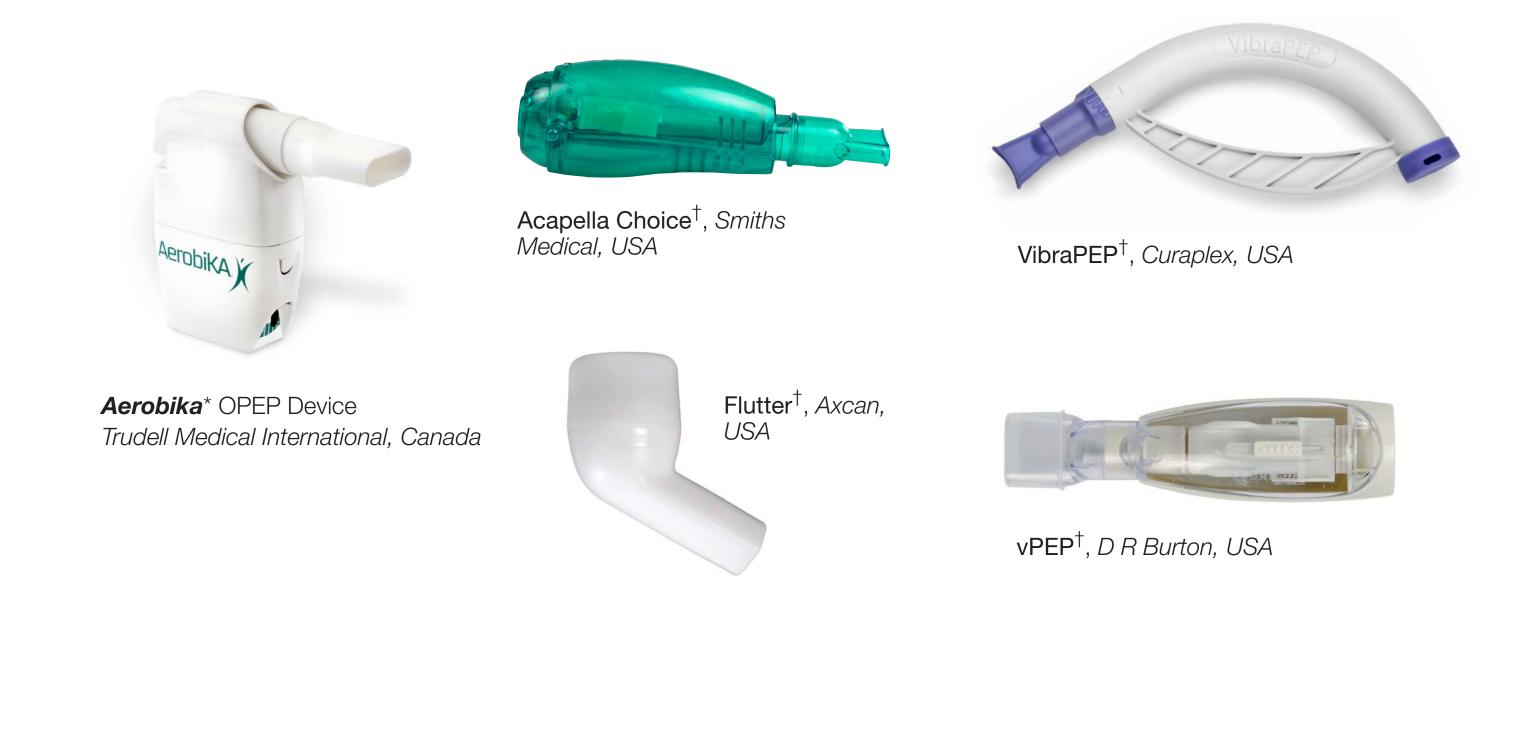
Bringing Greater Understanding to Oscillating Positive Expiratory Pressure Therapy — From *In Vitro* Performance Characterization to Physiological Effects and Clinical Impact

RATIONALE

- Oscillating Positive Expiratory Pressure (OPEP) devices generate positive pressure pulses in the airways.
- By mobilizing and clearing mucus, OPEP therapy has the potential to induce changes in airways ventilation and subsequent drug deposition.
- There is a scarcity of published evidence though linking laboratory performance characteristics to physiological effects and clinical impact.
- A specific OPEP device is reviewed in such context in order to provide a more wholistic understanding.

METHODS

- Different OPEP devices were reviewed in terms of laboratory waveform performance and specific *in vitro* metrics.
- Such lab data was then linked to previously reported physiological and clinical data for one device, *Aerobika**, in order to understand the entire pathway from lab performance to physiology to clinical efficacy.

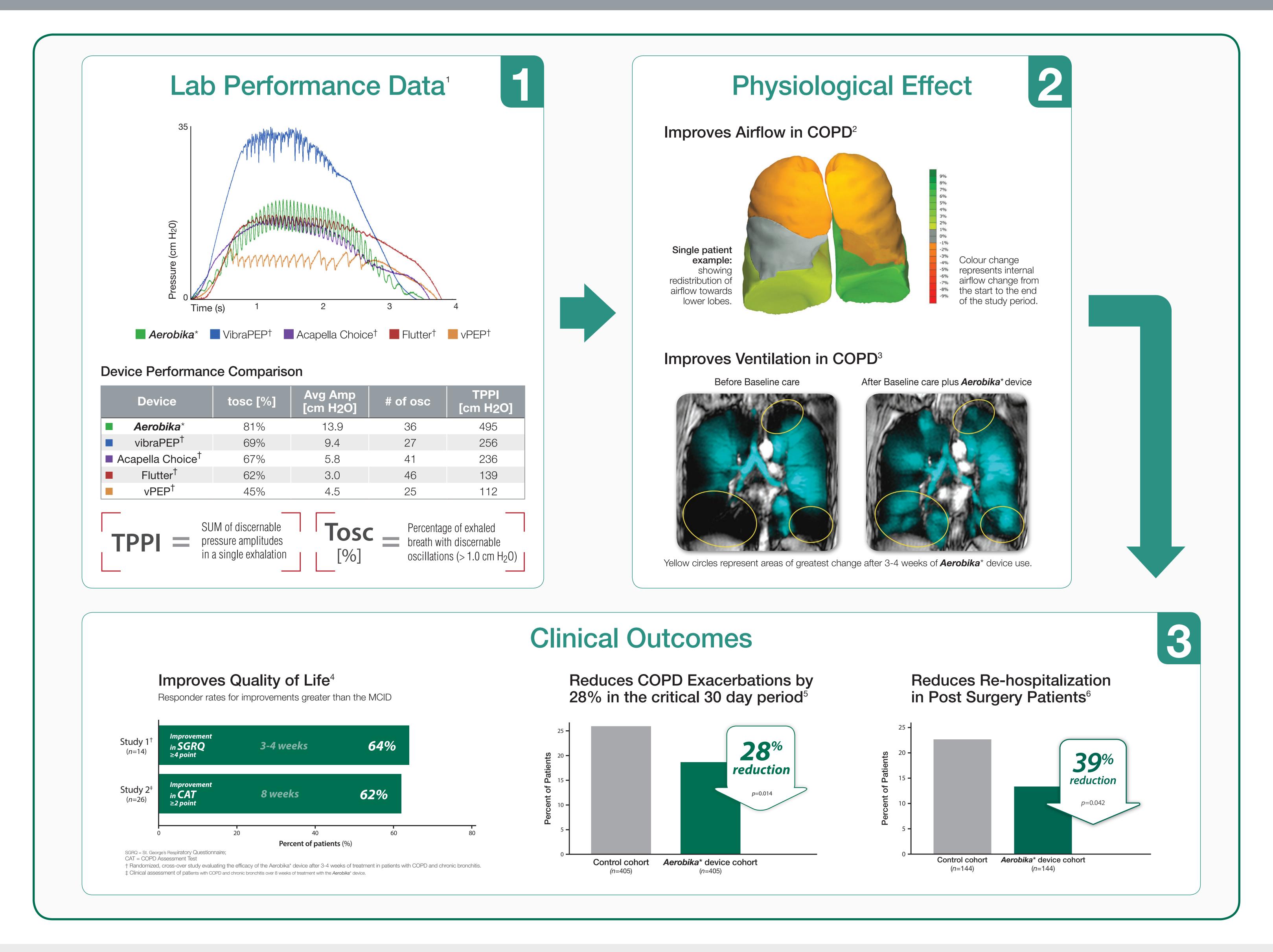


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RESULTS

- Laboratory pressure pulse waveforms from five different types of OPEP devices were shown to differ greatly in profiles and such differences translated into quantifiable differences in Total Pressure Pulse Impact (TPPI) and percentage of exhalation with significant oscillations.
- The OPEP device with the highest TPPI demonstrated physiological changes in airflow distribution and drug deposition patterns in a Functional Respiratory Imaging (FRI) study, which was then linked finally to reported clinical improvements in COPD and post-surgery patients.

CONCLUSIONS

• This laboratory and clinical overview demonstrates appreciable differences in pressure pulse waveforms for differing OPEP devices and then links these for the leading laboratory performing device into reported airway physiological changes and improved clinical outcomes.

⁶ Burudpakdee, C., et al. (2018) A Real-World Evidence Study Assessing the Impact of Adding the Aerobika Oscillating Positive Expiratory Pressure Device to Standard of Care Upon Healthcare Resource Utilization and Costs in Post-Operative Patients. Pulmonary Therapy. 4(1), 87-101. doi:10.1007/s41030-018-0055-9



¹ Meyer, A., Suggett, J. (2017) A Laboratory Assessment into the Efficiency and Effectiveness of Different Oscillating Positive Expiratory Pressure Devices by Means of Patient Simulated Expiratory Waveforms. CHEST, 152(4), Supplement:a970.2.

² Suggett, J., et al. (2018) The Use of Functional Respiratory Imaging to Investigate the Impact of an Oscillating Positive Expiratory Pressure Device on Lung Dynamics and Drug Deposition. Poster presented at the ERS International Conference. Retrieved from https://www.trudellmed.com/functional-respiratory-imaging-to-investigate-impact-of-opep-device-on-lung-dynamics-and-drug-deposition

³ Svenningsen, S., *et al.* (2016). Oscillatory Positive Expiratory Pressure in Chronic Obstructive Pulmonary Disease. Journal of COPD, 13(1), 66-74.

⁴ Stockley, RA. (2017). COPD10 Abstracts, *Chronic Obstructive Pulmonary Disease*. 4(3), 225-246. doi: org/10.15326/jcopdf.4.3.2017.0137.
5 Burudpakdee, C., et al. (2017) A Real-World Study of 30-Day Exacerbation Outcomes in Chronic Obstructive Pulmonary Disease (COPD) Patients

Managed with Aerobika OPEP. Pulmonary Therapy, 3(1), 163-171. doi:10.1007/s41030-017-0027-5 (published online: 06 February 2017).