**Revised Abstract**

**Objectives**

- Prospective study designed to determine the performance of the mid-turbinate swab (MTS) as compared to the nasopharyngeal swab (NPS) for respiratory virus detection in children.

- Primary endpoint:
  - Non-inferiority of MTS for respiratory viral detection

- Secondary endpoints:
  - Cellular yield, ease of use, patient tolerability

**Methods**

Children with presumed viral respiratory infection admitted to 3 general pediatric wards January 1-31, 2008. Nasopharyngeal flocked swabs (NPS) were the standard nasopharyngeal flocked swab for respiratory virus detection, and to assess its acceptability by patients and healthcare workers.

**Results**

- 181 samples were collected. 203/203 (100%) were positive by NPS. MTS or DFA for culture. Of the positives, 95 were positive by both methods. 26 (13.8%) were positive only by NPS and 10 (5.3%) were positive only by MTS. 140 were DFA positive, 140 DFA positive and 140 DFA negative. 7 By MTS and 7 by NPS. NPS swabs were collected by nurses, MTS swabs were collected by researchers. The nurses preferred the MTS swab due to ease of use and patient preference.

**Discussion**

The sensitivity of the new mid-turbinate flocked swab is comparable to the current nasopharyngeal flocked swabs for respiratory virus detection. The mid-turbinate swab was preferred by nurses due to ease of use and patient preference. Further study is required to determine ease of use and patient preference.

**Background**

- There is no ideal method for the detection of respiratory viruses in children.

- Goals include:
  - Maximize viral yield
  - Reduce discomfort to patient

**Results**

- 203 patient specimens in duplicate
  - 101 from children ≤ 2 years old
  - 39 were positive for respiratory viruses in at least one swab
  - 18 RSV
  - 8 Influenza A
  - 4 Influenza B
  - 6 Human metapneumovirus
  - 1 adenovirus
  - 1 parainfluenza 1
  - One DFA pool positive

- DFA and culture
  - 21 (54%) swabs were positive by both NPS and MTS
  - 18 (46%) were positive by either NPS or MTS
  - 13/18 were confirmed by PCR

- Comparison of NPS vs. MTS for Viral Detection

  - Sensitivity using PCR as gold standard
    - 87.5% for NPS, 78.3% for MTS (p<0.778)
  - No difference in cellular yield
  - 7.6% of samples of both NPS and MTS insufficient for DFA (< 20 cells per 10X field)
  - False negatives identified by PCR
  - Explanations include
    - Poor sample with insufficient cellular yield
    - Samples with no cells also negative by PCR
  - Impaired collection technique vs. swab characteristics
  - Decreased sensitivity inherent to DFA culture relative to PCR
  - Strong nurse and patient preference for MTS

**References**


Special thanks to all of the nurses and patients for their participation, and to Corap Diagnostics for providing the needs for this study.

**Evaluation of Discrepant Results by PCR**

<table>
<thead>
<tr>
<th>Virus</th>
<th>False Negative NPS</th>
<th>False Negative MTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSV</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Influenza A</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Influenza B</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Human metapneumovirus</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Adenovirus</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Parainfluenza 1</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NPS DFA or Culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
</tr>
<tr>
<td>Negative</td>
</tr>
</tbody>
</table>

**Results of Questionnaire**

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>MTS</th>
<th>NPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-inferiority of mid-turbinate swab (MTS) compared to nasopharyngeal swab (NPS) for respiratory viral detection in sample of 203 children</td>
<td>87.5% for NPS, 78.3% for MTS (p&lt;0.778)</td>
<td>No difference in cellular yield</td>
</tr>
</tbody>
</table>