The absorbance characteristics of rayon, polyester and nylon-flocked nasopharyngeal swabs (Copan Diagnostics, Inc; Corona, CA) were evaluated by placing swabs in 1.0ml of water and removing them after 15 minutes. The absorbance of the rayon was found to be significantly higher (p<0.05) than the polyester and nylon swabs (Fig. 6). Our findings seem to suggest that the fiber configuration and size of the nylon-flocked swab allowed for greater absorption than the actual nylon material itself. There are numerous other factors, not presently examined, which may have influenced swab performance.

Background:
Specimen collection is among the most important processes, necessary for obtaining a reliable and accurate diagnostic result. Numerous studies have demonstrated the deleterious effects that specimen collection variables can have on the diagnostic performance of the testing agent, even when employing “gold standard” culture or sophisticated, amplified molecular techniques. Sources of variability include the application of topical anesthetics prior to specimen collection, the addition of age in transport media, specimen collection with wood-filled or calcium alginate tipped swabs and the choice of collection tube.

Materials and Methods:
(1) Absorbance studies
Swabs were removed from the microsphere suspension, placed in 2 ml of water, vortexed at high speeds for 15 minutes, then removed, and air dried and prepared for SEM analysis.

Swab tip material was removed from swab shafts using tweezers or scalpel blades. A weight of 0.50g was collected in plastic centrifuge tubes (Sarstedt, Inc.; Newton, CT) and reweighed. Following addition of water (1.0 ml), tubes were shaken at high speeds for 1 minute, followed by centrifugation using a table-top Hermle Z180M centrifuge (Universal Labnet Co., Edison, NJ) for 5 minutes at maximum speed. Undiluted water was removed by decanting and wiping the inner tube surface with bibulous paper, and the tubes were reweighed. This exercise was repeated twice.

Conclusions:
• Fiber configuration and size of the nylon-flocked swab allowed for greater absorption than the actual nylon material itself.
• There are numerous other factors, not presently examined, which can affect swab performance.

Figure legend:
FIG. 1: SEM of an automated polyelectrolyte swab tip. Note the wide appearance of the swab tip compared to the narrow fibrous swab tips. 400 x.
FIG. 2: SEM of wooden rayon swab tip. 40x.
FIG. 3: SEM of uncoated nylon-flocked swab tip. 40x.
FIG. 4: SEM of uncoated nylon-flocked swab tip with 1.2% suspension of 1μ polystyrene beads. Beads too numerous to count are demonstrated in fiber swabs. 3000 x.
FIG. 5: SEM of nylon-flocked swab surface which was vortexed in water following placement of the swab in a 1.27% suspension of 1μ polystyrene beads. Beads are adhered to fiber swabs. 3000 x.
FIG. 6: SEM of a nylon-flocked swab surface placed in a 1.2% suspension of 1μ polystyrene beads which was vortexed in water for 15 minutes following placement of the swab in a 1.27% suspension of 1μ polystyrene beads. There was a dramatic reduction in beads on rayon fibers and the converse for nylon, 3000x.
FIG. 7: SEM of nylon fllocked swab surface which was vortexed in water following placement of the swab in a 1.27% suspension of 1μ polystyrene beads. Beads were observed to have been eluted from fiber surfaces but were sometimes demonstrated in great abundance in the viscous formed between adjacent fibers. 100x.

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