

Project Title

Improving Door-To Balloon Time Of Patients Presenting To NTFGH Emergency Department
With ST-Elevation Myocardial Infarction (STEMI)

Project Lead and Members

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Organisation(s) Involved

Ng Teng Fong General Hospital

Healthcare Family Group Involved in this Project

Medical, Nursing

Applicable Specialty or Discipline

Emergency Medicine, Cardiology

Project Period

Start date: 2018

Completed date: 2019

Aims

To increase the proportion of STEMI patients with a door to balloon time of 90 minutes or
less from 67.6% in 2018 to 90% in 2019.

Background

See poster appended / below

Methods

See poster appended / below

Results

See poster appended / below

Lessons Learnt

It takes the entire hospital/system, and the efforts of multidisciplinary teamwork in order to make a meaningful change for the patients. To achieve that, there needs to be clear problem definitions, open communication and mutual respect among the peers.

Conclusion

See poster appended / below

Project Category

Care & Process Redesign, Quality Improvement, Value Based Care, Safe Care

Keywords

Door-to-Balloon Time, ST-Elevation Myocardial Infarction, Percutaneous Coronary Intervention, Balloon Angioplasty

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IMPROVING DOOR-TO-BALLOON TIME OF PATIENTS PRESENTING TO NTFGH EMERGENCY DEPARTMENT WITH ST-ELEVATION MYOCARDIAL INFARCTION (STEMI)

MEMBERS: DR SAURABH RASTOGI, ASST PROF PIPIN KOJODJOD, DR WILLIAM KRISTANTO, DR KUA JIELI, DR TAM HOWEN, MS JEMEELA BEEVI, MS JOANNE YEO, MS TEO EI LEEN, MS ANG CHIN CHIN, MS YIN HONG, MS GAN HIONG HIONG, MR ASH ANG SOON HOCK

- SAFETY
- PRODUCTIVITY
- PATIENT EXPERIENCE
- QUALITY
- VALUE

Define Problem/Set Aim

Opportunity for Improvement

- Door-to-balloon (DTB) time measures how long it takes before a heart attack/STEMI patient to receive percutaneous coronary intervention (PCI) or balloon angioplasty upon entering the door of the hospital.
- The international standards developed by the American College of Cardiology and the American Heart Association states that hospital should achieve a DTB time of 90 minutes or less.
- In 2018, only 67.6% of patients presented to NTFGH Emergency Department (ED) with STEMI had a DTB time of 90 minutes or less. This is below the national average of 94.3% reported by National Data Registry Office, Singapore, in 2016.

Aim

The multidisciplinary team comprising members from NTFGH Cardiology and Emergency Medicine Department aims to increase the proportion of STEMI patients with a DTB time of 90 minutes or less from 67.6% in 2018 to 90% in 2019.

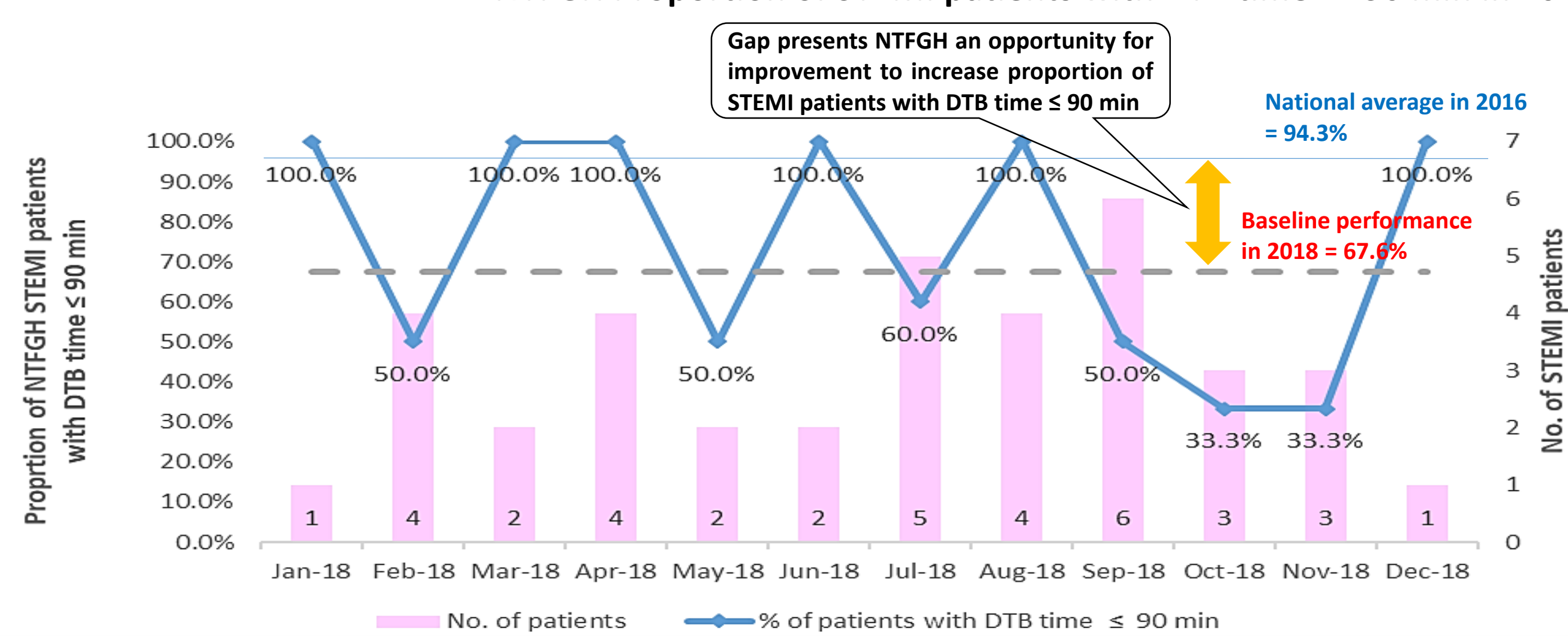
Establish Measures

Measures

1. Proportion of NTFGH STEMI patients with DTB time \leq 90 min = $\frac{\text{No. of NTFGH STEMI patients with DTB time } \leq 90 \text{ min}}{\text{No. of NTFGH STEMI patients}} \times 100\%$
2. Door-to-Balloon (DTB) Time = Time patient receives PCI – Time patient arrives at the hospital

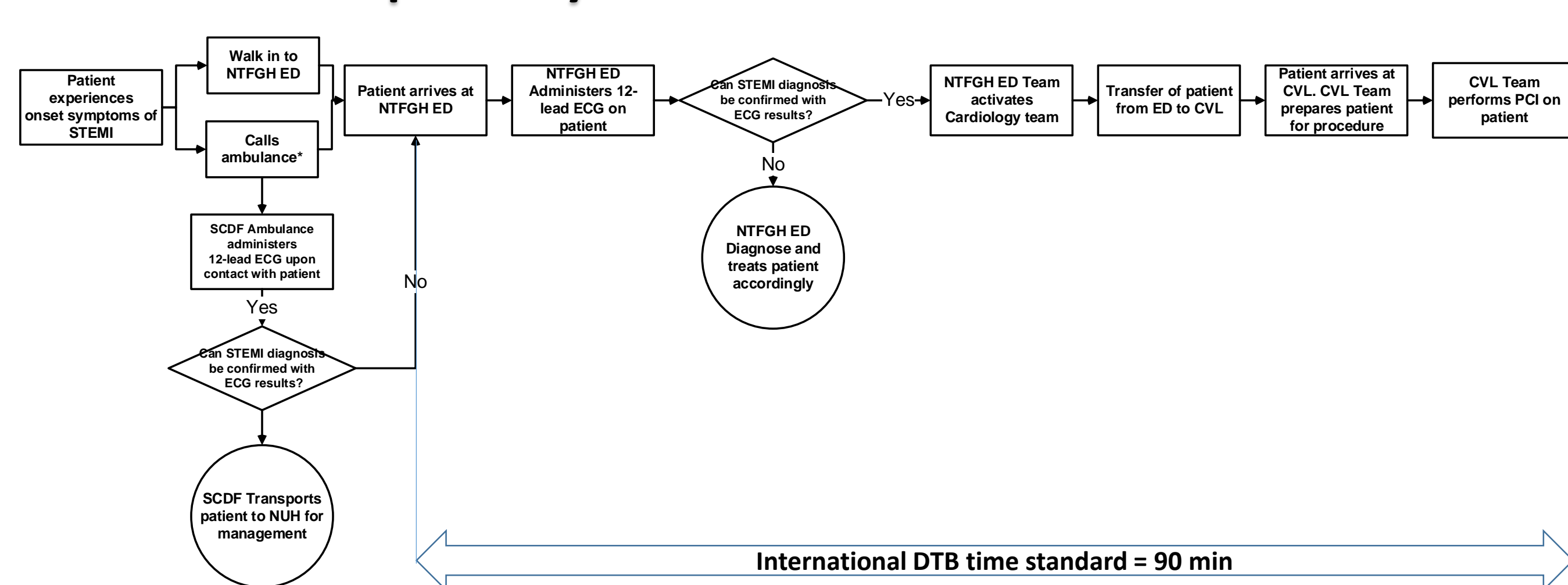
Baseline performance

NTFGH Proportion of STEMI patients with DTB time \leq 90 min in 2018



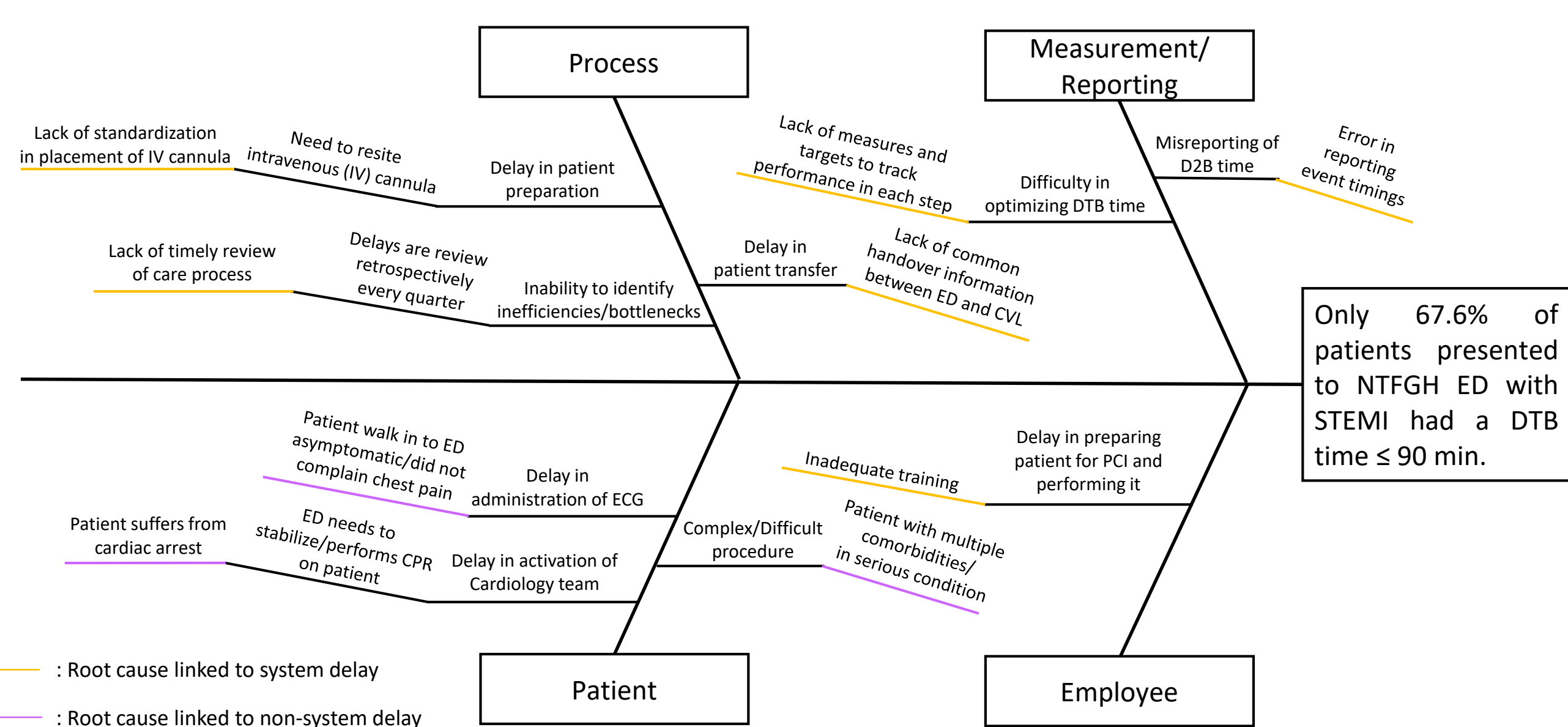
Analyse Problem

NUHS STEMI Care pathway



*Ambulance includes SCDF, SAF and private ambulances. The NUHS Cluster's Western STEMI Network enables SCDF ambulance and the paramedics to divert STEMI patients to NUH upon diagnosis with 12-lead ECG.

Root cause analysis of delay in DTB time



- In improving DTB time of STEMI patients, there is a need to distinguish between system (caused by hospital system and processes) and non-system delays (caused by random environmental/patient factors).
- The team felt that they had more control was more addressing root causes behind system delays.

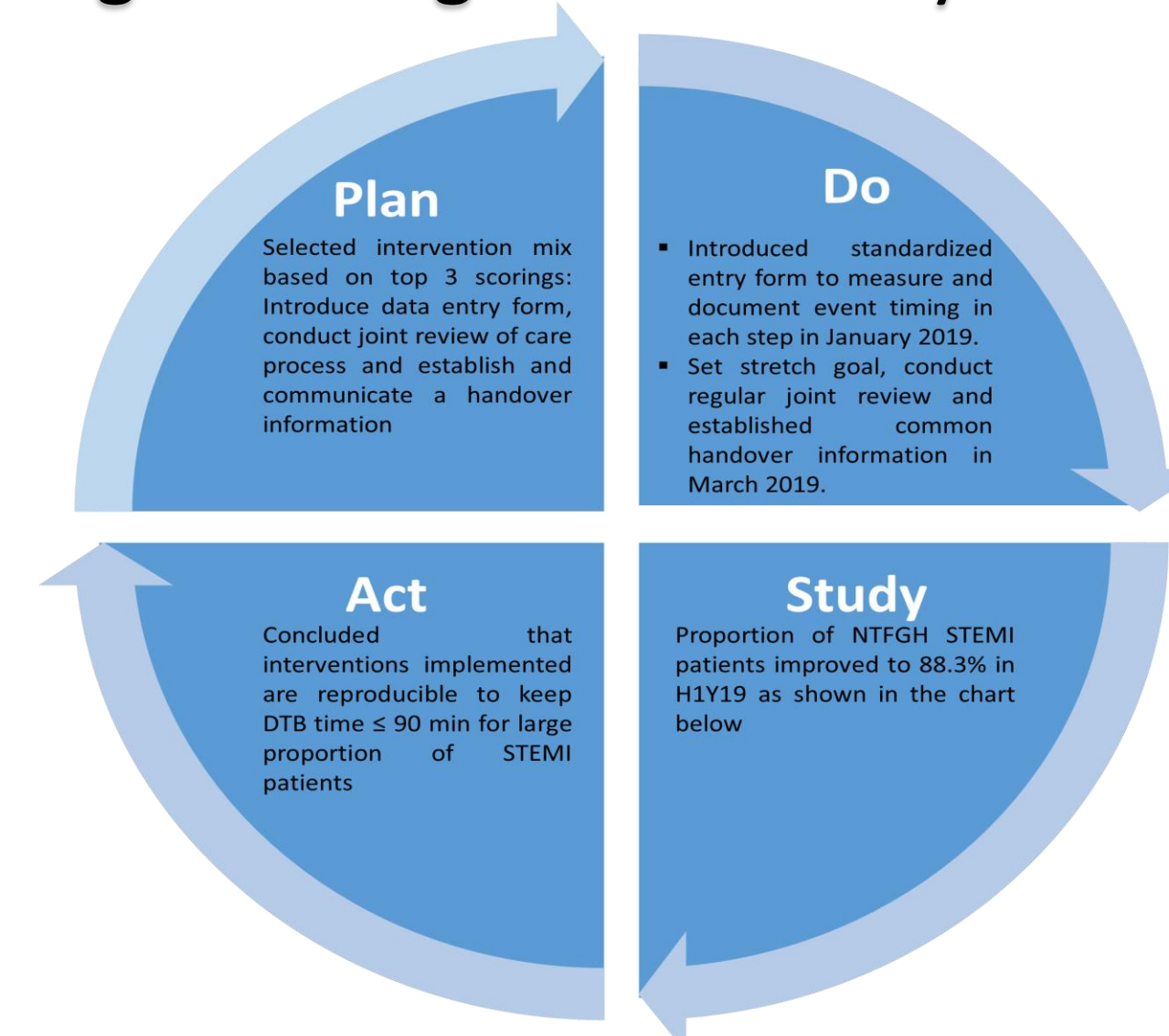
Select Changes

- To prioritize ideas which are deemed to have high impact and are relative easy to implement, ratings from 1-5 have been assigned to each potential solution.
- Score of each idea is derived by the product of ratings assigned to ease of implementation and impact.
- Below table highlights some brainstormed ideas. The top 3 scorers have been identified as the changes to be implemented first.

Root cause	Potential solution	Ease of implementation (1= Most difficult, 5= Easiest)	Impact (1= Least impactful, 5= Most impactful)	Score = Ease x Impact
Lack of measures and targets to track each step of the care process	Introduce a standardized data entry form to measure and document time taken in each step of the care process. This will enable the team to identify delay and cause (system vs non-system).	4	5	20
Error in reporting of event timings	Establish stretch goal/measure in each step of the care process to ensure greater accountability	4	5	20
Lack of timely review of care process	Conduct regular joint review of care process with ED team to identify cause of delay and take necessary corrective action(s).	3	5	15
Lack of common handover information between ED and CVL	Establish and communicate a common set of handover information to better prepare teams for sicker patients (e.g. need to activate ICU and the RT, inotropic infusion, intubation etc.)	4	3	12
Inadequate training	Conduct pit stop exercises in the CVL to cut prep and access times further	3	3	9
Lack of measures and targets to track each step of the care process	Build STEMI Narrator in NGEMR to replace data entry form in 2020	2	4	8

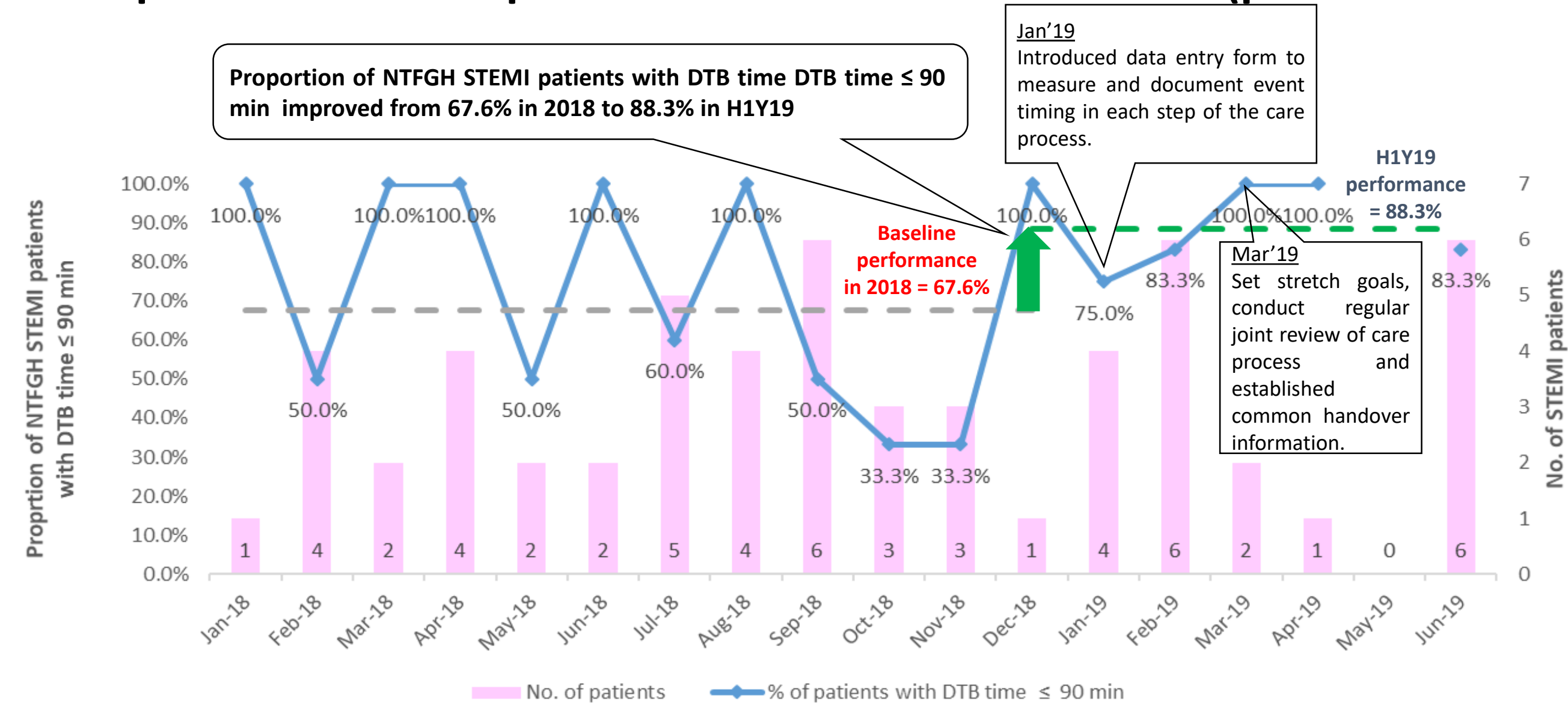
Test & Implement Changes

Piloting selected changes through the PDSA cycle



Initial results

NTFGH Proportion of STEMI patients with DTB time \leq 90 min (post interventions)



Spread Change/Learning Points

What are the strategies to spread change after implementation?

Leveraging the structural power of the employees on the ground to push change from the bottom up is a key strategy to spread change after implementation. Continued education through case based discussion also helps to keep the team in sight of the common goal and accountable to the performance of their respective step in the care process.

What are the key learnings?

It takes a hospital/system but not an individual (unit) to treat a patient i.e. Multidisciplinary teamwork is core to make a meaningful change. To achieve that, there needs to be clear problem definition, open communication and mutual respect among the peers.