

The Economic Impact of Providing Rapid Influenza Test Results to Physicians Caring for Ambulatory Adults with Influenza-Like-Illness (ILI)



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Objectives

- To determine the overall economic impact of performing rapid influenza testing in adult ambulatory patients with influenza-like illness (ILI).
- To determine the economic impact of rapid influenza testing in adult patients with ILI ≤ 2 days versus those with ILI > 2 days.

Background and Significance

Rapid diagnostic tests for influenza are being used more frequently in both outpatient and inpatient settings. Studies involving rapid influenza testing in children have documented that physician knowledge of a positive influenza test results in direct benefit to the patient through decreased antibiotic use, increased antiviral use and reduction in ancillary testing.

Studies demonstrate that up to 50-70% of children and adults with viral illnesses are inappropriately treated with antibiotics. Physicians frequently cite difficulty in differentiating bacterial from viral illnesses and the potential for an unfavorable outcome due to a serious bacterial illness as reasons for initiating antibiotic therapy. A recent study documented that physicians diagnosed influenza accurately less than 20% of the time in children with culture or PCR-proven influenza.

Proven clinical criteria exist for the presumptive diagnosis of influenza in adults, however they do not appear to be in widespread use. Several studies show that patients are much more likely to receive antibiotics at acute care visits and rarely receive antiviral agents, even during periods of peak influenza activity within the community.

The advent and improvement in rapid diagnostic tests for influenza have lead to an increased ability to accurately diagnose influenza infections in patients of all ages. Since these tests are being used with increasing frequency and in expanded settings, research to evaluate their effect on physician decision-making and the resultant economic outcomes is critical to determine optimal patient benefit from testing.

Methods

Enrollment, specimen collection and testing

- This study examines a cohort of adult patients that were part of a larger prospective study evaluating POC testing for influenza and RSV in adults presenting with acute respiratory symptoms to an academic medical center in Central Texas in the winter of 2005-06
- The study was approved by the Scott & White Hospital IRB
- Informed consent was obtained from each subject
- Subjects were enrolled during acute care visits to one of three different outpatient primary care clinics
- Subjects were assigned on alternate days into two groups:
 - MD Aware:** the physician received the rapid influenza A+B test results during the visit
 - MD Unaware:** the physician did not receive the rapid influenza test results
- Respiratory specimens were collected from each subject, tested with the Quidel QuickVue® Influenza A+B test and sent for viral culture

Economic Analysis of Rapid Influenza Testing in Ambulatory Adults with Influenza-Like Illness: Cohort Inclusion Criteria

Subjects from the above study were included in the economic analysis cohort of adult ambulatory patients with ILI if they met the following criteria:

- Age ≥ 18 years
- Outpatient visit at one of the three primary care clinics
- Illness duration of ≤ 7 days
- Symptoms include subjective or measured fever, plus at least one respiratory symptom (cough, congestion and/or coryza)

Data Collection Relevant to the Economic Analysis

Each subject's medical record was obtained for the date of their study visit and the subsequent two weeks. Data abstracted included:

- All laboratory tests performed and the results
- All radiology studies performed and the results
- Treatments and/or interventions performed during the visit
- All relevant prescriptions (except maintenance/refills or OTC)
- Discharged home or admitted to the hospital
- Number of visits to ED or clinic during the two weeks following enrollment that are related to the ILI
- Number of hospital admissions within two weeks of enrollment

Statistical Analysis

- Costs for diagnostic tests, treatments and physician billing were assigned using the Medicare fee schedule
- Medication costs were assigned using prescription drug average wholesale prices
- Productivity estimates were made using the average US employee compensation and were based on the following criteria:
 - age < 65 years
 - has culture proven influenza
 - antiviral therapy initiated within 48 hours of symptoms
 - which allowed an estimated $\frac{1}{2}$ day earlier return to work
- The two-sample t-test was used to compare mean costs between the MD Aware and MD Unaware groups. All costs are in US dollars.

Results

- The difference between groups for the mean total cost per subject was not statistically significant.

Subgroup Analysis

- Subjects presenting within 48 hrs of symptom onset had lower total costs when the MD was aware of the rapid influenza test results (\$216 vs. \$256; $p=0.05$).

Economic Analysis: All Subjects Meeting ILI Inclusion Criteria

Costs for Diagnosis and Treatment of ILI (mean / patient \pm SD)	MD Aware N=131	MD Unaware N=72
Diagnostic Costs		
Rapid Influenza Testing	16.76 \pm 0.00	0.00 \pm 0.00
All Other Diagnostics	4.48 \pm 12.24	4.55 \pm 14.74
Total	21.24 \pm 12.24	4.55 \pm 14.74
Medication Costs		
Antiviral Costs	17.85 \pm 31.23	8.17 \pm 23.27
Antibiotic Costs	22.80 \pm 40.20	36.29 \pm 53.48
All Other Prescriptions	120.16 \pm 58.49	121.12 \pm 54.84
Total	160.82 \pm 73.54	165.58 \pm 70.42
Physician Charges		
	54.19 \pm 14.18	52.81 \pm 9.08
Lost Work Productivity		
	-17.51 \pm 40.23	-3.03 \pm 18.08
Total Cost / Subject for Influenza-Like Illness	218.74 \pm 81.11	219.90 \pm 75.14

Conclusion

- Providing physicians with rapid influenza test results does not increase total costs for adults with ILI within the first week of symptoms, while provision of the test results within the first 48 hours has the potential to lower total patient care costs.

Funding and Support

Quidel provided research funding and QuickVue® Influenza A+B test kits