

Objectives

1. To promote good prescribing practices for broad-spectrum antibiotics
2. To improve prescribers' awareness of provincial criteria for broad-spectrum antibiotics
3. To implement and measure impact of a Reserved Antimicrobial Drug Pre-printed Order (RAD PPO).

Background

Inappropriate and over usage of broad-spectrum antibiotics is expensive and results in adverse patient outcomes, including superinfection and resistance. Thus, prescribers should utilize these agents only for specific approved indications.

RAD PPOs are used by some institutions to guide appropriate broad-spectrum antibiotic use by making prescribers aware of restricted indications and consider narrower spectrum agents.

We propose a RAD PPO would improve broad-spectrum antibiotic use at Vancouver General Hospital (VGH).

Problems & Issues

1. BC Health Authorities Pharmacy & Therapeutics Committee has established prescribing criteria for broad-spectrum antibiotics, however it is unclear whether prescribers follow these restrictions
2. Utilization of carbapenem antibiotics continues to be high despite antimicrobial stewardship efforts at VGH
3. Policing use of broad-spectrum agents is time consuming and not always possible, with limited antimicrobial stewardship resources.

Interventions & Strategy for Change

The VCH Antimicrobial Stewardship Programme (ASPIRES) proposed the need for a RAD PPO to promote optimal antimicrobial use. All prescribers must complete this form and specify indication and rationale for ordering these agents, in compliance with provincially mandated restrictions.

RAD PPO was developed collaboratively between ASPIRES and Pharmacy with multi-disciplinary feedback from the Medical Advisory and Pharmacy & Therapeutics Committees. Education was provided to hospital staff.

RAD PPO was launched on January 26, 2015 at VGH.

Effects of Changes

During initial 2-weeks post-implementation, RAD PPOs were completed 70% of the time.

For quality assurance, we assessed:

1. Appropriateness of antibiotic prescribing to criteria pre- and post-implementation
2. Prescriber compliance with RAD PPO
3. Antibiotic consumption

Reserved Antimicrobial Drug Pre-printed Order (RAD PPO)

Figure 1. Reserved Antimicrobial Drug Pre-printed Order

Measurements of Improvement

Design

ASPIRES conducted a retrospective chart review of patients receiving at least 1 RAD during the pre (May 1 to Aug 31, 2014) and post (May 1 to Aug 31, 2015) RAD PPO implementation periods at VGH. Based on a sample of convenience, 50 patients were randomly selected from each of the pre- and post-implementation phases. RADs included ceftazidime, daptomycin, linezolid, meropenem, and tigecycline.

Appropriateness of antibiotic prescribing to criteria, prescriber compliance with RAD PPO, and antibiotic consumption were evaluated.

Results

Fifty-two out of 406 (pre-implementation) and 59 out of 420 (post-implementation) orders were evaluated.

Reserved Antimicrobial Drugs	Number of Prescriptions		Appropriateness Based on Restrictive Criteria	
	Pre-implementation (N=52)	Post-implementation (N=59)	Pre-implementation (N=52)	Post-implementation (N=59)
Ceftazidime	3 (6%)	4 (7%)	3/3 (100%)	4/4 (100%)
Daptomycin	3 (6%)	4 (7%)	3/3 (100%)	3/4 (75%)
Linezolid	5 (10%)	3 (5%)	5/5 (100%)	1/3 (33%)
Meropenem	41 (79%)	47 (80%)	34/41 (83%)	43/47 (91%)
Tigecycline	0 (0%)	1 (2%)	0	1/1 (100%)
Total:	52	59	45/52 (87%)	52/59 (88%)

Figure 2. Reserved Antimicrobial Drugs and Appropriateness of Use Based on Restrictive Criteria

Results

During post-implementation, appropriateness of use was 100% when the RAD PPO was completed vs. 63% when written on a Prescribers' Order.

Reserved Antimicrobial Drugs	Compliance with RAD PPO
Ceftazidime	1/2
Daptomycin	3/4
Linezolid	1/3
Meropenem	29/44
Tigecycline	1/1
Total:	35/54 (64%)

Adherence by month

May:	69%
June:	54%
July:	81%
August:	50%

Figure 3. Prescriber Compliance with RAD PPO

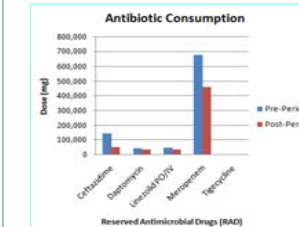


Figure 4. Antibiotic Consumption

Overall, RAD drug use decreased by 37% post-implementation.

Meropenem use decreased by 32%, while piperacillin-tazobactam use increased by 9%.

Key Message:

When the RAD PPO was completed, appropriateness of reserved antibiotic use was 100%.

Overall, broad-spectrum antibiotic usage decreased by 37%.

Summary of Lessons Learned and Key Messages

1. Importance of obtaining key stakeholders' support for RAD PPO Program
2. Education and engagement of physicians and pharmacists
3. Development of hospital policy and comprehensive approach to facilitate and ensure compliance
4. Review of RAD PPO program for improvements
5. Opportunities to improve compliance with RAD PPO

Sustainability

1. Engagement of physician and pharmacy stakeholders
2. Education and feedback
3. Annual quality assurance review
4. Report to hospital leadership
5. Support from leadership

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