RAPID DETECTION OF RSV: PERFORMANCE OF X/pect™ RSV and RSV RESPISTRIP™, TWO NEW IMMUNOCHROMATOGRAPHIC ASSAYS

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At the Children’s Hospital of Eastern Ontario (CHEO), the Regional Virus Laboratory (RVL) routinely performs RSV DFA and cell culture. Immunochromatographic technology promises to deliver simple and rapid diagnostic tests with high analytical sensitivity and specificity. Here we compare the performance of two new assays to traditional DFA and culture. The RSV Respi-Strip (Coris BioConcept, Gembloux, Belgium) is a 4-step dipstick format assay, with a time to test completion of 11 to 25 minutes, while Remel X/pect RSV (Remel Inc., Lenexa, KS), is a 1 to 3 step cartridge format test with a time to completion of 15 to 30 minutes.

Methods
Nasopharyngeal aspirate (NPA) or wash (NPW) specimens were collected prospectively from children (2 weeks to 15 years of age) presenting to the emergency department, outpatient clinic or admitted to CHEO with suspected RSV infection, between December 30 2003 and February 21 2004. At RVL, specimens were processed for DFA and for virus culture. DFA was performed on N-acetyl cysteine treated patient specimens using Merifluor RSV monoclonal antibodies (mAbs) (Meridian Bioscience Inc., Cincinnati, OH). These were also used to stain cell monolayers to confirm RSV culture. Specimens were inoculated into tubes of RMK cells (Connaught Laboratories Ltd., Mississauga, ON) and Human Fetal Lung cells (HFL; a CHEOderived primary cell line), and monitored for 8 days for the development of specific cpe. Specimens were tested by X/pect RSV and by RSV Respi-Strip concurrently. Assays were performed and interpreted according to manufacturer’s instructions.

Results
171 specimens were available for testing. Four were not cultured; 2 were unacceptable for DFA. Three X/pect tests failed.

Relative to DFA, the sensitivity and specificity of X/pect RSV (n=166) were 92.9% (78/84) and 91.5% (75/82), respectively. The sensitivity and specificity of RSV Respi-Strip (n=169) were 86% (74/86) and 92.8% (77/83), respectively. X/pect, Respi-Strip, and DFA results were in agreement for 146/166 (88%) of specimens.

Relative to cell culture, the sensitivity and specificity of X/pect RSV (n=164) were 94.1% (64/68) and 82.3% (79/96), respectively. In contrast, the sensitivity and specificity of RSV Respi-Strip (n=167) were 92.8% (64/69) and 86.7% (85/98), respectively. X/pect, Respi-Strip, and culture results were in agreement for 141/162 (87%) of specimens. A detailed analysis of discordant results will be presented.

Conclusions
Both kits perform well in the detection of RSV in NPA and NPW specimens. The Respi-Strip test is slightly less convenient to perform than X/pect, however result interpretation is unambiguous, and mucoid specimens are easily assayed. The X/pect test is very convenient to perform, however interpretation of weakly positive specimens can be subtle, and even mildly mucoid specimens can fail to migrate across the test membrane without predilution. Despite these limitations, both Remel X/pect RSV and Coris Respi-Strip RSV represent attractive and alternatives for the rapid detection of RSV.