Is There Validity to VRE Admission Screening?

Dr. Michelle Alfa, Diagnostic Services Manitoba

A Webber Training Teleclass

Is There Validity to VRE Admission Screening?

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Hosted by Paul Webber
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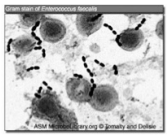
Session Rated PG99:
Scenes of Despair; may be offensive to some!

Overview of Session:

- Guidelines VRE screening
- VRE screening methods
- Data on VRE severe infections
- VRE cost benefits of screening.

Enterococcus



- >34 species, most rarely isolated.
- 18 have been reported as human pathogens.
- 4 species account for >98% of clinical infections
  - *E. faecalis* (90%) – Minority of VRE
  - *E. faecium* (~7%) – Majority of VRE

  } **Van A, Van B** Transmissible resistance

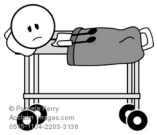
  - *E. gallinarum* (<1%)
  - *E. casseliflavus* (<1%)

  } **Intrinsic: Van C** always resistant , not transmissible

Manual of Clin. Microbiol. 10th Ed. 2011

Enterococcus Infections: 90% due to *E. faecalis*

- **Urinary tract infections**
  - 10% of UTIs in elderly.
  - 16–20% of nosocomial UTIs
  - Usually associated with underlying abnormalities or instrumentation.



- **Pelvic and intrabdominal infections.**
  - Role is controversial.
- **Bacteraemia and endocarditis.**
  - Up to 20% of native valve endocarditis.

Manual of Clin. Microbiol. 10th Ed. 2011

Why do we Screen for VRE on Admission to a Healthcare facility???

1. Limited treatment options for invasive VRE infections
2. **Prevent the spread of VRE to other patients by using contact isolation precautions**

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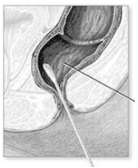
Guidelines:

- **Many guidelines (CDC, APIC, SHEA, PHAC, MB Health, CHICA, PIDAC) recommend screening (active surveillance) for VRE under some situations.**
  - Targeted or universal – depends on local epidemiology and situation.
- ***"VRE positive" is a Life Sentence!***

*Infect Control Hosp Epidemiol 2002; 23:*429-435.
Infect Control Hosp Epidemiol 2001; 22:437-442.

VRE Screening

- Specimens are usually **rectal swabs**.
- **Stool** is an alternative.

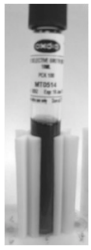


- Two major approaches to screening:
  - **Culture-based screening.**
  - Molecular detection of vanA and/or vanB

8

Culture Broth based Screening

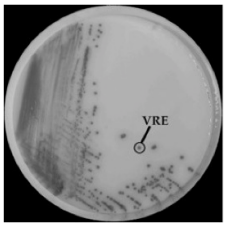
- Broth-based methods with definitive identification are considered the gold standard.
  - 100% sensitive, 100% specific.
  - Most use a bile esculin-sodium azide broth with vancomycin.
  - Growth in broth needs to be confirmed by sub-culture.



9

Chromogenic Media

- Contains: chromogenic substrates, vancomycin and proprietary inhibitors
- Differentiates *E. faecium & E. faecalis* from: *E. casseliflavus/gallinarum*
  - Account for >90% of suspect "VRE" isolates on screening



J Clin Microbiol. 2011 Nov;49(11):3947-9.
J Clin Microbiol. 2009 Dec;47(12):4113-6.

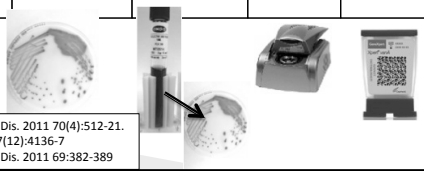
Nucleic Acid Amplification

- GeneXpert system:
  - "fool proof" PCR
  - minimal expertise needed
  - targets Van A, Van B
- TAT could be reduced to <2 hours.
- Cost is very high...

11

Screening Method Comparison

	Agar culture (Chromogenic)	Broth culture & Agar	Molecular (batched)	Molecular (real-time)
Sensitivity	80%	100%	80-90%	80-90%
Specificity	100%	100%	85%	85%
TAT	24-48h	48-72h	24-72h	2-3h
Cost (each)	$2.00	$2.89	$20.00	$50.00
Cost/year 22,000 spec.	$44,000	$63,580	$440,000	$1,100,000



Diagn Microbiol Infect Dis. 2011 70(4):512-21.
Clin Microbiol. 2009 47(12):4136-7
Diagn Microbiol Infect Dis. 2011 69:382-389

12

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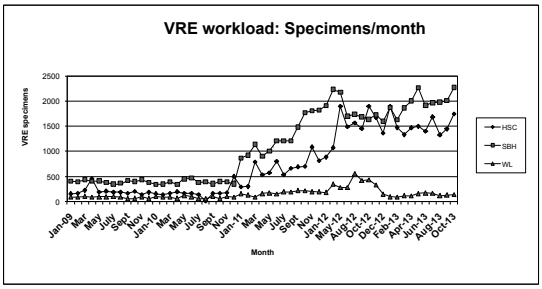
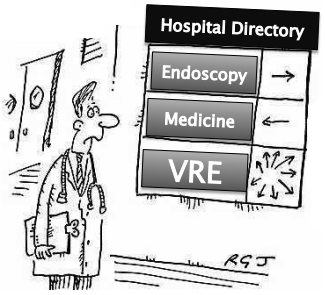
Manitoba Experience with VRE



VRE screening: now 18% of total specimens processed!
More VRE specimens/year than urines

13

Once you get VRE in a healthcare facility it just won't go away!



14

Surrender on the Battlefront!

- June – July, 2012: four Ontario tertiary-care teaching hospitals initiated practice changes:

Cessation of:
- VRE Screening
- Additional Precautions for VRE positive patients
- Declaring VRE outbreaks

15

PIDAC Responds!

- Review of Literature for Evidence-based Best Practices for VRE Control. PIDAC Aug 2012

"Centres discontinuing VRE control measures may be expected to experience ***significant increases in VRE infection rates, including VRE BSI***, over the next two to five years."

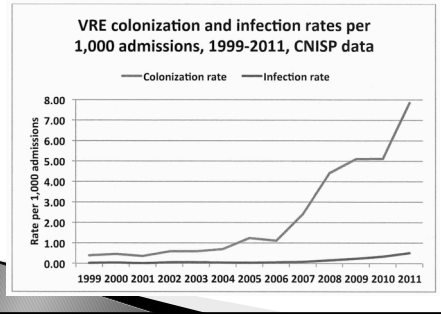
" …the ***benefit of VRE control programs*** to the overall patient population …***outweighs the potential adverse effects*** of additional precautions on individual patients."

"Published evidence demonstrates that VRE control programs ***are cost-effective*** when compared to the costs of increased VRE infections.."

16

Response to the PIDAC Response!

- Infection versus Colonization: CNISP data



17

What is the rate of VRE bacteremia ??

- Ontario Ministry of Health & Long-Term Care VRE bacteremia rates/100,000 patient days[1]:

- 2009: 0.46 cases/100,000 patient days
- 2010: 0.21 cases/100,000 patient days
- 2011: 0.41 cases/100,000 patient days

[1] Companion Document to: Review of Literature for Evidence-based Best Practices for VRE Control. Aug 2012 PIDAC: Public Health Ontario

18

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So are you totally confused yet??

19

Key Points to Consider:

- Despite VRE Admission screening…. VRE colonization rates continue to climb
- Despite all IP&C "Interventions" getting back to "baseline" rates has proved illusive
- Majority of VRE are *E. faecium* and have very low virulence
- The cost when VRE rates proliferate within a healthcare facility are staggering (lab staff and test costs, nursing costs, isolation costs).

"SOMETHING's GOT TO GIVE……."

20

Final Verdict on VRE Screening: Not yet in!

1. VRE colonization continues to expand
2. Few VRE bacteremias; often in patients with many underlying medical problems
3. Surveillance screening is costly: consider focusing resources on other interventions that may have an impact on reducing HAI rates (e.g. improve environmental disinfection)
4. We can't keep doing the same things …….. and expect a different outcome!

21

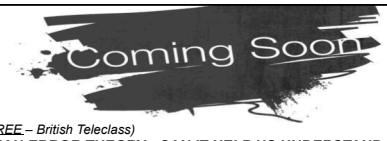
If you are looking for the Truth (Validity) in VRE surveillance….

22

References:

- CADTH: Screening, Isolation, and Decolonization Strategies for VRE and ESBL organisms: A Systematic Review of the Clinical Evidence and Health Services Impact. Sept 2012
- PIDAC: Review of Literature for Evidence-based Best Practices for VRE Control Aug 2012, Public Health Ontario
- PIDAC: Companion Document to: Review of Literature for Evidence-based Best Practices for VRE Control
- Response to the PIDAC: Review of literature for evidence-based best practices for VRE control: Oct 2012 [prepared by; Univ Health Network, Kingston Gen Hosp, Ottawa Hosp, London HSC & St. Joseph's Health Care London]

23



21 January *(FREE – British Teleclass)*
HUMAN ERROR THEORY - CAN IT HELP US UNDERSTAND AND MINIMISE THE INCIDENCE AND IMPACT OF OUTBREAKS?
Dr. Evonne Curran, Glasgow University, Scotland

23 January **HAND HYGIENE OVER THE DECADE: 2004-2014**
Dr. Elaine Larson, Columbia University
Sponsored by GOJO (www.gojo.com)

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Dr. Walter Zingg, University of Geneva Hospitals, Switzerland
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30 January **UNIVERSAL MRSA SCREENING - IS IT WORTHWHILE, AND FOR WHOM?**

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