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# Toward Smart Nebulization: Engineering Acoustic Airflow to Penetrate Maxillary Sinuses in Chronic Rhinosinusitis

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## ABSTRACT

**Treating chronic rhinosinusitis (CRS) by nebulization requires an airflow capable to deliver medication to deep target sites beyond the nasal valve. Fixed frequency acoustic airflow technology is currently available, mainly as post-surgical therapy, but still have not been able to realize the full potential of direct nose to paranasal sinuses delivery. Reported herein are the application of frequency sweep acoustic airflow and the optimization of its frequency range, sweep cycle duration and intensity.**

**The resonant frequencies of the model's maxillary sinuses can be estimated using the Helmholtz resonator theory. Results indicated a resonant frequency of 479 Hz for the right maxillary sinus and one of 849 Hz for the left maxillary sinus. The highest intrasinus**

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