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. 2-3
- 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 waiting 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
  - 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, decreases the Phase I time in PACU.

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.
- Phase I recovery time was measured from nursing documentation in 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 = 5,889

Outcome
- Overall, the adjusted mean difference in Phase I recovery time between control and intervention was a reduction of 4.9 minutes (95% CI: -2.1, p=0.007).
- No adverse patient care incidents were reported during the intervention

<table>
<thead>
<tr>
<th>Total Sample</th>
<th>Control Group</th>
<th>Intervention Group</th>
<th>Unadjusted Difference, 95% CI</th>
<th>Adjusted Difference 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (SD)</td>
<td>Median (IQR)</td>
<td>Min-Max</td>
<td>n=5809</td>
<td>n=2802</td>
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<tr>
<td>N=5809</td>
<td>n=2802</td>
<td>n=2949</td>
<td>4.9 (4.6-4.9)</td>
<td>4.9 (4.6-4.9)</td>
</tr>
<tr>
<td>Minutes</td>
<td>101 (74, 148)</td>
<td>109 (78, 152)</td>
<td>101 (74, 143)</td>
<td>101 (74, 143)</td>
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<tr>
<td>Phase I</td>
<td>Median</td>
<td>Min-Max</td>
<td>p&lt;0.001</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Time</td>
<td>30 minutes</td>
<td>2.1</td>
<td>4.9</td>
<td>4.9</td>
</tr>
<tr>
<td>Adjusted</td>
<td></td>
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</tbody>
</table>
- Adjusted for patient's age, gender, race, ethnicity, BMI and ASA score
- p=0.007

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 arrived 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 inpatient and pediatric PACUs.

Sustainability
- Patient flyer developed in multiple languages for preoperative teaching and discussion,走入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

References

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