

# Performance of a Rapid Respiratory Syncytial Virus Test in the Emergency Department

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## OBJECTIVE

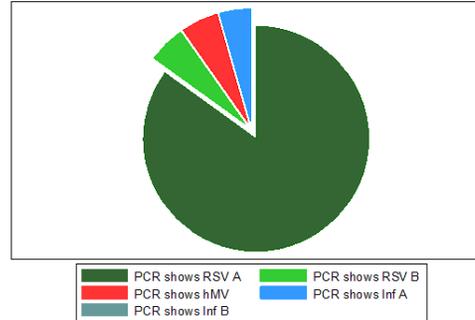
To compare a commercially available enzyme linked immunoassay (ELISA) for RSV antigen with a commercially offered reverse transcriptase PCR (rt-PCR) assay.

## METHODS

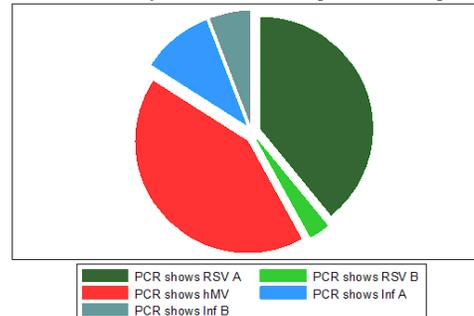
Children less than 18 months of age with a clinical diagnosis of bronchiolitis or apnea in whom the clinician ordered RSV testing were included. ELISA testing was performed in a hospital clinical laboratory using Directigen RSV kit (Becton Dickinson, Sparks, MD) according to the manufacturer's instructions on fresh saline nasal aspirates.

PCR based testing was done on mid turbinate nylon flocked swabs or nasal aspirates diluted in universal transport medium room temp. These were frozen to -20°C before being shipped on dry ice for batch testing. RNA extraction was performed using the QIAmp viral RNA purification kit (QIAGEN, Valencia, CA). We performed the rt-PCR for RSV A and B, human metapneumovirus (hMV) and influenza virus (Inf) A & B.

Virus identified by PCR when RSV antigen test was positive

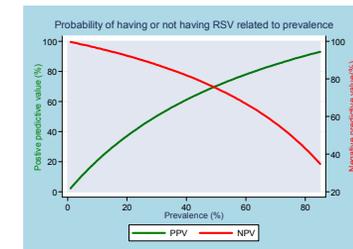


Virus identified by PCR when RSV antigen test was negative



## RESULTS

We enrolled 394 patients between 11/1/2006 and 11/1/2008. RSV antigen testing completed in 373 samples and was positive in 176 samples (47%). Via PCR RSV-A was positive in 129/372 (35%) and RSV-B was positive in 11/372 (3%). In addition, PCR assay revealed 35 samples positive for hMV; 7 of which were RSV positive by ELISA (20%). 12 were PCR positive for INF-A while 6 of those had been RSV positive by ELISA (50%). Using rt-PCR as the gold standard, ELISA had a sensitivity 78% (95% CI 70%, 85%). and a specificity 68% (95% CI 62%, 74%).



## LIMITATIONS

Both methods, but particularly PCR may fail to detect RSV-S or other strains of RSV. We did not attempt a third method of diagnosis when the methods differed as to the presence of RSV

**CONCLUSION: Sensitivity (78%) and Specificity (68%) of a widely used ELISA test for RSV may be lower in the ED practice than suggested by its manufacturer.**