

# Improving Patient Flow in Weinberg 3 PACU

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## 4 Conclusions

The data show some significant trends regarding post-op complications for various groups of patients. Two groups of particular interest are OTO and OSA patients, as they represent cases that fall both above and below the average time values for all cases combined.

Protocols have been developed, often referred to as enhanced recovery, which are evidence-based sets of perioperative techniques designed to standardize care, reduce physiologic stress, and improve patient outcomes (Ricciardi & Mackay, 2015). Most colorectal surgical patients that the Weinberg 3 PACU sees are already being managed with the ERAS protocol, which is an enhanced recovery protocol, with the goal of providing better pain management with less incapacitation due to the anesthesia (Counihan & Favuzza, 2008).

This unit also has a relatively high proportion (18.4%) of patients who either have or are considered high risk for OSA. All patients are screened with the STOPBANG questionnaire prior to surgery, and if they are diagnosed with OSA or identified as high risk, they must undergo a room air trial prior to signing out. As discussed by Ankichetty & Chung (2011), patients with OSA present challenges to perioperative care due to the risk of transient oxygen desaturation and the dangers of narcotic pain medicine causing respiratory depression. In addition to this issue, a much higher rate of postoperative delays in signing out was seen in this population (an average of 2.34 versus 1.50 in all cases). This higher number of delaying factors makes it especially interesting that these patients were reported to have much lower rate of pain-related delay (21.1%) than was average for all cases combined (33.4%), since pain was the leading factor for the entire population. Overall, finding a way to balance patient safety with improved flow is a challenge with these patients due to the fact that there are often multiple complicating factors.

## 5 Future Directions

In the future, it would be beneficial to look further at the various patient populations seen by Weinberg 3 Pre-op/PACU in order to further define the patient population and challenges posed by various groups of patients. Data that would be especially useful would be the length of time in the OR and a more extensive medical background for each patient, as this study only looked at a few factors and relied on nurses to accurately and completely fill out the forms.

## 6 References

- Ankichetty, S., & Chung, F. (2011). Considerations for patients with obstructive sleep apnea undergoing ambulatory surgery. *Current Opinion in Anaesthesiology*, 24, 6, 605-11.
- Counihan, C. & Favuzza, J. (2009). Fast Track Colorectal Surgery. *Clinics in Colon and Rectal Surgery*, 22, 1, 60-72.
- Lalani, S.B., Ali, F., Kanji, Z. (2013). Prolonged-stay patients in the PACU: A review of the literature. *Journal of Perianesthesia Nursing*, Vol 28, No 3(June): pp. 151- 155.
- Ricciardi, R. & Mackay, G. (2015). Fast-track protocols in colorectal surgery. In M. Weiser (Ed.), *UpToDate*. Retrieved from <http://www.uptodate.com/>

## 3 Results

A total of 206 cases were considered. While many different services were represented, services covering similar types of surgeries were combined for the purpose of analysis, leading to six categories: otolaryngology (OTO), lower GI (Colorectal), gynecology (GYN), genitourinary/urological (URO), plastics (PLS), and bone marrow. All patients, regardless of service, who were either positively identified to have or screened as high risk of having obstructive sleep apnea were also looked at as a group (OSA).

Service	Average Time to Critical Elements Met	Service	Average Time to Sign Out
Bone Marrow	0:16	OTO	2:17
Colorectal	0:25	URO	2:58
OTO	0:39	PLS	3:13
OSA	0:48	GYN	3:17
URO	0:47	Colorectal	3:24
GYN	0:48	OSA	4:06
PLS	1:03	Bone Marrow	4:08

Table 1: Average times to critical elements and sign out.

For many patients, there were multiple factors delaying sign out. The most common reason was insufficient pain control, which manifested in many forms. Some common circumstances that were reported included pain being uncontrolled by large doses of pain medications, pain/sedation mismatch, unstable vitals due to pain medication, patients refusing pain medication but still experiencing significant discomfort, and chronic pain patients. Sometimes overlapping with the pain issue was the issue of anesthesia being slow to wear off or the patient being too sedated. This resulted in low RASS scores (Richmond Agitation-Sedation Scale, which measures level of sedation) and patients being unsteady when attempting to ambulate or feeling dizzy.

Another common obstacle to patient readiness for sign out was for the O2 protocol not being met. Decreased urine output and waiting for the patient to void together contributed to the delay in signing out in 20.4% of cases. Delay moving patients from the PACU, lack of available beds in other units and waiting for various providers (including anesthesia) contributed to the delay in 26.3% of cases. All the contributing factors are listed in Table 2, along with the percent of cases that reported each factor. The percentages total to more than one hundred percent because many cases reported multiple factors. The average number of factors delaying sign out reported per case was 1.50.

The average time for OTO patients to meet critical elements was 0:39, which is 9% less than that of all the services combined, and average time to sign out was 2:19, which is 23% less than all services combined. Furthermore, there were lower percentages of O2 protocol not being met and a lower rate of delays overall, with only 1.19 delays per case reported on average.

The average time for OSA patients to meet critical elements being met was 0:48, which is 12% longer than that of all cases, and average time to sign out was 4:06, which is 36% longer than that of all cases. The average number of factors delaying sign out reported for each case among this group was 2.34.

## 1 Background

The Weinberg 3 Pre-op/PACU unit at the Johns Hopkins Hospital experiences an unusual mix of cases that provide a challenge to optimizing patient flow. 85% are outpatient surgeries and there is a predominance of gynecological, urological and otolaryngological surgeries. These cases often require a longer length of stay (LOS) in the PACU in order to assure the patients' safety before sending them home. An extended PACU stay is generally defined as anything over 2 hours (Lalani, Ali, and Kanji, 2013). While other PACUs at JHH have an average LOS of approximately 90-120 minutes, the average LOS in Weinberg PACU during the period of this study was 3 hours.

PACU stays that extend beyond the expected length of time lead to staffing issues and may cause the OR schedule to back up and surgical cases to be postponed. In searching for solutions to the problem, however, improved patient flow must be balanced with patient safety, as initiatives that would improve patient safety generally increase LOS. For example, some patients must void prior to leaving to meet discharge criteria (safety), but this may take longer than average after urological procedures. Another example of a protocol that increases patient safety while also increasing LOS is the STOPBANG OSA screening tool, which requires patients scoring as high risk to undergo a room air trial prior to discharge. Risk is measured based on 8 simple questions about snoring, tiredness, whether anyone has observed them stop breathing, hypertension, BMI, age, neck circumference and gender. Scores of 5 or above are considered high risk for OSA.

## 2 Methods

Data were collected over a period of three weeks using a form that noted patients' age and gender, type of surgery, service, the time when certain critical elements for discharge were met, sign out time, and factors affecting the patient's readiness to leave. Critical elements included such basic criteria as having pain controlled and being stable on room air (or on the patient's baseline O2 requirement). Factors assessed for which typically delayed sign out time included pain, nausea/vomiting, decreased urine output, O2 protocol not met, unstable vital signs, too sedated, anesthesia not available, and "other." Nurses were responsible for filling out the form.

Reason Delaying Sign Out	#	%
Pain	70	33.4
Too Sedated/Anesthesia Slow Wearing Off	40	19.4
O2 Protocol Not Met	38	18.4
Delay Moving Pts from PACU/Waiting for People	29	14.1
Decreased Urine Output	21	10.2
Waiting to Void	21	10.2
Unstable Vital Signs	20	9.7
No Bed Available	17	8.3
Infusions/Monitoring/Time-Based Requirements	15	7.3
Nausea/Vomiting	14	6.8
Anesthesia Not Available	8	3.9
Agitation/Anxiety	6	2.9
Other	5	2.4
RN Factors	4	1.9
Teaching Needs	2	1.0

Table 2: Factors delaying sign out

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