#### Horizontal Strategy for Control of Vancomycin Resistant Enterococci (VRE) at SCGH

**ACIPC WA Special Interest Group Presentation** 

**David Speers** 



## Burden of VRE

- History in WA
  - Significant outbreak at RPH 2001 (about 80 cases)
  - Low level isolation until exponentially increasing incidence since 2007
  - Large colonisation outbreak at SCGH in 2011 (131 cases)
- Morbidity and mortality
  - Related to VRE infections
  - Colonisation usually precedes infection
  - VRE has a different virulence profile to other MROs
    - Disease only in identified higher risk groups c.f. MRSA, ESBL, CPE, C. difficile
- Costs:
  - Control
    - Pathology, PPE equipment in contact precautions
  - Colonisations
    - Use of single rooms, bed management
  - Infections
    - LOS and health care costs

#### Vancomycin Resistant Enterococci

Western Australia 1998 – 25<sup>th</sup> January 2016: 3,414 *vanA* and *vanB E faecalis* and *E faecium isolates* 



YEAR

### SCGH vanA and vanB E faecium and E faecalis



Quarterly

#### VRE versus VSE bloodstream infection Mortality meta-analysis



**DiazGranados CID 2005** 

New antibiotics, contribution to death less clear c.f. more virulent organisms

#### Attributable Costs and LOS VRE versus VSE Bloodstream Infections

	Cos	sts	LOS	
	US\$ (95	5% CI)	days (95%Cl)	
Statistical method	VRE BSI n = 94	VSE BSI n = 182	VRE BSI	VSE BSI
GLS regression model				
mean value	\$4,479	\$2,250	2.3	1.2
	(3,500-5,732)	(1,758-2,880)	(1.8-2.8)	(0.9-1.5)
GLS regression with IPW				
mean value	\$4036	\$2023	2.2	1.1
	(3,170-5,140)	(1,588-2575)	(1.7-2.7)	(0.9-1.4)
Matched pairs	\$9949	\$5,282	3.5	2.2
	(1,579-24,693)	(2,042-8,043)	(2.1-7.3)	(1.0-3.5)

Butler ICHE 2010

### Morbidity and Mortality

#### • HISWA + ACCESS data

Reporting period	No of clinical isolates notified to HAIU	HAI	CAI	Total number of infections	Total number of colonisations	Isolates referred from private labs - infection/colonisation status unknown*
2012-13	13	7	2	9	4	0
2013-14	47	29	1	30	9	8
2014-15	72	36	4	40	15	17**

• Analysis of bloodstream infections by higher-risk patient groups

Unit	2012-13	2013-14	2014-2015	1 Jul – 7 Aug 2015
Dialysis	0	3	1	1
ICU	0	1	2	0
Haematology/Oncology	2	0	3	0
Transplant	0	0	0	0
Non- higher-risk unit	0	3	3	0

# What is the best approach for prevention and control of VRE?

TABLE 1. Preventing Healthcare-Associated Infections: Examples of Vertical and Horizontal Approaches

Vertical approaches reduce risk of infections due to specific pathogens:

- · Active surveillance testing to identify asymptomatic carriers
- · Contact precautions for patients colonized or infected with specific organisms
- · Decolonization of patients colonized or infected with specific organisms

Horizontal approaches reduce risk of a broad range of infections and are not pathogen specific:

- · Standard precautions (eg, hand hygiene)
- · Universal use of gloves or gloves and gowns
- · Universal decolonization (eg, chlorhexidine gluconate bathing)
- · Antimicrobial stewardship
- · Environmental cleaning and disinfection

SOURCE. Modified from Wenzel and Edmond.3

# What is the best approach for prevention and control of VRE?

- One size does not fit all
  - Dependent on:
    - availability of single rooms, SCGH vs FSH
    - Local prevalence of VRE
    - Resourcing of cleaning
    - Establishment of AMS programmes
    - Staff compliance
      - with contact precautions (literature quotes 63-73%)
      - with horizontal measures (HHA audits 60-80%)
- Vertical approach more suited to hospitals with high proportion of single rooms, fewer colonised patients, high compliance with contact precautions (PPE etc)
- Horizontal approach more suited to hospitals with fewer single rooms, more colonised patients, multiple MROs of concern, better cleaning resourcing

### **Costs of Vertical Control**

- PathWest Pathology
  - Cost/test = \$30.60
  - Tests 1/07/14 to 31/01/16 = 24,815
    - 364 positive = 1.5%
  - Total cost = \$480,000/yr
- PPE
  - More difficult to assess
  - Chicago study (1,000 bed acute care hospital)
    - Cost of \$34/day to \$44/day for ICU
    - IPCU nurse cost \$19,400/yr
    - Total cost \$141,900/yr

## Costs of horizontal control

- Resourcing of:
  - Cleaning
  - Antimicrobial stewardship programme
  - IPCU nursing for communication, education, policy development (e.g. shared equipment)
- Education
  - Hand hygiene, aseptic technique
- Auditing
  - Compliance with dress code, environmental cleaning, hand hygiene

## Costs vs success of Contact Precautions in Non-outbreak settings

- VRE colonisation rates increasing internationally despite contact precaution efforts
- Staff impacts
  - Decreased satisfaction with rectal swabs, PPE donning and doffing, bed blocking
- Patient impacts
  - Increased anxiety and depression (best evidence)
  - Decreased patient satisfaction
  - Fewer patient-HCW interactions
  - Care delays
  - Increased non-infectious adverse events
    - Not shown universally

## VRE OD

- Changes from 2014 version:
  - the introduction of a VRE clearance protocol (VRE carriage was previously considered to be life-long)
  - revision of definitions to align with the Australian Institute of Health and Welfare (AIHW), National Standards and WA Health to ensure consistency
  - adoption of standard precautions for the management of VRE-positive patients in sub acute wards (previously, patients in sub-acute wards were required to be cared for in single rooms under contact precautions)
    - non-inpatients, ambulatory care, rehabilitation, residential care
    - Haemodialysis units excluded
- Two year trial of universal control strategy at SCGH
  - Based on experiences elsewhere showing no increased VRE rates post-implementation
  - State-wide hospital-specific VRE infection rates to be collated

# Impact of transition from vertical to horizontal precautions for VRE

Horizontal infection prevention measures and a risk-managed approach to vancomycin-resistant enterococci: An evaluation

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**Conclusion:** A risk-managed approach to VRE can be implemented without adverse consequences and potentially with significant benefits to a facility.

Impact of contact precautions on falls, pressure ulcers The and transmission of MRSA and VRE in hospitalized Prec patients Devi

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No significant differences in the rates of falls and pressure ulcers among MRSA/VRE patients were found after the policy change compared with before the policy change. There was no overall change in MRSA or VRE hospital-acquired transmission. The Impact of Discontinuing Contact Precautions for VRE and MRSA on Device-Associated Infections

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investigated in this before-and-after study. In the setting of a strong horizontal infection prevention platform, discontinuation of contact precautions had no impact on device-associated hospital-acquired infection rates.

Infect. Control Hosp. Epidemiol. 2015;36(8):978-980

Two year trial of VRE Universal Strategy Plan at SCGH

STRATEGY	Requirements	Person Responsible	Time Frame
Internal Communication	Global email: VRE Strategy and rationale from Hospital Executive IC Update: More detailed Information on VRE strategy and rationale Front page of CHIPS :New strategy update Regular (3 monthly) reports to Hospital Executive	Hospital Executive IP&C Nurses	Once completion of education/policies
External Communication	Prepare standard message for enquiries from other HCF's	IP&C Nurses	
Patient Flow/Bed Management	Revise Bed Management Guidelines on Micro V/Micro F admission, ward allocation Attend Patient Flow meeting as required Attend G74,G71 ward meetings to explain new VRE stategy	IP&C Nurses	2 weeks
MRO Policy Update	Revise IP&C Policy #2 and #3 to reflect changes to screening and management of patients	IP&C Nurses	4 weeks
Education	Revise IP&C e-learning program Develop PPT presentation Organise education sessions: initially for high risk wards (G71, G73, G63, G44, G45) and then all relevant clinical staff include Medical, Nursing and Allied Health staff	IP&C Nurses CNE	6 weeks
Staff Information Sheets	Update Micro V staff information sheet Update Micro F staff information sheet Update micro-alert IP&C information sheet Update CHIPS	IP&C Nurses	4 weeks
Auditing Process for High Risk Wards (G71, G73, G63, G44, G45)	Audit HH compliance 3 x per year Compile HH report and feedback audit results Develop patient equipment cleaning program -Shared patient equipment cleaning program Develop PPE compliance audit tool Audit PPE compliance quarterly	IP&C Nurses Cleaning Manager	Ongoing
Antibiotic Stewardship	High Bisk wards to be involved in HAPI Program	ID HAPI Bound	Ongoing
Cleaning Protocols	Daily Chloradet patient single room cleaning Twice daily Chloradet patient single room cleaning Weekly whole ward Chloradet cleaning 6 monthly ward empty and deep clean Increase "TOPCAT" auditing on high risk wards Fortnightly cleaning audits IP&C and Cleaning Dept Update SCGH Cleaning guidelines	IP & C Nurses Cleaning Services	Ongoing
Patient Information	Update VRE patient brochure Update Micro V patient letter Update Micro F patient information sheet Update CHIPS	IP&C Unit	6 weeks
Clearance Process for Micro-V patient	Review all known SCGH Micro V patients (approx 800) Review specimens for these patients, delete micro-alert Greater than 4 years - delete micro alert Inform inpatients if required	IP&C Nurses	3 months/ongoing
PATHWEST	Inform lab regarding decrease in screening volume Ability to clear Micro alert V patients - process swabs Change comment on VRE result to include clearance	IP&C Nurses Microbiology Lab	2 weeks

# Summary of new risk management approach

- hand hygiene\*
- adherence to the Dress Code Policy (bare below the elbow)\*
- correct use of personal protective equipment (PPE)\*
- aseptic technique\*
- enhanced environmental cleaning\*
  - automated disinfectant dispensers, extra cleaning of en suites, H<sub>2</sub>O<sub>2</sub> terminal cleaning
- Single patient equipment, cleaning shared patient equipment between use
- chlorhexidine bathing for patients
- management of intravascular catheters
- antimicrobial stewardship

\*regular audit with reporting to General Executive Committee

## Communication



#### Preventing and Controlling Healthcare Associated Infections Page 2 of 2

3. Patient Equipmen

To reduce the risk of transmission of micro-organisms reusable equipment must be cleaned after each patient use.

High risk wards must have a cleaning schedule in place for re-useable medical equipment, for example glucometer, bladder scanner, dynamap/blood pressure machines and intravenous poles. Weekly visual inspection of equipment must be conducted by the ward CNS.

Single patient use items, for example tourniquets and blood pressure cuffs should be used.

4. Correct use of Personal Protective Equipment (PPE)

The use of PPE reduces the risk of transmission of infectious agent to and from healthcare workers and patients. It includes a variety of barriers, used alone or in combination to protect mucous membranes, airways, skin and lothing from micro-organisms.

The correct use of PPE will be audited monthly by the Infection Prevention and Control Unit. A minimum compliance rate of 80% must be achieved.

 Prevention of Device Related Infections
 An intravascular catheter is an access route directly into the bloodstream and is a potential source of serious, but preventable infection.

Daily antibacterial body wash solution is to be introduced for patient use on high risk wards.

Clinical staff must be competent in Aseptic Technique (AT). AT assessors on high risk wards must audit quarterly (February, May, August, November) using AT audit tool. A minimum compliance rate of 85% must be achieved.

Clinical staff must manage Peripheral Vascular Catheters (PVC) according to Nursing Practice Guideline No. 20. Auditing is to be conducted quarterly (March, June, September, December) using the PVC Bundle audit tool. A minimum compliance rate of 85% must be achieved.

6. Antimicrobial Stewardship

All high risk wards will be involved in the SCGH Healthy Antimicrobial Prescribing Initiative (HAPI).

#### Conclusion

SCGH Infection Prevention and Control Unit are determined to prevent healthcare associated infections. The adoption of strict adhremore to standard and transmission based precations is essential in this process and requires al staff to comply with Infection Prevention and Control policies.

Using a risk management approach to VRE management is an opportunity to concentrate on raising compliance with infection control strategies to improve patient outcomes at SCGH.

Government of Western Australia Department of Health North Metropolitan Area Health Service Page 2

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### Monitoring trial outcomes

Sir Charles Gairdner Hospital Infection Prevention and Control Unit

#### Report on the VRE risk management approach February 2016

#### INTRODUCTION

On 1st February 2016, SCGH commenced a two-year trial on a new approach for the management of vancomycin-resistant enterococci (VRE). The risk management approach replaced the VRE screening and isolation strategies in place on G71, G73, G63, G44 and G45.

#### Aseptic Technique (AT) Compliance



