

# Target Enriched Multiplex- Polymerase Chain Reaction(TEM-PCR) vs. Rapid Influenza Diagnostic Test(RIDT) for the diagnosis of H1N1 severe infection for hospitalized patient.

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## Introduction

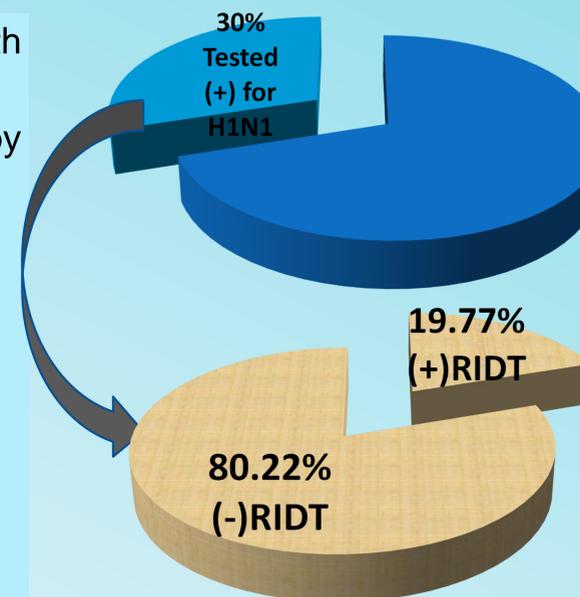
- Influenza virus A/H1N1 2009 (H1N1) remains a potent pathogen.
- Was the dominant virus seen during the 2013 winter flu season
- Caused 6,655 laboratory-confirmed hospitalizations in US.
- Center for Disease Control and Prevention (CDC) recognizes PCR as the gold standard for the identification of H1N1
- Recommended initial diagnostics are rapid antigen tests (RIDT) which often produce a substantial number of false-negative results

## Methods

- Nasopharyngeal samples were tested from 246 patients for H1N1 using Target Enriched Multiplex – Polymerase Chain Reaction (TEM-PCR)
- Retrospective chart review revealed that 163 symptomatic patients from Huntsville Hospital (Huntsville, AL) were tested for H1N1 by both RIDT and TEM-PCR
- The clinical effects of TEM-PCR were measured with regard to the change in number of antimicrobial and antiviral prescriptions and isolation days
- TEM-PCR and RIDT samples were obtained from December 2013 to February 2014. All TEM-PCR testing was conducted at Diatherix Laboratories Inc. and all RIDT testing was performed at Huntsville Hospital

## Results

- 163 patients tested using both TEM-PCR and RIDT.
- 30% confirmed to have H1N1 by PCR
- RIDT results:
  - Sensitivity–19.77%(95%CI:11.96-29.75%)
  - Specificity–98.00%(95%CI:94.26-99.56%)
  - PPV-85%(95%CI:62.08-96.62%)
  - NPV-68.06%(95%CI:61.39-74.22%)



### H1N1 patients with RIDT(-)

- In summation, a total of 111 days of Oseltamivir were delayed in 23 patients (mean 4.8 ± 4.5 days per patient)
- 65 days of isolation were withheld in 15 patients (mean 4.3 ± 4.5 days per patient)
- Antibiotics were stopped in 6 patients, saving a total of 15 days (mean 2.5 ± 1.6 days per patient) of antibiotic usage

### Suspected H1N1 with PCR (-)

- 408 days (mean 6.8± 1.7 days per patient) of Oseltamivir therapy were saved.
- 315 days of isolation (mean 10.5 ± 2.1days per patient) were saved as patients only averaged 3.6 days of excessive isolation

## Results

### Cost Saving Analysis

H1N1 suspected cost: **\$393,122.40**  
 H1N1(-) by TEM-PCR: **\$184,277.55**  
 Cost Difference: **\$208,981.65**

## Conclusion

- Promptly discriminating H1N1 from other viral or bacterial respiratory infections increases the degree of proper patient management and correct use of hospital resources.
- If TEM-PCR was utilized as a first-line diagnostic for the detection of H1N1, unnecessary downstream complications and the associated costs would likely be avoided.

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