

## Optimal insertion depth for nasal mid-turbinate and nasopharyngeal swabs - a clinical trial

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### Introduction:

Millions of people are COVID-19 tested daily during the pandemic, and lack of evidence to guide optimal nasal swab testing can increase the risk of false negative test results. Guidelines suggest anywhere from 4-10cm for nasopharyngeal swabs and CDC suggests 2cm for mid-turbinate swabs. This study aimed to determine the optimal insertion depth for nasal mid-turbinate and nasopharyngeal swabs.

### Methods:

We conducted a prospective clinical trial in March 2021 to measure the optimal insertion depth of nasal mid-turbinate and nasopharyngeal swabs for COVID-19 testing. The measurements were made with a flexible endoscope during the collection of clinical specimens with a nasopharyngeal swab. The setting was a public COVID-19 test center in Copenhagen, Denmark. Participants were volunteer adults  $\geq 16$  years of age without significant nose pathology. 109 were included.

### Results:

All 109 participants (100%) completed the endoscopic measurements; 52 (48%) women; 103 (94%) white; mean age 34.39 (SD, 13.2) years and mean height 176.7 (SD, 9.29) cm. The mean swab length to the posterior nasopharyngeal wall was 9.40 (SD, 0.64) cm. The mean endoscopic distance to the anterior and posterior end of the inferior turbinate were 1.95 (SD, 0.61) cm and 6.39 (SD, 0.62) cm, respectively. The mean depth to nasal mid-turbinate was calculated to 4.17 (SD, 0.48) cm.

### Discussion:

The optimal depths of insertion for nasal mid-turbinate swabs are underestimated in current guidelines compared to our findings. This study provides clinical evidence for optimal nasal and nasopharyngeal swab specimen collection for virus testing.

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