

## Project Title

Opioid Safety in Operating Theatres

## Project Lead and Members

Project lead: Tan Yuen Ming

Project members: Dr Yap Sau Hsien, Nina Rachel Mercado Atienza, Ng Mei Leng, Lim Siaw Ling

## Organisation(s) Involved

Ng Teng Fong General Hospital

## Healthcare Family Group Involved in this Project

Medical, Nursing, Allied Health, Pharmacy

## Applicable Specialty or Discipline

Anaesthesiology, Day Surgery

## Aims

To reduce patient harm from opioid use in OT by:

- (A) Increasing 6 monthly average safety rate of appropriate opioid use, thus not requiring reversal with naloxone, from Six Sigma performance level 4 to level 5 for the period between July to December 2018 and maintained for another 6 months, from January to June 2019. (Six Sigma level 5 equates to not more than 233 iatrogenic cases requiring naloxone use for every million opioid doses given in OT).
- (B) Sustaining 6 monthly average safety rate for opioid incidents (excluding naloxone-required) at Six Sigma level 5 for the period between July to December 2018 and maintained for another 6 months, from January to June 2019. (Six Sigma level 5 equates to not more than 233 opioid incidents (excluding naloxone-required) for every million opioid doses given in OT).

## **Background**

See poster appended/ below

## **Methods**

See poster appended/ below

## **Results**

See poster appended/ below

## **Lessons Learnt**

Education technique and awareness of opioid use and dangers can be spread to other areas. Case-based discussions helped foster closer relationships between senior consultants and junior anaesthetists as well as quickened the learning of juniors in OT. Regularly sharing naloxone use data and opioid incidents also facilitate team learning and improvement. Periodic communication on safe work procedures (SWP) with regular audits helped improve compliance.

## **Conclusion**

See poster appended/ below

## **Project Category**

Care & Process Redesign

Value Based Care, Safe Care, Adherence Rate, Quality Improvement

## **Keywords**

Opioid Use, Operating Theatre

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# OPIOID SAFETY IN OPERATING THEATRES

MEMBERS: YAP SH, TAN YM, ATIENZA NRM, NG ML, LIM SL

- SAFETY
- QUALITY
- PATIENT EXPERIENCE
- PRODUCTIVITY
- COST
- TEAMWORK
- COMMUNICATION

## Define Problem, Set Aim

### Problem/Opportunity for Improvement

From January to June 2018, in operating theatres (OT), for every million opportunities, there is an average of 280 iatrogenic opioid adverse events, requiring reversal with naloxone. This is a safety rate equivalent to Six Sigma performance level 4. Level 4 represents an error rate of between >233 to <6,210 errors per million opportunities.

As for opioid incidents (excluding naloxone-required), there is an average of 53 for every million opportunities in OT for the same period. This is a safety rate equivalent to Six Sigma performance level 5. Level 5 represents error rate between >3.4 to < 233 per million opportunities.

As opioid is a class of high alert medicine, the team aims to further reduce risk of patient harm by decreasing rate of iatrogenic opioid adverse event, requiring reversal with naloxone; while maintaining current safety rate of other opioid incidents (excluding naloxone-required).

### Aim

To reduce patient harm from opioid use in OT by:

(A) Increasing 6 monthly average safety rate of appropriate opioid use, thus not requiring reversal with naloxone, from Six Sigma performance level 4 to level 5 for the period between July to December 2018 and maintained for another 6 months, from January to June 2019.

Six Sigma level 5 equates to not more than 233 iatrogenic cases requiring naloxone use for every million opioid doses given in OT (OUTCOME MEASURE 1).

(B) Sustaining 6 monthly average safety rate for opioid incidents (excluding naloxone-required) at Six Sigma level 5 for the period between July to December 2018 and maintained for another 6 months, from January to June 2019.

Six Sigma level 5 equates to not more than 233 opioid incidents (excluding naloxone-required) for every million opioid doses given in OT (OUTCOME MEASURE 2).

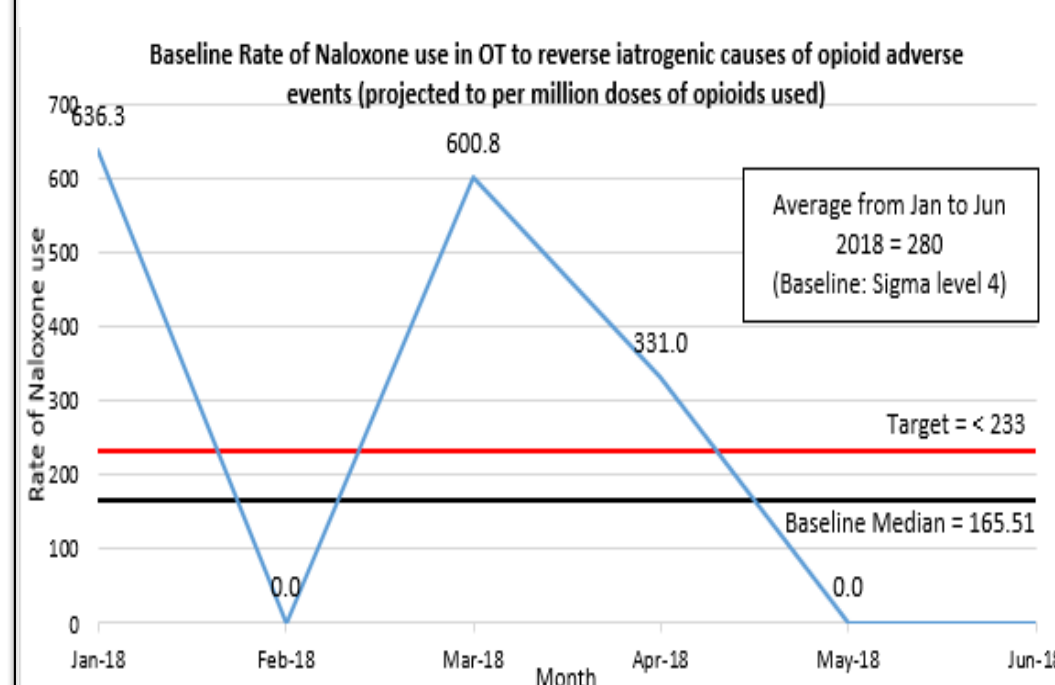
## Establish Measures

### Outcome Measures

- OUTCOME MEASURE 1: Rate of Naloxone use to reverse iatrogenic causes of opioid adverse events in patients who received opioids in OT.
- OUTCOME MEASURE 2: Rate of opioid incidents (excluding Naloxone-required) in OT.

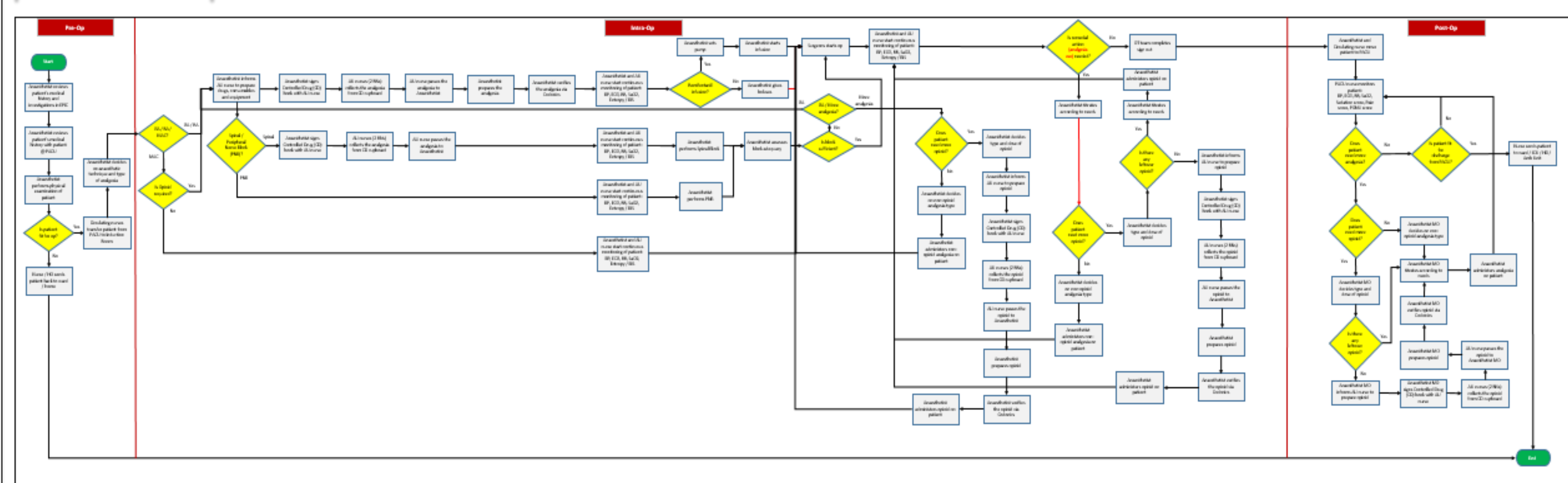
### Process Measure

- Rate of intraoperative pain management done correctly by doctors.

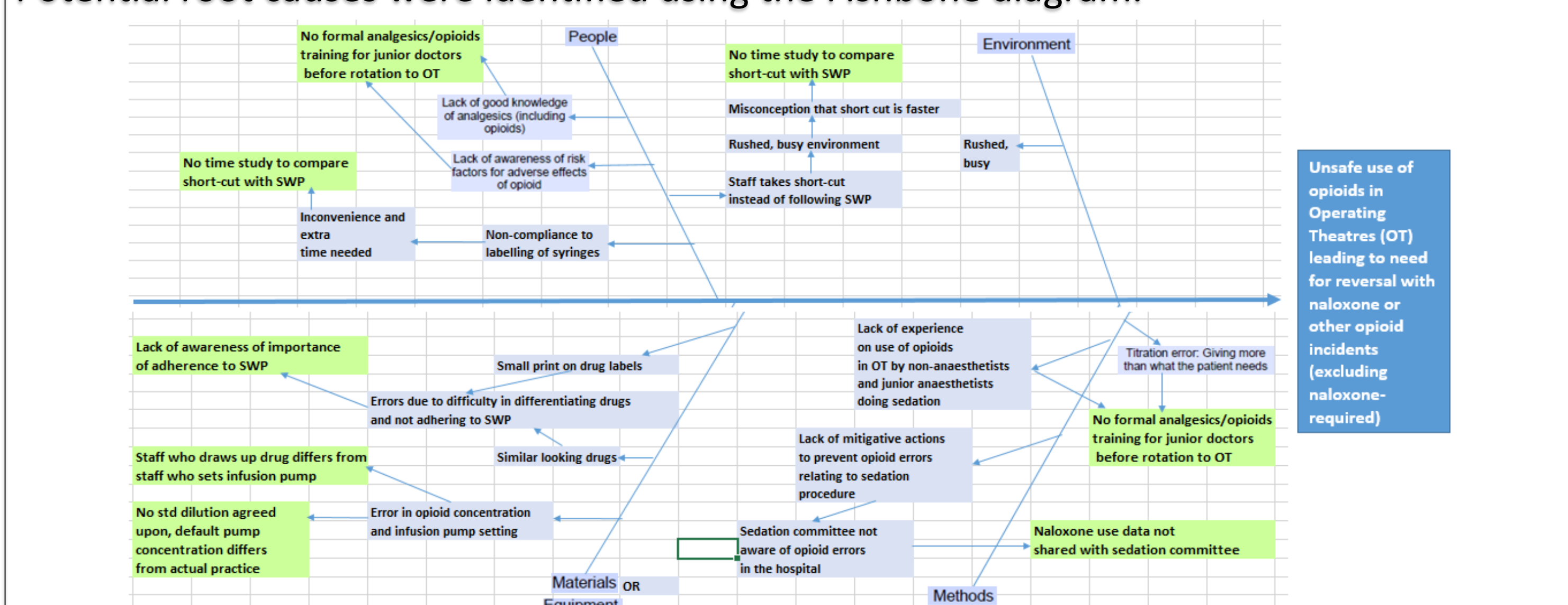


## Analyze Problem

The opioid process in OT was mapped, and Gemba Walk conducted to validate the process map



Potential root causes were identified using the Fishbone diagram.



## Select Changes

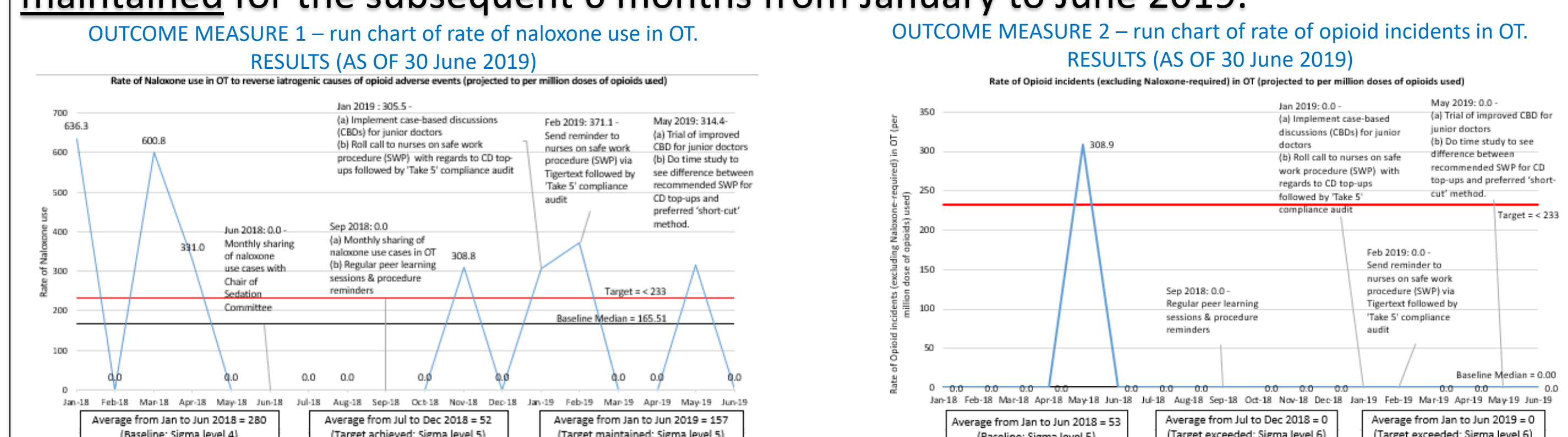
Changes were selected using the 'Impact-Ease of implementation' tool.

## Test & Implement Changes

PDSA Cycle	Run	Plan	Do	Study	Act
1	6/18	1 Sharing of naloxone use cases with Chair, Sedation committee	Team identifies iatrogenic cases requiring naloxone use and share with Sedation committee every month.	With awareness of these cases, committee strengthens sedation processes.	Adopt
2	9/18	1 (a) Monthly sharing of naloxone use cases in OT (b) Regular peer learning sessions & procedure reminders	Implemented department-wide in OT	Useful in creating awareness but does not resolve all issues in relation to iatrogenic causes of opioid adverse events.	Adopt
3	1/19	1 Implement case-based discussions (CBDs) for junior doctors	Junior doctors given a pre-CBD questionnaire before going through CBD. A post-CBD questionnaire was administered post-CBD.	Performance improved from 20% (pre-CBDs) to 60% (post-CBD). There is still room for improvement.	Adapt - Enhance CBD
3	5/19	2 Further improve CBD	Improved version of CBD implemented with standard answers provided and guide for trainers.	Standard answers and guidance for trainers allowed for uniform training and facilitates juniors' learning.	Adopt
4	1/19	1 Roll call to nurses on safe work procedure (SWP) with regards to CD top-ups	Roll call conducted over different shifts and all staff were required to sign off in the communication book.	A 'Take 5' exercise was conducted by looking at Automated Dispensing Cabinet (ADC) records. Zero compliance found.	Adapt - same info sent via 'Tiger text'.
4	2/19	2 Send reminder to nurses on SWP	Reminder sent via 'Tiger text'.	A 'Take 5' exercise was conducted by looking at ADC records. Compliance increased to 100%.	Adopt - Team will do periodic 'Take 5' exercise.
5	5/19	1 Do time study to see difference between recommended SWP for CD top-ups and preferred 'short-cut' method.	Time study conducted using both methods with the same types and quantities of opioids both times.	The time difference between the recommended (safer) method and the 'short-cut' (riskier) method is less than one minute.	Share results with staff & advise all to follow SWP.

## Results, Learning Points

Both outcome measure targets were achieved from July to December 2018 and maintained for the subsequent 6 months from January to June 2019.



OT setting is very different from all other areas in the hospital in terms of workflow and practices. However, main lesson learnt is the education technique and awareness of opioid use and dangers can be spread to other areas. Case-based discussions helped foster closer relationships between senior consultants and junior anaesthetists as well as quickened the learning of juniors in OT. Regularly sharing naloxone use data and opioid incidents also facilitate team learning and improvement. Periodic communication on safe work procedures (SWP) with regular audits helped improve compliance to SWP.