A Standardized Stir-up Regimen Shortens Phase I Recovery Time in PACU

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Background

- The nursing action to recover patients after emergence from general anesthesia is described as the "Stir-up Regimen," which helps to prevent post operative complications.[1]
- The Stir-up Regimen definition has evolved since the early 1940s. [1-3]
- There are no comparative studies testing the effectiveness of the Stir-up Regimen in the literature.
- Phase I is the time from a patient's arrival in Post Anesthesia Care Unit (PACU) to the time the patient is ready for inpatient transfer or outpatient discharge.[4]
- No documented standard on when to initiate Stir-up Regimen during Phase I recovery. Nursing practice varies when waking patients up.

Purpose

- To standardize the Stir-up Regimen by initiating the following within the first 30 minutes of patient arrival in PACU:
  - Deep breathing
  - Coughing
  - Reposition
  - Mobilization – moving arms and legs
  - Assessing and managing pain
  - Assessing and managing nausea
- To evaluate if implementing the Stir-up Regimen, on patient's arrival, deceases the Phase I time in PACU.

References

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Methods

- A pragmatic stepped wedge cluster randomized control trial (RCT).[5]
- Three PACU units (A, B, C) were randomized at the unit level.
- A longitudinal design over 26 weeks from May to October 2021.
  - Control (baseline)
  - Training (2 weeks)
  - Intervention (standardized Stir-up Regimen)
- Training period included: video demonstration of Stir-up Regimen, virtual in-services, in-person team huddles and email notifications.

Weeks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
PACU A	C	C	C	C	C	C	C	C	C	C	T	T	I	I	I	I	I	I	I	I	I	I	I	I	I	I
PACU B	C	C	C	C	C	C	C	C	C	C	C	C	T	T	I	I	I	I	I	I	I	I	I	I	I	I
PACU C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	T	T	I	I	I	I	I	I	I	I	I	I

C = Control; T = Training; I = Intervention

- Phase I recovery time was measured from nursing documentation in the electronic health records (EHRs).
- Quality Improvement per local Institutional Review Board (IRB).
- In the three PACUs, 18,808 cases were screened retrospectively.
- PACU Phase I time between intervention and control were evaluated using generalized mixed-effects models (GLMM).

Study Cohort

- Inclusion criteria were adult surgical patients who received at least 30 minutes of general anesthesia: n = 5,809
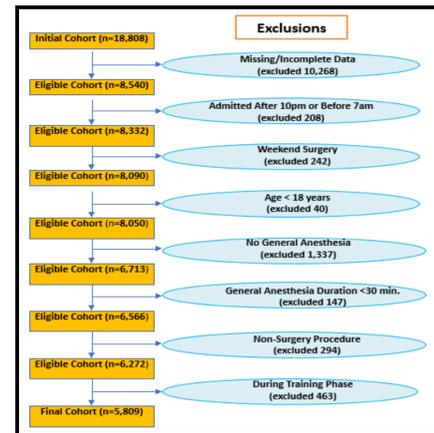
Outcome

- Overall, the adjusted mean difference in Phase I recovery time between control and intervention was a reduction of 4.9 minutes (95% CI: -8.4 to -1.4, p=0.007).
- No adverse patient care incidents were reported during the intervention

	Total Sample	Control Group	Intervention Group	Unadjusted Difference, 95% CI	Adjusted Difference, 95% CI*
	n=5809	n=2860	n=2949		
Median [IQR] Minutes	105 [75, 148]	109 [78, 152]	101 [74, 143]	-4.9 [-7.7 to -2.1] p<0.001	-4.9 [-8.4 to -1.4] p=0.007
Mean (SD) Minutes	121.27 (66.36)	124.43 (68.33)	118.21 (64.26)		

*Adjusted for patient's age, gender, race, ethnicity, BMI and ASA score
BMI = body mass index; ASA = American Society of Anesthesiologists
IQR = Interquartile Range; CI = Confidence Interval; SD = Standard Deviation
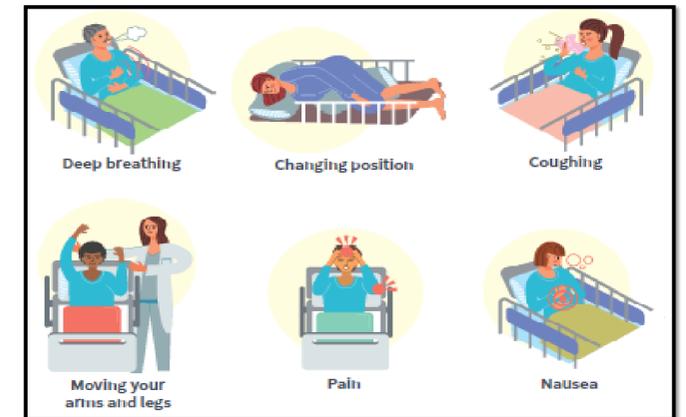
Discussion

- Over 50,000 surgeries are performed each year. When scaled over time, a reduction of 4.9 minutes per case translates to:
  - 245,000 minutes (4,083 hours) saved annually.
- Shorter Phase I time positively impacts PACU efficiency and throughput.
- Phase I was selected for the Stir-up intervention for these reasons:
  - Patients: Preventing complications from residual anesthetics such as atelectasis, deep vein thrombosis, and nausea.
  - Nurses: Variation of knowledge and experience in initiating the Stir-up Regimen within 30 minutes of patient arrival in PACU.
  - PACU Throughput: PACU times impact bed holds for pre-, intra- and post-procedure areas along with inpatient transfer.

Conclusion & Implications

- A standardized Stir-up Regimen for surgical adult patients, within 30 minutes of PACU arrival shortened Phase I recovery time.
- The stepped wedge cluster RCT is a novel design to test the effectiveness of a nursing intervention across multiple settings.
- Future research is needed to assess the standardized Stir-up Regimen in various settings such as outpatient and pediatric PACUs.

Sustainability

- Patient Flyer developed in multiple languages for preoperative teaching and discussion, hyperlink in EHR
- Stir-up Regimen implemented across all 9 PACUs at Stanford Health Care
- PACU nurse orientation now includes Stir-up Regimen
- PACU nurses as champions to educate and promote practice
- Documentation of Stir-up Regimen initiated during the immediate PACU recovery.
- Adopted for PeriAnesthesia as a strategic goal for fiscal year 2023

Deep breathing | Changing position | Coughing | Moving your arms and legs | Pain | Nausea

Acknowledgments