

# Two Years of High Frequency Chest Wall Oscillation (HFCWO) Outcomes in a Large Registry of Non-CF Bronchiectasis Patients

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## ABSTRACT

While high-Frequency Chest Wall Oscillation (HFCWO) vests have long been used to treat patients who require airway clearance, few studies establish their long-term effectiveness for non-CF bronchiectasis.

12,344 records extracted from a registry of adult bronchiectasis patients using HFCWO therapy allowed examination of hospitalization patterns before and after initiation of HFCWO therapy, as well as antibiotic use and self-reported metrics of quality of life.

When compared to the prior year, the rate of hospitalization fell sharply, an improvement that was sustained for up to two years. Similar improvements were seen in self-reported respiratory health and ability to clear mucus.

### Objective

To measure self-reported hospitalization and quality of life of patients initiating HFCWO therapy

### Questions Asked

- What changes occur to hospitalization, respiratory health, and ability to clear mucus compared to the prior year?
- For how long are these changes sustained?

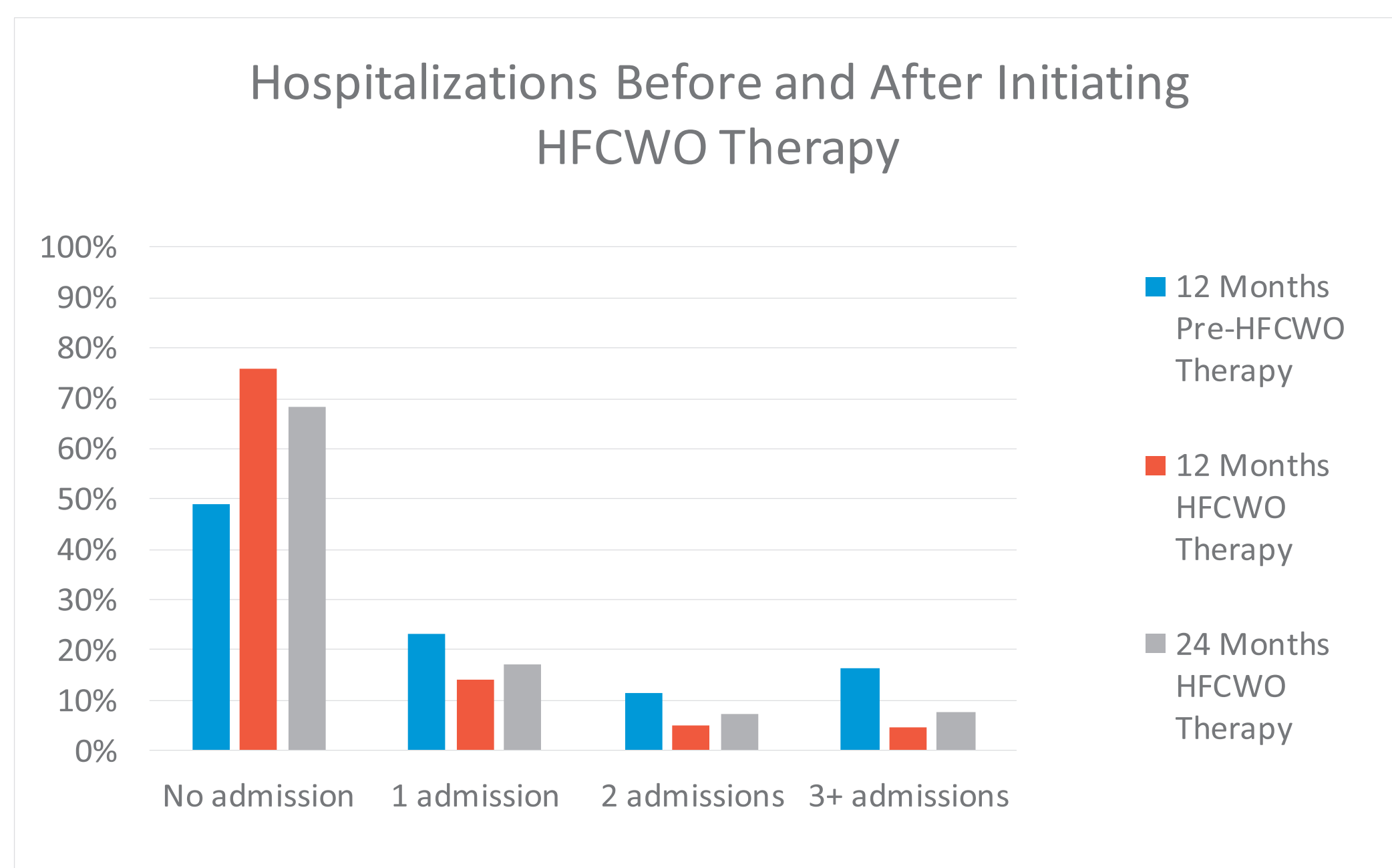
This study was sponsored by RespirTech, a Philips company, through funding to Cirdan and NAMSA. Gary Hansen and Sarah Daignault are employed by RespirTech. Tara Barto is a consultant to RespirTech.

## INTRODUCTION

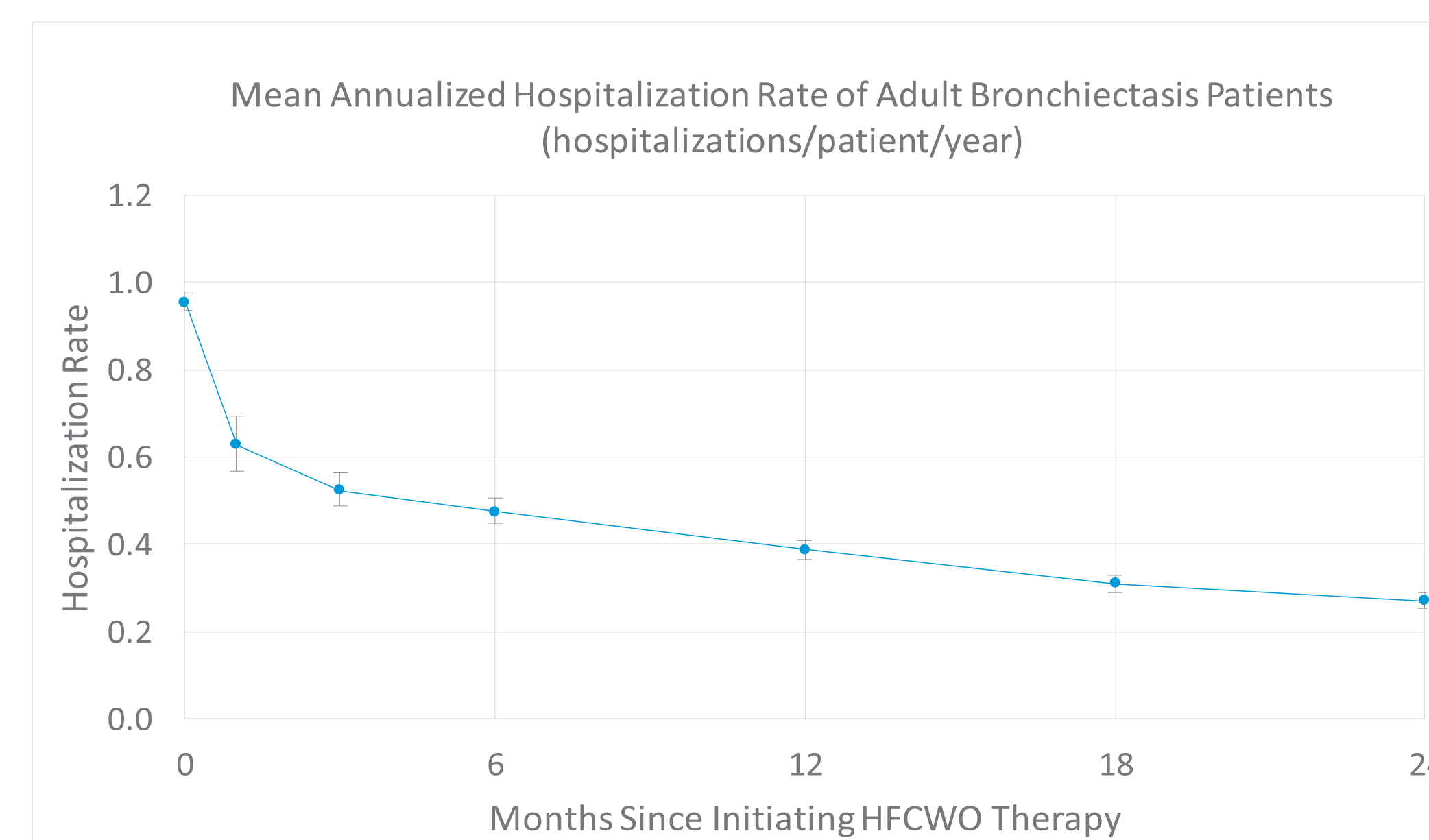
High-Frequency Chest Wall Oscillation (HFCWO) vests have long been used to assist in airway clearance for patients with cystic fibrosis and other diseases. Limited research establishes the outcomes for this device in treating adult patients with non-cystic fibrosis bronchiectasis.<sup>1</sup> In this study, we sought to evaluate the impact of HFCWO on hospitalizations and quality of life for adult non-CF bronchiectasis patients.

## METHODS

- 12,344 records from a registry of adult bronchiectasis patients using HFCWO therapy (inCourage system, RespirTech, St. Paul, MN).
- Telephone survey
  - Initiation of therapy, 1, 3, 6, 12, and 24-month follow-up
  - Hospitalizations 1 year prior to and after initiation of vest therapy
  - Current antibiotic use
  - Quality of life metrics – Likert scale
    - Respiratory health
    - Ability of clear lungs
- All data were deidentified and informed consent was obtained from all patients.



**Figure 1.** Hospitalizations following introduction of HFCWO therapy compared to the prior year. The proportion of patients who had none, 1, 2, or 3+ hospitalizations is the year before and one or two years after initiating HFCWO therapy.



**Figure 2.** Hospitalizations following introduction of HFCWO therapy compared to the prior year. The mean annualized hospitalization rate after starting HFCWO therapy at time zero. Error bars are 95% confidence limits.

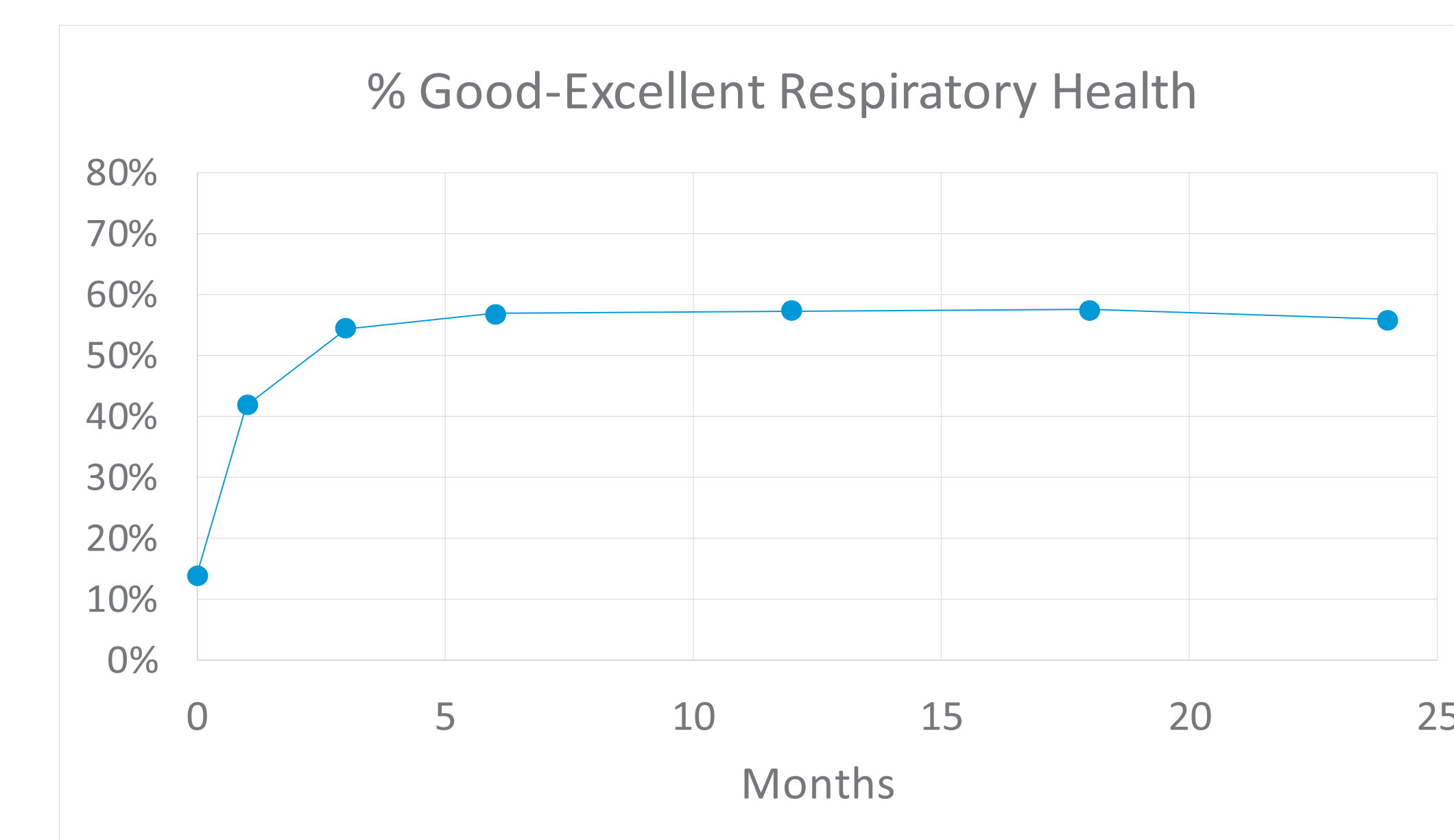
## RESULTS

	Prior year	After one year	After two years
Mean annualized hospitalization rate	0.956	0.387 (60% reduction)	0.270 (72% reduction)
% of patients with no hospitalizations	48.8%	75.9% (27% increase)	68.2 (19% increase)
% of patients with 3+ hospitalizations	16.5%	4.7% (12% reduction)	7.5% (9% reduction)
“Overall respiratory health” rating as good-excellent	13.8%	57.3% (44% increase)	55.8% (42% increase)
“Ability to clear your lungs” rating as good-excellent	11.2%	72.1% (61% increase)	72.7% (62% increase)

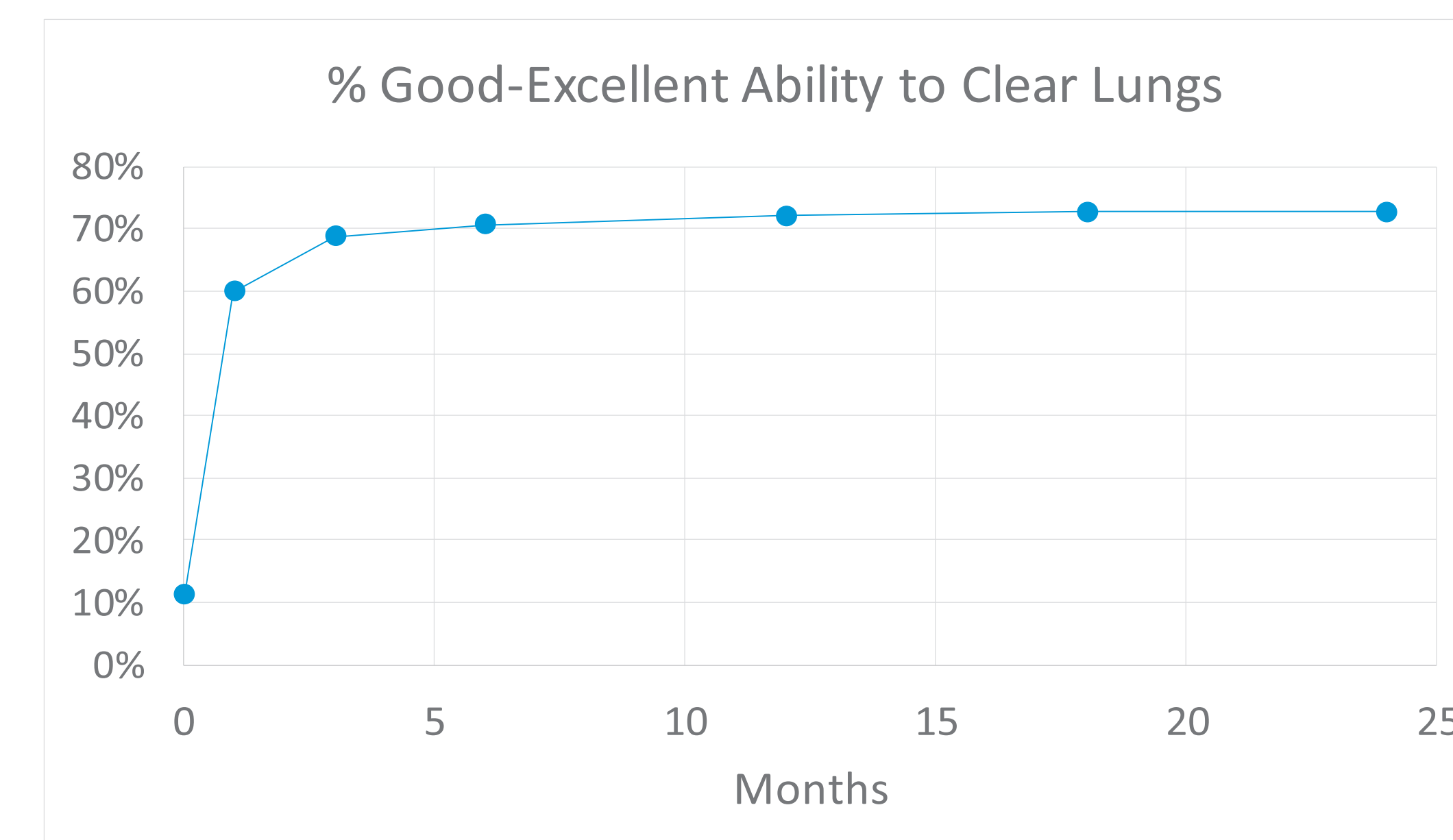
All differences significant to p-value<0.001 at 12 and 24 months.

## DISCUSSION

- There was a strong association of HFCWO with positive outcomes
- The strength of the association was sustained for two years
- The self-reported measure of hospitalization rate was consistent with self-reported quality of life measures
- The improvement was rapid and corresponded to initiation of therapy
- Removing dropouts slightly improved hospitalization and quality of life scores, suggesting that dropout groups were somewhat sicker, however this effect is small compared to the overall improvement
- This study has limitations common to registry studies and cannot definitively assign causality



**Figure 3.** The proportion of patients who answered positively (good, very good, or excellent) to the question: “How would you rate your overall respiratory health?” The x-axis indicates months since initiating HFCWO therapy. Error bars are 95% confidence limits.



**Figure 4.** The proportion of patients who answered positively (good, very good, or excellent) to the question: “How would you rate your ability to clear your lungs?” The x-axis indicates months since initiating HFCWO therapy. Error bars are 95% confidence limits.

## CONCLUSIONS

This analysis of adult non-cystic fibrosis bronchiectasis patients showed improved self-reported outcomes associated with the initiation of HFCWO therapy as measured by number of hospitalizations, antibiotic use, and the subjective experience of airway clearance. The improvement was rapid and sustained for two years.

## REFERENCES

1. Nicolini A, Cardini F, Landucci N, Lanata S, Ferrari-Bravo M, Barlascini C. Effectiveness of treatment with high-frequency chest wall oscillation in patients with bronchiectasis. BMC Pulm Med. 2013;13:21.