

A challenging case of NTM in person with CF

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What is NTM?

Non-tuberculosis mycobacteria (> 200 *sp*)

Environmental organisms

Lungs are primary site for infection (NTM-PD)

Pre-existing lung disease more susceptible

Treatment burden

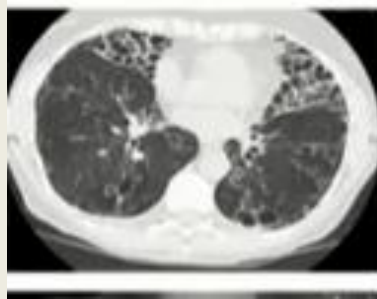
Diagnosis

CLINICAL



Cough
Fatigue
Weight loss

RADIOLOGICAL



BACTERIOLOGY



3 +ve sputum
samples

Clinical suspicion of NTM-PD

Send three sputum samples for acid-fast bacilli smear and culture

Patient must have stopped taking antibiotics that are effective against NTM
Examples include macrolides, aminoglycosides, fluoroquinolones, and tetracyclines

All samples test negative

High-resolution CT scan of the chest (HRCT)

Are scan images consistent with NTM-PD?

No

No evidence of NTM-PD
Seek alternative diagnosis

Yes

CT-directed aspirate and lavage

Samples negative for NTM

No active disease
Monitor sputum

1 sample tests positive

HRCT

Are scan images consistent with NTM-PD?

Yes

CT-directed aspirate and lavage

Samples negative for NTM

No active disease
Monitor sputum

Samples positive for NTM

Consider treatment for NTM-PD

No

2 samples test positive for the same NTM species

HRCT

Are scan images consistent with NTM-PD?

No

No evidence of NTM-PD
Monitor patient with HRCT and sputum samples periodically

Yes

Consider treatment for NTM-PD

NTM prevalence in CF

**Non-tuberculous
mycobacterium (NTM)**
prevalence remains stable at
6.9%.

52.6%

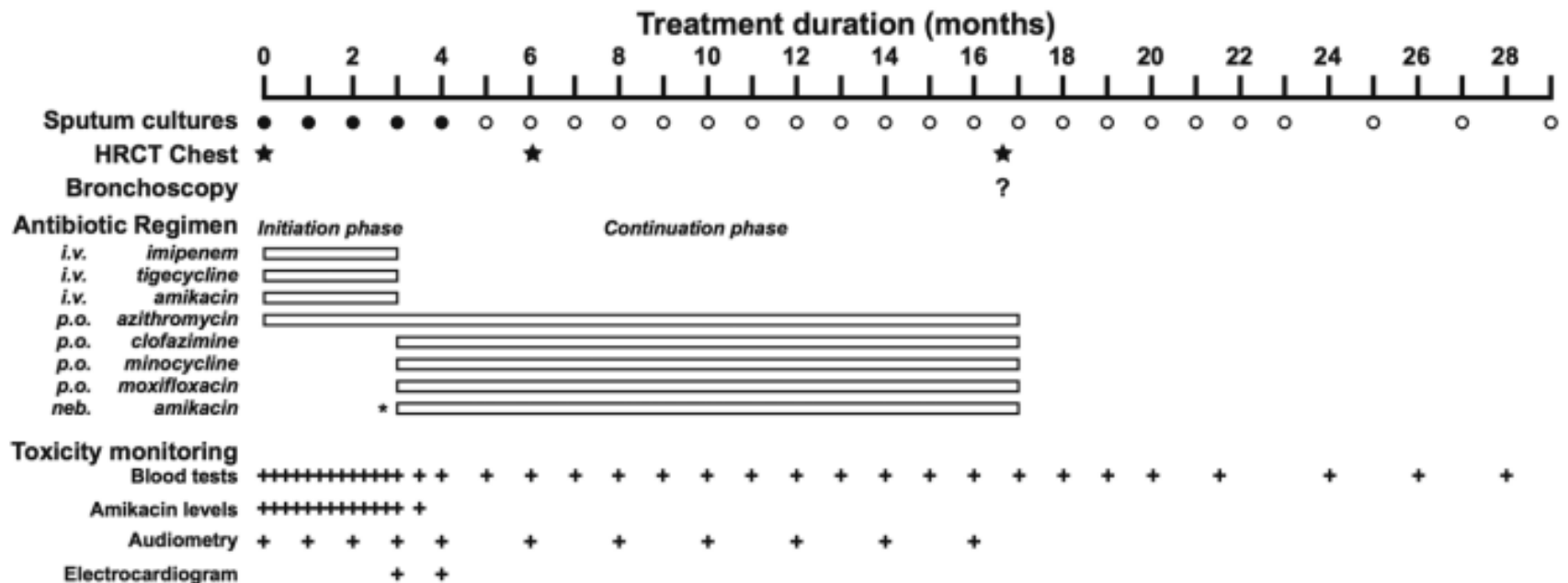
of people recorded as having
NTM are on treatment for it,
which is similar to 2019.

- Widespread antibiotic use- shift in lung microbiome?
- Greater surveillance and diagnostics

- 95% are Mycobacterium avium complex (MAC) and M. abscessus complex (MABSC)
- MAC most common (75%), remainder mostly MABSC (11)

Treatment for *M. abscessus* in CF

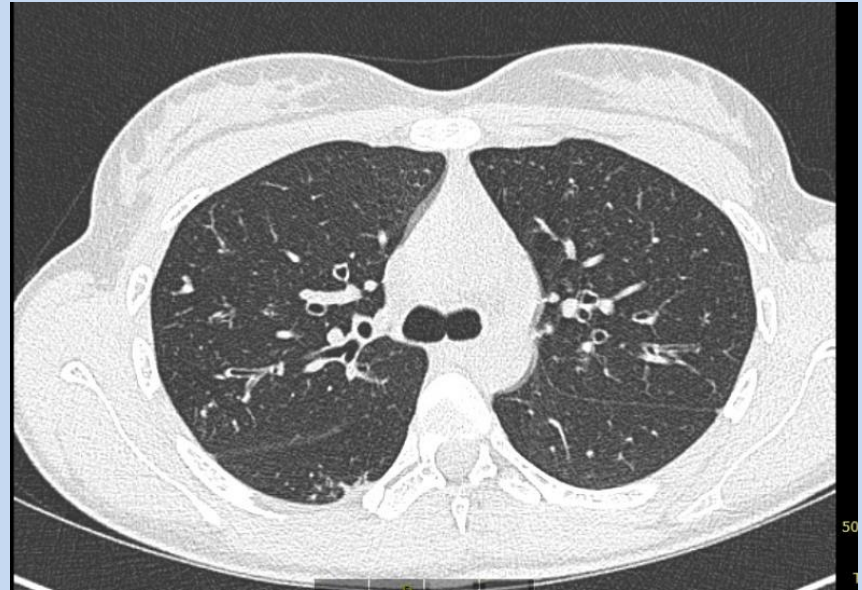
A Typical *M. abscessus* treatment schedule



CF patient with *M. abscessus*

- 26yr ♀
- 53kg BMI 20.8 kg/m²
- FEV₁ 90% (stable)
- Intermittent PA, aspergillus fumigates.
- NTM treatment May 2012 (x3 isolates ***M. abscessus*** , clinical, radiological decline)

Baseline CT scan 2010



Background changes
consistent with CF
No acute pathology

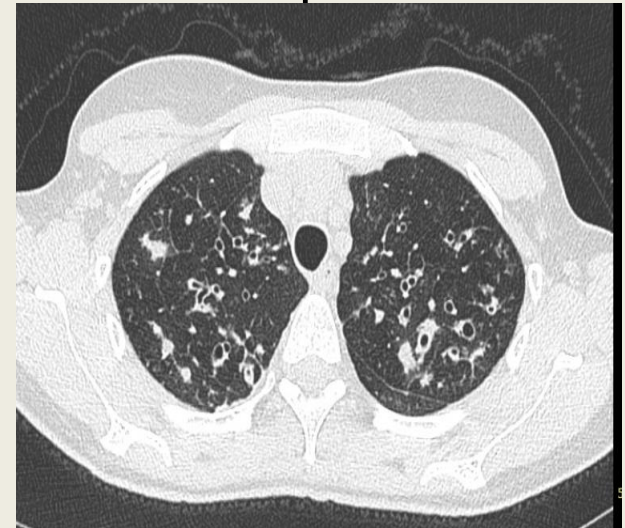
May 2012-March 2013

- ↓ 51.3kg, BMI 20:- ONS-Polycal[®] 200mls o.d (124gCHO, 494kcal) more physically active
- FEV₁ 92% ↔
- Sept 2012 : ↓ 50.6kg BMI 19.8, ↓ FEV₁ 90 %
- Feb 2013 1st isolate *Ps.A* in 2yrs, promixim nebs
- March 2013: 'Chronic' *Ps.A* ↓ FEV₁ 85%
- 51.3kg (BMI 20)

Early post partum (PP) (Aug- Dec 2014)

- Baby boy 3.5kg 27/07/2014
- 3/52 pp: CXR ? Disease progression
- Breast/bottle feeding. 53.2kg (BMI 20.8).
- 7/52 pp: Iv meropenem Pre/Post FEV₁
↓ 68%/63% ; 51/51.2kg

- Widespread bronchiectasis
- Peribronchial consolidation + florid areas of nodular consolidation (RLL)



Jan- Aug 2015 Intensive and Holistic MDT management

Poor response to NTM
treatment

Extended courses of
IV's, oral and nebulised
therapies

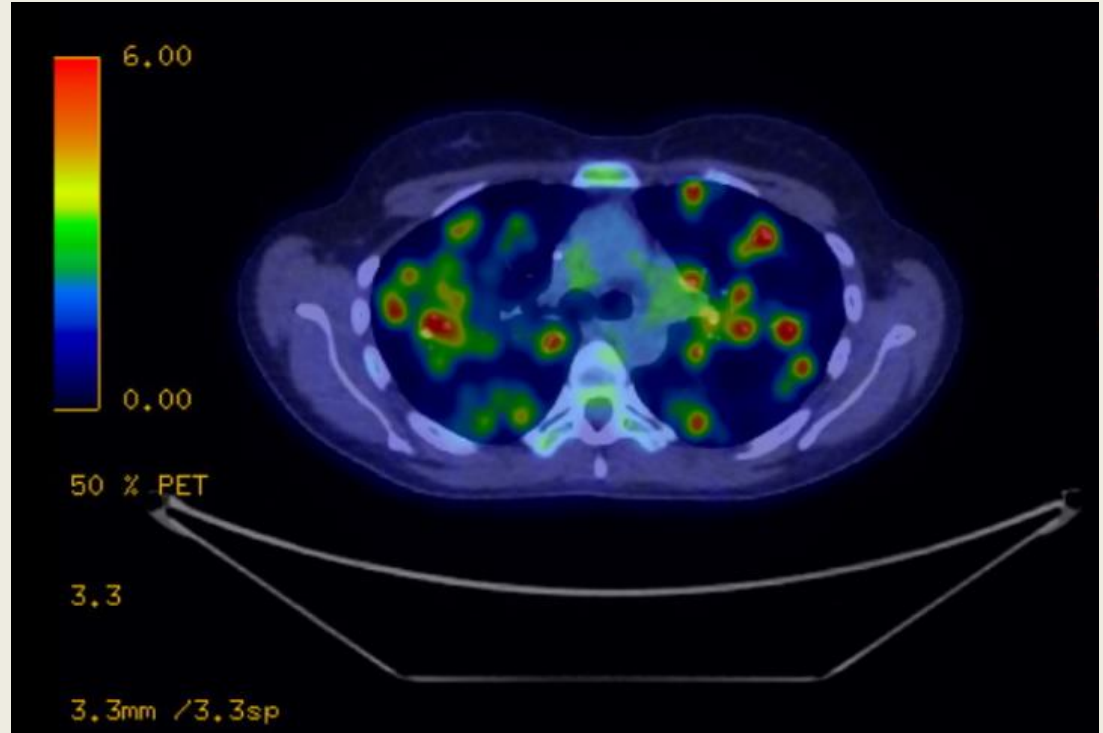
Rapid decline
PFTS (FEV₁ 55%)

- **Nausea**
- **Anorexia**
- **Psycho-social**

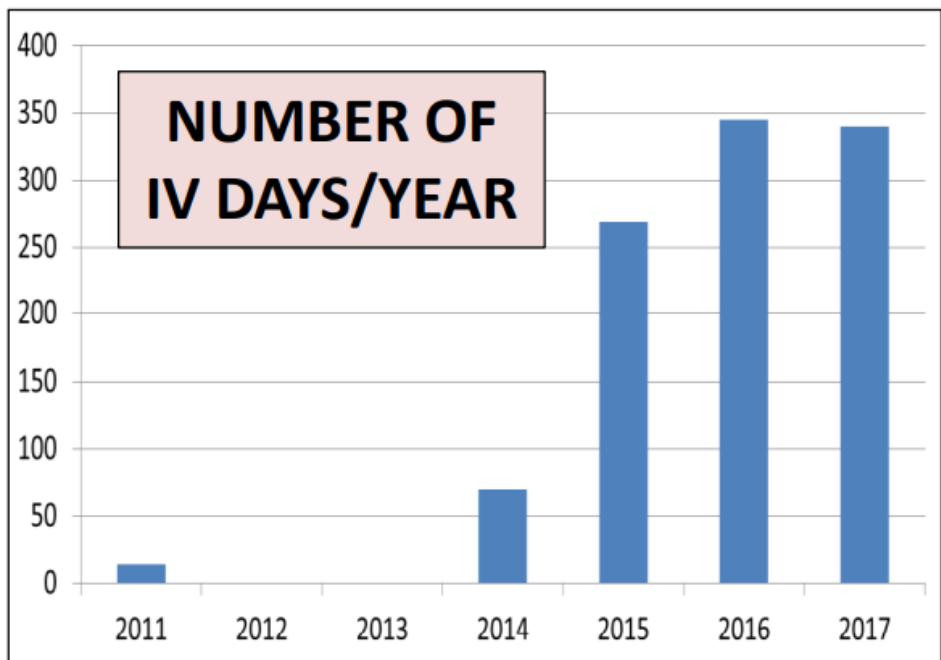
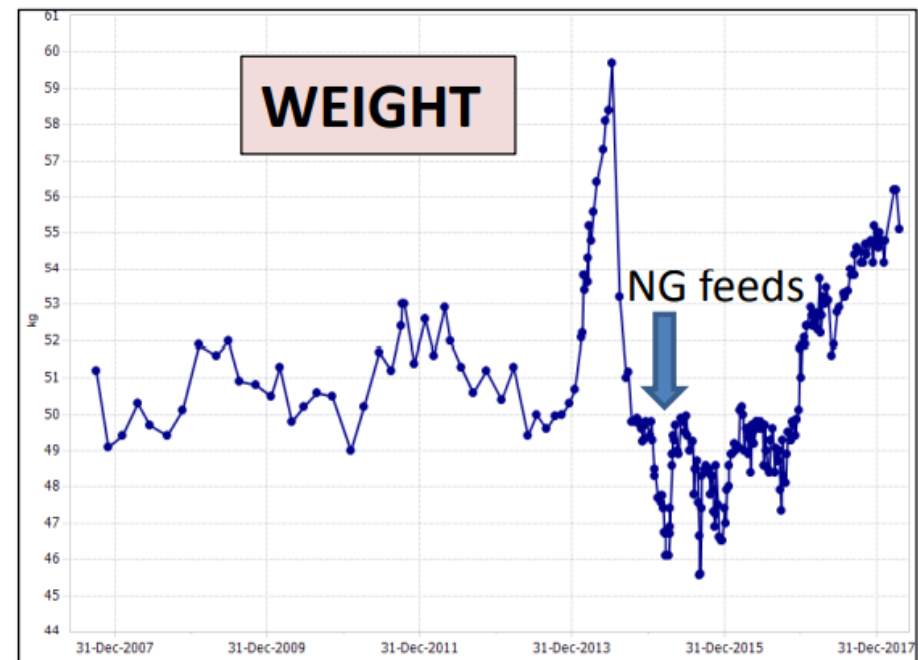
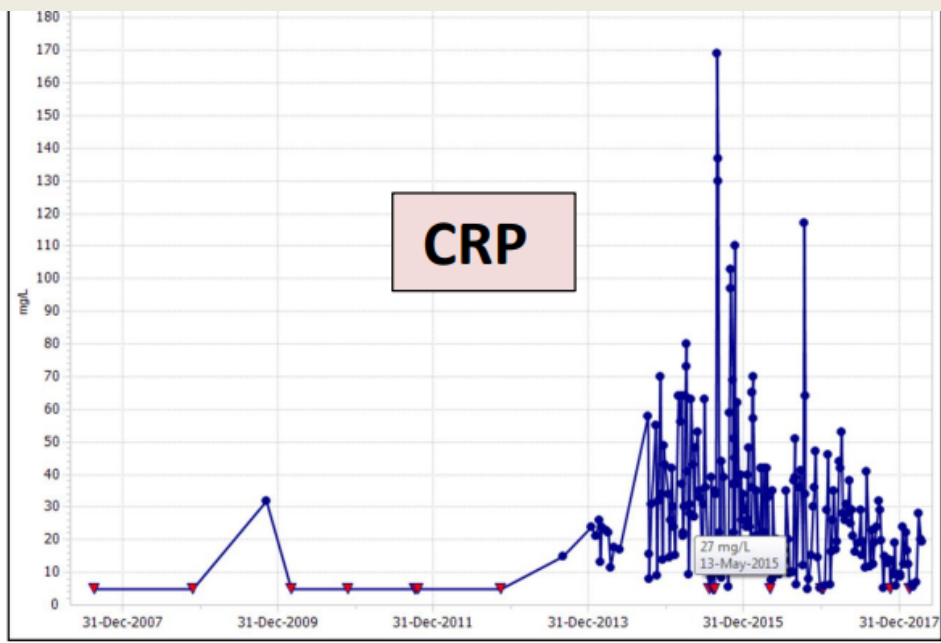
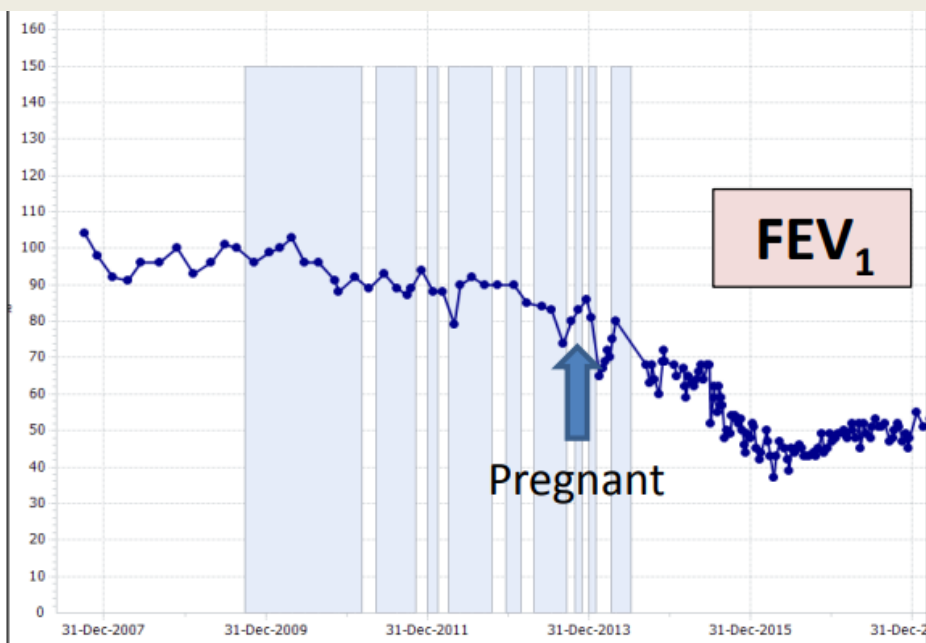
Intensive dietetic
support. Overnight NG
feeding (inpatient)
46.1kg, BMI 18.2

May 2015 PET scan

PET SCAN 13 May 2015

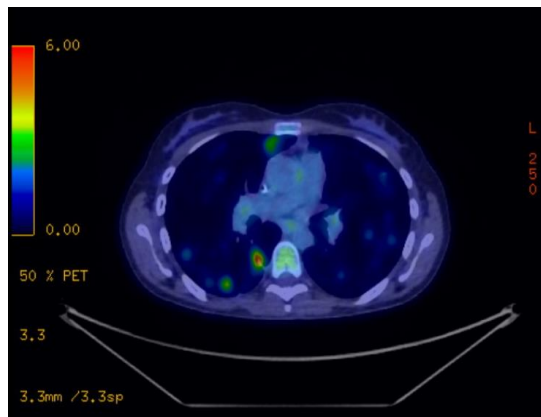


**Marked FDG activity both lungs.
Multinodular consolidation**



Aug 2015-
Sept 2015

- FEV₁ 45%,
- Aug 2015- commenced interferon 3/7
- Sides effects- viral like, nausea, poly pharmacy
- 45.6kg BMI 18, NG feeding (total daily 4500kcal)
- Clinical psychologist input.
- Dry cough, continuous high fevers
- PET scan Sept 2015 (on interferon)

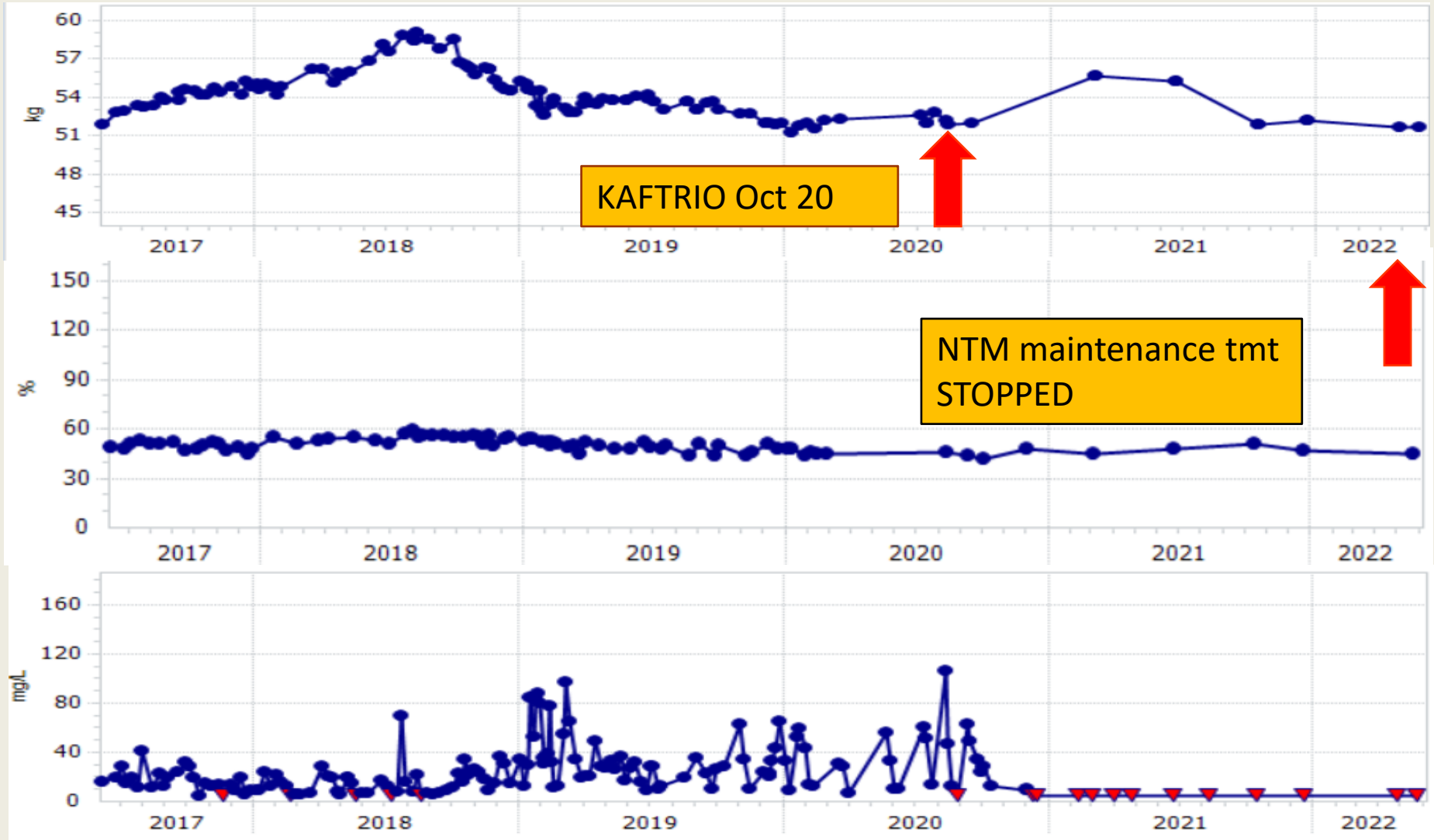


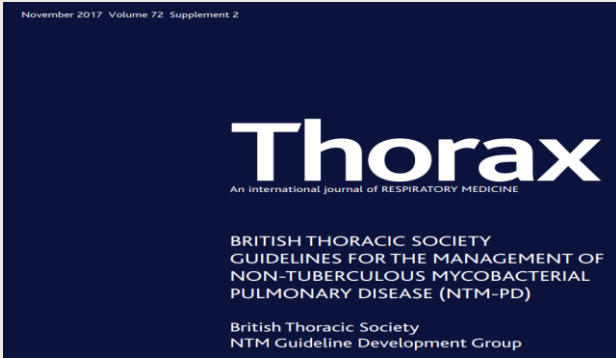
Multifocal consolidation and small airways infection on background chronic CF-related changes, overall improvement.

Sept 2015- Aug 2018

- Long-term IV courses, oral nebulised therapies
- FEV1 37 – 59%
- Wt 46.5kg- 58.4kg (diet and ONS)
- Jan 2017 CF Diabetes- mealtime Novorapid.
- Long term prednisolone
- DEXA Oct 2015 osteopenia (Z -1.8) (FFMI 12.3kg/m²)
- April 2018 Osteoporosis (Z -2.1) (FFMI 13.4kg/m²)
- Vit 25 OH D levels maintained > 75 nmol/l

October 2020 – June 2022

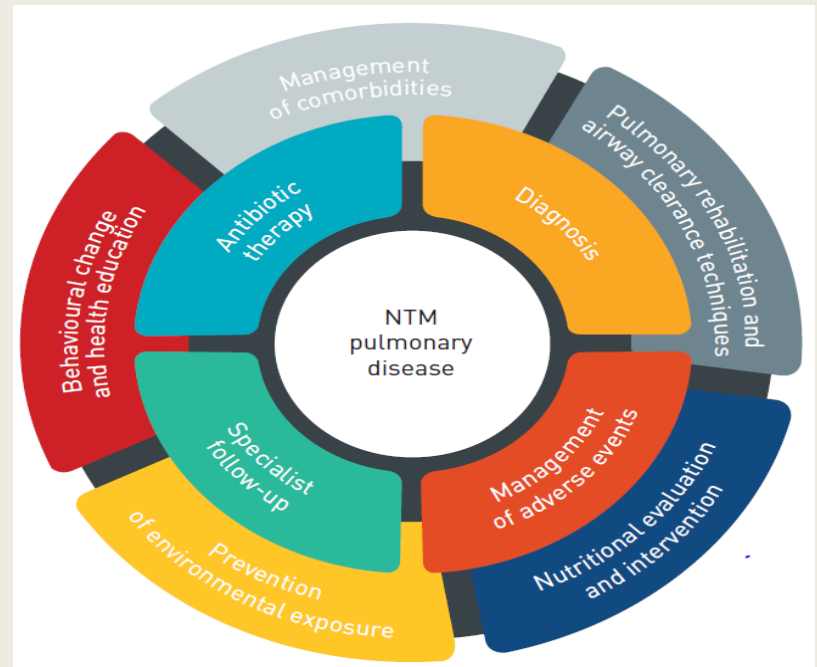




“Nutritional status should be optimised prior to lung resection surgery”

Haworth CS, et al, Thorax 2017 ;
72 Suppl 2

HOLISTIC MANAGEMENT TO INCLUDE NUTRITION



Faverio. P *et al* ERJ Open Res 2021 7: 00574-020.

Lipman. M *et al* Int. J. Infect. Dis. 2021 113S S73-S77

Key Nutritional Considerations

Low BMI and FMI are independent risk factors for NTM-PD in bronchiectasis
(Lim *et al* 2021)

Progression of NTM-PD associated with body composition. (Kim *et al* 2017)

? Modifiable risk factors-
early nutritional support in
pts with low FFM

Key Nutritional Considerations

The presence of NTM-PD in context of CF, may be at higher risk of nutritional decline

Proactive approach to nutritional evaluation and intervention

CFTR modulator therapy and NTM

We still have a lot to learn

Thank You

Questions?



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Cystic Fibrosis

References.

1. Ferreira IM et al. Cochrane Database Syst Rev. 2012;12
2. Lim et al. Medicine (2021) 100:14
3. Kim et al. BMC Pulmonary Medicine (2017) 17:5
4. Ricotta EE,. et al ERJ Open Res 2022; in press
(<https://doi.org/10.1183/23120541.00724-2021>).