

Operational Outcomes of Propofol Sedation versus Fentanyl, Midazolam and Diphenhydramine Sedation for Endoscopies and Colonoscopies at an Academic Medical Center

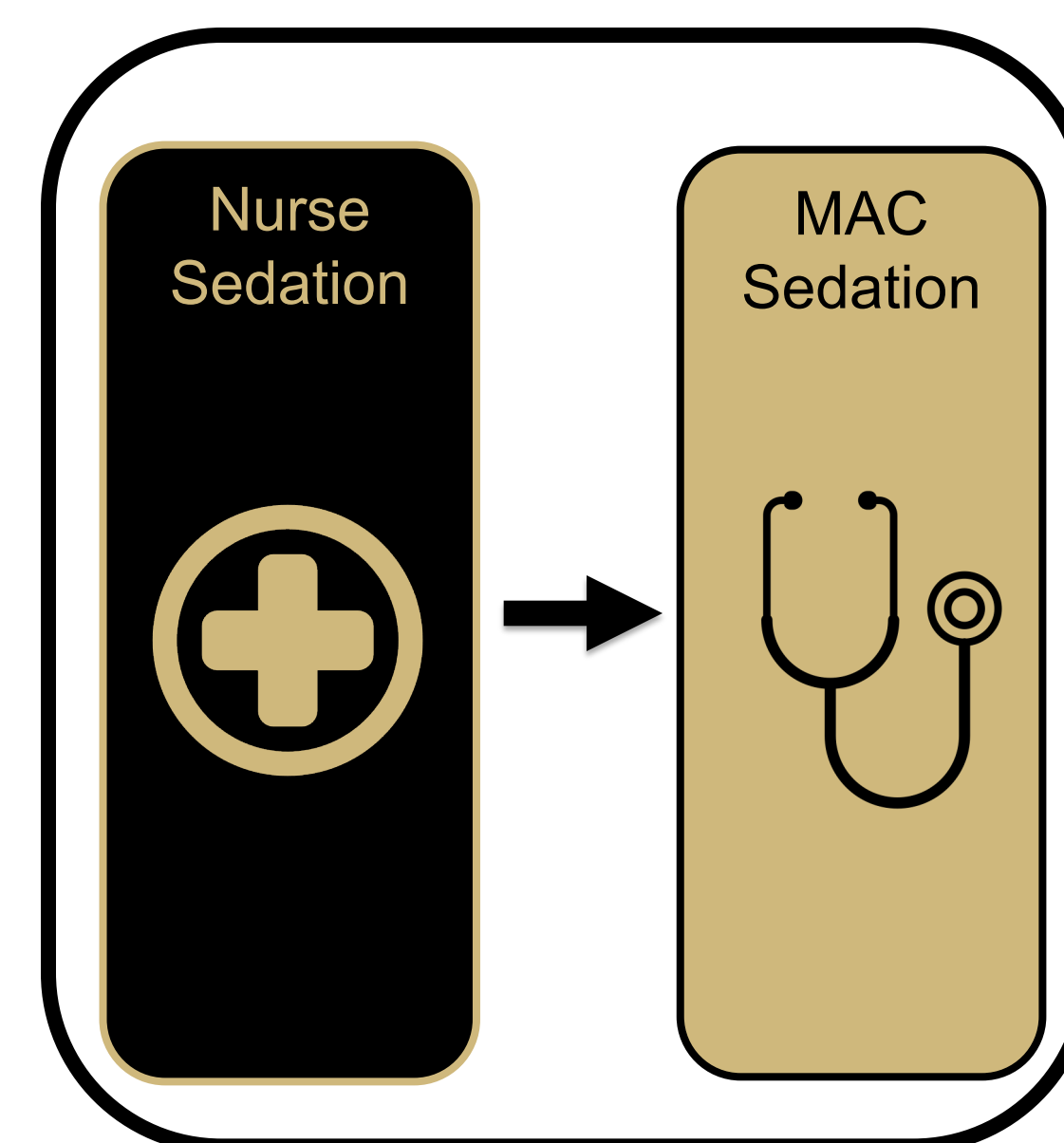
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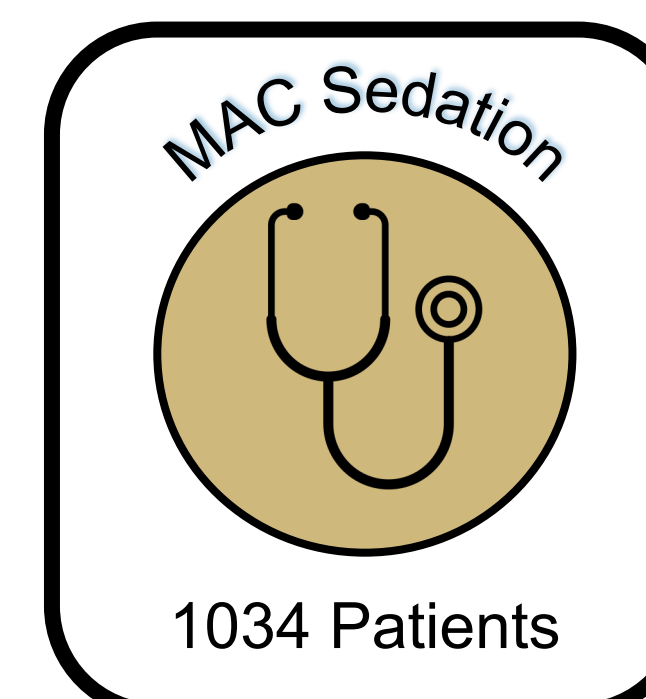
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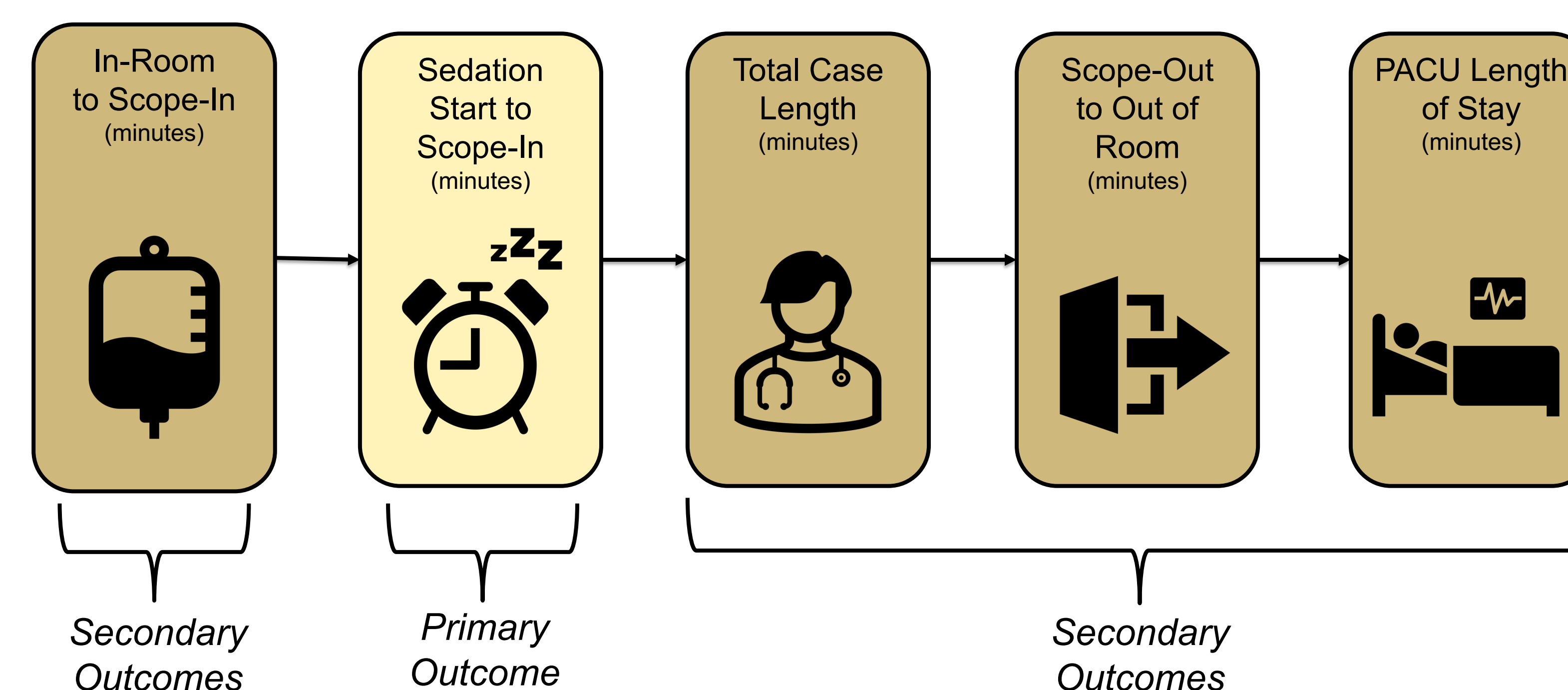
Sedation Provider Change
July 1, 2021



Analysis
5640 Patients



Sedation Process Flow With Outcomes



Background

- 51.5 million gastrointestinal endoscopies are performed annually in the United States and are predicted to grow at an annual rate of 2.6%.^A
- University of Colorado Hospital (UCH) Department of Anesthesia implemented Monitored Anesthesia Care (MAC) for sedation of gastrointestinal procedures in place of Nurse Administered Sedation (NAS) on 7/1/21.
 - MAC Sedation:** propofol without adjuncts
 - NAS:** IV fentanyl, midazolam, diphenhydramine
- Consenting by GI proceduralists shifted from in-procedural suite to in-preoperative area to improve patient flow on 7/1/21.
- We hypothesize that MAC will improve operational outcomes as compared to NAS.

Conclusions

- Primary and secondary outcomes demonstrate MAC sedation at UCH is more operationally efficient than NAS.
- Statistically significant decreases in SSSI and PACU LOS were a result of changes in sedation depth and medications between MAC sedation and NAS. Statistically significant decreases in IRSI were a result of changes to both sedation and consenting procedures during prep.
- TCL decreased as a result of decreases in all outcomes.
- SSSI was chosen as the primary outcome for its direct correlation to the change in sedation technique. Secondary outcomes were a result of both sedation technique changes and improvements to process flow.

Methods

- A COMIRB approved, retrospective, single-cohort analysis using STROBE guidelines.
- Inclusion criteria was based on sedation type (MAC or NAS), abstracted from the UCH EMR, and analyzed using a two-sample t-test.
- Significant comorbidities assessed: obstructive sleep apnea, asthma, coronary arterial disease, GERD, hepatic dysfunction, hypertension, kidney disease, liver disease, pulmonary hypertension, renal disease, and valvular heart disease.
- Primary and secondary outcome measures will include:
 - Sedation Start to Scope-In (SSSI):** Time sedation begins to time scope is placed
 - In-room to Scope-in (IRSI):** Time patient enters procedural suite to time scope is placed
 - Total Case Length (TCL):** Time patient enters procedural suite to time patient exits suite
 - Scope-Out to Out of Room (SOOR):** Time sedation ends to time patient exits procedural suite
 - PACU Length of Stay (PACU LOS):** Time patient enters PACU to time patient exits PACU

Results

Table 1: Demographics

Sex	NAS (n=4606)	MAC (n=1034)
Female	2459 (53%)	555 (54%)
Male	2147 (47%)	479 (46%)
Age (years)		
18-29	287 (6.3%)	64 (6.2%)
30-49	1090 (24%)	248 (24%)
50-64	1833 (40%)	397 (38%)
≥65	1396 (30%)	325 (31%)
Body Mass Index (BMI)		
<18.5	92 (2%)	21 (2%)
18.5-24.9	1651 (36%)	399 (39%)
25.0-29.9	1643 (36%)	355 (34%)
≥30	1158 (25%)	258 (25%)
Comorbidities		
0-1	3735 (81%)	834 (80%)
2-4	848 (18%)	194 (19%)
≥5	23 (0.5%)	6 (0.5%)
Procedure Type		
Upper GI	1202 (26%)	234 (23%)
Lower GI	3070 (67%)	704 (68%)
Combined	334 (7.3%)	96 (9.3%)

Table 2: Evaluation of Primary Outcome

Sedation Start to Scope-in	NAS	MAC	P-value	Difference
Mean minutes (Standard Deviation)				
Upper GI	9.95 (3.69)	7.56 (3.69)	0.0000*	- 2.39
Lower GI	9.45 (3.57)	7.34 (3.00)	0.0000*	- 2.11
Combined	9.93 (3.60)	7.84 (3.40)	0.0000*	- 2.09

Table 3: Evaluation of Secondary Outcomes

In Room to Scope in Time	NAS	MAC	P-value	Difference
Mean minutes (SD)				
Upper GI	31.76 (15.57)	10.34 (10.16)	0.0000*	- 21.42
Lower GI	29.39 (15.35)	9.94 (9.32)	0.0000*	- 19.45
Combined	30.31 (15.96)	10.00 (8.55)	0.0000*	- 20.31
Total Case Length				
Mean minutes (SD)				
Upper GI	44.25 (17.40)	23.07 (13.77)	0.0000*	- 21.18
Lower GI	54.83 (18.69)	34.12 (14.18)	0.0000*	- 20.71
Combined	67.89 (19.48)	48.17 (14.29)	0.0000*	- 19.72
Scope-Out to Out of Room				
Mean minutes (SD)				
Upper GI	4.92 (5.45)	4.05 (7.19)	0.0815	- 0.87
Lower GI	4.16 (5.27)	3.57 (5.49)	0.0089*	- 0.59
Combined	4.94 (4.82)	4.08 (3.22)	0.0425*	- 0.86
PACU Length of Stay				
Mean minutes (SD)				
Upper GI	48.77 (31.56)	41.76 (25.68)	0.0003*	- 7.01
Lower GI	41.57 (21.37)	39.46 (22.02)	0.0212*	- 2.11
Combined	50.30 (25.98)	48.23 (22.66)	0.4473	- 2.07

*p-values ≤ 0.05 are statistically significant

Implications

- Decreased SSSI in combination with decreased secondary outcomes allows for increase in number of GI procedures per day. This results in improved access to care which studies have shown can reduce patient morbidity and mortality.^B
- There is opportunity for other service lines to adopt MAC sedation for enhanced efficiency and increased access to more health services.

No Disclosures

References

^A Tan, George, and Satish S.C. Rao. "Part I: How to Ergonomically Design a Modern Endoscopic Suite." *Techniques in Gastrointestinal Endoscopy*, vol. 21, no. 3, 2019, pp. 133-139., <https://doi.org/10.1016/j.tgie.2019.07.001>.

^B Prentice, Julia C, and Steven D Pizer. "Delayed access to health care and mortality." *Health services research* vol. 42,2 (2007): 644-62. doi:10.1111/j.1475-6773.2006.00626.x