

## Prospective Evaluation of a Novel Powered Nasal Irrigator Device in the Post-FESS Cadaver Model

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**Introduction:** The objective of this study was to evaluate the distribution of aerosol delivered via a powered nasal irrigator device in 5 fresh frozen-cadaver heads (10 total sides).

**Methods:** The NasoNeb™ nasal irrigator (Medinvent, St. Paul, Minnesota) was used to deliver 10 ml of saline stained with 0.1 ml of 10% fluorescein solution. Aerosol distribution was assessed in 3 clinical trials: (1) unoperated nose; (2) post endoscopic sinus surgery (ESS); and (3) post ESS with endoscopic modified Lothrop procedure (EML). Two independent observers rated the distribution of the fluorescein-dyed saline in the anterior nasal cavity (ANC), olfactory cleft (OC), middle meatus (MM), sphenoid recess (SER), nasopharynx (NP), maxillary sinus (MS), ethmoid cavity (EC), sphenoid sinus (SS), frontal sinus (FS) and frontal neo-ostium (F-NEO).

**Results:** The irrigator consistently delivered aerosolized saline to the ANC, MM/EC and SER/SS across the 3 trials. A statistically significant increase in delivery was noted in the MS+EC compared to the MM ( $p=0.044$ ) post ESS. In addition, a statistically significant increase in delivery to the F-NEO was noted relative to the FS post EML ( $p=0.001$ ). Multiplicity adjustment done for the ESS group showed statistical superior delivery to the EC vs OC ( $p=0.031$ ) and FS ( $p=0.02$ ) and the SS vs FS ( $0.031$ ). Multiplicity adjustment after EML improved delivery to the FS resulting in no statistical difference in aerosol delivery between F-NEO and EC or SS.

**Conclusions:** The novel irrigator device consistently delivered aerosolized saline to multiple nasal subsites, with improvement in delivery seen to the F-NEO after EML. This has important implications for the delivery of topical medications to the paranasal sinuses and frontal neo-ostium.

## **A Comparative Study of the Distribution of Normal Saline Delivered by Large Particle Nebulizer vs. Large Volume/Low Pressure Squeeze Bottle**

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**Introduction:** Rhinologists often recommend topical administration of therapeutic agents after endoscopic sinus surgery. In theory, a large particle nasal nebulizer (LPNN) device offers more effective drug delivery into open sinuses.

**Methods:** A blinded panel of four rhinologists assessed the distribution of dilute fluorescein in isotonic saline solution by LPNN device (Nasoneb 9070, MedInvent LLC) and by a large-volume / low-pressure (LVLP) squeeze bottle (SinusRinse, NeilMed Pharmaceuticals) using a 4-point scale at 5 anatomic sites in 10 post-operative sinus surgery patients (18 sides).

**Results:** Fluorescein staining was higher than baseline for both LPNN and LVLP devices. No difference between LPNN and LVLP was noted, but a trend favoring LVLP at the frontal recess/sinus was observed. For LVLP, a fixed concentration produced statistically significant greater fluorescein staining at all sites. For a fixed amount of dye, LPNN scored better than the LVLP at the ethmoid sinuses and olfactory cleft.

**Conclusions:** Both LPNN and LVLP delivered dye to all sites. The LPNN may offer advantages in the delivery of high concentrations of drug in relatively small volumes. LVLP may provide greater drug delivery at the frontal recess/sinus. The practical significance of these observations is unclear, but further investigation seems warranted.