

## **Project Title**

Nurse Initiated Bronchodilator Therapy At Woodlands Polyclinic

## **Project Lead and Members**

**Project lead:** Dr Kung Jian Ming, Family Physician, Associate Consultant, Woodlands Polyclinic, NHGP

**Project Co-lead:** Jia Shuli, Nurse Manager, Woodlands Polyclinic, NHGP

### **Project members:**

- Wendy Ong, Nurse Manager, Woodlands Polyclinic, NHGP
- Dr Goh Kar Cheng, Family Physician, Associate Consultant, Woodlands Polyclinic, NHGP
- Dr Neesha Maganlal, Senior Family Physician, Woodlands Polyclinic, NHGP
- Dr Tan En Yu, Senior Family Physician, Woodlands Polyclinic, NHGP
- Noratikah Baharuddin, Senior Staff Nurse, Woodlands Polyclinic, NHGP
- Constant Saleena, Senior Staff Nurse, Woodlands Polyclinic, NHGP
- Noor Hariyanti, Senior Staff Nurse, Woodlands Polyclinic, NHGP
- Li Ming, Senior Staff Nurse, Woodlands Polyclinic, NHGP
- Kang Yimin, Senior Staff Nurse, Woodlands Polyclinic, NHGP

**Project Facilitator:** Dr Tang Wern Ee, Family Physician, Senior Consultant, NHGP

**Project Sponsor:** Dr Evan Sim, Family Physician, Principal Staff, NHGP

## **Organisation(s) Involved**

National Healthcare Group Polyclinics

## **Project Period**

Start date: May 2018

Completed date: Oct 2018

## **Aims**

The primary aim was to reduce time to emergency bronchodilator nebulization for breathless patients with mild to moderate exacerbation of Asthma or COPD seen at Woodlands Polyclinic from baseline of 23 minutes to less than 10 minutes over 6 months.

## **Background**

Woodlands Polyclinic sees approximately 6900 patient visits for Asthma and 1200 patient visits for Chronic Obstructive Pulmonary Disease (COPD) per year. Approximately 20-50 of these patient visits per month would be for acute exacerbation of disease, where the patient would require emergency bronchodilator nebulization. During an exacerbation, patients would require to wait for a doctor to attend to them before receiving their emergency treatment nebulization.

Our baseline mean time to nebulization (time from initial nursing triage to time of emergency nebulization administration) at Woodlands Polyclinic was 23 minutes. During this crucial time window, patients are at risk of deteriorating and becoming hypoxic.

## **Methods**

We formed a multi-disciplinary care team including 4 Family Physicians, 2 Nurse Managers and 5 treatment room Senior Staff Nurses. Through our Root Cause Analysis and Pareto voting and we identified that patients had to move through multiple contact points in the care process before receiving their nebulization treatment. Doctors also had to physically e-order the bronchodilator treatment before nurses could administer the medication.

A literature review showed that Nurse Initiated bronchodilator therapy could be safely and effectively done to reduce time to nebulization in the emergency department setting.

Woodlands Polyclinic piloted a structured NIBT training Programme from May 2018 to August 2018 to train treatment room nurses to follow a clinical protocol to:

- i. Perform clinical assessment (including lung auscultation) for patients presenting with shortness of breath/ wheeze/ cough to the triage room.
- ii. Appropriately identify if a patient has an acute exacerbation of asthma/ COPD and assess severity of exacerbation.
- iii. Initiate bronchodilator therapy when indicated before doctor's consultation.

The NIBT training Programme included a pre-clinical phase with classroom-based teaching and scenario-based MCQ assessments and a clinical phase with formative and summative assessments.

## Results

1. Time to nebulization reduced from mean of 23 minutes to 9 minutes.
2. An audit post roll-out showed all patients triaged and treated by NIBT trained nurses were managed appropriately.
3. A survey conducted amongst the NIBT trained nurses post roll-out showed they were confident in their knowledge and skills with NIBT after the completion of the training programme.
4. A survey showed that doctors were confident in the knowledge and skills of the NIBT trained nurses after their training.
5. A survey showed that patients who received NIBT under the new workflow were satisfied with the experience and treatment given by the nurses.
6. Doctors consultation time with patients with acute Asthma or COPD reduced by 26% from 13 minutes to 9.5 minutes. This translates to estimated projected cost savings of \$1790 for the Polyclinic per year.

## Lessons Learnt

With a robust training program, nurses can be trained to assess and treat selected patients with Asthma or COPD in the primary care setting with emergency nebulization prior to doctor's consultation.

## **Conclusion**

Nurse Initiated Bronchodilator Therapy effectively reduced time to nebulization for patients with acute Asthma and COPD in the primary care setting.

## **Project Category**

Care Redesign, Clinical Improvement, Workflow Redesign

## **Keywords**

Care Redesign, Clinical Improvement, Workflow Redesign, Primary Care, Safe Care, Healthcare Training & Education, Quality Improvement Tool, Pareto Chart, Root Cause Analysis, Waiting Time, Cost Savings, Pulmonology, Medical Services, Nursing, National Healthcare Group Polyclinics, Emergency Nebulization, Nurse Initiated Bronchodilator Therapy, Asthma, Chronic Obstructive Pulmonary Disease

## **Name and Email of Project Contact Person(s)**

Name: Kung Jian Ming

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## Mission Statement

To reduce time to nebulization for breathless patients with mild to moderate exacerbation of Asthma or Chronic Obstructive Pulmonary Disease (COPD) at Woodlands Polyclinic from 23 mins to less than 10 minutes over a 6 month period.

## Team Members

	Name	Designation	Department
Team Leader	Dr Kung Jian Ming	Family Physician, Associate Consultant	Medical
	Jia Shuli	Nurse Manager	Nursing
Team Members	Wendy Ong	Senior Nurse Manager	Nursing
	Dr Neesha d/o Maganlal	Senior Family Physician	Medical
	Dr Tan En Yu	Senior Family Physician	Medical
	Dr Goh Kar Cheng	Family Physician, Associate Consultant	Medical
Sponsor	Dr Evan Sim	Family Physician, Principal Staff	Medical
Facilitators	Dr Tang Wern Ee	Family Physician, Senior Consultant	Medical

## Evidence for a Problem Worth Solving

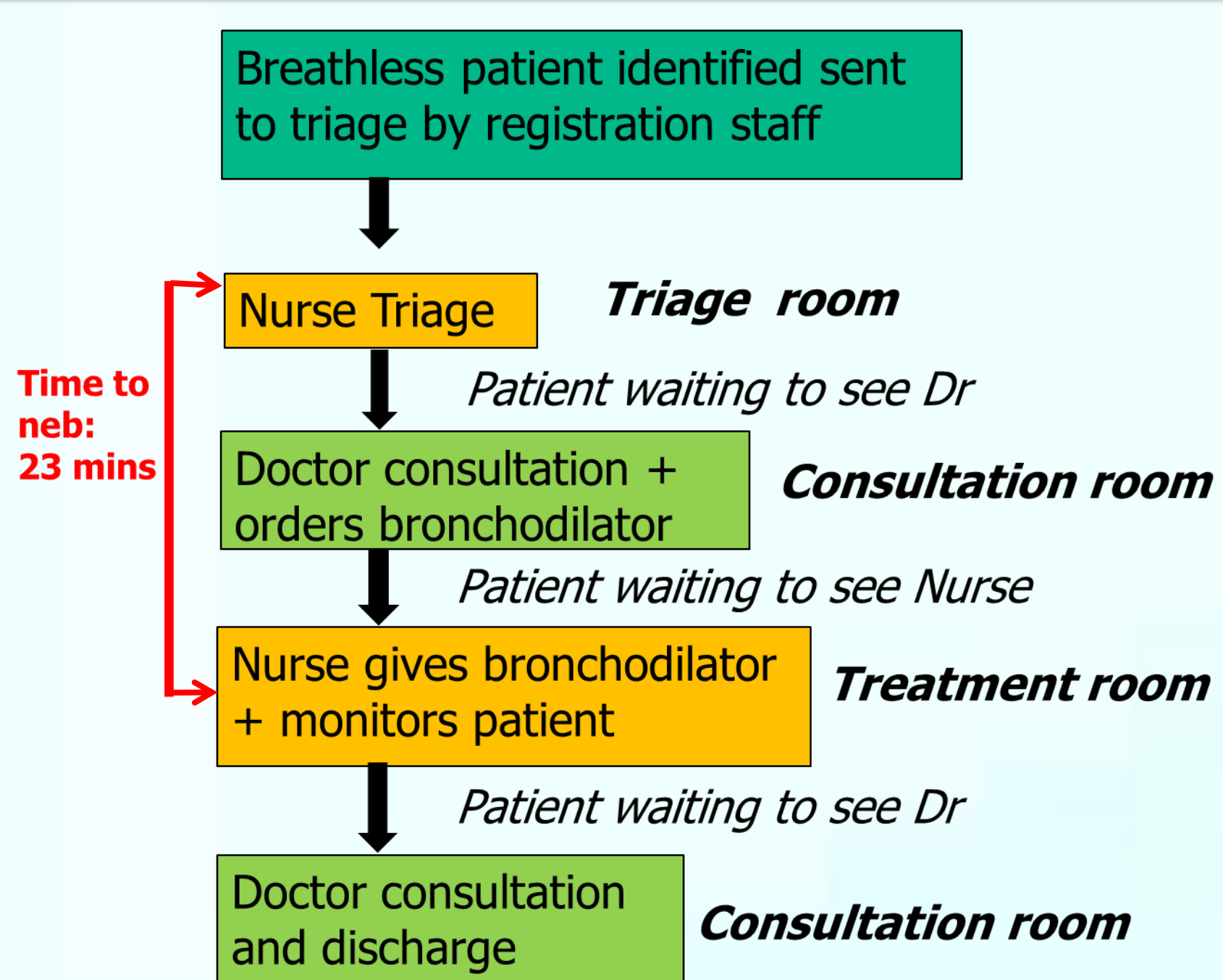
Woodlands Polyclinic sees approximately 6900 patient visits for Asthma and 1200 patient visits for Chronic Obstructive Pulmonary Disease (COPD) per year. Approximately 20-50 of these patient visits per month would be for acute exacerbation of disease, where the patient would require emergency bronchodilator nebulization. During an exacerbation, patients would require to wait for a doctor to attend to them before receiving their emergency treatment nebulization.

Breathless patients attending Woodlands Polyclinic with an exacerbation of Asthma or COPD experience waiting time before emergency bronchodilator nebulization. During this crucial time window, they may potentially deteriorate. The baseline time from initial nursing triage to time of bronchodilator administration (time to nebulization) was 23 minutes.

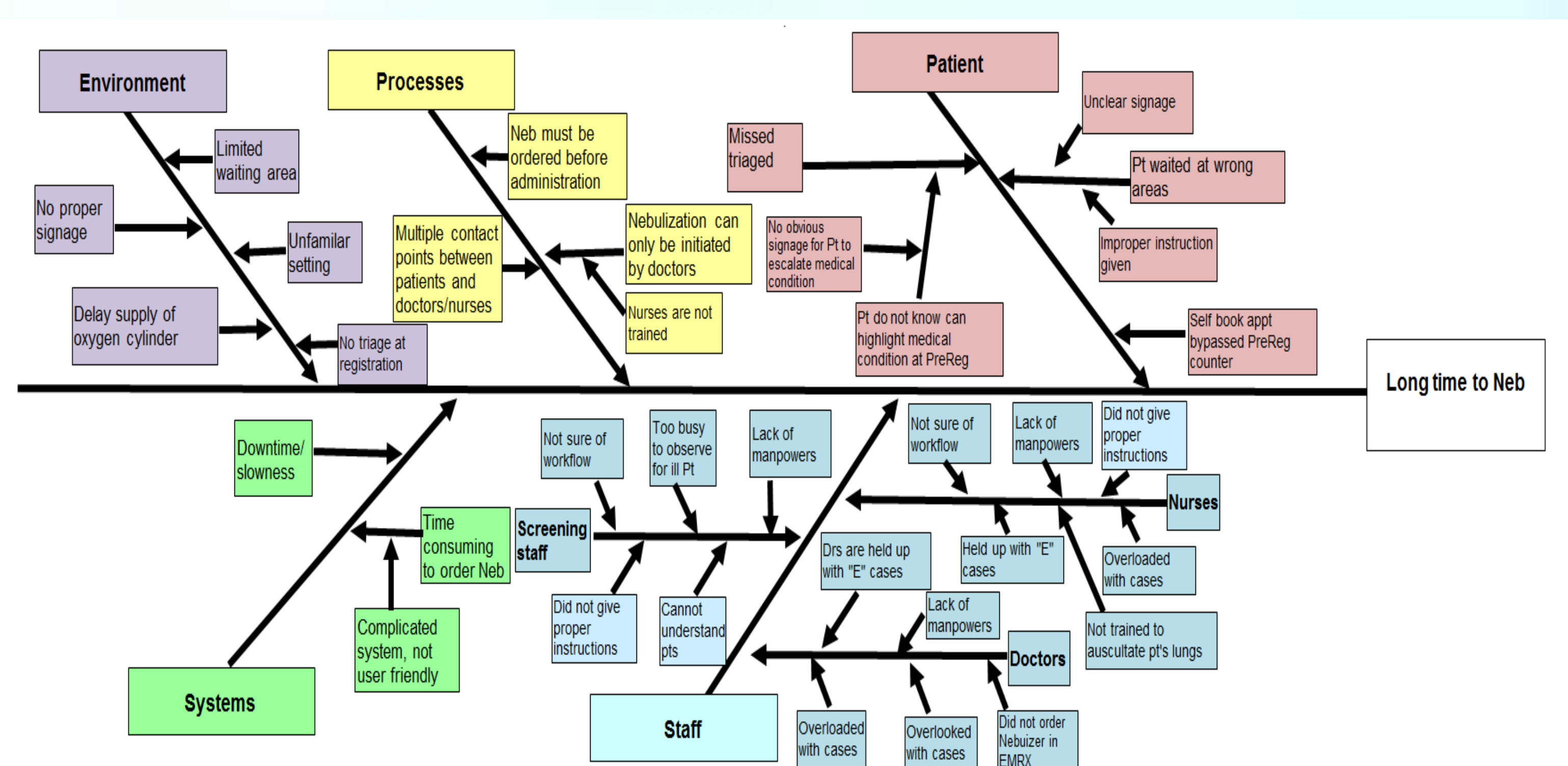
## Current Performance of a Process

Patients with acute Asthma or COPD exacerbation had to move through multiple contact points in the care process before receiving nebulization. Doctors had to order nebulization treatment before nurses could administer the medication. While nurses are trained to do a triage, they are not empowered to initiate treatment for patients with Asthma or COPD exacerbation.

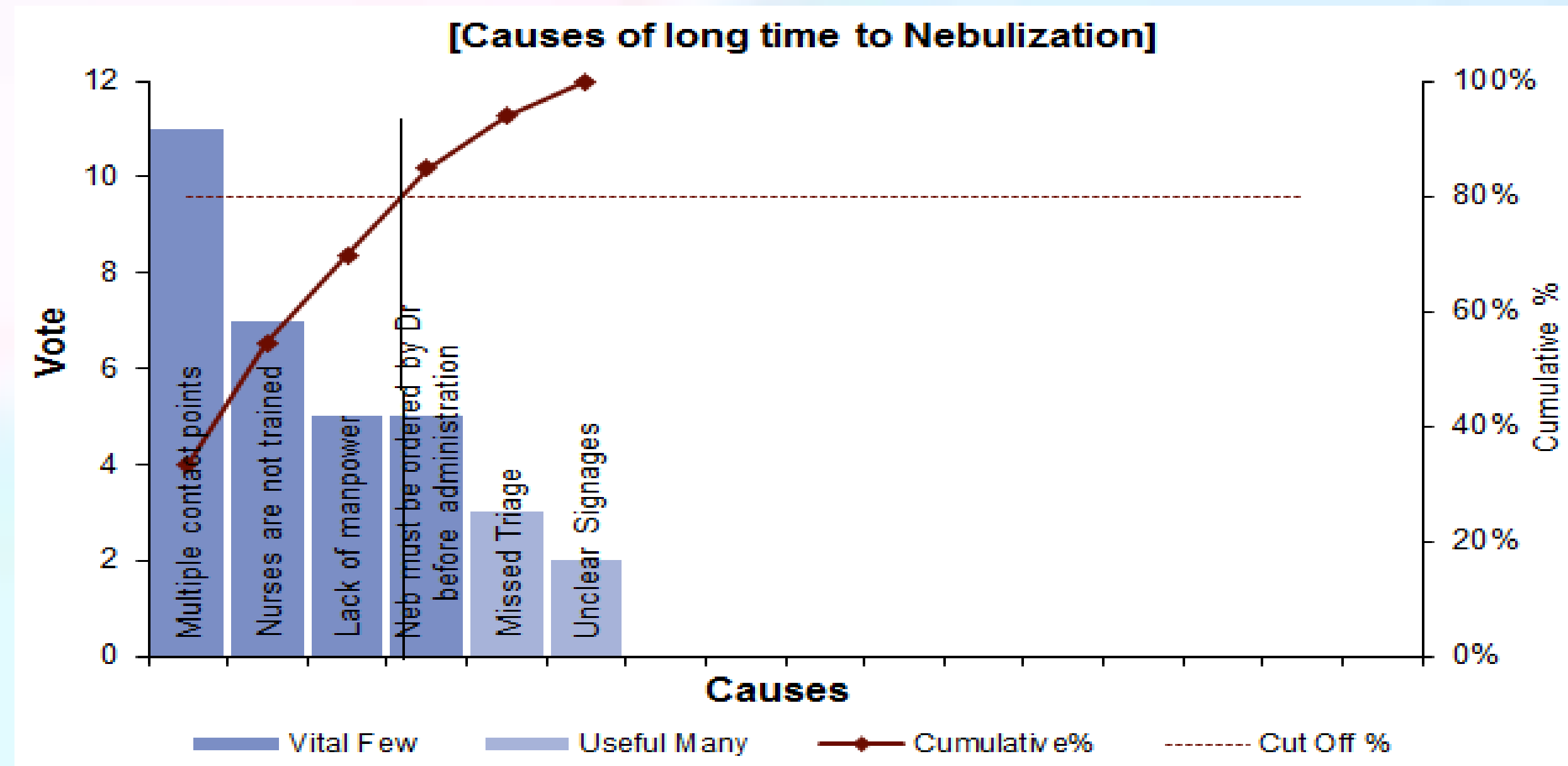
## Flow Chart of Process



## Cause and Effect Diagram



## Pareto Chart



## Implementation

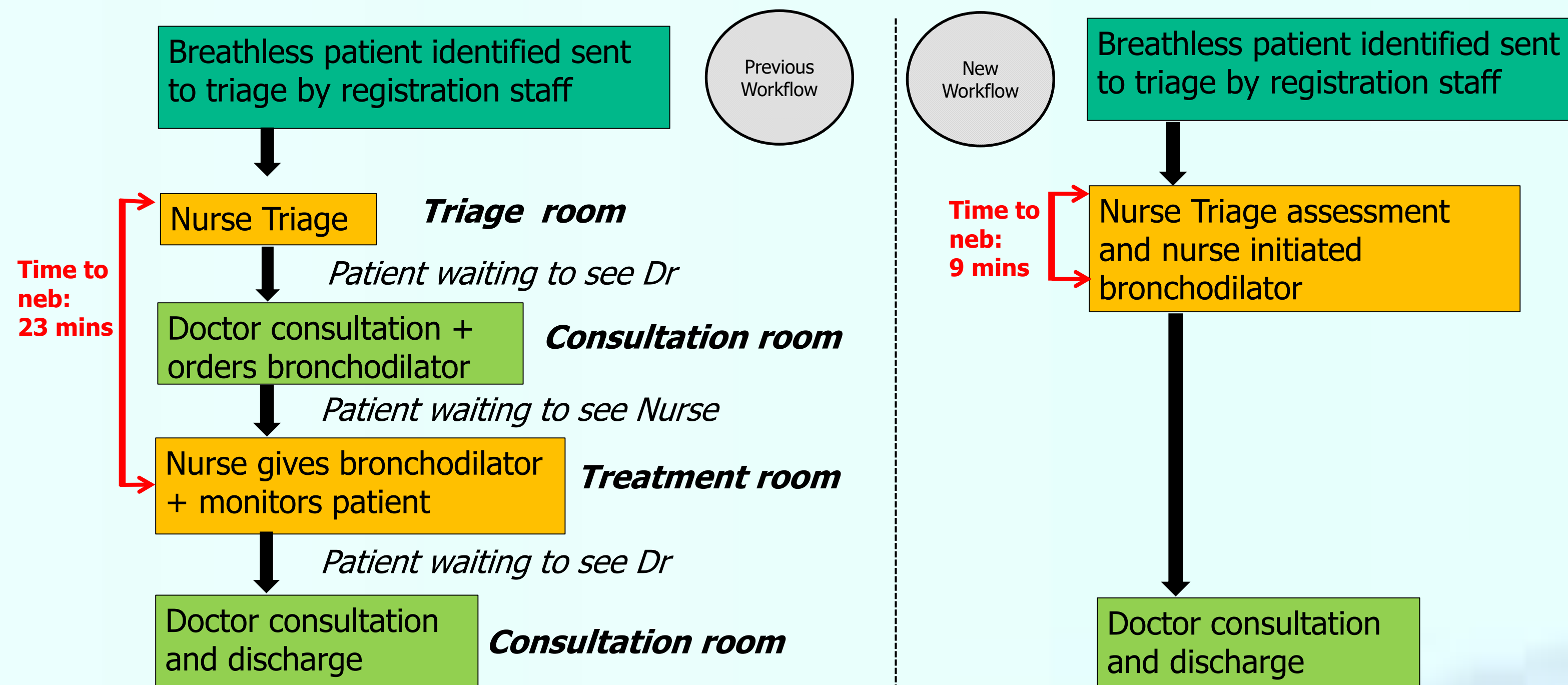
Five nurses who had undergone advanced diploma in nursing in critical care & medical-surgical care were selected to undergo NIBT training at Woodlands Polyclinic. A structured NIBT training programme was piloted to equip the nurses with the necessary skills to:

- Clinically assess (including lung auscultation) a patient presenting with shortness of breath/ wheeze/ cough
- Appropriately identify if a patient has an acute exacerbation of asthma/ COPD and assess severity
- Initiate bronchodilator therapy when indicated

This training included one month of pre-clinical training and four months of clinical training including summative and formative assessments.

## Results

1. Time to nebulization was reduced from 23 minutes to 9 minutes.



2. An audit post roll-out showed all patients triaged and treated by NIBT trained nurses were managed appropriately.

3. A survey conducted amongst the NIBT trained nurses post roll-out showed they were confident in their knowledge and skills with NIBT after the completion of the training programme.

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5. A survey showed that patients who received NIBT under the new workflow were satisfied with the experience and treatment given by the nurses.

## Cost Savings

Estimated projected cost savings for the Polyclinic is \$1790 per year. Projected estimated cost savings for 6 NHGP Polyclinics would be \$10740 per year.

## Strategies to Sustain

A two yearly competency assessment for NIBT-trained nurses will be conducted. More nurses will be trained and NIBT workflow will be spread to all other NHGP Polyclinics.