



# BRONCHIECTASIS AND HFCWO: CLINICAL OUTCOMES AND HEALTHCARE RESOURCE UTILIZATION

## OVERVIEW

In current clinical practice, airway clearance therapy (ACT) is commonly prescribed for patients with bronchiectasis\* (BE). A recent study was conducted to determine the effectiveness of high frequency chest wall oscillation (HFCWO) therapy in improving clinical and economic outcomes for BE patients in the United States.

This retrospective pre-post cohort study was conducted using a commercial claims database. BE patients receiving HFCWO for ACT were included. All-cause and disease-specific healthcare care resource utilization were compared for the 12-months pre- and post-initiation of HFCWO therapy.<sup>1</sup>

## RESULTS

Of the 255 BE patients included in the analysis, the mean age was 55.6 years and 67.1% were female. Of note in this patient population:

- HFCWO devices were prescribed by pulmonologists (34.5%), primary care physicians (15.7%) and hospitalists (9.4%)
- 57.7% had a high risk BACI<sup>2</sup> score
- 63.9% had comorbid COPD, 51.4% had asthma, 37.3% had sinus disease and 36.5% had documented GERD
- In the pre-HFCWO period: 13.7% had Pseudomonas Aeruginosa colonization and 13.7% had comorbid non-tuberculous mycobacteria (NTM) infection

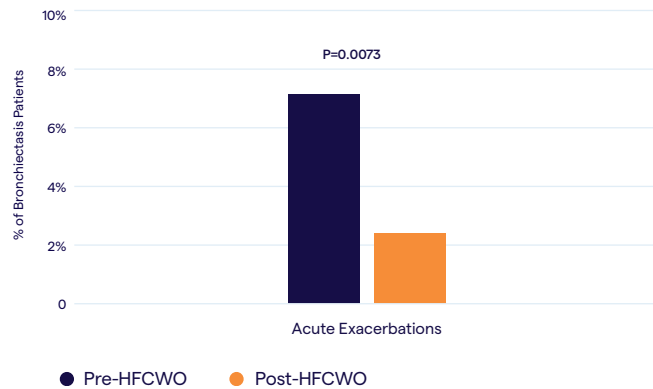
\*Non-Cystic Fibrosis Bronchiectasis

## FINDINGS

Initiation of HFCWO therapy for BE patients significantly improved key clinical and economic outcomes within 12 months of starting treatment. Of note were the following:

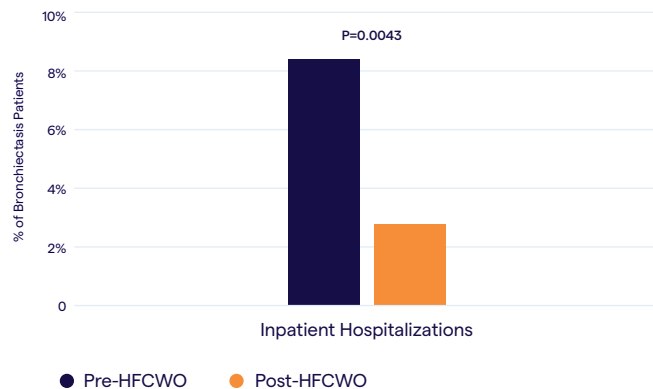
- 66% reduction in rate of acute exacerbations (p=0.0073)
- 65% reduction in disease-specific inpatient hospitalizations (p=0.0043)
- 9% reduction in oral antibiotic use (p=0.0017)
- 46% reduction in IV antibiotic use (p=0.0106)
- 16% reduction in emergency department visits (p=0.0606)

**FIGURE 1: ACUTE EXACERBATIONS OF BRONCHIECTASIS**



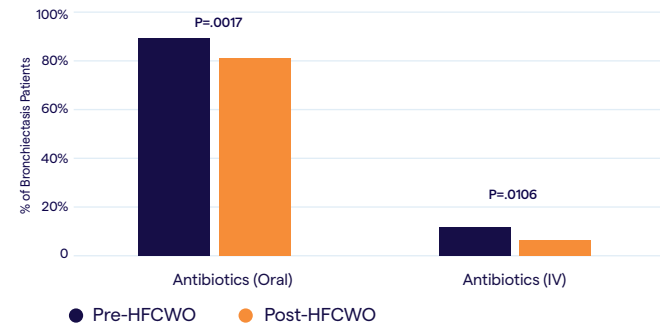
In the 12 months post-initiation of HFCWO, there was a statistically significant reduction in acute exacerbations of bronchiectasis.

**FIGURE 2. INPATIENT HOSPITALIZATIONS**



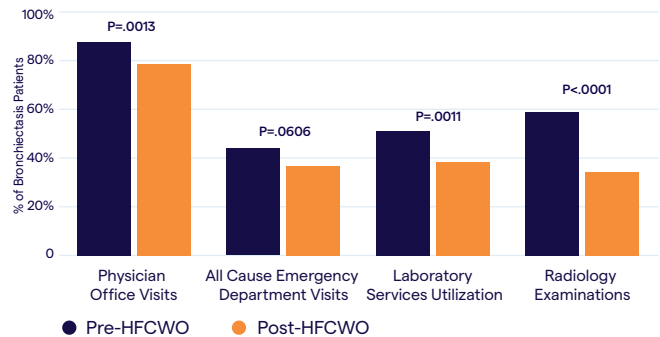
In the 12 months post-initiation of HFCWO, there was a statistically significant reduction in the proportion of patients with disease-specific inpatient hospitalizations.

**FIGURE 3: UTILIZATION OF MEDICATIONS**



In the 12 months post-initiation of HFCWO, there was a statistically significant reduction in the proportion of patients utilizing these disease-specific medications.

**FIGURE 4: UTILIZATION OF HEALTHCARE RESOURCES**



In the 12 months post-initiation of HFCWO, there was a statistically significant reduction in the proportion of patients utilizing disease-specific physician office visits, laboratory services and radiology exams. There was also a reduction in the proportion of patients who visited the emergency department.

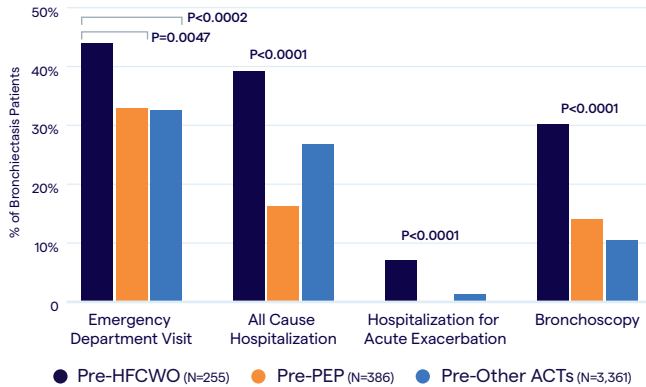
## IDENTIFYING WHO CAN MOST BENEFIT FROM HFCWO

Another study sought to analyze the demographics, clinical characteristics and healthcare resource utilization of BE patients in the 12 months prior to receiving ACT. For those who eventually received HFCWO after this analysis was conducted, these patients had been particularly challenged with more severe disease, frequent and/or severe exacerbations. They were more likely to have:<sup>3</sup>

- been hospitalized
- visited the emergency department
- been prescribed antibiotics and other medications during the 12 months prior
- incurred higher health care costs
- a high risk BACI score of  $\geq 6$  (directly correlated with the BSI<sup>4</sup>)

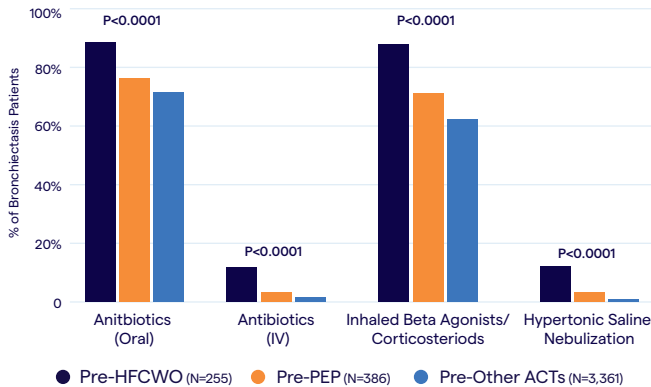
The following shows the differences between those who would go on to eventually receive either HFCWO, PEP, or Other ACT. BE patients who were eventually prescribed HFCWO had more severe disease and more frequent and/or severe exacerbations prior to receiving HFCWO.

**FIGURE 5: HEALTH CARE RESOURCE UTILIZATION IN THE 12 MONTHS PRIOR TO INITIATION OF THERAPY**



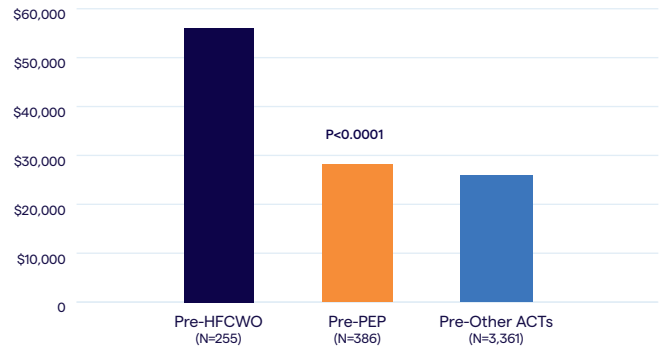
**In the 12 months prior to initiating therapy, health care resources were used by a significantly higher proportion of those patients who eventually received HFCWO as compared to PEP or Other ACTs.**

**FIGURE 6. UTILIZATION OF SPECIFIC MEDICATIONS OF INTEREST IN THE 12 MONTHS PRIOR TO INITIATION OF THERAPY**



**In the 12 months prior to initiating therapy, medications to manage bronchiectasis were used by a significantly higher proportion of those patients who eventually received HFCWO as compared to PEP or Other ACTs.**

**FIGURE 7. MEAN ALL CAUSE COST PER PATIENT IN THE 12 MONTHS PRIOR TO INITIATION OF THERAPY**



**In the 12 months prior to initiating therapy, health care costs were significantly higher for those patients who eventually received HFCWO as compared to PEP or Other ACTs.**

## CLINICAL IMPLICATIONS

When considering prescribing HFCWO compared to PEP or other ACT (in addition to or instead of these), you can consider the effectiveness of HFCWO therapy for your patient. HFCWO is shown to significantly improve outcomes vs. PEP in a randomized clinical trial. These patients who were prescribed HFCWO vs. PEP showed significant improvements in dyspnea (breathlessness, cough & sputum score / BCSS) and quality of life (COPD assessment test / CAT). They also showed significant improvement in respiratory function (FVC and FEV1).<sup>5</sup>

Identifying bronchiectasis patients who have experienced an adverse event like a hospitalization or visit to the emergency department, or have a high risk BACI, then prescribing HFCWO, will help them to achieve better clinical and economic outcomes and improve their quality of life.



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References

- <sup>1</sup> A. Basavaraj, M. DeKoven, D. Shah, et al. Impact of High Frequency Chest Wall Oscillation on Clinical Outcomes and Healthcare Resource Utilization in Adult Patients with Non-Cystic Fibrosis Bronchiectasis in the United States: A Pre-Post Cohort Analysis. *American Journal of Respiratory and Critical Care Medicine* 2020;201:A7758. [https://www.atsjournals.org/doi/abs/10.1164/ajrccm-conference.2020.2011\\_MeetingAbstracts.A7758](https://www.atsjournals.org/doi/abs/10.1164/ajrccm-conference.2020.2011_MeetingAbstracts.A7758).
- <sup>2</sup> Bronchiectasis Aetiology and Co-Morbidity Index (BACI). <http://www.bronchiectasisseverity.com/bronchiectasis-aetiology-and-co-morbidity-index/>.
- <sup>3</sup> A. Basavaraj, M. DeKoven, D. Shah, et al. Prescribing Patterns in the United States of High Frequency Chest Wall Oscillation and Other Airway Clearance Therapies in Adult Patients with Non-Cystic Fibrosis Bronchiectasis. *American Journal of Respiratory and Critical Care Medicine* 2020;201:A7759. [https://www.atsjournals.org/doi/abs/10.1164/ajrccm-conference.2020.2011\\_MeetingAbstracts.A7759](https://www.atsjournals.org/doi/abs/10.1164/ajrccm-conference.2020.2011_MeetingAbstracts.A7759).
- <sup>4</sup> McDonnell MJ, Aliberti S, Goeminne PC, et al. Comorbidities and the risk of mortality in patients with bronchiectasis: an international multicentre cohort study. *Lancet Respir Med*. 2016;4(12):969-979. doi:10.1016/S2213-2600(16)30320-4. [https://www.thelancet.com/journals/lanres/article/PIIS2213-2600\(16\)30320-4/fulltext](https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(16)30320-4/fulltext).
- <sup>5</sup> Nicolini A, Cardini F, Landucci N, et al. Effectiveness of treatment with high-frequency chest wall oscillation in patients in patients with bronchiectasis. *BMC Pulm Med* 2013; Apr 4;13:21. doi: 10.1186/1471-2466-13-21.

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