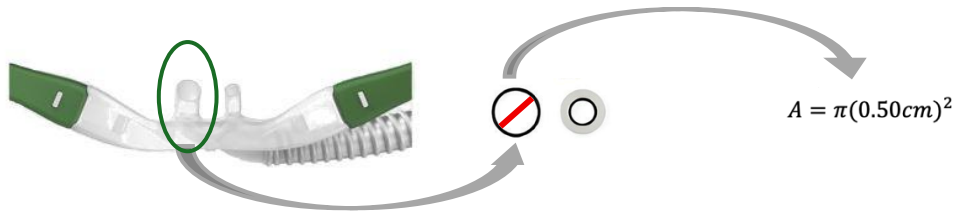


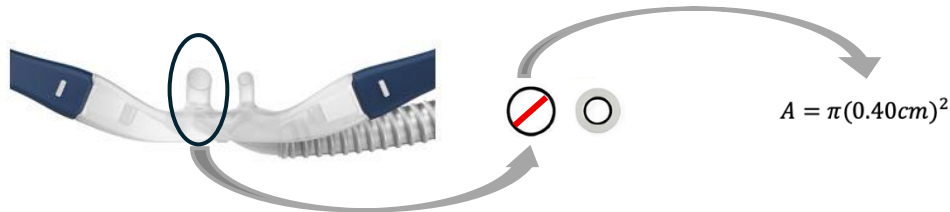
## METHODS NASAL CAVITY MEASUREMENTS AND CANNULA SELECTION

Before enrolling patients, we calculated the cross-sectional area of the asymmetrical interface Optiflow® Duet system:

- Size "Large" = we measured the **diameters** of the lager prong, equal to **1 cm**, then we calculated the area equal to  $0,78 \text{ cm}^2$



- Size "Medium" = we measured the **diameters** of the lager prong, equal to **0.8 cm**, then we calculated the area equal to  $0,50 \text{ cm}^2$

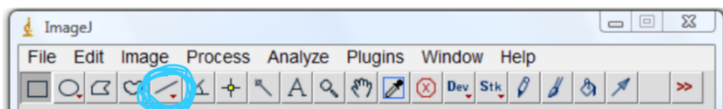


Then, we acquired a photograph of each patient's nostrils (Fig.1) using a digital camera, ensuring that the nostrils were positioned perpendicular to the camera lens.



Fig. 1. Photograph patient's nostrils example

Using software "ImageJ", we open the photo, and we calibrated pixel-to-centimetres scale as shown in the following example:



The camera's structure reported a square (green circle in the Fig. 2), in particular one side of square (yellow arrow in the Fig. 2) were used to “set scale” on ImageJ software.

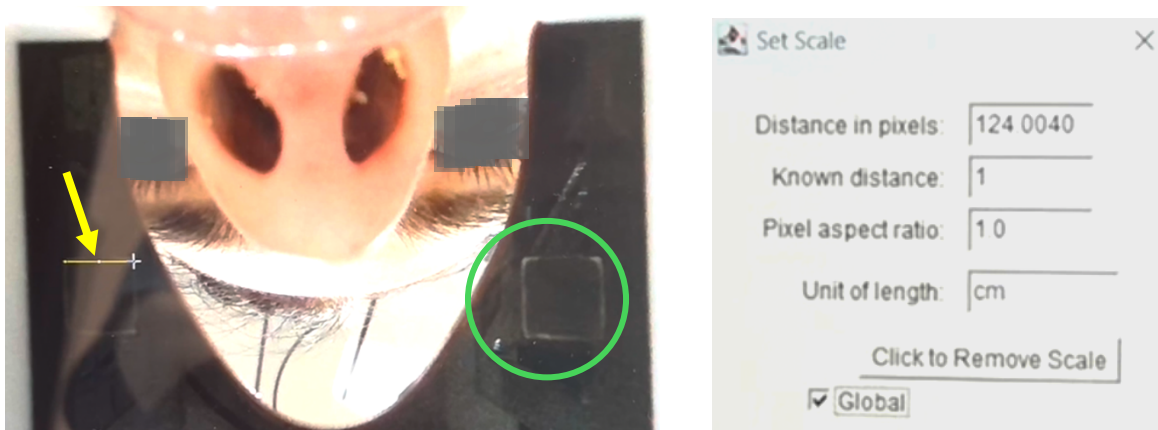


Fig.2 Calibration and set scale on ImageJ

We manually delineated the region of interest (nostril) on the image using a cursor-based tracing tool (Fig. 3) and then extracted the area using the “measure” function in ImageJ software (Fig. 4).



Fig. 3. Cursor-based tracing tool using ImageJ

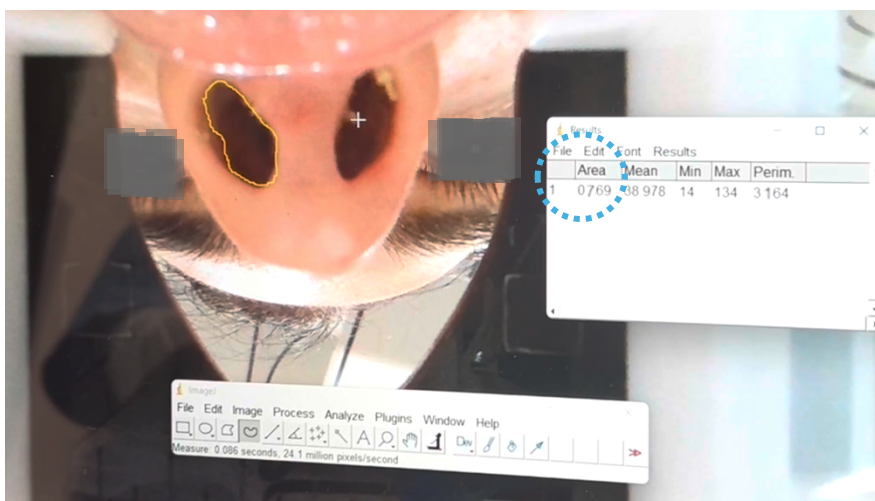


Fig. 4 Area extraction

The area was  $0,76 \text{ cm}^2$  ( $> 0,50 \text{ cm}^2$ ), so for this patient the “fully occlusive nasal prong” was size Large, while “partially occlusive nasal prong” was size Medium.