

Dr Tan Geak Poh

Department of Respiratory & Critical Care Medicine (RCCM)

Mission Statement

To improve the percentage of good quality spirometry* from 64% to >80% among the individuals referred to the Respiratory Function Laboratory over a sustained period.

*Acceptable and reproducible spirometry as per 2005 ATS/ERS standards.

^ Includes any outpatient referrals and excludes inpatient cases.

Team Members

	Name	Designation	Department
Team Leader	Dr Tan Geak Poh	Consultant	RCCM
Team Members	Dr Chai Gin Tsen	Consultant	RCCM
	Dr Debra Seow	Senior Resident	RCCM
	Qi Danqing	Principal Technologist (Laboratory Manager)	Respiratory Function Laboratory
	Yusmarita Bte Mohd Yusoff	Senior Technologist	Respiratory Function Laboratory
	Gan Chu Ying	Technologist	Respiratory Function Laboratory
	Nur Diyaningsih	Technician	Respiratory Function Laboratory
	Tay Yian Kwan	Senior Patient Service Associate	Respiratory Function Laboratory
	Ng Yu Shuang	Patient Service Associate	Respiratory Function Laboratory

Sponsor: A/Prof John Arputhan Abisheganaden (Head of Department, Respiratory and Critical Care Medicine)

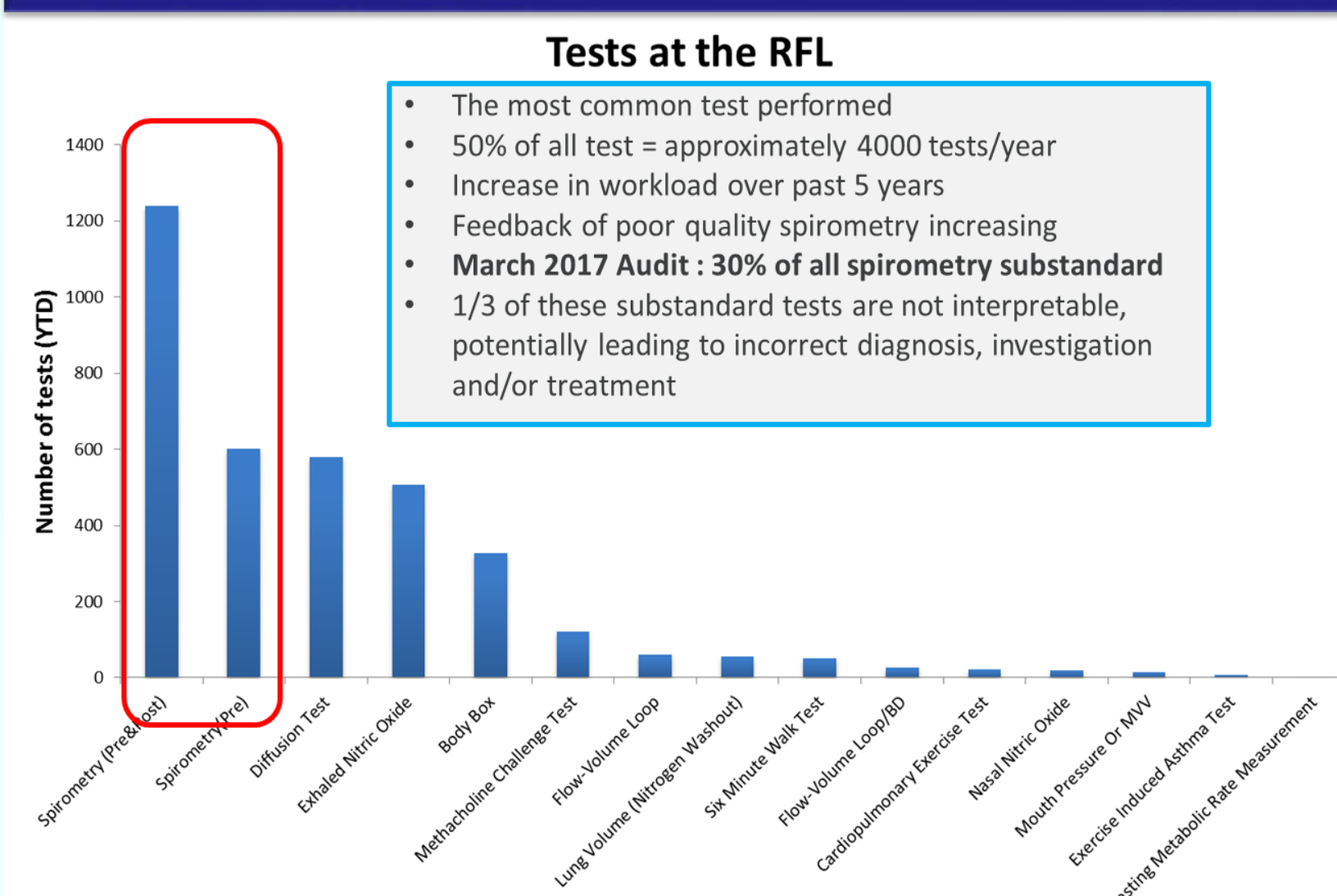
Mentor: Dr William Chan (Senior Consultant, Rehabilitation Medicine)

Evidence for a Problem Worth Solving

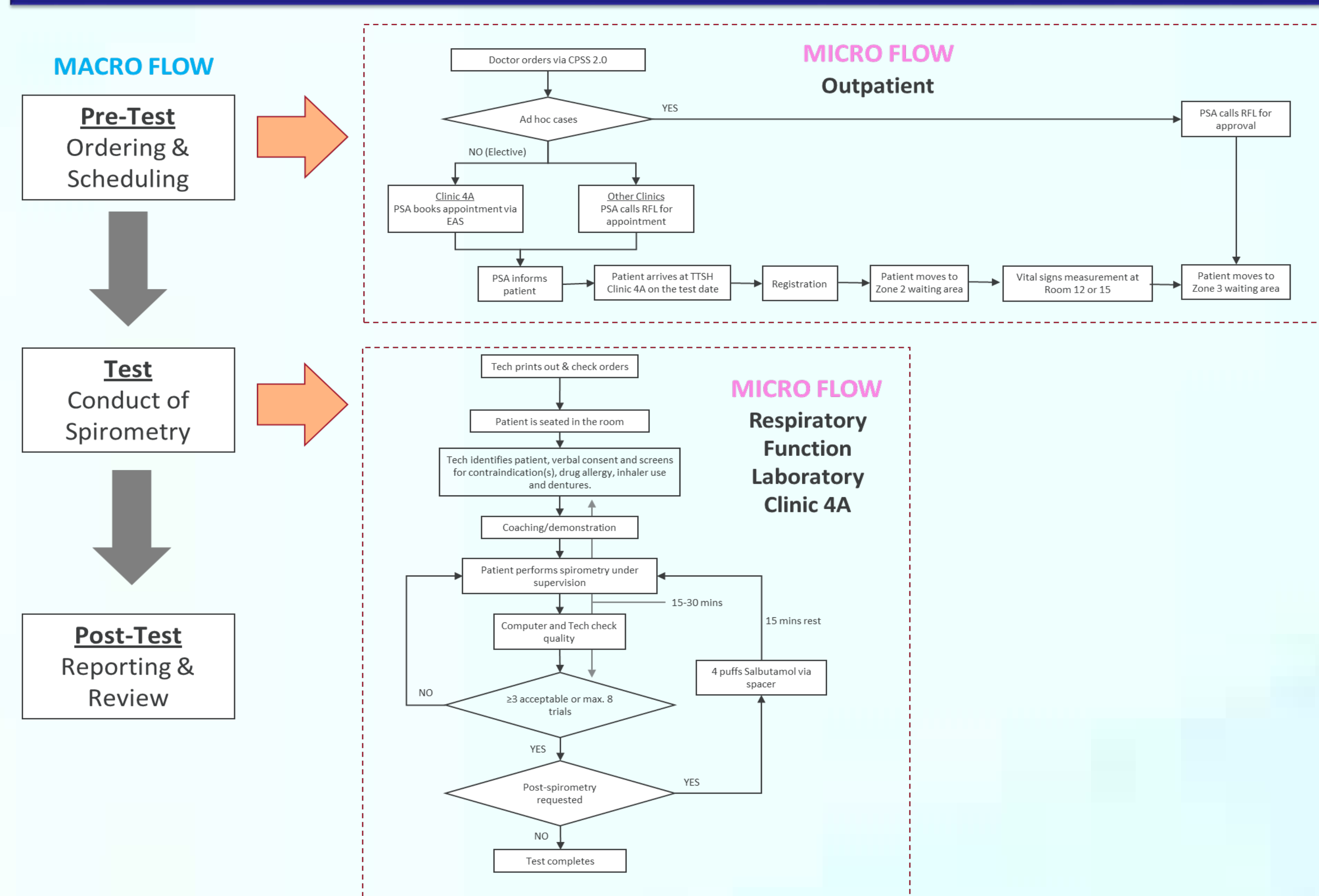
- Forced expiratory test that measures exhaled lung volumes and flow rates
- Utility
 - Essential for the diagnosis of airway diseases e.g. COPD, asthma
 - Assessment of ventilatory reserve
 - Monitoring of treatment response
- Effort dependent tests
- Good quality tests requires good patient understanding and effort

Spirometry is considered of suboptimal quality if it does not meet any of the ATS acceptability criteria

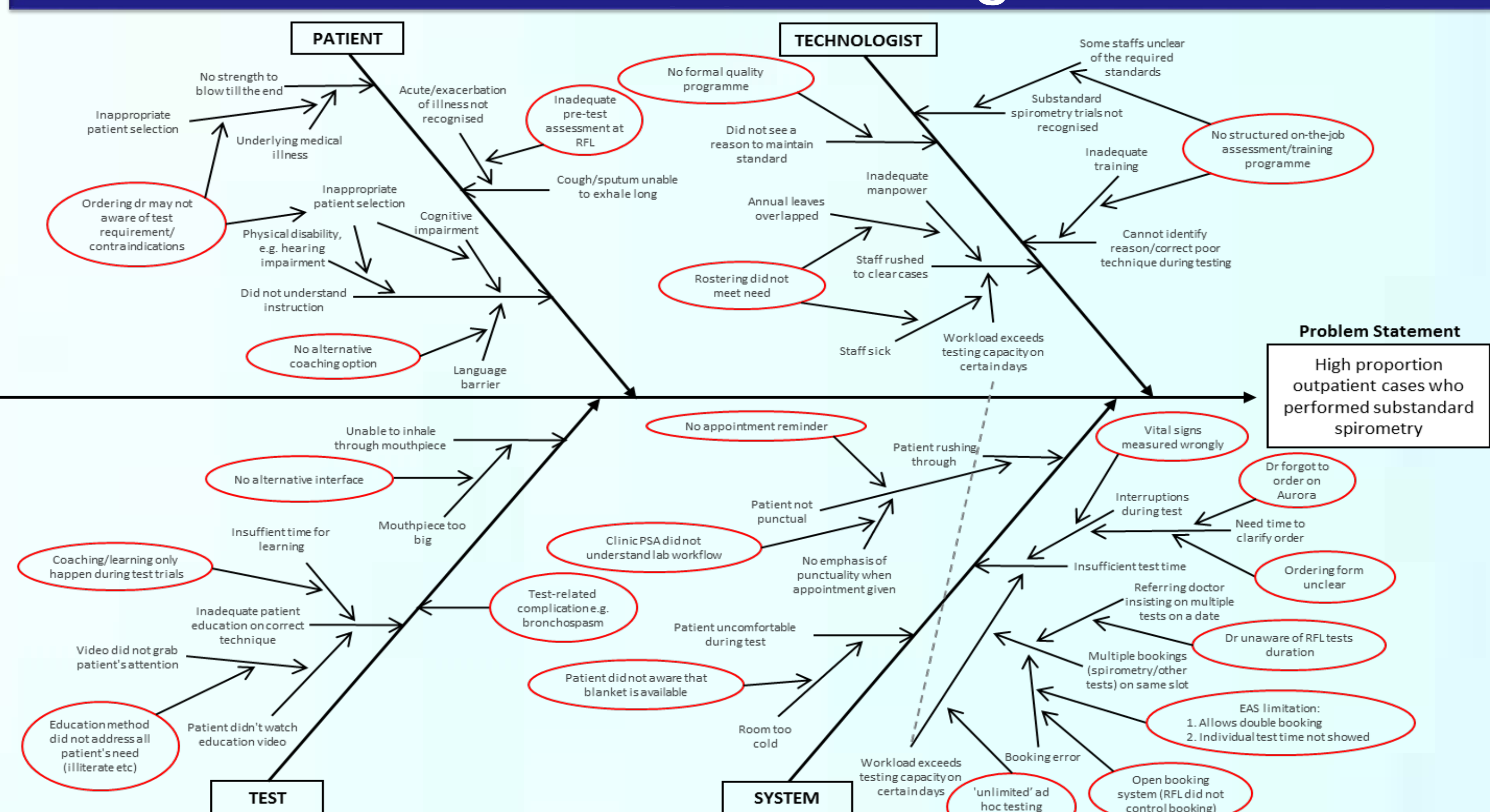
Current Performance of a Process



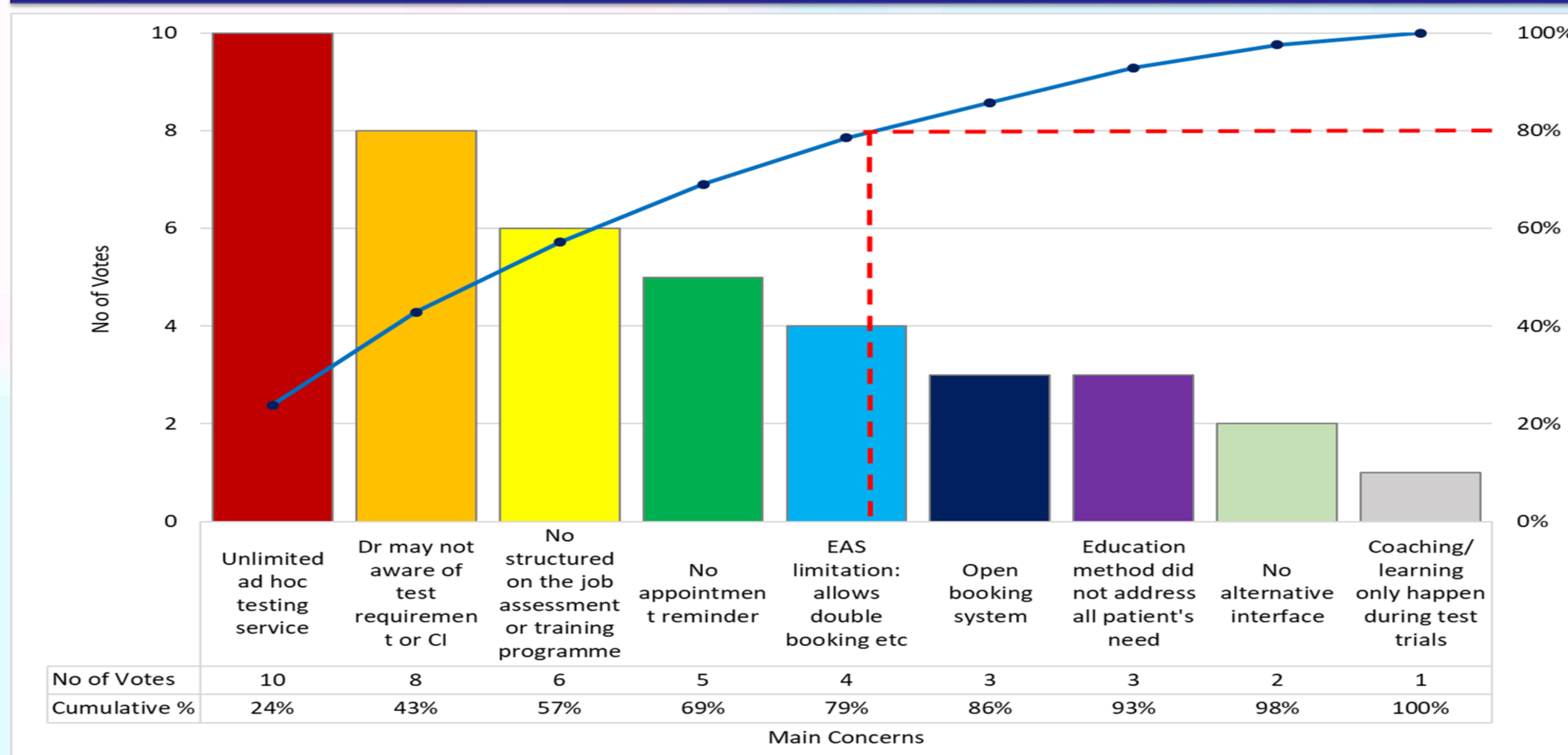
Flow Chart of Process



Cause and Effect Diagram



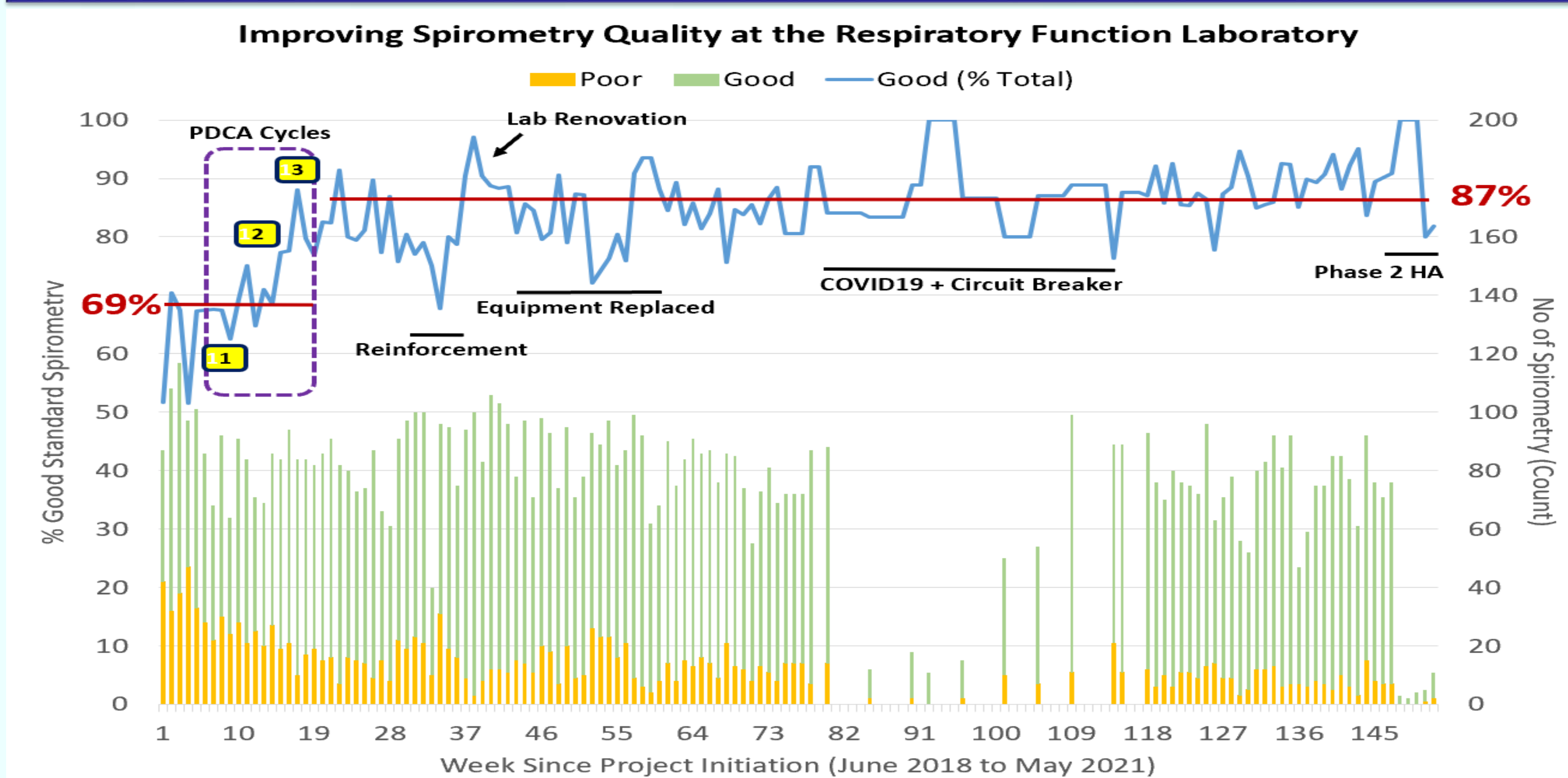
Pareto Chart



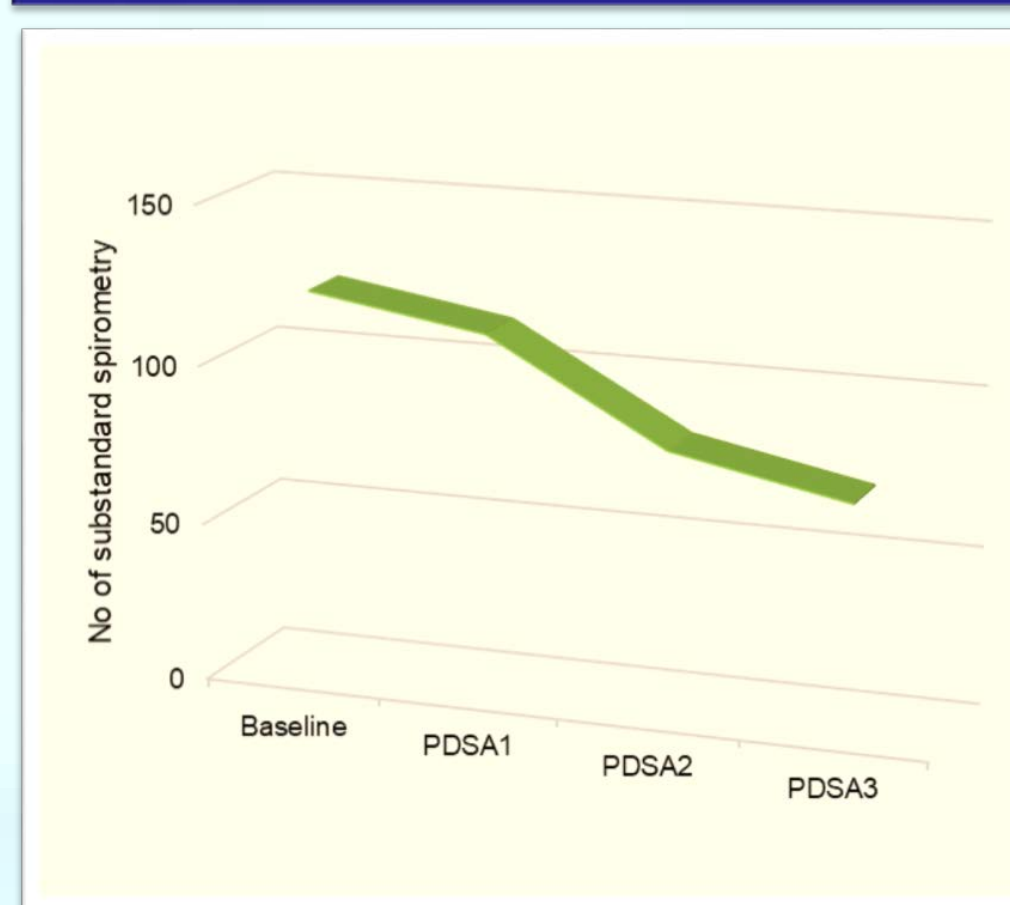
Implementation

CAUSE / PROBLEM (refer to Pareto Chart)	INTERVENTION	DATE OF IMPLEMENTATION
Too many ad hoc referrals for lung function tests	1. Limiting the ad hoc referral access: Senior residents only maximum 1 ad hoc test/day, additional to clear with RFL lead 2. Department sharing of workflow change and share the RFL workload and issues with spirometry quality 3. Block 1 hour lunch break on the EAS system	1. 5-9-2018 2. 13-9-2018 3. 20-9-2018
No appointment reminder	Automated SMS/letter reminder	5-10-2018
No structured on the job/training programme	Visual reminder of ATS/ERS criteria	16-10-2018

Results



Cost Savings



- Cost of a suboptimal spirometry:
 - Spirometry = SGD 84.28
 - Additional tests, inappropriate imaging and treatment = SGD 156
- Avoided 122 - 44 = 78 substandard spirometry
- Monthly avoided cost = SGD 18,742
- Annualised cost avoidance = **SGD 224,904**

Lessons Learnt

- A good team matters
- Important to understand what's happening at the 'ground level' and need of the relevant stakeholders
- Plan data collection carefully to avoid wasting time collecting useless data
- Good quality test takes time; strike a balance between productivity versus quality.
- Realise that the 'usual way we do things' may not be the best way
- Need to re-model our service in accordance to a change in clinical need and workload
- Hardest part is to change mindset: Need to reason, find common goals and show results to effect change.
- Interventions that involves behavioural change may not sustain without regular reinforcement

Strategies to Sustain

- Continue to monitor performance regularly
- Display in the laboratory notice board
- Share at roll call and unit meeting to reinforce the interventions
- Aim to publish our findings/results in a respiratory journal for spread