Is There Validity to VRE Admission Screening?
Dr. Michelle Alfa, Diagnostic Services Manitoba
A Webber Training Teleclass

Is There Validity to VRE Admission Screening?
Dr. Michelle Alfa, Ph.D., FCCM
Medical Director, Clinical Microbiology Discipline,
Diagnostic Services Manitoba
Hosted by Paul Webber
paul@webbertraining.com

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

  Intrinsic: Van C always resistant, not transmissible


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.


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!

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

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.

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

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...

Screening Method Comparison

<table>
<thead>
<tr>
<th></th>
<th>Agar culture (Chromogenic)</th>
<th>Broth culture &amp; Agar</th>
<th>Molecular (batched)</th>
<th>Molecular (real-time)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>80%</td>
<td>100%</td>
<td>80-90%</td>
<td>80-90%</td>
</tr>
<tr>
<td>Specificity</td>
<td>100%</td>
<td>100%</td>
<td>85%</td>
<td>85%</td>
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<tr>
<td>TAT</td>
<td>24-48h</td>
<td>48-72h</td>
<td>24-72h</td>
<td>2-3h</td>
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<tr>
<td>Cost (each)</td>
<td>$2.00</td>
<td>$2.89</td>
<td>$20.00</td>
<td>$50.00</td>
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<tr>
<td>Cost/year 22,000 spec.</td>
<td>$44,000</td>
<td>$163,580</td>
<td>$440,000</td>
<td>$1,100,000</td>
</tr>
</tbody>
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Manitoba Experience with VRE

VRE workload: Specimens/month

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

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

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

PIDAC Responds!

  "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."

Response to the PIDAC Response!

› Infection versus Colonization: CNISP data

What is the rate of VRE bacteremia ??

› Ontario Ministry of Health & Long-Term Care VRE bacteremia rates/100,000 patient days:
  - 2009: 0.46 cases/100,000 patient days
  - 2010: 0.21 cases/100,000 patient days
  - 2011: 0.41 cases/100,000 patient days

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So are you totally confused yet??

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………..”

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!

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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

Dr. Elaine Larson, Columbia University
Sponsored by GOJO (www.gojo.com)

29 January (FREE – WHO Teleclass - Europe)
INNOVATION AND IMPLEMENTATION STRATEGIC APPROACHES TO REDUCE CATHETER-RELATED BACTERIAEMIA: THE RESULTS OF A EUROPEAN MULTICENTRE STUDY (PROHIBIT)
Dr. Walter Zingg, University of Geneva Hospitals, Switzerland
Sponsored by WHO Patient Safety Agency, CLEAN Care is Safer Care

30 January UNIVERSAL MRSA SCREENING - IS IT WORTHWHILE, AND FOR WHOM?

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