) Adverse effects from CP
3) Impac
4) S
5) Tra ed
6) Seve
7) VRE afety is impr er IPAC
8) Rout peared

PIDAC:
Debatable as there are studies showing adverse effects, and others do not.
The benefit of VRE control outweighs the potential risk for adverse effects from CP

VRE landscape

Summer 2012: 4 Ontario tertiary-care teaching hospitals decided to no longer screen and isolate for VRE with the following rationale:

1) Few clinical infections despite increase in colonization rates
2) Adverse effects from CP
3) Impact of patient flow
4) Significant costs related to VRE
5) ed
6) S
7) VRE afety is impr er IPAC
8) Rout peared

PIDAC:
Lack of VRE control will result in higher VRE infection rates, and these infections in an increase in length of stay affecting patient flow, too.

VRE landscape

Summer 2012: 4 Ontario tertiary-care teaching hospitals decided to no longer screen and isolate for VRE with the following rationale:

1) Few clinical infections despite increase in colonization rates
2) Adverse effects from CP
3) Impact of patient flow
4) Significant costs related to VRE
5) Transfer of resistance from VRE to MRSA have not been realized
6) S
7) VR fety is impr r IPAC
8) Routi eared

PIDAC:
Published literature demonstrates that VRE control programs are cost-effective when compared to the costs related to an increase in VRE infections.

Summer 2012: 4
longer screen an

PIDAC:
Transfer from VRE to MRSA occurred in a small number of cases in the US but has not become widespread.

1) Few clinica
2) Adverse e
3) Impact o
4) Significant costs related to VRE
5) Transfer of resistance from VRE to MRSA have not been realized
6) Several antibiotics are now available to treat VRE
7) VRE control not sustainable and lack of evidence that patient safety is improved by these measures while detracting resources for other IPAC activities
8) Routine practice have improved significantly since VRE first appeared

VRE landscape

Summer 2012: 4
longer screen an

PIDAC:
Correct. However, linezolid resistance as well as daptomycin resistance is already increasing

1) Few clinic
2) Adverse e
3) Impact
4) Signi
5) Transfer of
6) Several antibiotics are now available to treat VRE
7) VRE control not sustainable and lack of evidence that patient safety is improved by these measures while detracting resources for other IPAC activities
8) Routine practice have improved significantly since VRE first appeared

VRE landscape

Summer 2012: 4
longer screen an

PIDAC:
Given that VRE control has been shown to be cost-effective, sustainability should not be an issue and had been proven to be feasible in numerous jurisdictions.

1) Few clinic
2) Adverse e
3) Impact
4) Signif
5) Tra er of
6) Several antibiotics are now available to treat VRE
7) VRE control not sustainable and lack of evidence that patient safety is improved by these measures while detracting resources for other IPAC activities
8) Routine practice have improved significantly since VRE first appeared

VRE landscape

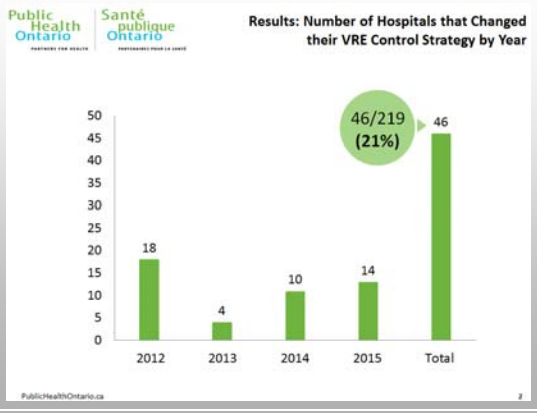
Summer 2012: 4 Ontario tertiary-care teaching hospitals decided to no longer screen and isolate for VRE with the following rationale:

1) Few clini
2) Adverse
3) Impact o
4) Significa
5) Transfer
6) Sever
7) VR is im oved IPAC activities
8) Routine practice have improved significantly since VRE first appeared

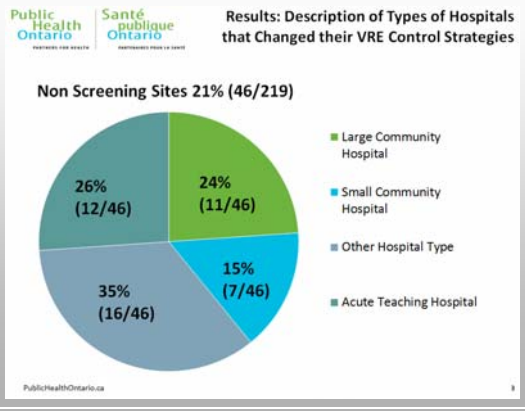
PIDAC:
VRE transmission is still occurring, thus, surveillance and containment through CP is needed.

OAHPP, PIDAC. Review of literature for evidence-based best practices for VRE control. http://www.publichealthontario.ca/en/eRepository/PIDAC-IPC_VRE_Evidence-based_Review_2012_Eng.pdf

VRE landscape



VRE landscape



CP for VRE- evidence

Results:

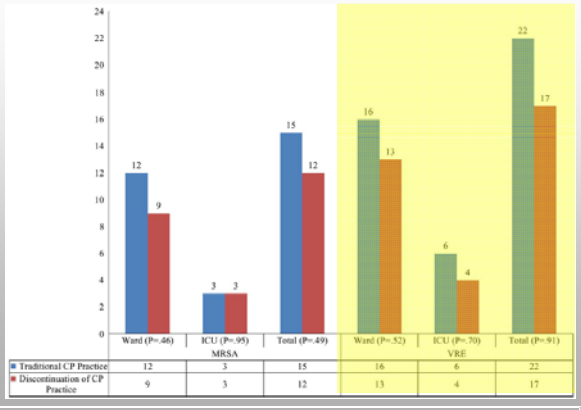
Table 2. Rates at Risk of Acquisition of Antibiotic-Resistant Bacteria per 1000 Patient-Days

	Intensive Care Units							
	Intervention			Control				
	No. of Acquisitions	Patient-Days at Risk	Mean Rate (95% CI)[a]	No. of Acquisitions	Patient-Days at Risk	Mean Rate (95% CI)[a]	Difference (95% CI)[b]	P Value[c]
VRE								
Study period	411	27 765.5	13.59 (10.26 to 17.99)	337	28 340.5	11.88 (8.65 to 16.33)		
Baseline	108	7691.5	15.18 (10.50 to 21.95)	122	8818.0	14.37 (10.31 to 20.02)		
Change[d]			−1.60 (−7.18 to 3.98)			−2.48 (−5.53 to 0.56)	0.89 (−4.27 to 6.04)	.70
MRSA								
Study period	199	30 454.5	6.00 (4.63 to 7.78)	191	30 024.0	5.94 (4.59 to 7.67)		
Baseline	77	7841.0	10.03 (8.05 to 12.50)	59	9182.0	6.98 (4.50 to 10.83)		
Change[d]			−4.03 (−6.50 to −1.56)			−1.04 (−3.37 to 1.28)	−2.98 (−5.58 to −0.38)	.046

Harris et al. JAMA. 2013; 310(15):1571-80

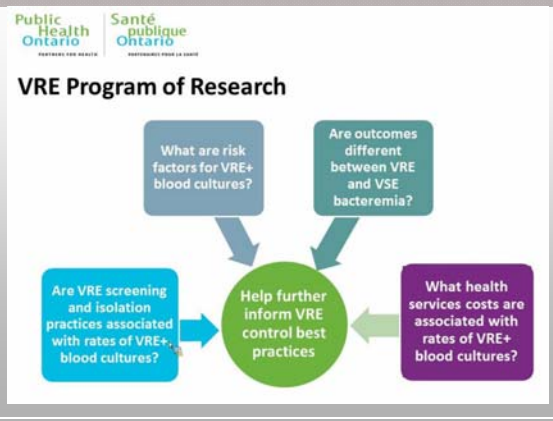
CP for VRE- evidence

Results:



Edmond et al. Infect Contr Hosp Epidemiol. 2015; 36(8): 978-980

OPH VRE study



OPH VRE study

INFECTION CONTROL & HOSPITAL EPIDEMIOLOGY JANUARY 2016, VOL. 37, NO. 1

ORIGINAL ARTICLE

VRE and VSE Bacteremia Outcomes in the Era of Effective VRE Therapy: A Systematic Review and Meta-analysis

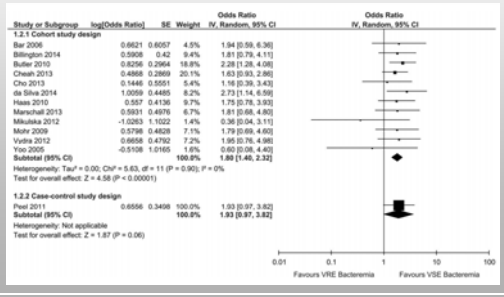
Chatura Prematunge, MSc;[1] Colin MacDougall, MSc;[1] Jennie Johnstone, MD, PhD;[1,2,3] Kwaku Adomako, MSc;[1] Freda Lam, MPH;[1] Jennifer Robertson, PhD;[1] Gary Garber, MD[1,3,4,5]

- Systematic review of VRE and VSE bacteremia outcomes in the era of effective VRE therapy
- Published literature from 1997-2014 and reporting on mortality (all-cause, in-hospital)

OPH VRE study

Results:

- 13 studies of 4,878 screened studies included
- Higher mortality with VRE vs. VSE in cohort studies:

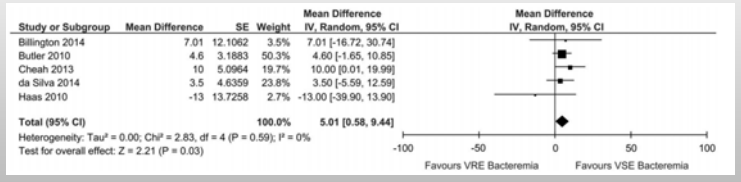


Prematunge et al. Infect Contr Hosp Epidemiol. 2016; 37(1): 26-35

OPH VRE study

Results:

- 13 studies of 4,878 screened studies included
- Length of stay significantly shorter with VSE vs. VRE bacteremia



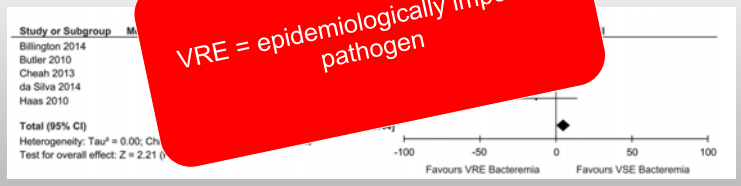
Prematunge et al. Infect Contr Hosp Epidemiol. 2016; 37(1): 26-35

OPH VRE study

Results:

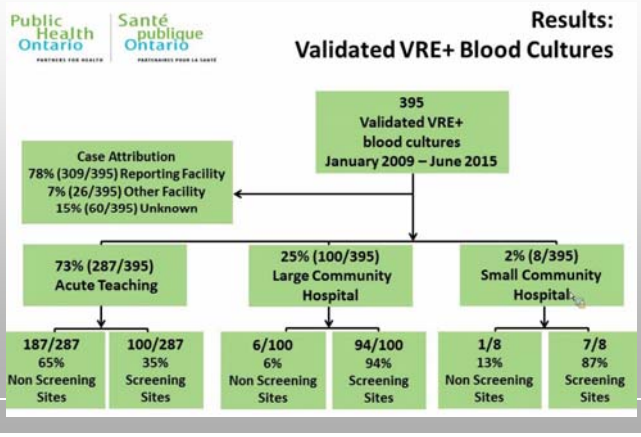
- 13 studies of 4,878 screened studies in
- Length of stay si emia

VRE = epidemiologically important pathogen

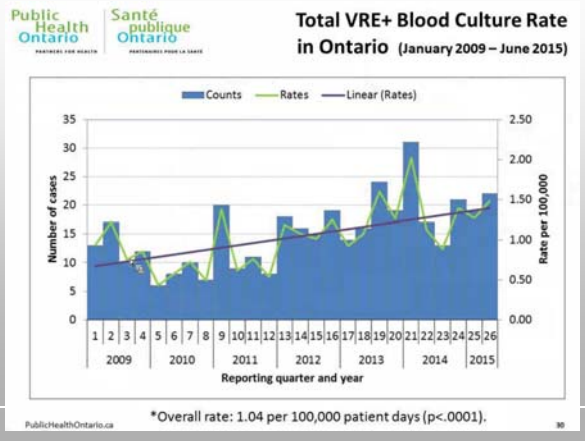


Prematunge et al. Infect Contr Hosp Epidemiol. 2016; 37(1): 26-35

OPH VRE study



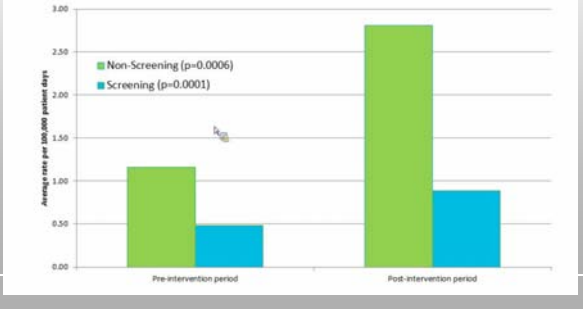
OPH VRE study



OPH VRE study

Public Health Ontario | Santé publique Ontario

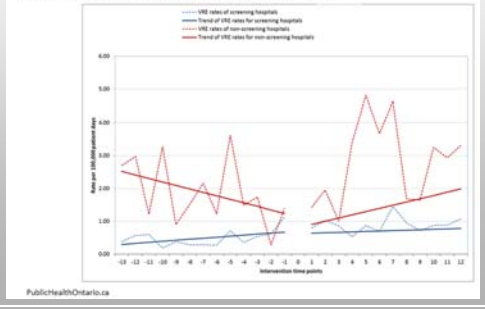
Non-Screening and Screening Hospitals: Did Mean Rates Increase?



OPH VRE study

Public Health Ontario | Santé publique Ontario

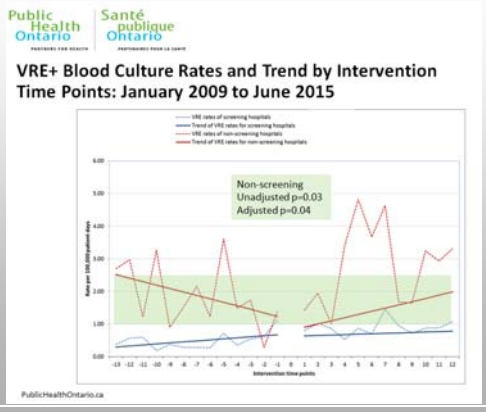
VRE+ Blood Culture Rates and Trend by Intervention Time Points: January 2009 to June 2015



OPH VRE study

Public Health Ontario | Santé publique Ontario

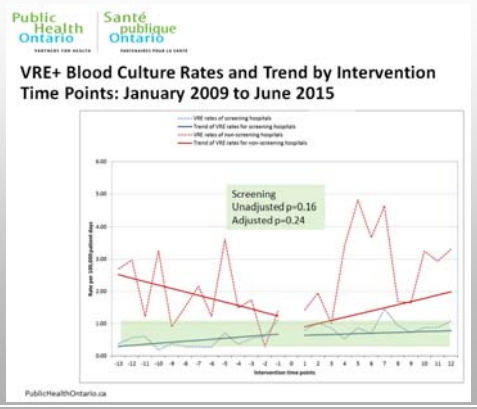
VRE+ Blood Culture Rates and Trend by Intervention Time Points: January 2009 to June 2015



OPH VRE study

Public Health Ontario | Santé publique Ontario

VRE+ Blood Culture Rates and Trend by Intervention Time Points: January 2009 to June 2015



OPH VRE study

Public Health Ontario | Santé publique Ontario

Overall Conclusions

- VRE control programs in Ontario are increasingly heterogeneous
- Rates of VRE+ blood cultures increased between January 2009 and July 2015
- Although VRE+ blood culture rates have increased in both screening and non-screening hospitals over time, discontinuation of VRE screening was associated with an increased rate of rise of VRE+ blood cultures

PublicHealthOntario.ca 9

Objectives

1) MRSA and VRE epidemiology
2) Contact precautions for MRSA
   - The rationale
   - The evidence
3) Approach to VRE in Ontario
   - Current landscape
   - PHO study findings
4) **Duration of MRSA/VRE carriage**

Duration of MRSA/VRE carriage

Implications on:

- Which patients with a previous history of MRSA/VRE carriage need empiric CP at re-admission?
- Do known MRSA/VRE carriers with long length of hospital stay need f/u surveillance cultures for MRSA/VRE?

Duration of MRSA/VRE carriage

American Journal of Infection Control 41 (2013) 1119-21

Contents lists available at ScienceDirect

American Journal of Infection Control

journal homepage: www.ajicjournal.org

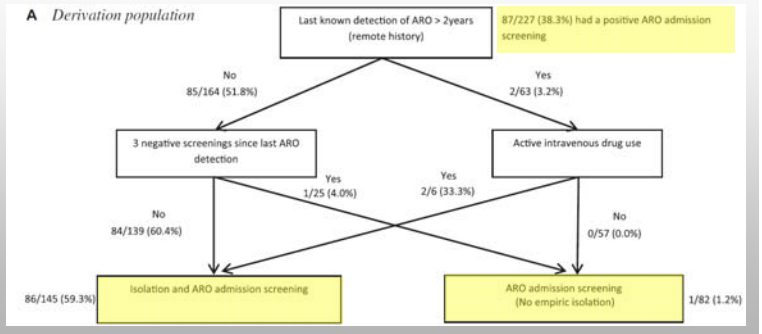
Brief report

Algorithm to reduce unnecessary isolation days in patients with a history of colonization by antimicrobial-resistant organisms

Dominik Mertz MD, MSc[a,b,c,*], Khuloud Nuri MD[a], Cindy O'Neill MLT[c], Mark Loeb MD, MSc[a,b,c,d,e], and Hamilton Health Sciences Infection Prevention and Control Team

- Do patients with an ARO history need CP until screening results available?
- Retrospective cohort study to identify persisting ARO carriage upon re-admission in patients previously known to be ARO colonized

Duration of MRSA/VRE carriage



Mertz et. al. Am J infect Control. 2013; 41:1119-1121

Duration of MRSA/VRE carriage

- Validation population (247 admissions, 38.1% ARO positive)
- Sensitivity 93.6% and specificity 56.2% to identify persisting ARO carriage
- By using this algorithm, unnecessary CP in re-admitted patients could be reduced by almost 60%

Mertz et. al. Am J infect Control. 2013; 41:1119-1121

Duration of MRSA/VRE carriage

Journal of Hospital Infection 88 (2014) 230–233

Available online at www.sciencedirect.com

Journal of Hospital Infection

journal homepage: www.elsevierhealth.com/journals/jhin

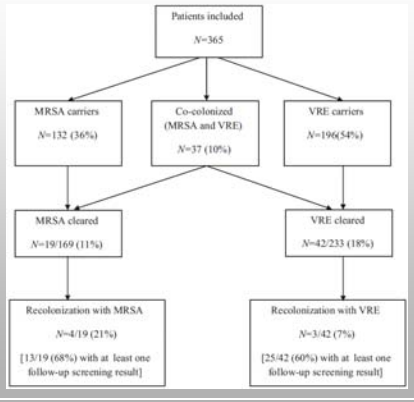
Short report

Value of an active surveillance policy to document clearance of meticillin-resistant *Staphylococcus aureus* and vancomycin-resistant enterococci amongst inpatients with prolonged admissions

A. Ghosh[a], L. Jiao[b], F. Al-Mutawa[b], C. O'Neill[c], D. Mertz[a,c,d,e,*]; Hamilton Health Sciences Infection Prevention and Control Team[c]

- Do patients with prolonged hospital benefit from re-swabbing?
- Retrospective cohort study assessing the value of re-screening of known MRSA/VRE carriers with a hospital stay >30 days

Duration of MRSA/VRE carriage



Ghosh et. al. J Hosp Infect. 2014; 88:230-233

Duration of MRSA/VRE carriage

Table I
Clearance and impact of clearance on isolation days

	MRSA	VRE
No. of patients[a]	169	233
No. of patients cleared (%)	19 (11.2)	42 (18.0)
Median time to clearance (IQR), days	23 (14–39)	26.5 (13–45.5)
No. of cleared patients recolonized (%)	4 (20.0)	3 (7.0)
No. of isolation-days saved	961	1190
No. of screenings conducted	538	877

Ghosh et. al. J Hosp Infect. 2014; 88:230-233

Duration of MRSA/VRE carriage

- Active surveillance of known MRSA/VRE carriers with a hospital stay of 30+ days allowed D/C CP in 11 and 18% of cases
- Re-screening weekly x2 months, monthly x3 months, then q6 months reduced CP days by ~2000
- 1,400 swabs obtained to save 2,000 CP days → cost effective

Ghosh et. al. J Hosp Infect. 2014; 88:230-233

Take home messages

- Infection and in-hospital transmission of MRSA decreasing. VRE more challenging and outbreaks common.
- Evidence to support CP for MRSA is better than for VRE explaining the heterogeneous landscape in VRE control practices.
- The recent OPH study shows that discontinuation of VRE control practices seems to increase VRE bacteremia and PIDAC continues to recommend screening and CP for VRE.
- Simple algorithms and re-screen policies can reduce unnecessary isolations days for patients with an ARO history.