

# TrUMPET-CF

## Survey of Antibiotic Utilization for MRSA-Associated Cystic Fibrosis Pulmonary Exacerbations: A Canadian Pharmacist Approach to Vancomycin Therapy



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### Background

- Methicillin resistant staphylococcus aureus (MRSA) prevalence in sputum cultures of patients with cystic fibrosis (CF) has increased from 3% in 2006 to 6.4% in 2016<sup>1,2</sup>
- Chronic MRSA infection in CF has been associated with ↑ antibiotic use, ↓ lung function, ↑ risk of hospitalization, and ↑ risk of mortality<sup>3</sup>
- The US CF Foundation Guidelines do not outline treatment strategies for MRSA-associated acute pulmonary exacerbations (APE)<sup>4</sup>
- The UK Cystic Fibrosis Trust Guideline and Cochrane Review only comment on MRSA decolonization and eradication therapies<sup>5,6</sup>
- A 2015 survey study found that sulfamethoxazole/trimethoprim (SMX/TMP) was the most common PO outpatient treatment; IV and PO linezolid was the most common inpatient treatment<sup>7</sup>
- The utilization of antibiotics to treat MRSA-associated APE in patients with CF has not yet been characterized in Canada

### Objective

To describe the utilization of vancomycin and other anti-MRSA antibiotics for the treatment of APE in adult and pediatric patients with CF from the perspective of pharmacists associated with Cystic Fibrosis Canada Accredited Care Centres (CFCACC)

### Methods

- A survey, created in SurveyMonkey®, was distributed anonymously by email to 35 CFCACC pharmacists via the Canadian CF Pharmacist Listserv provided by Memorial University, NL
- The survey consisted of both adult and pediatric sections. It consisted of 81 multiple choice and open-ended questions
- Consent was obtained via voluntary survey participation
- The estimated time to complete both the adult and pediatric sections of the survey was 20-30 minutes (10-15 minutes per section)
- Survey responses were gathered from December 10, 2017 to January 21, 2018 and were tabulated in the form of descriptive statistics
- The study protocol was reviewed by the Providence Health Care Research Ethics Board and was deemed Quality Assurance in nature, thereby exempting the study from the ethics approval process

### Results

- Response rate of 20/35 (57.1%)
- Demographics
  - 90% of respondents had been involved in the management of a MRSA-associated APE
  - 70% of respondents dedicate <0.25 FTE to CF patient care

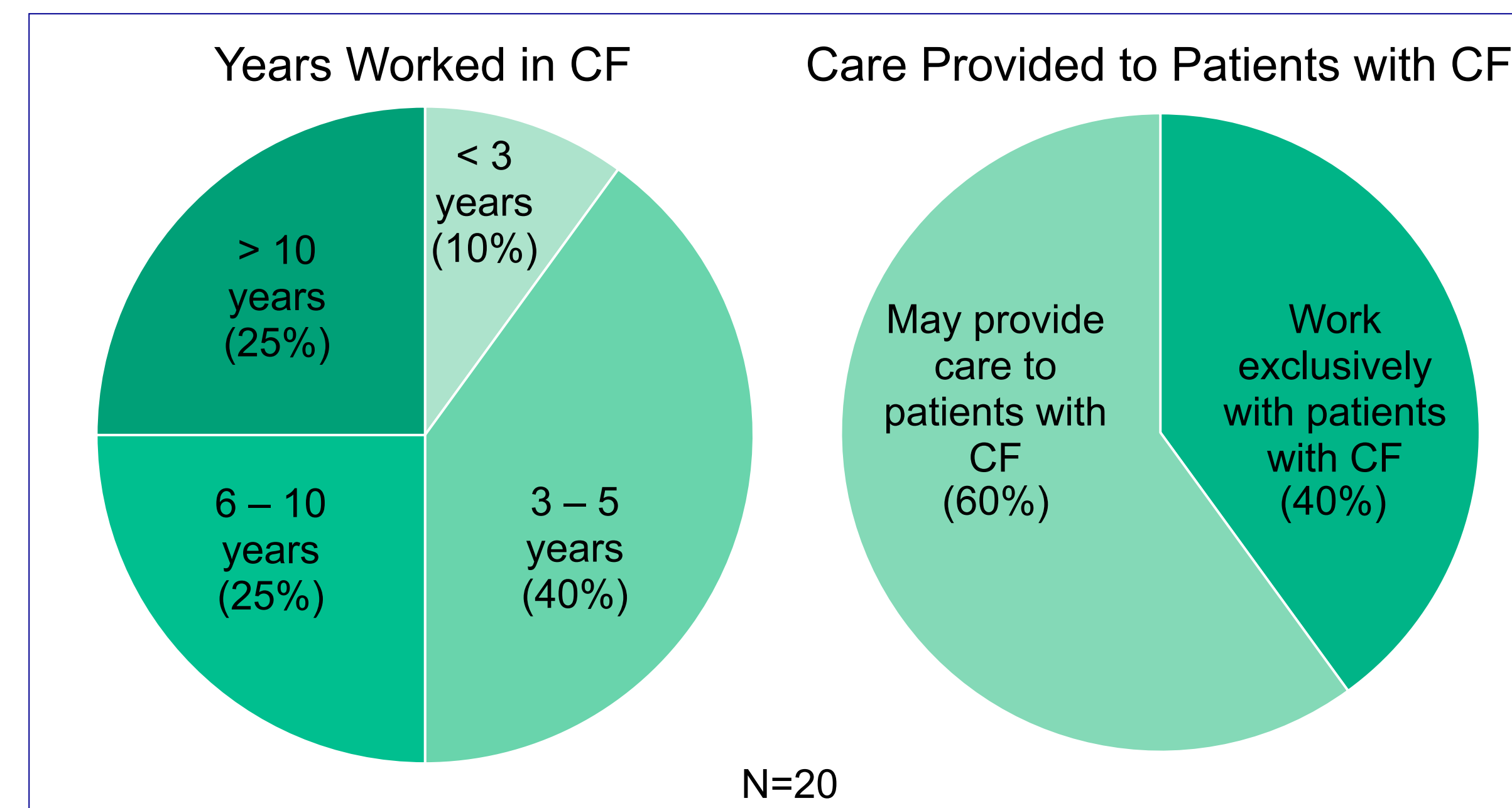


Figure 1: Respondent Demographics

Adult Population Response(s) (%), N=11	Pediatric Population Response(s) (%), N=7
<b>Pharmacist's Involvement in Initiating Antibiotic</b>	
Antibiotic selection (46%)	Antibiotic selection (29%)
Dosing (36%)	Dosing (57%)
Consultation (18%)	Consultation (29%)
<b>Monitoring for Antibiotic Efficacy and Safety</b>	
Physician (91%)	Physician (100%)
Pharmacist (91%)	Pharmacist (100%)
Nurse (27%)	Nurse (29%)

Table 1: Involvement in Antibiotic Therapy and Monitoring

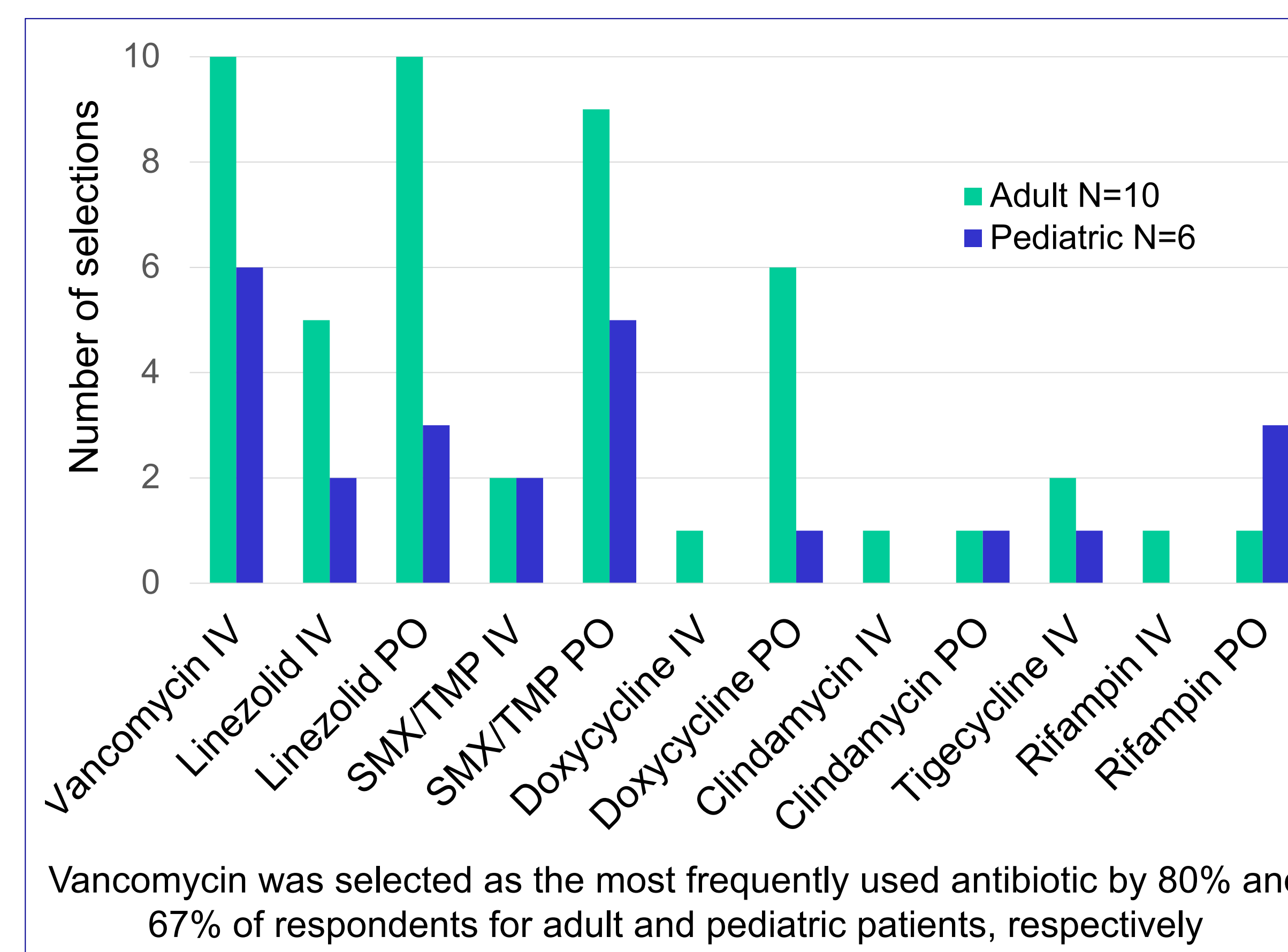


Figure 2: Top 4 Most Frequently Used Antibiotics

	Adult Population Most frequent response(s) (%)	Pediatric Population Most frequent response(s) (%)	Neonatal Population Most frequent response(s) (%)
<b>Vancomycin Initial Dosing</b>			
<b>Dosing Strategy</b>	Weight based (90%)	Weight based (100%)	-
<b>Loading Dose</b>	20 mg/kg (38%) No load (38%)	No load (80%)	No load (83%)
<b>Maintenance Dose</b>	15 mg/kg/dose (62%)	15 mg/kg/dose (100%)	15 mg/kg/dose (83%)
<b>Dosing Frequency</b>	Q8H (40%) Q12H (40%)	Q6H (86%)	Q8H (33%) Q12H (33%) Other (33%)
<b>Vancomycin Duration</b>	10-14 days (50%)	10-14 days (57%)	-
<b>Therapeutic Drug Monitoring (TDM)</b>			
<b>Serum Levels</b>	Trough levels (90%)	Trough levels (71%)	-
<b>Trough Level Timing</b>	Pre 4 <sup>th</sup> dose (70%)	Pre 4 <sup>th</sup> dose (60%)	-
<b>Target Trough Level</b>	15-20 mg/L (100%)	15-20 mg/L (60%)	-
<b>TDM Follow-Up Frequency</b>	Weekly (60%)	Weekly (86%)	-
<b>Laboratory Monitoring for Possible Adverse Drug Reactions</b>			
<b>Laboratory Parameter</b>	SCr and/or BUN (100%) CBC with differential (73%)	SCr and/or BUN (100%) CBC with differential (57%)	-
<b>Frequency</b>	Twice per week (73%)	Weekly (43%)	-

SCr = Serum creatinine, BUN = Blood urea nitrogen, CBC = Complete blood count

Table 2: Vancomycin Dosing, Duration, and Monitoring

### Limitations

- Small sample size
- Listserv may not have captured new pharmacists
- Respondents may not be experts in the area
- Respondents may not have spent enough time in CF to be familiar with specific dosing practices
- Variability in response may be attributed to respondents' interpretation of question

### Conclusions

- First set of Canadian data on treatment practices for MRSA-associated APE in patients with CF
- Variability in vancomycin dosing strategies, especially in adult patients
- More research on optimal vancomycin dosing strategies in this population is needed
- Data suggest future education opportunities

Reference List available by request