

Home-based Intermittent Inhaled High-Dose Nitric Oxide (NO) in Nontuberculous Mycobacterial Pulmonary Disease Using a Novel NO Generator and Delivery System is Safe and Well-Tolerated

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Rationale

Treatment-refractory nontuberculous mycobacterial pulmonary disease (NTM_PD) poses a significant unmet medical need; current guidelines recommend combination antibiotic regimens, which are not always well tolerated or effective.

Intermittent high-dose inhaled nitric oxide (NO) has demonstrated bactericidal activity against NTM, and synergy with standard antibiotic therapy in vitro. Early clinical data suggest NO treatment may benefit these patients.

Methods

In this ongoing open-label pilot study, patients with treatment-refractory NTM lung infection receive intermittent high-dose NO inhalations via a novel investigational medical device (LungFit GO™, Beyond Air®, Garden City, NY) that generates NO from room air and delivers it via a breathing circuit and standard CPAP face mask, in addition to stable guideline-based NTM treatment.

Easy to Use:

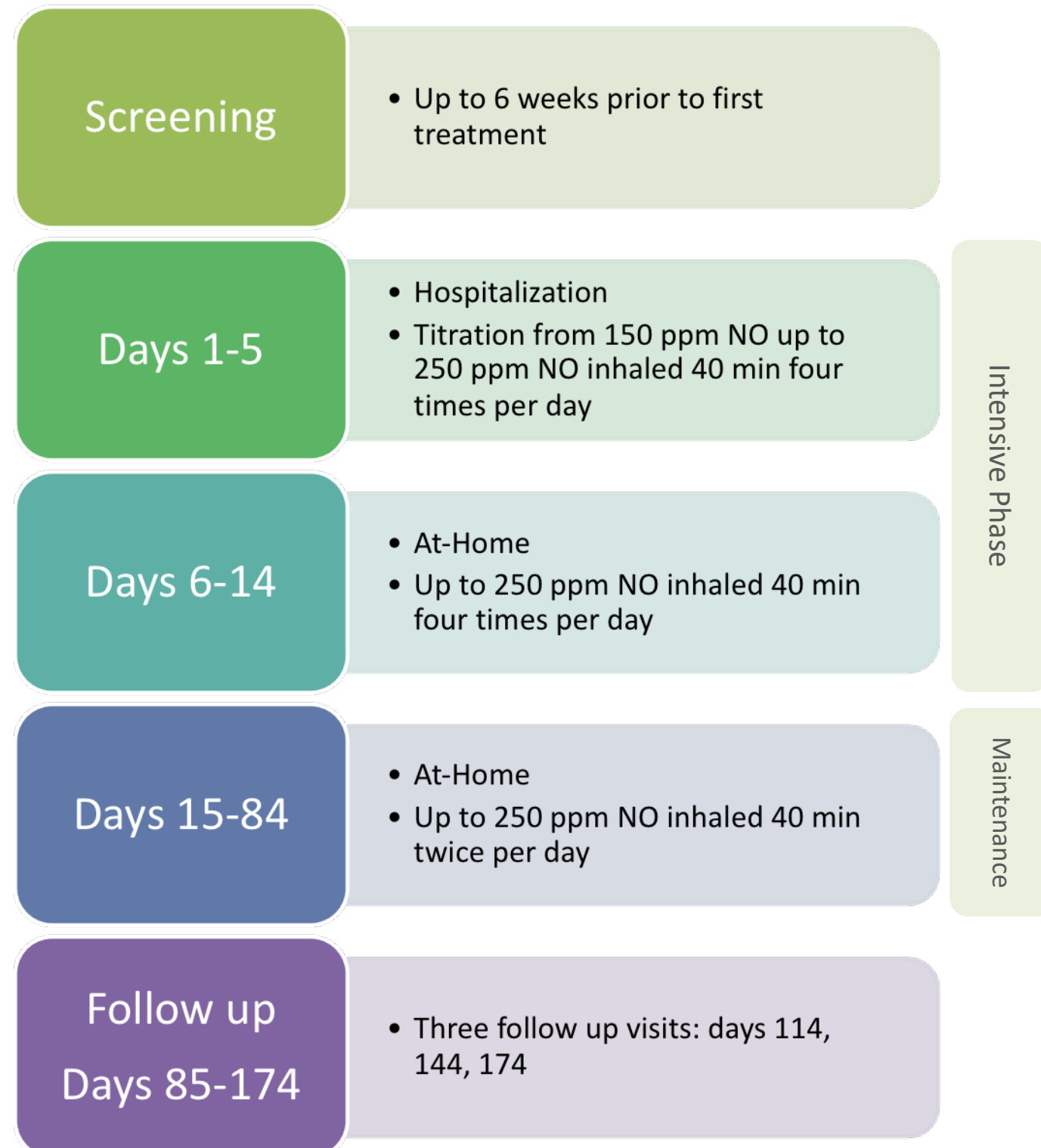
- Programmable by filter
- Insert filter and press go
- Alarms monitor performance
- Use with any electrical outlet

Portable:

- Width 350 mm
- Depth 510 mm
- Height 300 mm
- Weight ~9kg

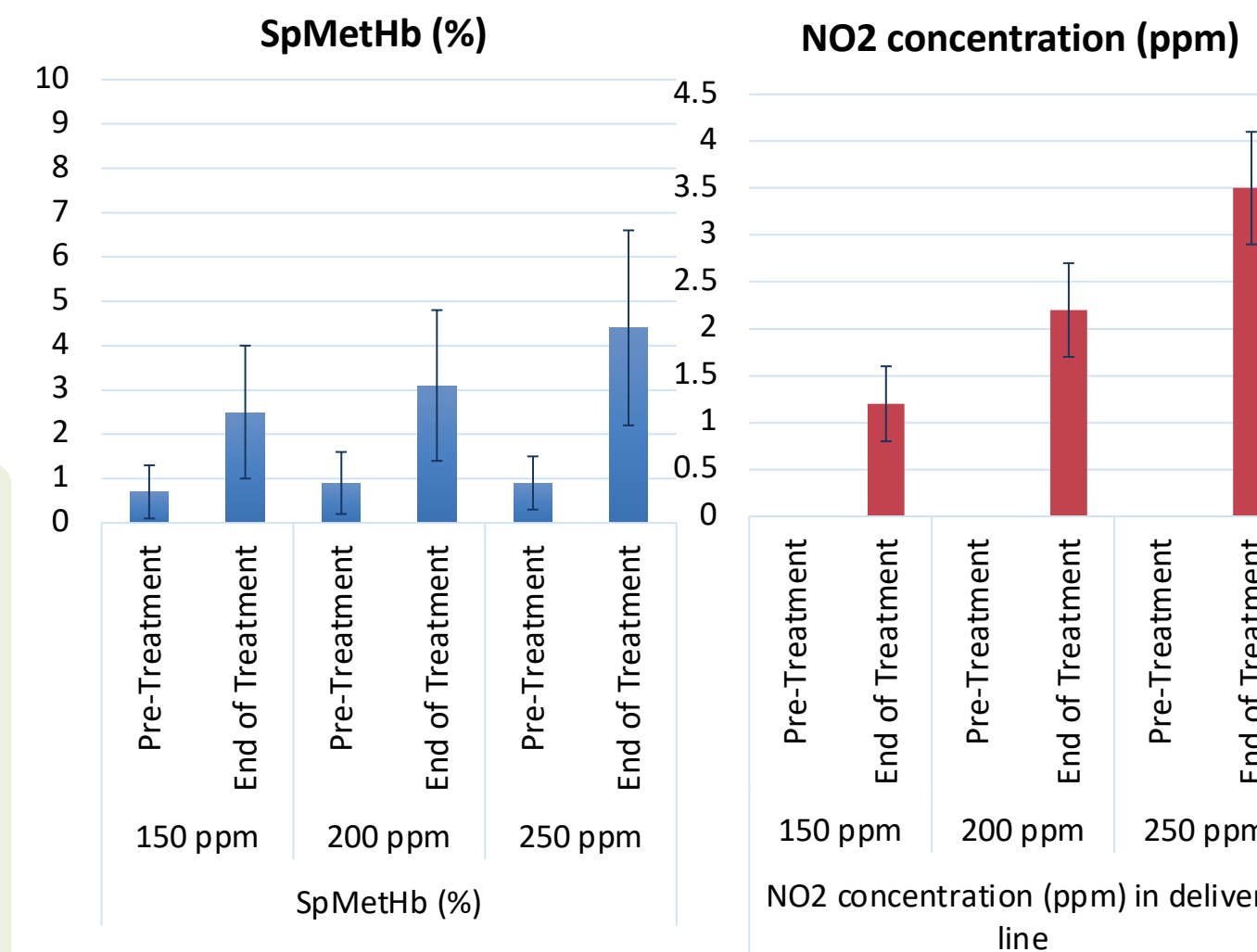


Treatment Design



Inhalation Parameters

- All subjects completed the in-hospital phase and were successfully titrated to receive a **250 ppm NO** regimen at home
- A total of **300** inhalations were administered during the hospitalization period, with mean SpMetHb of 4.4% and NO₂ of 3.5 ppm at the end of inhalation
- To date, a total of **2323** inhalations were self administered at home with no treatment related AE discontinuations reported and overall high treatment compliance



*Graphs represent mean ± SD

Baseline Demographics

Demographics		
Age (years)	N	15
	Mean	62.1
	SD	15
	Min	22
	Max	82
Gender	Male (N):Female (N)	3:12

- All subjects were diagnosed with refractory NTM including:
 - Mycobacterium avium complex* (MAC)
 - Mycobacterium abscessus*
 - Other NTM e.g. *M. simiae*
- A history of multiple mycobacterial infections was noted

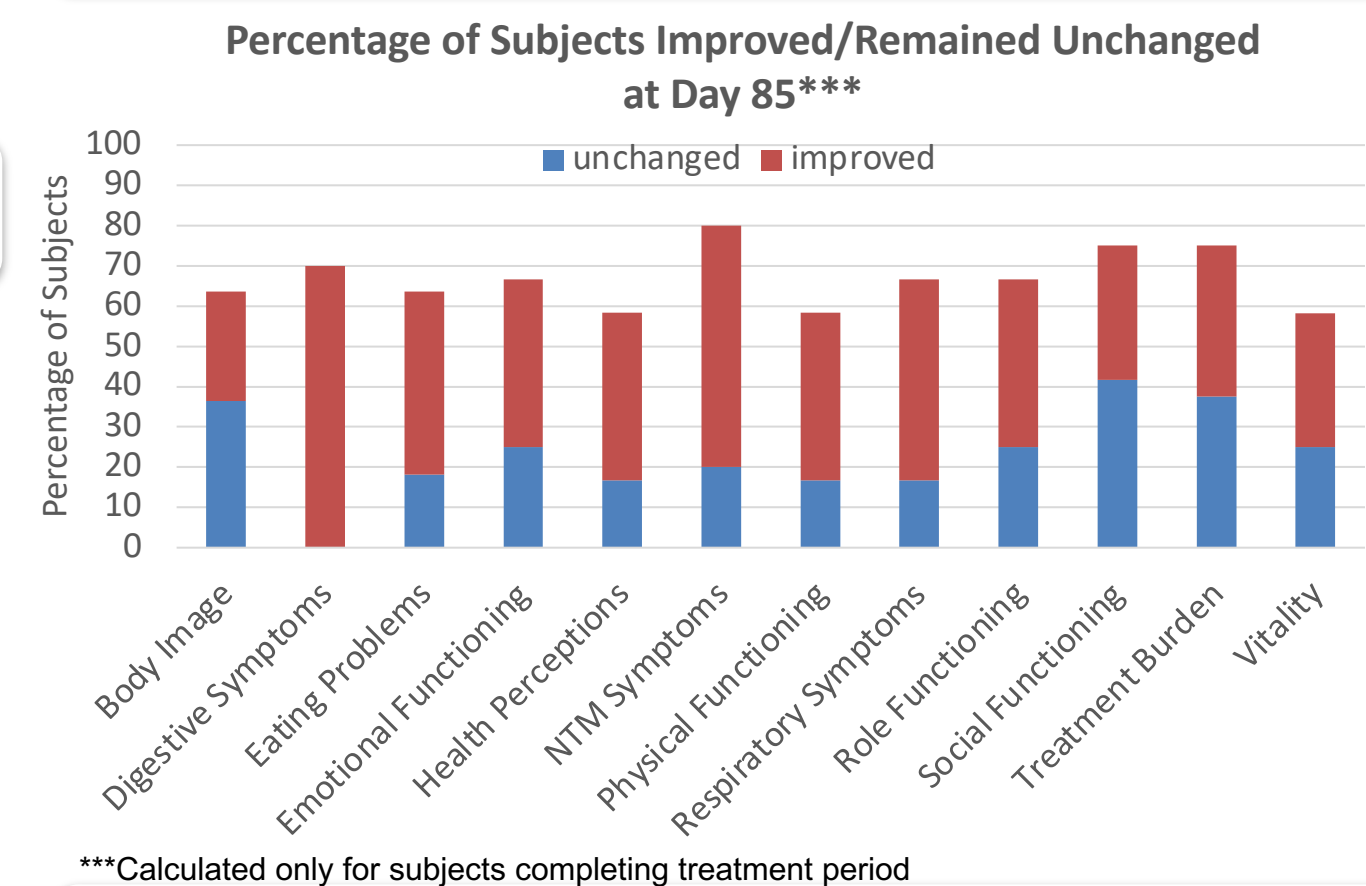
Baseline conditions		
System Organ Class (SOC)	Preferred Term	N
Congenital, familial and genetic disorders	Cystic fibrosis	2
	Primary ciliary dyskinesia	1
Respiratory, thoracic and mediastinal disorders	Bronchiectasis	7
	Chronic obstructive pulmonary disease	1

Adverse Events

Total N (ITT** Population) = 15	N	%
Any AE	14	93.3
Any AE related to study treatment *	9	60.0
Any AE related to study treatment classified as Severe *	0	0
Any SAE	6	40.0
Any Treatment Emergent SAE occurring during treatment period	2	13.3
Any SAE related to study treatment *	1	6.7

*Including possibly, probably, and definitely related
**Intention to treat

Quality of Life (QoL-B)



Conclusions

- This novel system has delivered intermittent high-dose inhaled NO in both hospital and home settings.
- The treatments have been well tolerated.
- Early improvements in QoL-B (NTM) are noted.
- Other data collected, such as bacteriology, will be available once all subjects have completed and the database is locked.

Given the antimicrobial, anti-inflammatory, and direct pulmonary vasodilation properties of NO, beneficial effects of NO treatment on NTM lung infections are anticipated.