IMPACT OF AIRWAY CLEARANCE COMPLIANCE ON PATIENTS ATTENDING THE ONE-STOP BRONCHIECTASIS SPECIALIST OUT-PATIENT CLINIC (SOC)

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Mission Statement

To increase the daily home airway clearance rate of patients at the bronchiectasis clinic from 29 to 50% within 6 months

Team Members

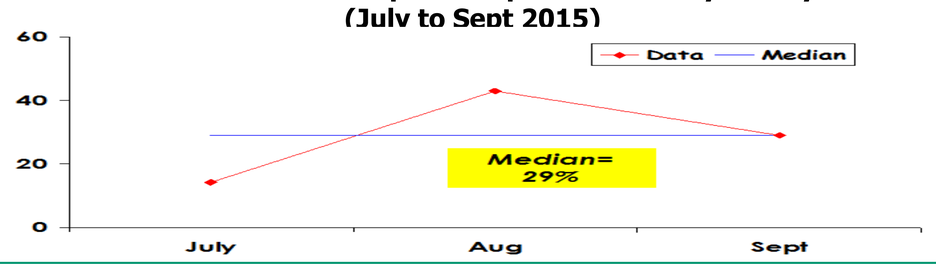
SN	Name	Designation	Department	Role
1	John Abisheganaden	HOD & Senior Consultant	Respiratory & Critical Care Medicine	Sponsor
2	Lim Yick Hou Albert	Senior Consultant	Respiratory & Critical Care Medicine	Leader
3	Jaclyn Tan	Senior Physiotherapist	Physiotherapy	Member
4	Patricia Wong Lee Fong	Nurse Manager	Clinic 4A	Member
5	Quek Poh Seo	Advanced Practice Nurse	Nursing Service	Member
6	Tham Lai Mei	Senior Nurse Clinician	Nursing Service	Member
7	Mindy Tay	Pharmacist	Pharmacy	Member
9	Winnie Tan Lay Chin	Patient Service Associate	Clinic 4A	Member

Evidence for a Problem Worth Solving

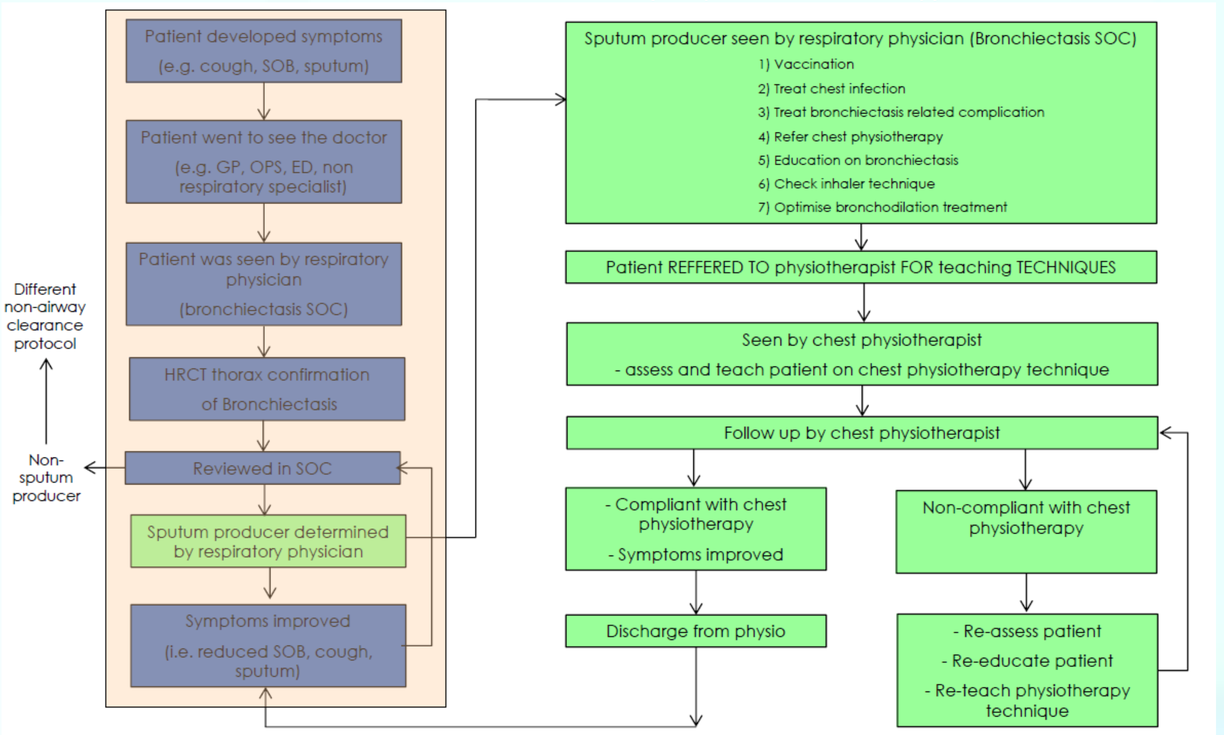
- British Thoracic Society guidelines recommend all patients with bronchiectasis (sputum producers) for daily airway clearance[1]
- Evidence suggests airway clearance improves quality of life, reduces respiratory symptoms and pulmonary exacerbations[2]
- Pulmonary exacerbation is the most important predictor on subsequent exacerbation and death[3,4,5]

Current Performance of a Process

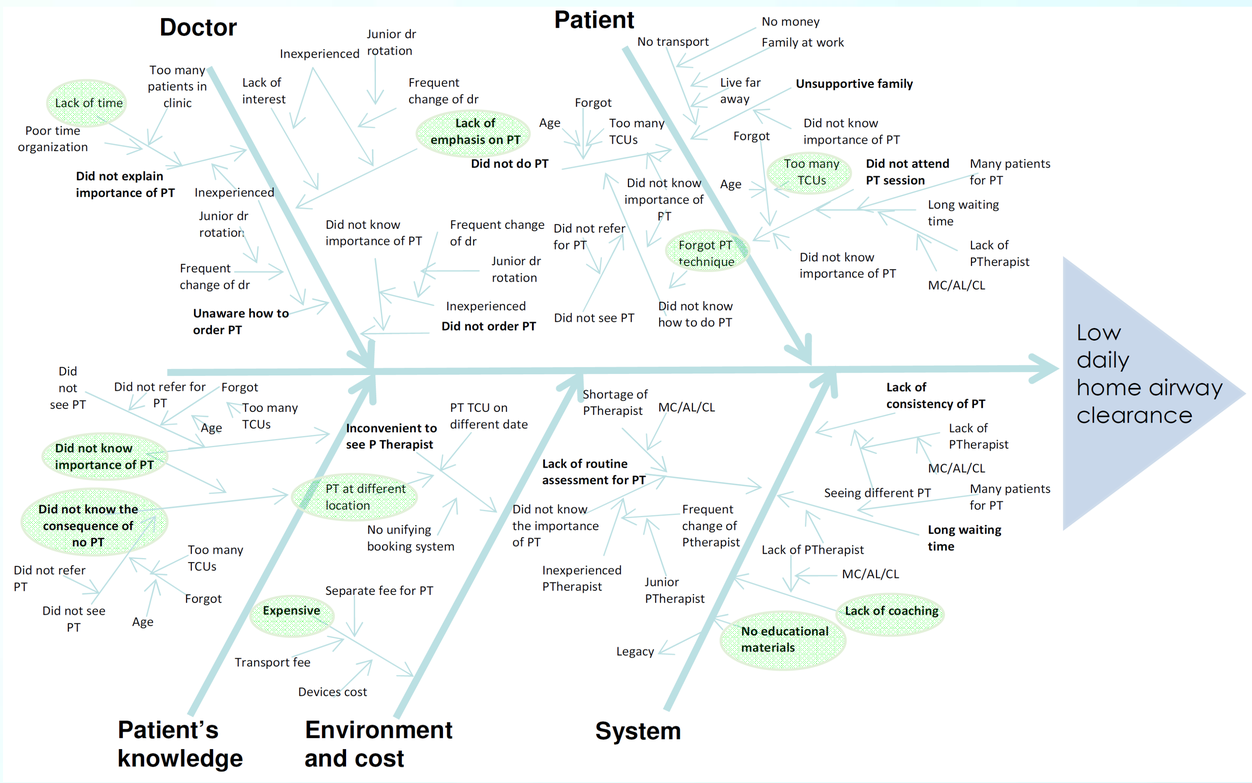
Proportion of the bronchiectasis clinic patients performed daily airway clearance at home (July to Sept 2015)



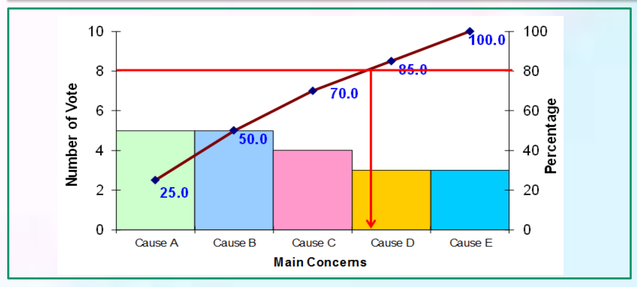
Flow Chart of Process



Cause and Effect Diagram



Pareto Chart



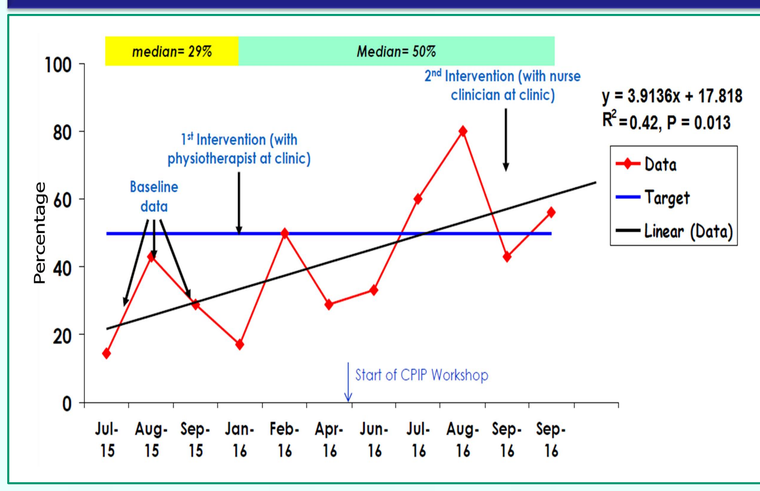
A	Too many clinic appointments
B	Cost
C	Patients lack of knowledge on the importance of physiotherapy
D	Lack of educational materials
E	Lack of emphasis on the importance of physiotherapy by medical staffs

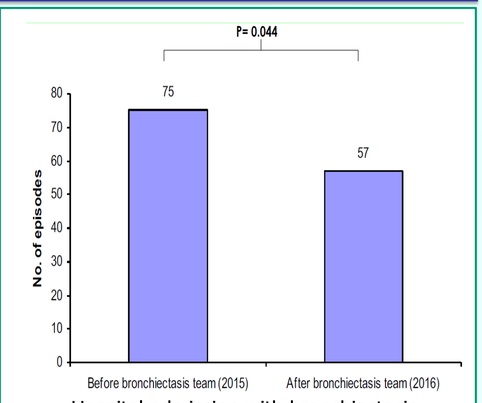
Implementation

A work flow was created by the multidisciplinary team to streamline the treatment plan at the one stop SOC on each Friday afternoon

	1st Intervention	2nd Intervention
Plan	A bronchiectasis physiotherapist was added to provide on-site service at the one-stop SOC.	A nurse was added to provide education on bronchiectasis management, and life style modification at the one-stop SOC on each Friday afternoon.
Do	A dedicated room for bronchiectasis physiotherapist at the one-stop SOC. The work flow was re-evaluated and adjusted accordingly.	Discussion with senior management, re-organization of the existing nursing man power, and allocation of a nurse for the one-stop SOC. The work flow was re-evaluated and adjusted accordingly.
Study	A pilot study to assess compliance on daily airway clearance at home.	A study to asses the impact of compliance of daily airway clearance by education provided by nurse.
Act	Patients' education, screening and referral for bronchiectasis physiotherapist had been intensified.	Nursing input on education for bronchiectasis patients had been intensified.

Results





Hospital admission with bronchiectasis exacerbation (n = 98)

We studied 98 patients. Daily airway clearance at home significantly increased from 29% to 50% (R^2=0.42, p=0.013). Hospitalisation with exacerbation was significantly reduced after attending the one-stop SOC (0.58/person/year *vs.* 0.77/person/year; p=0.04). A 24% reduction in hospitalization was achieved by this new service. The number of patients needed to treat for averting 1 hospital admission was 4 patients (NNT=4).

Cost Savings

- ***Reduction in hospitalisation:*** A 24% of the potential increase in 1 year hospital admissions would be averted if patients in the intervention group follow the same trend as before intervention (75 vs. 57, p=0.04). For this study (n=98), this is equivalent to 18 patients; NNT=4.
- ***Potential bed day saving:*** The median length of stay (LOS) for bronchiectasis is 6 days. A potential of 108 (18x6) bed days would be saved in 1 year if the trend remains unchanged.
- ***Potential costs saving (patients):*** The median bill size for patients admitted with bronchiectasis is SGD1,015 for class C and SGD5,276 for class A wards. The potential cost saving for this study (n=98) is in between SGD18,270 (class C) and SGD94,968 (class A) in 1 year.
- ***Potential costs saving (hospital):*** The daily cost per bed in the hospital is SGD1,114. For this study, 18 patients would be averted from hospital admissions. This is equivalent to SGD120,312.

Problems Encountered

- The complexity of managing patients with bronchiectasis - resolved by a dedicated team approach with specific role of each team member.
- Clinical outcomes improvement - achieved by regular assessment and implementation of appropriate measures without incurring additional resources.

Strategies to Sustain

- Re-design the role of bronchiectasis specialist nurse on management of patients (e.g. Nurse led services)
- Easy access for patients to the bronchiectasis specialist team (e.g. telehealth)

References

1. Pasteur MC, *et al.* Thorax 2010;65:i1-i58
2. Pamela J, *et al.* AJRCCM 2013;188(6):647-656
3. Lim AYH, *et al.* AJRCCM 2014;189:A6251
4. Puah SH, *et al.* AJRCCM 2014;189:A5107
5. Chalmers JD, *et al.* AJRCCM 2014;189(5):576-585