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Supplementary Materials

Differential Performance and Lung Deposition of Levofloxacin with Different Nebulisers Used in Cystic Fibrosis

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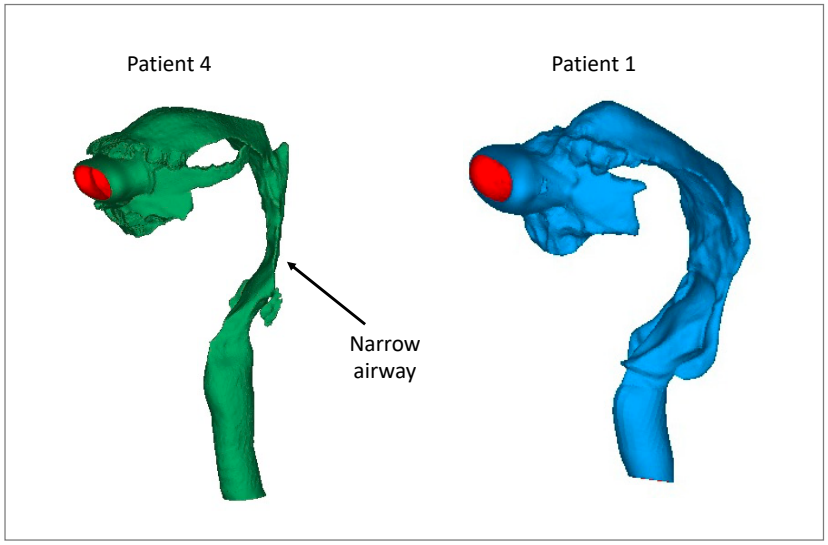
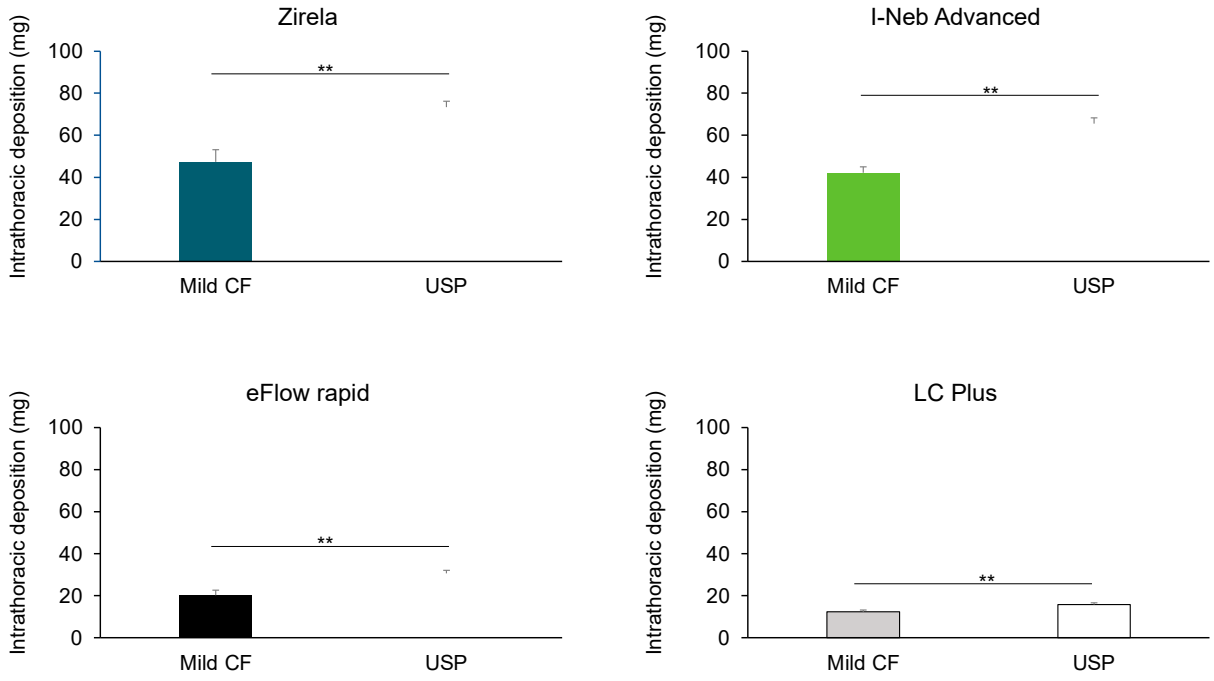
Supplementary Materials

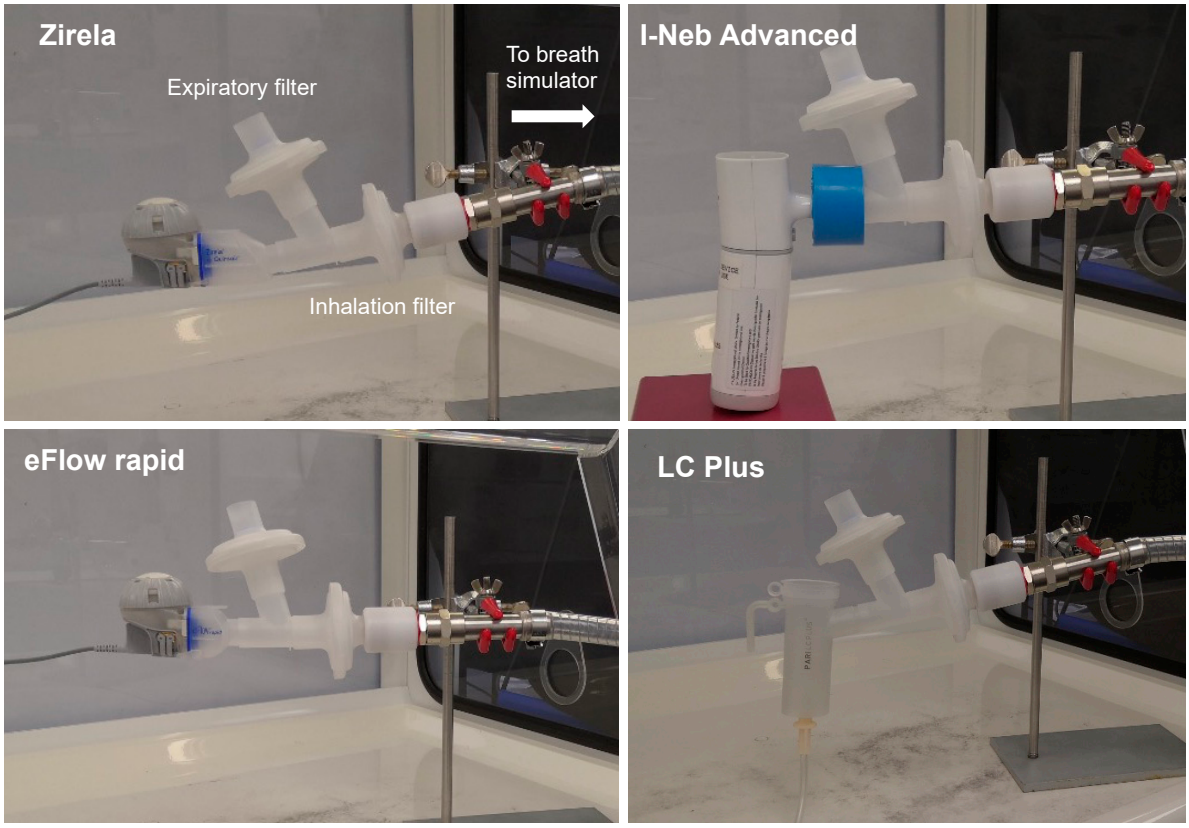
Supplementary Figure S1. Structural differences between the airway trees reconstructed from patients 4 and 1 (patient 1 is representative for the other patients included in the study). Patient 4 had a narrow pharyngeal airway associated with a low intrathoracic levofloxacin deposition, irrespective of the nebuliser used.



Supplementary Figure S2. Comparison of the intrathoracic levofloxacin deposition between the breathing pattern averaged from patients with mild CF (**Mild CF**: tidal volume [V_T] of 759 mL, rate of 31 cycles/min, inspiratory:expiratory ratio [I:E] 1:1.23) and the "adult" compendial breathing pattern that was used in the delivered dose and delivery rate experiments (**USP**: V_T of 500 mL, rate of 15 cycles/min, I:E 1:1). The intrathoracic deposition was estimated through functional respiratory imaging experiments conducted with the reconstructed airways of n=3 patients. Mean ± standard deviation. ** $p < 0.01$ (*t*-test).



Supplementary Figure S3. Set-up to determine the delivered dose and delivery rate of levofloxacin according to the United States Pharmacopeia.



Supplementary Method S1. High-Pressure Liquid Chromatography (HPLC) method for levofloxacin detection. Levofloxacin was extracted from the collection filters and rinsed from the next generation impactor stages using an extraction diluent consisting of Water/Methanol (80:20, v/v). The chromatographic method is reported below.

Chromatographic conditions
HPLC device: Agilent HPLC 1260 Infinity II.
Detector: Diode Array or Variable Wavelength
Wavelength: 260 nm
Run time: 6 min
Column: Synergy Polar-RP 4µm, 80A, 150 x 3.0mm (Phenomenex)
Column temperature: 30ºC
Autosampler temperature:5ºC
Injection volume: 5 µl
Flow: 1 mL/min
Eluent A: 20mM potassium dihydrogen phosphate buffer pH 2.5
Eluent B: Methanol
Isocratic: Eluent A / Eluent B = 65/35 (v/v)
Rinse solution: Methanol/Water = 50/50 (v/v)
Retention time (RT): 4.1 min

Supplementary Figure S4. Set-up to determine the aerosol particle size distribution according to the United States Pharmacopeia.