BACKGROUND: Sensitivity of nasopharyngeal swabs (NPS) collected for viral diagnosis is affected by the number and quality of respiratory epithelial cells collected. It has been reported that the new flocked swab design yielded significantly more respiratory epithelial cells, and more infected respiratory epithelial cells which have a greater effect on diagnostic sensitivity of respiratory infections.

OBJECTIVE: To compare NP swabs collected with the Copan pernasal flocked swab to NP swabs collected with the current swab used in our institution, for the detection of viruses in pediatric patients with acute respiratory infections.

METHODS: 131 children, who consulted at our outpatient clinic and emergency room with acute respiratory symptoms, were enrolled in this study during the winter and spring 2007 in the southern hemisphere (July-November). Two NP swabs were collected from each patient by a trained nurse. One NP swab was collected from one nostril using the pernasal flocked swab (Copan Diagnostic, CA) and the other NP swab was collected from the other nostril using the current swab (a Dacron UltramicropurTM swab, PurFybr.Inc. IN, USA). (Fig 1) All NP swabs were placed in 3 ml tube of universal transport medium (UTM), (Copan Diagnostics) and transported at 4°C within 6 hours to the virology laboratory. Each NP specimen for both swabs was vigorously vortexed and the specimen was divided in 4 aliquots. One aliquot was used for direct immunofluorescence assay (DFA), another was used for 48 hrs shell vial culture (MDCK and H992 cells) followed by DFA staining using D3 Ultra DFA, respiratory viruses, screening and ID kit, and the D3 DFA hMPV kit [Diagnostic Hybrids Inc. (DHI)]. Two NPS aliquots were frozen at -80°C and were tested with an in-house PCR assays for human metapneumovirus (hMPV) (347 bp of F gene encoding the fusion protein, rhinovirus (Rh) (473 bp of NTR segment) and human bocavirus (hBoV) (290 bp of NS1 gene encoding a non structural protein. The PCR reaction was done only for negative NPS by DFA and culture. Clinical diagnosis was recorded for each patient.

RESULTS: Patients median age was 12 months and main respiratory diagnosis were acute bronchial obstruction (32%), flu like illness (31%) and fever with pharyngitis (25%). Out of 131 NP samples collected with both swabs, DFA detected 58 positive and 73 negative, culture detected 50 positive and 81 negative. RSV and ADV were the most frequent identified agents followed by hMPV, influenza B and Parainfluenzas. Mixed infections were found in 4 samples. The smears of the samples collected with Copan flocked swabs in UTM had better quality and larger quantity of epithelial infected cells than the samples collected with the Dacron swabs (Fig 2). Fifty four samples, DFA/culture negative for both swabs, were tested by PCR for hMPV, Rhinovirus and hBoV found 14 additional positive. NPS collected with flocked swabs in UTM had 13 positive, while the Dacron swabs had 7 positive. NPS collected with Flocked swabs in UTM detected 71 (54.2%) when tested by DFA/culture/PCR; the Dacron swabs detected 59 (45%).

CONCLUSIONS: NP specimens, collected with Copan pernasal flocked swabs, tested by DFA, culture and molecular assays, detected more positive than Dacron swabs. Although, cells were not counted for each specimen, the operator found that the smears of NP collected with flocked swabs were easier to read because more cells were available for examination.