



Project Title

Delay in Post Anaesthesia Care Unit (PACU) Discharge: How Nurse-Led PACU
Discharge Improved Operating Theatre Efficiency

Project Lead and Members

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Project members: SSN Wang Hongyan, SN Yuan Lu, SSN Tang Xueru

Organisation(s) Involved

Ng Teng Fong General Hospital

Healthcare Family Group Involved in this Project

Medical, Nursing

Applicable Specialty or Discipline

Anaesthesiology

Project Period

Start date: Jan 2019

Completed date: Aug 2022

Aims

- To increase the percentage of selected post-operative ASA I & ASA II patients with discharge order ready within 45 minutes from 74% to 80% by end of August 2022.
- To increase the percentage of selected post-operative ASA I & ASA II patients discharged out of PACU within 60 minutes from 45% to 60% by end of August 2022.

Background

See poster attached



CHI Learning & Development (CHILD) System

Methods

See poster attached

Results

See poster attached

Lessons Learnt

See poster attached

Project Category

Care & Process Redesign, Quality Improvement, Workflow Redesign

Keywords

Nurse-led PACU discharge, Nurse Empowerment

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DELAY IN PACU DISCHARGE: HOW NURSE-LED PACU DISCHARGE IMPROVED

OPERATING THEATRE EFFICIENCY

LEAD: DR LEAN LYN LI (ANAESTHESIA), APN YANG DONGLI (NURSING)

TEAM MEMBERS: SSN Wang Hongyan, SN Yuan Lu, SSN Tang Xueru

SPONSORS: ADN Joanna Tan (MOT), Dr Yap Sau Hsien (Anaesthesiology), ADN Clarice Wee (Nursing Clinical Service)

Define Problem, Set Aim

Problem/Opportunity for Improvement

- A prolonged Post Anaesthesia Care Unit (PACU) stay has been shown to have implications on Operating Theatre (OT) efficiency. It may also lead to dissatisfaction of surgeons, nurses, patients and their families. Post-anaesthesia patients should be discharged as soon as deemed fit in order to promote bio-psycho-social wellbeing.
- Data obtained from January to December 2019 showed 69% of total patients were ASA 1 & 2 patients. 26% of them spent more than 45 minutes before a discharge order was put up and 55% of them spent more than 60 minutes before being discharged out of PACU. It was postulated that this delay was due to a delay in review and discharge of uneventfully recovered patients by PACU anaesthetists. It was our aim to reduce unnecessary delay of patient discharge from PACU.

Aim

- To increase the percentage of selected post operative ASA I & ASA II patients with discharge order ready within 45 minutes from 74% to 80% by end of August 2022.
- To increase the percentage of selected post operative ASA I & ASA II patients discharged out of PACU within 60 minutes from 45% to 60% by end of August 2022.

Establish Measures PACU stay >45min in different time periods Percentage of patients with discharge order ready within 45 minutes in 2019 Percentage of patients discharged out of PACU within 45 minutes in 2019 Percentage of patients discharged out of PACU within 45 minutes in 2019 ASA 18.2 ASA 18.2

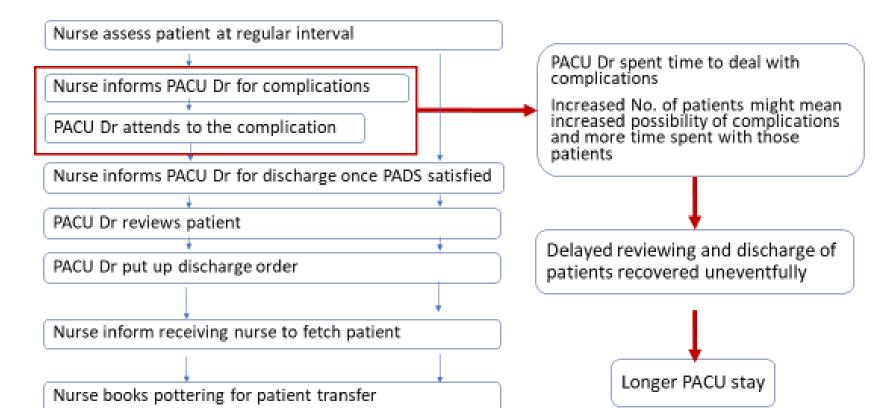
Key measurements

Percentage of patients with discharge order ready within 45min and discharged out of PACU within 60min across the day and during various periods (8.30am-12NN, 1201-1700hrs, off office hours) and at various intervals (<=45min, 46-60min, 61-90min, 91-120min, >120min) will be measured.

Analyse Problem

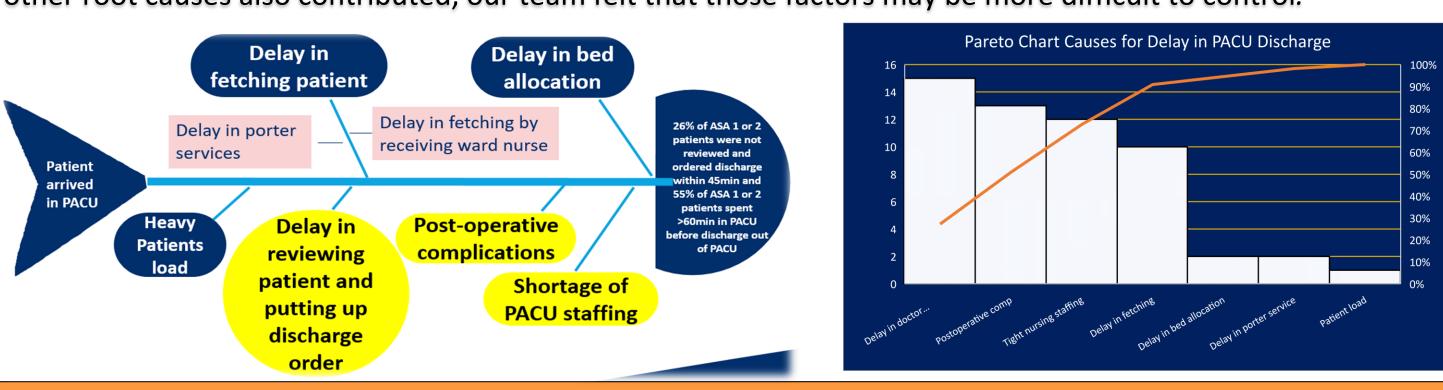
Process before interventions

Current PACU discharge work flow and encountered issue



Probable root causes

We identified Delay in reviewing patient by doctor as the root cause that is the most important, followed by Postoperative complications in PACU, shortage of nursing staff and delay in fetching from wards. Although the other root causes also contributed, our team felt that those factors may be more difficult to control.



Select Changes

Root Cause		Potential Solutions
Delay in review by doctor		Pilot and implement a Nurse-Led PACU Discharge Protocol: To improve OT efficiency and subsequently aid in hospital discharge and impact
Postoperative complications in PACU	1	1 ward bed turnover
Tight nursing staffing		To free up medical manpower to deal with postop complications more promptly To reduce PACU work load and improve work satisfaction to ease staffing issue
Delay in fetching patient	1	To allow nurses autonomy to pre-arrange transfer of patients with porter and receiving nurses to facilitate patient's transfer

Test & Implement Changes

Nurse led PACU discharge work flow and three ways of discharging patients (in red, orange and blue color codes)

PACU Nurse assesses the patient at regular interval

PACU Nurse informs PACU APN or Dr for complications

PACU APN or Dr attends to the complication

PACU APN or Dr attends to the complication

PACU Nurse releases discharge order once PADS satisfied

PACU Nurse prearranges for patient's transfer with receiving nurse and porter service before releasing discharge order if patient's condition is stable

Nurse inform receiving nurse to fetch patient

Discharge patient out of PACU

Nurse patient out of PACU

Project scope: ASA 1 and ASA 2 patients not for major neuro, ENT, thoracic, abdominal, vascular surgery

Under Monitored Anaesthesia, Regional Anaesthesia and/or General Anaesthesia Patients not at risk of OSA or difficult airways

Patients without significant intraoperative events or to be discharged to HDU Phase I for suitable eye patients, Phase II for all suitable patients

- PLAN: From the root causes, we decided to implement a Nurse-Led Discharge workflow that will concurrently address ALL four root causes:
- It solves the problem of delay in doctor reviewing patient
- It leads to early discharge and improves patient flow in PACU
- It frees up medical manpower to deal with postop complications
- It increases nursing autonomy and satisfaction.

Test & Implement Changes CYCLE PLAN **STUDY ACT** DO OT efficiency improved and there were no postop Training and Nurse-Led PACU discharge Result: complications or incidents **Engagement of** protocol was restricted to There was improved PACU Planned to proceed to next cycle staff included MAC ophthalmology patient flow from observation zoom and in patients done during office **Learning point:** Identify champion as reference hours. The test was carried person talks, medical and out as planned. person for doctors and nurses; Feedback and observation: nursing in-service Orientation for new doctors and competency Some doctors were unsure joining department about selection criteria and assessments of made incomplete orders. the nurses were Some PACU nurses were done to ensure patient safety. The not sure about when to NGEMR workflow release the discharge order was finalised Medical and We tested out our hypothesis Conclusion: Nurse-Led PACU discharge nursing champions OT efficiency improved and there were no by collecting data for one week protocol involved all were identified as post-discharge major adverse incidence during 1-7 August 2022 and GA/MAC/RA cases, and at compared with data in the • With proper training and guidelines, it was reference persons; all times of the day. Orientation for same week in 2019. shown that PACU nurses were capable of new doctors making decisions for discharge for selected Total 179 patients in 2019 and There was closure of OTs in 190 patients in 2022 had valid patients and at the same time able to joining August (from 9 elective OTs department data (N ASA 1 or ASA 2 = 134 in maintain patient safety to 7), so more elective There was high satisfaction in the work and both year). operations were listed in performance for both medical and nursing 3 time periods (8.30am-12nn, the limited numbers of OTs staff, potentially improving nursing autonomy 1201-1700hr, 1701-7.59am) and ended late after office and across all time periods We proceeded to formalise Nurse-Led PACU hours. Meanwhile, more were analyzed. discharge protocol into PACU discharge policy and emergency operations were work flow done after office hours. Result report Percentage of patients discharged out of percentage of patients with discharge order ready PACU within 60min in 2019 and 2022 within 45 min in 2019 and 2022 80% Last 2 time Goal=80% Med 2019=72% Goal=60% Nurse discharge" for

SAFETY

QUALITY

PATIENT

EXPERIENCE

10% more patients were reviewed with discharge order ready

selected patients

Med 2019=42%

Nurse discharge" for

selected patients

PRODUCTIVITY

COST

reduced 2 minutes (Med 2019 = 36min, Med 2022 = 34min)

8.30AM -12NN

PACU STAY DURATION BEFORE DISCHARGE

ORDER READY

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| Comparison of the content of the c

PACU stay duration before being discharged out of PACU reduced 10 minutes (Med 2019 = 66min, Med 2022 = 56min)

1201-1700

PACU STAY DURATION BEFORE DISCHARGE

ORDER READY

2019
2022

221
245MIN 46-60MIN 61-90MIN 91-120MIN >120MIN

PACU STAY DURATION

• Nurse-Led PACU Discharge freed up medical manpower to allow patients with complications to be attended to and treated early and subsequently discharged on time, which can be seen that more patients during office hours had discharge order ready within 60min and all had discharge order ready by 90min in 2022 (refer chart No. 5 & 6).

2019 DISTRIBUTION OF PATIENT LOAD

2022 DISTRIBUTION OF PATIENT LOAD

2023 DISTRIBUTION OF PATIENT LOAD

2024 DISTRIBUTION OF PATIENT LOAD

2025 DISTRIBUTION OF PATIENT LOAD

2026 DISTRIBUTION OF PATIENT LOAD

2026 DISTRIBUTION OF PATIENT LOAD

2027 DISTRIBUTION OF PATIENT LOAD

2028 DISTRIBUTION OF PATIENT LOAD

2028 DISTRIBUTION OF PATIENT LOAD

2029 DISTRIBUTION OF PATIENT LOAD

2020 DISTRIBUTION DISTRIBUT

OFF OFFICE HOURS
PACU STAY DURATION BEFOR
DISCHARGE ORDER READY

2019

1201-1700

1701-8.29

2 45 MIN 46-61-91->
60 MIN 90 MIN 120 MIN

JRS
JBEFORE
READY

2019

2019

2022

PACU STAY DURATION BEFORE
OUT OF PACU

3.4%

2019

2022

2036

2037

2045

2045

2057

2068

2070

2088

2088

2098

2098

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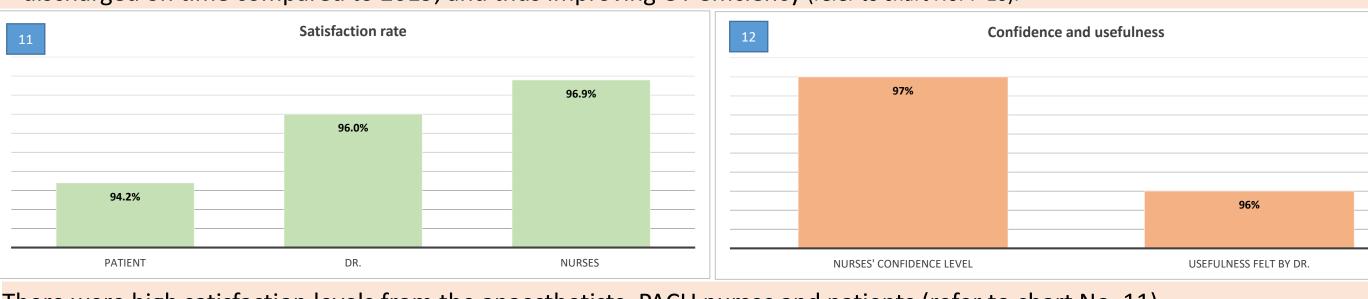
2009

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20

• Out of office hours patient caseload went up quite significantly in 2022. This is probably explained by the closure of OTs, so more elective operations were listed in the limited numbers of OTs and ended late into off office hours. Meanwhile, more emergency operations were listed. However, with our Nurse led PACU discharge established, there were significantly more patients who were discharged on time compared to 2019, and thus improving OT efficiency (refer to chart No. 7-10).



There were high satisfaction levels from the anaesthetists, PACU nurses and patients (refer to chart No. 11). Nurses had a high confidence level in the new workflow with our workplace training and assessment (refer to chart No. 12).

Learning Points

- Our Nurse-Led Discharge Protocol successfully increased the percentage of patients with discharge order ready by 10%.
- Effective training of the nurses increased their confidence and autonomy and so allowed them to proactively plan for timely discharge of patients out of PACU, successfully increasing the rate by 20%.
- Maintenance of the success of our protocol required continuous training and repeated cues from project champions.
- Our protocol empowered nurses to exercise their autonomy to manage less complex patients, allowing doctors to be able to focus on more complex patients, in order to achieve a shared goal of patient quality and safety.



