

# Clinical Impact of Rapid Diagnostics using Xpert Flu/RSV™ PCR on Antimicrobial Stewardship Initiatives during Influenza Season

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## Introduction

Several commercial rapid Influenza tests (RIT) are available, however literature of its clinical impact on clinical management in relation to antibiotic cessation in patients who present with Influenza like illness (ILI) is minimal.

Avoiding unnecessary antibiotic use in patients who have ILI is a challenge for antimicrobial stewardship programs (AMS).

Studies utilising respiratory virus PCR have shown benefit in terms of shortening antimicrobial therapy and hospital length of stay (LOS).

We designed this study to assess whether RIT had an impact on antibiotic cessation.

## Materials and methods

Xpert Flu/RSV (Cepheid, CA) was done on all patients who presented with ILI in 2017.

Clinical data was collected from electronic medical records (eMR).

Turnaround time (TAT) for test was time from specimen collection until when result was either notified or appeared on eMR.

Standard univariate analysis and multivariable regression analysis (MVRA) were done.

## Table

Variable	Antibiotic given/continued (%) n=368	Antibiotic ceased/not given (%) n=297	p	Odds ratio	P
Age (median years)	68	62	0.020		
TAT (median hours)	7	6	0.203		
TAT ≤ 2 hours	78 (21)	73 (24)	0.303		
TAT ≤ 6 hours	177 (48)	159 (53)	0.163		
TAT ≤ 12 hours	233 (63)	217 (73)	0.008	1.55 [1.11-2.24]	0.011
Immunosuppression	42 (11)	12 (4)	0.001	2.88 [1.45-5.73]	0.002
Haematological malignancy	16 (4)	11 (3)	0.676		
Pneumonia	64 (17)	3 (1)	<0.001	18.8 [5.79-60.94]	<0.001
COPD	67 (17)	22 (7)	0.001	2.43 [1.42-4.16]	0.001
Patients discharged	116 (31)	202 (68)	0.001		

## Results

A total of 665 patients tested positive- Influenza A (63%) and B (37%)

Total number of tests performed in the study period was 1710 ( 1<sup>st</sup> March to 30<sup>th</sup> September, 2017)

After positive results, antimicrobials were ceased in 34% (226/665) or not given in 10% (71/665) cases

Median TAT was 7 hours with 50% of tests completed in ≤ 6hours  
56% (368/665) of patients had their antibiotics continued

On MVRA, results of Flu PCR that were available in ≤ 12 hours resulted in most antibiotic cessation (73%, OR 1.55, p=0.011)

It was found that antibiotics are continued in immunosuppressed patients (OR 2.88, p=0.002), pneumonia (OR 18.8, p<0.001) and COPD (OR 2.43, p=0.001)

Cost per test in the study period was 34 AUD which included cost of test, approximately 20 min of scientist bench time was utilised in the preanalytical and post analytical phase combined

Transport costs for urgently sending specimens (taxi courier) from Wyong to Gosford (35 km) was 17000 AUD  
Median length of stay of the patients who were admitted was 120 hours

## Discussion

Influenza is a major cause of respiratory disease outbreaks and can cause severe morbidity and mortality in pediatric, immunosuppressed and elderly patients.

Previously, the use of rapid Influenza diagnostic tests (RIDT) was the mainstay for detection of the Influenza virus however the main limitation was that of suboptimal sensitivity leading to false negative results.

Recent studies have investigated the sensitivity and specificity of PCR in the detection of Influenza, with results indicating PCR is more sensitive compared to antigen-based RIDTs.

The early detection of Influenza is associated with decreased prescription of antibiotics, LOS in hospital, and a reduction in morbidity and mortality.

## Conclusion

The implementation of a rapid Influenza test is associated with a reduction in antimicrobial prescriptions.



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References are available on request from the corresponding author.