

Outcomes with High-Frequency Chest Wall Oscillation Among Patients with Non-CF Bronchiectasis or COPD

Derek Weycker Ph.D.¹, Gary L. Hansen Ph.D.², Frederic D. Seifer M.D.³

¹Policy Analysis Inc. (PAI), Brookline, MA, ²RespirTech, St. Paul, MN, ³St. Lawrence Health System, Potsdam, NY

ABSTRACT

High-frequency chest wall oscillation (HFCWO) has gained acceptance for treating airway clearance issues in patients with non-CF bronchiectasis (BE), either by itself or combined with chronic obstructive pulmonary disease (COPD). Little is known about the effectiveness of HFCWO for patients with COPD who lack a diagnosis of BE (COPD-only).

Using a large commercial database of healthcare claims, patients who had an initial claim for HFCWO and a diagnosis of BE or COPD-only (865 and 135, respectively). Mean healthcare utilization for any reason was calculated for the three months prior to and the three months after initiating HFCWO therapy.

Number of hospitalizations, physician office visits, emergency department visits, and prescriptions were lower during the period following start of HFCWO therapy. These findings were true for both BE and COPD-only groups.

INTRODUCTION

- High-frequency chest wall oscillation (HFCWO) is increasingly used for airway clearance therapy in patients with non-CF bronchiectasis (BE) and chronic obstructive pulmonary disease (COPD).
- Limited evidence currently exists on the relationship between HFCWO therapy and clinical/economic outcomes in patients with BE, and even less evidence exists on this relationship in patients with COPD who do not have BE.

METHODS

- A retrospective pre/post-cohort design and data from a healthcare claims repository were employed:
 - Data were deidentified and thus exempt from IRB approval.
- The study population included all patients who had ≥ 1 encounter for HFCWO therapy between January 2010 and December 2012 and, at any time on or before the first encounter for HFCWO therapy, had evidence of BE (irrespective of COPD) or COPD-only (i.e., without BE).
- Study outcomes—including selected measures of all-cause healthcare utilization—were evaluated during the three-month period before and three-month period after initiation of HFCWO therapy.
- Statistical comparisons were undertaken using a dependent-samples t-test, and were adjusted for differential follow-up.

RESULTS

- The study population included 865 patients with BE and 135 patients with COPD only who had initiated HFCWO therapy.
- Among patients with BE:
 - The mean number of all-cause hospitalizations was lower by 33% during the post-period versus pre-period (0.2 vs. 0.3, $p < 0.001$).
 - Numbers of physician office visits, emergency department visits, hospital outpatient visits, and prescriptions also were significantly lower.
- Among patients with COPD-only:
 - The mean number of all-cause hospitalizations was lower by 40% during the post-period (0.3 vs. 0.5, $p = 0.020$).
 - Physician office visits and emergency department visits also were significantly lower.

Healthcare Utilization Before and After Initiating HFCWO Therapy

	Non-CF Bronchiectasis			COPD-only		
	3-Month Pre	3-Month Post	P-value	3-Month Pre	3-Month Post	P-value
Patients	865	865		135	135	
Acute-care hospitalizations (mean)	0.3	0.2	<0.001	0.5	0.3	0.020
Physician Office Visits (mean)	6.4	5.5	<0.001	5.7	5.0	0.032
Emergency Department Visits (mean)	0.4	0.3	<0.001	1.1	0.8	0.040
Hospital Outpatient Visits (mean)	2.5	2.1	<0.001	2.8	2.6	0.482 (NS)
Other Visits (mean)	5.0	6.4	<0.001	13.7	14.2	0.333 (NS)
Prescriptions (mean)	7.3	6.7	<0.001	9.0	8.4	0.097 (NS)

Table 1. All-cause healthcare utilization for patients with BE (with or without COPD) and COPD (without BE). Mean values for utilization are provided for the three-month periods before and after initiation of HFCWO therapy. (NS) indicates not statistically significant.

Relative Change in Utilization After Initiating HFCWO Therapy

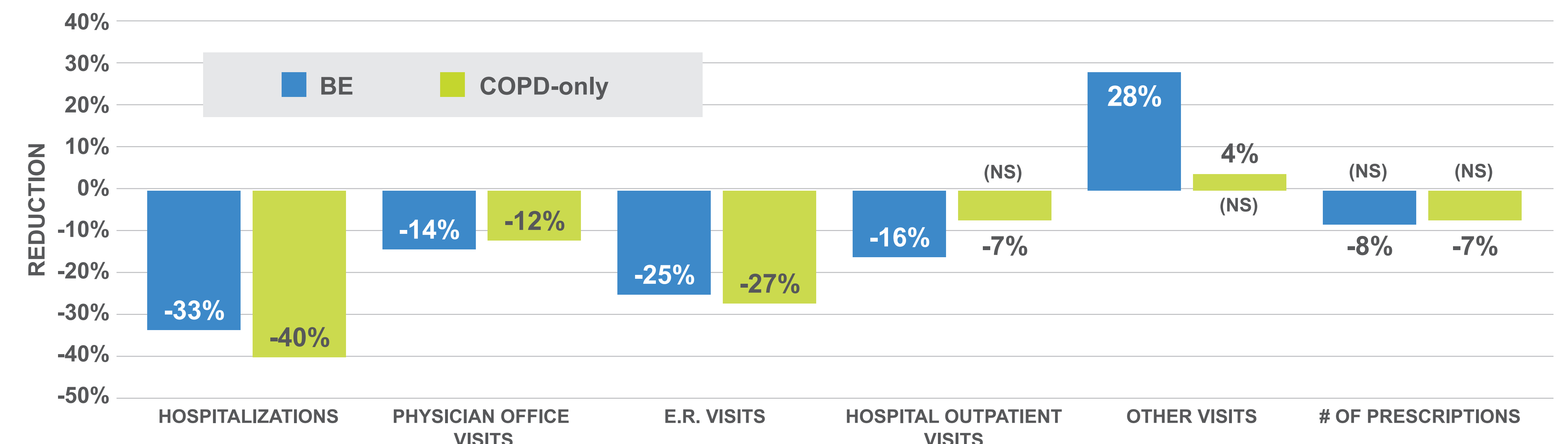


Figure 1. The change in all-cause healthcare utilization for patients with BE (with or without COPD) and COPD (without BE), comparing the three-month periods before and after initiation of HFCWO therapy. (NS) indicates not statistically significant.

DISCUSSION

- HFCWO has found increasing acceptance in treating adults with non-CF bronchiectasis.
- Studies have found HFCWO to be effective for non-CF bronchiectasis¹ and also for COPD when the status of BE was unknown.²⁻⁴
- The paucity of published results for COPD-only patients may be due, in part, to the lack of reimbursement for this condition.
- These data suggest that HFCWO is effective in COPD patients without recognized bronchiectasis.
- More research is needed to confirm these findings.

CONCLUSIONS

- For patients with non-CF bronchiectasis and patients with COPD in the absence of BE, hospitalizations and other metrics of utilization were significantly improved during the three-month period following initiation of HFCWO therapy.
- Patients with COPD without recognized bronchiectasis may benefit from HFCWO treatment.

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