Session Number: P01

Session Title: Practice Management 2021 ePosters

Presentation Number: EA10

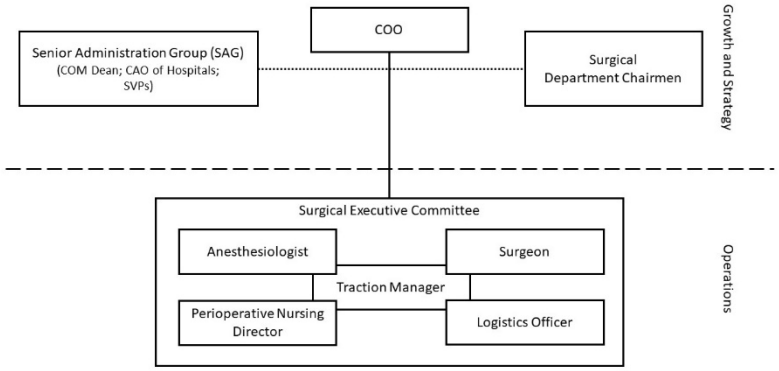
Topic 1: 1.1 Quality Improvement

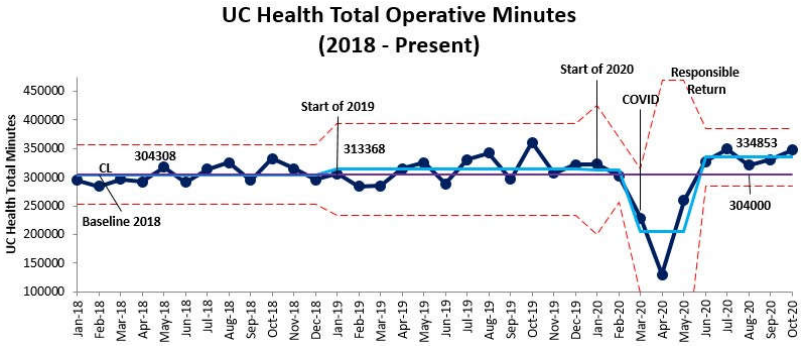
Publishing Title: Never Let a Good Crisis Go to Waste

Author Block: **S. Bertsch**[1], C. Zender[2], C. Krombach[3], R. Wiehe[3], A. D. Friedrich[1]; [1]Anesthesiology, University of Cincinnati, Cincinnati, OH, [2]Otolaryngology-Head and Neck Surgery, University of Cincinnati, Cincinnati, OH, [3]UC Health, Cincinnati, OH.

Abstract Body: The COVID pandemic impacted the US and health systems across the country, dramatically changing surgical services. In the 6 months since the initial stages of the pandemic, UC Health's operative services continue to thrive despite significant challenges with no increase from pre-COVID resources. The COVID pandemic caused disruption but also promoted forward thinking. On March 16th 2020, UC Health decided to cancel all elective surgeries. Surgical cases dropped more than 50% overnight. Medically necessary, time sensitive cases proceeded with approval from surgical chairs and oversight through the COVID Response Team. As the pandemic evolved, UC Health planned for a responsible return of operative services. The COO of the health system realigned organizational structure to form a new Surgical Executive Committee (SEC), comprised of an anesthesiologist, surgeon, Perioperative Nursing Director and Logistics Officer. The previous model of an Operating Room (OR) medical director and Perioperative Nursing Director was phased out. The new governance structure directly reported to the COO of the health system with strategic input from both the senior administration group and surgical chairs. This restructuring at the nadir of pandemic, allowed new thought and action on the resumption of surgical services. The newly formed SEC eliminated historical silos, promoted feedback loops, encouraged constant dialogue and communication with key stake holders, helping to align system strategic growth with logistical operations. Allocation of operative time morphed entirely. The previous surgeon level block was revamped to reflect departmental needs and a perceived backlog of elective cases. Operative time was allocated for two months at a department level with plans to resume a 'typical' surgeon block schedule in July 2020. Each department was now responsible for determining the necessity of case, allocation of time and ability to fit cases together to maximize efficiency and operative time. In addition, the release times for all surgeons were set at 1 week to ensure proper scheduling. This also helped to facilitate COVID

testing for all patients prior to the OR and identify cases needing rescheduling due to a positive COVID test. As all operative sites resumed cases on June 29th, 2020, a new hybrid block system began. Department chairs were allowed to allocate to a surgeon level, a group level or maintain the department level. Departments varied on their approach. This change forced cooperation amongst surgical schedulers from different offices within the same department who previously didn't communicate. Furthermore, this allowed better allocation of operative time for well-established surgeons versus those growing a practice. Since the responsible return of the OR in June, both operative case counts and operative minutes surpassed pre-COVID levels. Continued dialogue, engagement, and feedback of surgical scheduling and practices helped to restart UC Health's operative services. The overall growth not only occurred during the return from the pandemic but also during a resource constrained environment where staffing levels are slowly returning back to normal as of November 2020.





Abstract Body2:

Organizational realignment at the nadir of the COVID pandemic promoted forward thinking to help with resumption of surgical cases. UC Health surpassed pre-COVID operative case counts and operative minutes following the restart of elective surgery post pandemic. The formation of a new Surgical Executive Committee focused on continual change and performance improvement during the COVID pandemic to increase operative services.

Session Number: P02

Session Title: Practice Management 2021 ePosters

Presentation Number: EA10

Topic 1: 1.1 Quality Improvement

Publishing Title: Never Let a Good Crisis Go to Waste

Author Block: **S. Bertsch**[1], C. Zender[2], C. Krombach[3], R. Wiehe[3], A. D. Friedrich[1]; [1]Anesthesiology, University of Cincinnati, Cincinnati, OH, [2]Otolaryngology-Head and Neck Surgery, University of Cincinnati, Cincinnati, OH, [3]UC Health, Cincinnati, OH.

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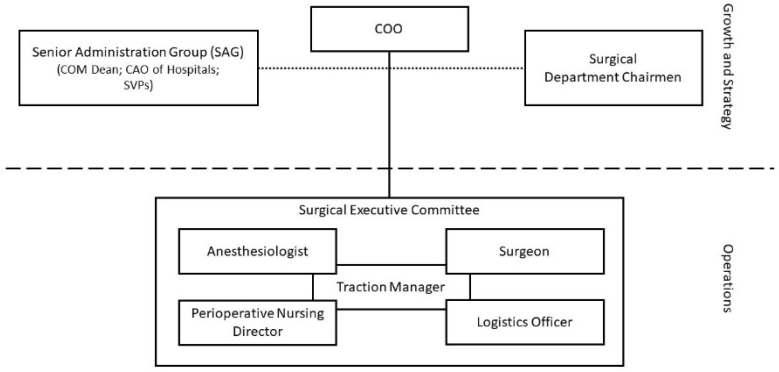

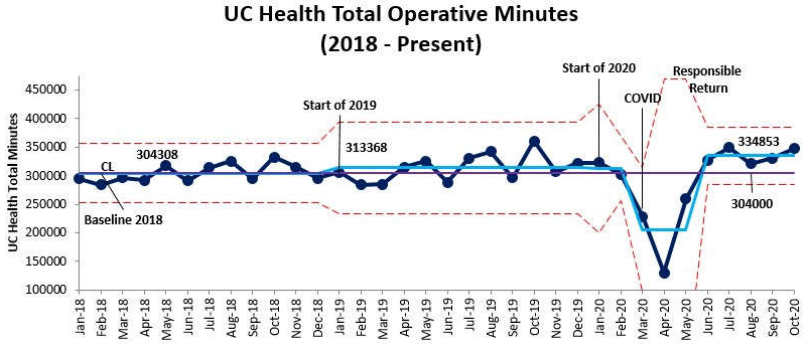

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Session Number: P03

Session Title: Practice Management 2021 ePosters

Presentation Number: EA10

Topic 1: 1.1 Quality Improvement

Publishing Title: Never Let a Good Crisis Go to Waste

Author Block: **S. Bertsch**[1], C. Zender[2], C. Krombach[3], R. Wiehe[3], A. D. Friedrich[1]; [1]Anesthesiology, University of Cincinnati, Cincinnati, OH, [2]Otolaryngology-Head and Neck Surgery, University of Cincinnati, Cincinnati, OH, [3]UC Health, Cincinnati, OH.

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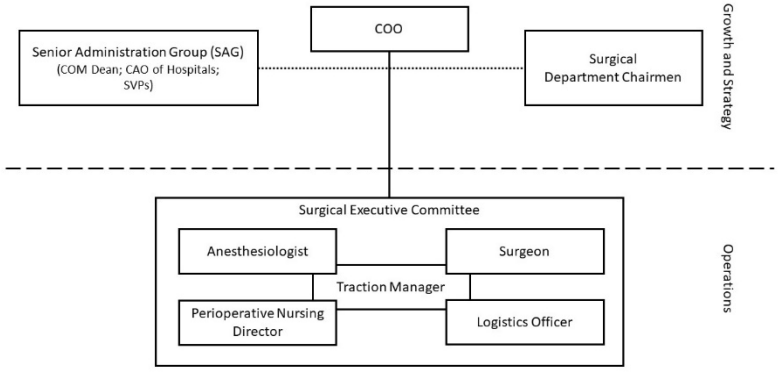
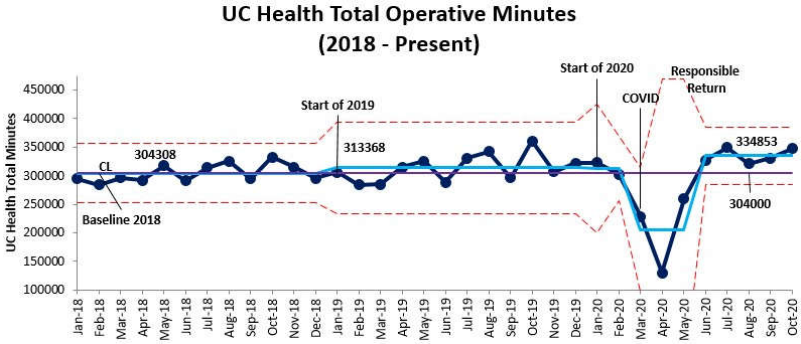
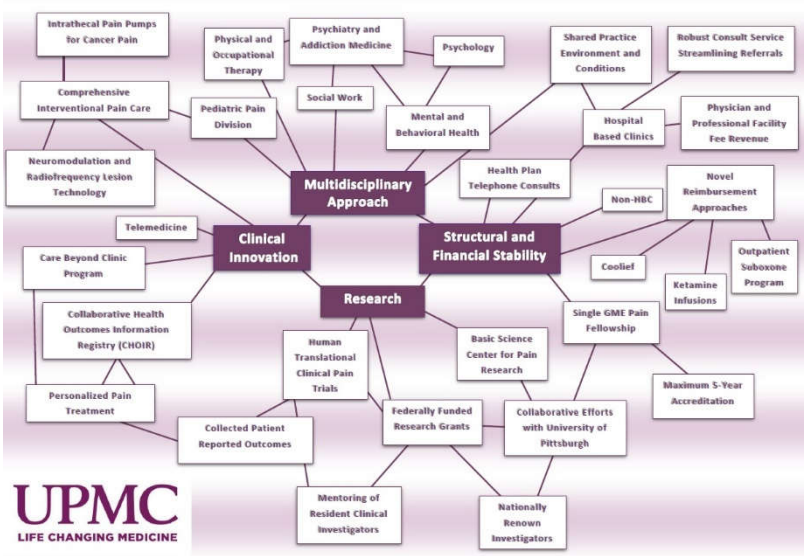




Abstract Body2: Organizational realignment at the nadir of the COVID pandemic promoted forward thinking to help with resumption of surgical cases. UC Health surpassed pre-COVID operative case counts and operative minutes following the restart of elective surgery post pandemic. The formation of a new Surgical Executive Committee focused on continual change and performance improvement during the COVID pandemic to increase operative services.

Session Number:	P01
Session Title:	Practice Management 2021 ePosters
Presentation Number:	EA12
Topic 1:	1.1 Quality Improvement
Publishing Title:	**Refining Business Strategy through the Development of a Chronic Pain Division Activity System Map**
Author Block:	**H. Burke**, S. Morrissey, T. Emerick; Anesthesiology and Perioperative Medicine, Chronic Pain Division, University of Pittsburgh Medical Center, Pittsburgh, PA.
Abstract Body:	**Introduction:** Many organizations, businesses, and healthcare groups alike, are always striving for operational effectiveness in their given field. However, the truly successful practices only thrive when they develop strategic positioning or a pre-determined value of functions that they believe will set them apart from competition or inefficiency. The main cause of organizations that fail is mainly due to the inability to distinguish between operational efficiency and strategy, which can also be defined as creating fit among an organization's activities.[1] This project was designed to not only define the individual activities that the Department executes but to map them out into an easy to visualize graphic that better streamlines current target implementation. In recent years, healthcare groups reviewing progress towards goals have needed to expand their cognizance to a system-based approach to bring clarity to performance assessment.[2] Additionally, as healthcare currently finds itself amidst the transition from fee-for-service care to value-based care, it is of utmost importance to be able to participate in the coordination of these changes[3], which will be aided by the results of this project. The purpose of this project was to develop an Activity System Map, direct visualization of how the varying, day-to-day functions of the Chronic Pain Division are interwoven for its overall, aspirational strategic position in today's current healthcare model. **Methods and Sample:** This project was approved by the Institutional Quality Improvement (QI) Committee (#2538). The sample data includes the administrative organization as well as day day-to-day functioning activities that the department executes while the set includes the entirety of the UPMC Chronic Pain Division, across all outpatient clinic sites, ambulatory surgery centers, and inpatient consult services. The Activity Systems Map was created used by Microsoft Word and Microsoft OneNote.**Results and Analysis:** **Figure 1:** Completed Activity Systems Map. Solid purple boxes represent core organization activities, and the white boxes represent the peripheral components. Solid purple lines display interwoven organizational activities. The Activity Systems Map was developed through Microsoft Publisher and Microsoft OneNote (Figure 1). The results were primarily used to improve processes and healthcare delivery throughout the Chronic Pain Division. This means evaluating which activity processes need greater attention or improvement to better align their function within the department's overarching strategic position. The results helped

to identify how the activities play a role in the current patient care management model and highlight which aspects may need changing or improvement.
References: 1. Porter, ME *What Is Strategy?* Harvard Business Review, Nov-Dec 1996, Accessioned Online; https://hbr.org/1996/11/what-is-strategy; 02/27/2020 2. Levesque JF Sutherland K, Combining patient, clinical, and system perspectives in assessing performance in healthcare: an integrated measurement framework. BMC Health Serv Res. 2020 Jan 8;20(1):23. doi: 10.1186/s12913-019-4807-5. 3. Allin O, Urman RD, Edwards AF, Blitz JD, Pfeifer KJ, Feeley TW, Bader AM, Using Time-Driven Activity-Based Costing to Demonstrate Value in Perioperative Care: Recommendations and Review from the Society for Perioperative Assessment and Quality Improvement (SPAQI); J Med Syst. 2019 Dec 11;44(1):25. doi: 10.1007/s10916-019-1503-2.



Abstract Body2: The purpose of this project was to develop an Activity System Map, direct visualization of how the varying, day-to-day functions of the Chronic Pain Division are interwoven for its overall, aspirational strategic position in today's current healthcare model.

Session Number:	P02
Session Title:	Practice Management 2021 ePosters
Presentation Number:	EA12
Topic 1:	1.1 Quality Improvement
Publishing Title:	**Refining Business Strategy through the Development of a Chronic Pain Division Activity System Map**
Author Block:	**H. Burke**, S. Morrissey, T. Emerick; Anesthesiology and Perioperative Medicine, Chronic Pain Division, University of Pittsburgh Medical Center, Pittsburgh, PA.
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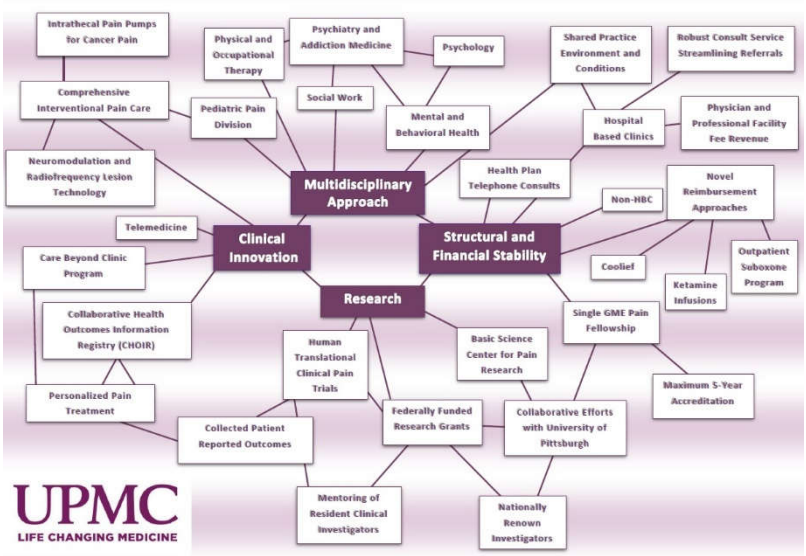

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Session Number: P03

Session Title: Practice Management 2021 ePosters

Presentation Number: EA12

Topic 1: 1.1 Quality Improvement

Publishing Title: **Refining Business Strategy through the Development of a Chronic Pain Division Activity System Map**

Author Block: **H. Burke**, S. Morrissey, T. Emerick;
Anesthesiology and Perioperative Medicine, Chronic Pain Division, University of Pittsburgh Medical Center, Pittsburgh, PA.

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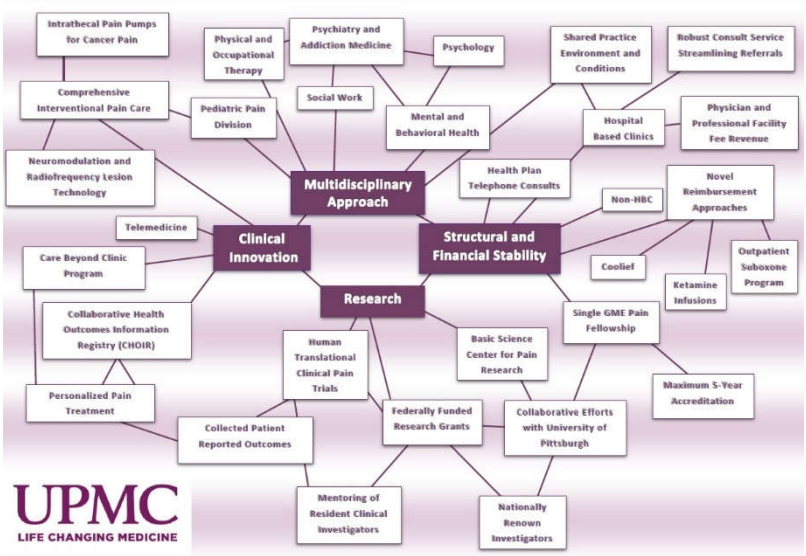

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Session Number: P01

Session Title: Practice Management 2021 ePosters

Presentation Number: EA07

Topic 1: 1.1 Quality Improvement

Publishing Title: **The Effect of Modular Clinical Staffing Assignments on Augmenting Increased COVID Clinical Demand**

Author Block: **H. Burke**, E. E. Lebovitz, R. D. Ball;
Anesthesiology and Perioperative Medicine, University of Pittsburgh Medical Center, Pittsburgh, PA.

Abstract Body: **Introduction** At the end of 2019, the novel coronavirus, SARS-CoV-2, was discovered in the Hubei Province of China. The subsequent disease syndrome was named COVID-19 and would cause 1 million cases and 50,000 deaths in the first 3 months alone.[1] Due to the inherent nature of the pandemic's spread, there was significant variation across the United States and the rest of the world in regards to estimating peak need for hospital resource requirements.[2] Therefore, while the disease will go on to profoundly impact basic and clinical science alike, it also has significant ramifications towards impacting hospital administration resource and staffing management. The CDC dictates that should severe staffing shortages arise, specific contingency capacity strategies are utilized. These strategies include adjusting staff schedules, hiring additional healthcare personnel, canceling all non-essential procedures/visits, and rotating healthcare personnel to positions that support patient care activities.[3] **Materials and Methods** UPMC is an integrated delivery and financial system with multiple hospitals in and around Western PA and internationally. The Department of Anesthesiology and Perioperative Medicine covers all anesthetizing locations and consists of approximately 200 anesthesiologists throughout all their hospital locations. The group utilizes a modular staffing system, with a contractual obligation of 230 clinical assignments to be covered throughout the year. As a result of this system, staff can transition between hospitals to cover equivalent assignments as needed. Working with the current modular staffing system, the group sought to repurpose clinical assignments that were previously used for daytime operating room coverage of elective cases, to a 24-hour in-house staffing a COVID response team to assist in the ICU and ER. This would allow staff to continue to fulfill clinical assignment obligations and also work to staff a critical need in a time of crisis. To accomplish this, two previous daytime operating room assignments, designated as a total of 2.4 clinical assignments along with partial assignment credit totaling 0.4 clinical assignment, were temporarily suspended, and, in turn, a 24-hour in-house COVID team shift was designed and designated a 2.8 in clinical assignment credit. **Results and Analysis Table 1:** Modular clinical staffing assignments and their subsequent time equivalence in hours. After repurposing of staff for the COVID Response team, there was a net difference of 0 for total Time Equivalents. COVID response team coverage was required for approximately one month from April 1st to May

1st, 2020. During this time, frequent intubations were required and multiple urgent operating room COVID cases were successfully negotiated via this coverage. As a result of the repurposed shifts, staff continued to meet contractual obligations for clinical assignment coverage even though there was a significant reduction in elective operating room cases.

References 1. National Institute for Allergy and Infectious Disease, NIH. COVID-19, MERS & SARS, April 6th, 2020. https://www.niaid.nih.gov/diseases-conditions/covid-19 (Accessed May 5th, 2020). 2. McIntosh, K. Coronavirus disease 2019 (COVID-19): Epidemiology, virology, clinical features, diagnosis, and prevention. M Hirsch, A Bloom (Eds.), 2020. UpToDate. (Accessed May 7th, 2020). 3. Bedard, NA et alia. Effect of COVID-19 on Hip and Knee Arthroplasty Surgical Volume in the United States. J. of Arthroplasty, 2020. https://doi.org/10.1016/j.arth.2020.04.060 (Accessed May 8th, 2020)

Old Designation	CA Credit	Time Equivalent (HRS)
L1	1.4	13
L2	1.2	11
L3	1.2	9
L4	1	9
L5	1	9
GI	1	9
ASC	1.2	11

New Designation	CA Credit	Time Equivalent (HRS)	Change
COVID Response	2.8	24	24
L1	1.4	13	0
L2	0 (Suspended)	0	-11
L3	1 (Reduced)	9	-2
L4	1	9	0
L5	0 (Suspended)	0	-9
GI	1	9	0
ASC	1 (Reduced)	9	-2

Abstract Body2:

Our objective is to demonstrate how the modular clinical assignments staffing plan can allow for quick redeployment of personnel. This allows staff to meet contractual obligations and quickly shift to covering situations for the COVID crisis, such as intubations and alternative patient management scenarios.

Session Number: P02

Session Title: Practice Management 2021 ePosters

Presentation Number: EA07

Topic 1: 1.1 Quality Improvement

Publishing Title: **The Effect of Modular Clinical Staffing Assignments on Augmenting Increased COVID Clinical Demand**

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Old Designation	CA Credit	Time Equivalent (HRS)
L1	1.4	13
L2	1.2	11
L3	1.2	9
L4	1	9
L5	1	9
GI	1	9
ASC	1.2	11

New Designation	CA Credit	Time Equivalent (HRS)	Change
COVID Response	2.8	24	24
L1	1.4	13	0
L2	0 (Suspended)	0	-11
L3	1 (Reduced)	9	-2
L4	1	9	0
L5	0 (Suspended)	0	-9
GI	1	9	0
ASC	1 (Reduced)	9	-2

Abstract Body2:

Our objective is to demonstrate how the modular clinical assignments staffing plan can allow for quick redeployment of personnel. This allows staff to meet contractual obligations and quickly shift to covering situations for the COVID crisis, such as intubations and alternative patient management scenarios.

Session Number:	P03
Session Title:	Practice Management 2021 ePosters
Presentation Number:	EA07
Topic 1:	1.1 Quality Improvement
Publishing Title:	**The Effect of Modular Clinical Staffing Assignments on Augmenting Increased COVID Clinical Demand**
Author Block:	**H. Burke**, E. E. Lebovitz, R. D. Ball; Anesthesiology and Perioperative Medicine, University of Pittsburgh Medical Center, Pittsburgh, PA.
Abstract Body:	**Introduction** At the end of 2019, the novel coronavirus, SARS-CoV-2, was discovered in the Hubei Province of China. The subsequent disease syndrome was named COVID-19 and would cause 1 million cases and 50,000 deaths in the first 3 months alone.[1] Due to the inherent nature of the pandemic's spread, there was significant variation across the United States and the rest of the world in regards to estimating peak need for hospital resource requirements.[2] Therefore, while the disease will go on to profoundly impact basic and clinical science alike, it also has significant ramifications towards impacting hospital administration resource and staffing management. The CDC dictates that should severe staffing shortages arise, specific contingency capacity strategies are utilized. These strategies include adjusting staff schedules, hiring additional healthcare personnel, canceling all non-essential procedures/visits, and rotating healthcare personnel to positions that support patient care activities.[3] **Materials and Methods** UPMC is an integrated delivery and financial system with multiple hospitals in and around Western PA and internationally. The Department of Anesthesiology and Perioperative Medicine covers all anesthetizing locations and consists of approximately 200 anesthesiologists throughout all their hospital locations. The group utilizes a modular staffing system, with a contractual obligation of 230 clinical assignments to be covered throughout the year. As a result of this system, staff can transition between hospitals to cover equivalent assignments as needed. Working with the current modular staffing system, the group sought to repurpose clinical assignments that were previously used for daytime operating room coverage of elective cases, to a 24-hour in-house staffing a COVID response team to assist in the ICU and ER. This would allow staff to continue to fulfill clinical assignment obligations and also work to staff a critical need in a time of crisis. To accomplish this, two previous daytime operating room assignments, designated as a total of 2.4 clinical assignments along with partial assignment credit totaling 0.4 clinical assignment, were temporarily suspended, and, in turn, a 24-hour in-house COVID team shift was designed and designated a 2.8 in clinical assignment credit. **Results and Analysis Table 1:** Modular clinical staffing assignments and their subsequent time equivalence in hours. After repurposing of staff for the COVID Response team, there was a net difference of 0 for total Time Equivalents. COVID response team coverage was required for approximately one month from April 1st to May

1st, 2020. During this time, frequent intubations were required and multiple urgent operating room COVID cases were successfully negotiated via this coverage. As a result of the repurposed shifts, staff continued to meet contractual obligations for clinical assignment coverage even though there was a significant reduction in elective operating room cases.

References 1. National Institute for Allergy and Infectious Disease, NIH. COVID-19, MERS & SARS, April 6th, 2020. https://www.niaid.nih.gov/diseases-conditions/covid-19 (Accessed May 5th, 2020). 2. McIntosh, K. Coronavirus disease 2019 (COVID-19): Epidemiology, virology, clinical features, diagnosis, and prevention. M Hirsch, A Bloom (Eds.), 2020. UpToDate. (Accessed May 7th, 2020). 3. Bedard, NA et alia. Effect of COVID-19 on Hip and Knee Arthroplasty Surgical Volume in the United States. J. of Arthroplasty, 2020. https://doi.org/10.1016/j.arth.2020.04.060 (Accessed May 8th, 2020)

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GI	1	9
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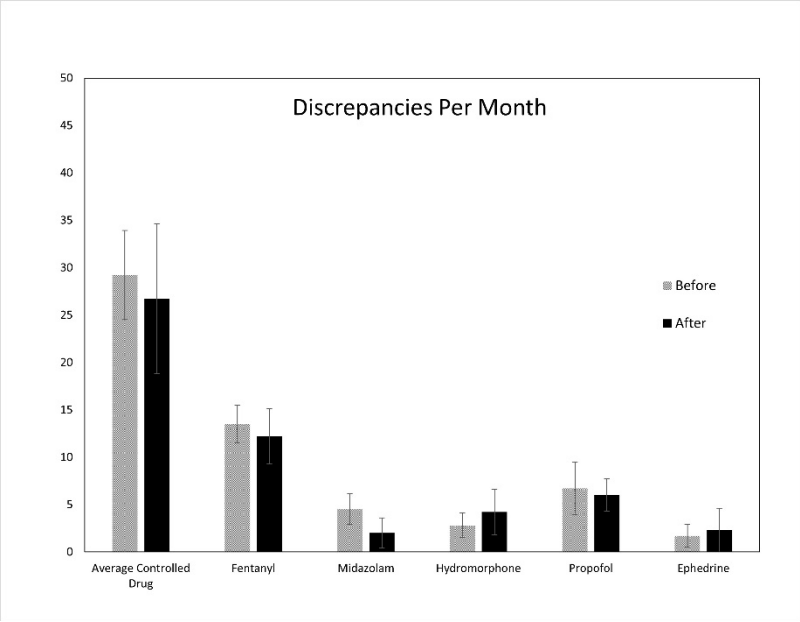
New Designation	CA Credit	Time Equivalent (HRS)	Change
COVID Response	2.8	24	24
L1	1.4	13	0
L2	0 (Suspended)	0	-11
L3	1 (Reduced)	9	-2
L4	1	9	0
L5	0 (Suspended)	0	-9
GI	1	9	0
ASC	1 (Reduced)	9	-2

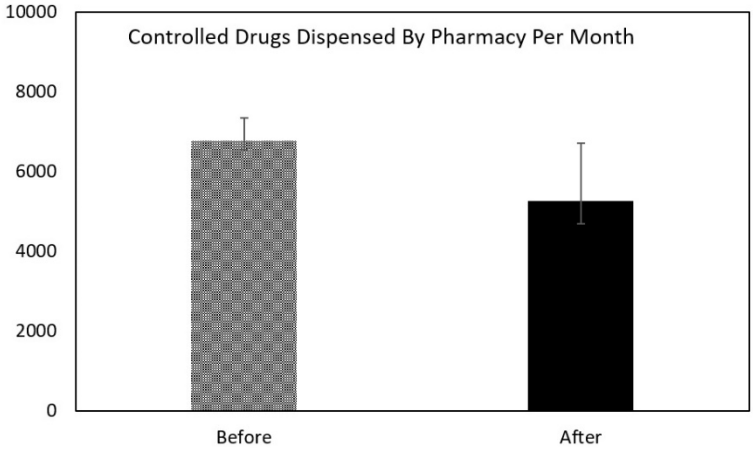
Abstract Body2:

Our objective is to demonstrate how the modular clinical assignments staffing plan can allow for quick redeployment of personnel. This allows staff to meet contractual obligations and quickly shift to covering situations for the COVID crisis, such as intubations and alternative patient management scenarios.

Session Number:	P01
Session Title:	Practice Management 2021 ePosters
Presentation Number:	EA05
Topic 1:	1.1 Quality Improvement
Publishing Title:	Simplification of Standard Controlled Substance Bag Leading to Reduced Charting Discrepancies
Author Block:	**G. Pere**[1], B. Beagley[1], J. V. Pham[2], S. K. Morihara[3], C. Lyda[4], B. Fullmer[4], J. Dong[1]; [1]University of Colorado, Aurora, CO, [2]University of California San Diego, Hillcrest, CA, [3]PHYSICIANS ANESTHESIA SERVICE, Honolulu, HI, [4]UC Health, Aurora, CO.
Abstract Body:	**Background**: Intraoperative controlled substance charting error is the most common cause of overall medication discrepancy errors. In our institution, there is an average of 35 controlled substance discrepancies per month in the general inpatient operating rooms by anesthesia providers. We believe the duplicate vials of controlled substances in a standard bag contribute to accounting errors. In collaboration with OR pharmacy and anesthesia staff, we reviewed patterns of charting discrepancies, simplified components of the standard controlled substance bag, and tracked changes in monthly medication discrepancies. **Method**: In this prospective quality improvement investigation at a large academic hospital, we reviewed records of controlled substance discrepancies withdrawn from pharmacy to examine the effect of simplifying a standard controlled substance bag in our daily practice. At the start of our study, the standard bag contained 9 vials of medications with duplicates of fentanyl, midazolam, and propofol. We removed the duplicate vials of midazolam and fentanyl in February 2020 and compared the monthly discrepancies made over a 6-month period before and after the change. Paired t-tests to compare the monthly discrepancies determined a p-value <0.05 to be statistically significant. **Results**: The most common controlled substance discrepancies were associated with fentanyl, midazolam, and propofol. After removal of duplicate fentanyl and midazolam vials, there was a statistically significant 56% reduction in monthly discrepancies of midazolam (before 4.5 ± 1.6 vs after 2.0 ± 1.5, $p = 0.004$). There were numerical reductions in average monthly discrepancies associated with fentanyl (13.5 vs 12.1) and propofol (6.7 vs 6.0) that were not statistically significant ($p = 0.444$ and $p = 0.675$, respectively). We also observed a numerical reduction in average number of discrepancies from 29.2 to 26.7 per month after removal of duplicate vials ($p = 0.514$). Duplicate vial reduction did not result in influx of number of controlled drugs requested from pharmacy by anesthesia providers during cases. Conversely, there was a 22% reduction in the mean number of controlled substances checked out by the pharmacy (6774 vs 5268, $p = 0.059$). **Conclusion**: Our analysis demonstrated a statistically significant reduction in

number of some controlled substance discrepancies at our institution by reducing number of vials in the standard controlled substance bag. In addition, pharmacy also reported decreased number of controlled substance requests by anesthesia providers as well as a decrease in errors, time, and effort of the pharmacy staff in the making of controlled substance bags.





Discrepancies Per Month	Before	*Std*	After	*Std*	P-value
Average Controlled Drug	29.2	*4.7*	26.7	*7.9*	0.514
Fentanyl	13.5	*2.0*	12.2	*2.9*	0.444
Midazolam	4.5	*1.6*	2.0	*1.6*	0.004 *
Hydromorphone	2.8	*1.3*	4.2	*2.4*	0.102
Propofol	6.7	*2.8*	6.0	*1.7*	0.675
Ephedrine	1.7	*1.2*	2.3	*2.3*	0.595

Abstract Body2:

Intraoperative narcotic charting error is the most common type of controlled substance discrepancy. The duplicate vials of controlled substances in standard controlled substance bags contributes to accounting errors. After reviewing

patterns of charting discrepancies, we simplified components of standard controlled substance bags, which resulted in reduced frequency of discrepancies and amount of controlled substances dispensed by pharmacy.

Session Number:	P02
Session Title:	Practice Management 2021 ePosters
Presentation Number:	EA05
Topic 1:	1.1 Quality Improvement
Publishing Title:	Simplification of Standard Controlled Substance Bag Leading to Reduced Charting Discrepancies
Author Block:	**G. Pere**[1], B. Beagley[1], J. V. Pham[2], S. K. Morihara[3], C. Lyda[4], B. Fullmer[4], J. Dong[1]; [1]University of Colorado, Aurora, CO, [2]University of California San Diego, Hillcrest, CA, [3]PHYSICIANS ANESTHESIA SERVICE, Honolulu, HI, [4]UC Health, Aurora, CO.
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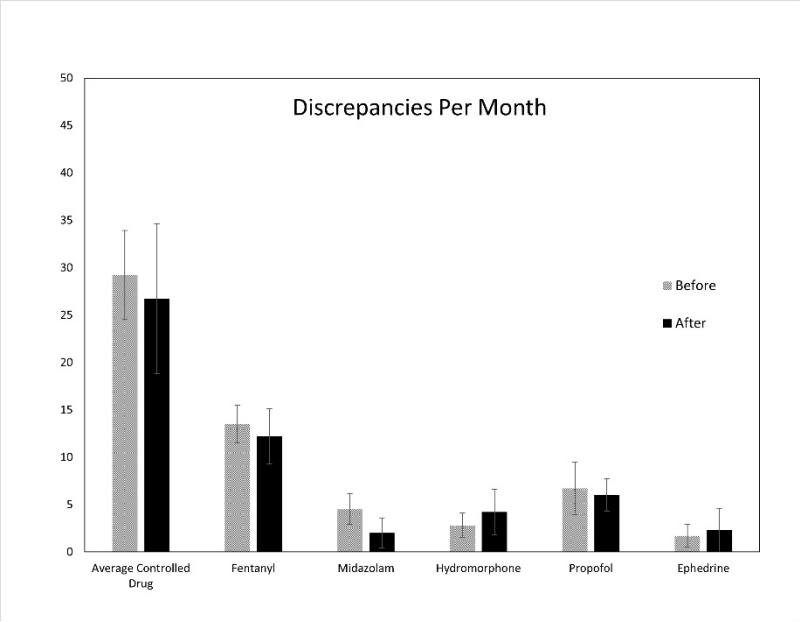

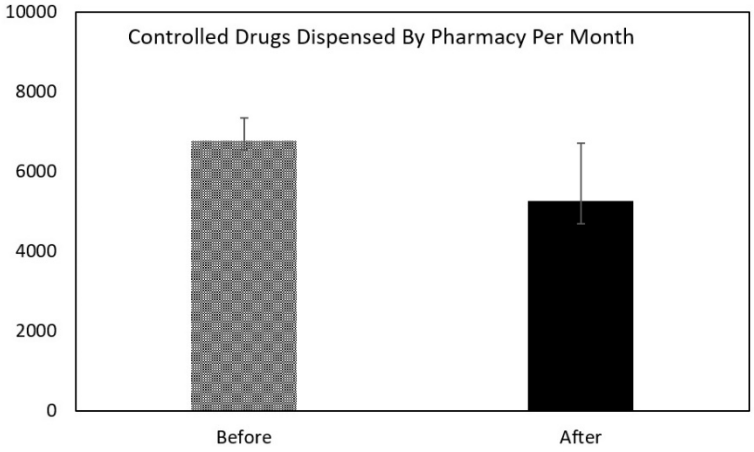

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Session Number: P03

Session Title: Practice Management 2021 ePosters

Presentation Number: EA05

Topic 1: 1.1 Quality Improvement

Publishing Title: Simplification of Standard Controlled Substance Bag Leading to Reduced Charting Discrepancies

Author Block:
G. Pere[1], B. Beagley[1], J. V. Pham[2], S. K. Morihara[3], C. Lyda[4], B. Fullmer[4], J. Dong[1];
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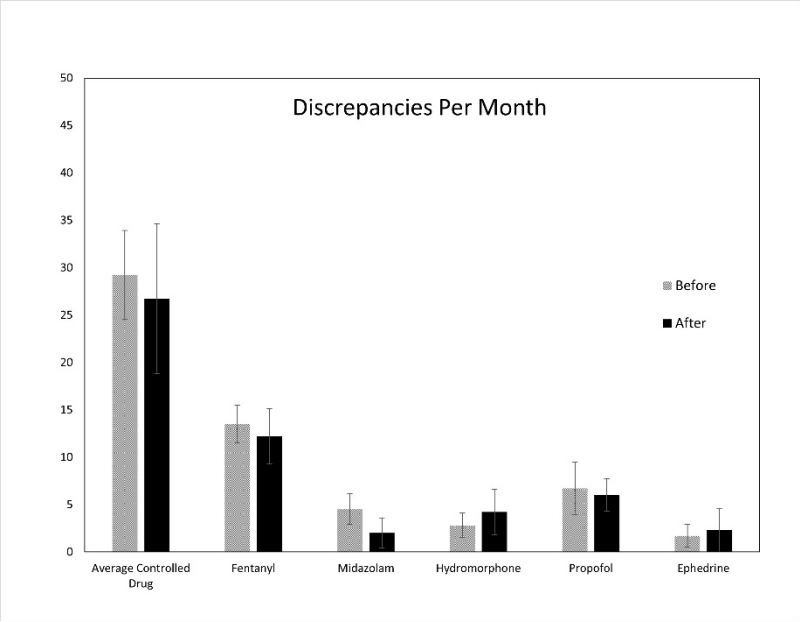

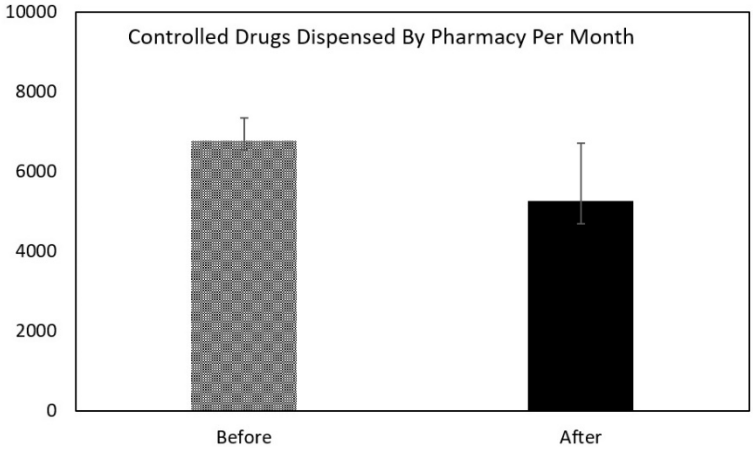

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Session Number: P01

Session Title: Practice Management 2021 ePosters

Presentation Number: EA04

Topic 1: 1.1 Quality Improvement

Publishing Title: Causes and Cost of Unplanned Admissions from an Outpatient Surgery

Author Block: **J. Pham**[1], S. Vig[2], R. A. Gabriel[3];
[1]Perioperative Anesthesia, University of California San Diego, San Diego, CA, [2]San Diego, CA, [3]University of California, San Diego, San Diego, CA.

Abstract Body:

Purpose Hospital and emergency department (ED) admissions after outpatient surgery can be costly to patients and healthcare facilities. We aimed to identify surgeries with the highest odds for unplanned hospitalization and ED visits postoperatively. We also sought to identify the most common post-surgical complications and comorbidities associated with patients requiring additional care. The goal is to use the data to develop interventions to help prevent unplanned post-surgical admissions.

Methods Data was collected from all patients that underwent surgery at our freestanding surgery center from March 2018 to October 2020. The primary outcome of interest was admission to hospital or ED immediately after surgery up to postoperative day 1 (POD1). Data collected included, surgical procedure, service line, cause of admission, age, body mass index, and medical history. We performed logistic regression to analyze the association between service line and admission. The odds ratio (OR) and 95% confidence interval (CI) was presented, in which a p-value <0.05 was considered statistically significant.

Results During this period, a total of 11,476 cases were performed, in which 95 patients (0.83%) were admitted postoperatively (25 were admitted to the hospital and 70 presented to the ED by POD1). Compared to orthopedic surgery, patients undergoing ear nose and throat (OR 2.48, 95% CI: 1.41 - 4.39) and urologic (OR 2.36, 95% CI: 1.24 - 4.64) surgeries had increased odds for admission (Table 1. $p < 0.05$). The most common cause for admission was minor surgical bleeding (26.3%), pain related to surgery (15.8%), urinary retention (11.6%), and hypoxemia (11.6%) (Figure 1). The most common patient comorbidities were obesity (32.6%), hypertension (31.6%), anxiety (23.2%), and depression (22.1%) (Figure 2).

Discussion The average cost of an ED visit ranges from $1,016 to $1,389 (as of 2017), a hospital admission averages $22,543, and ambulance services add an extra $400-$1200. Additionally, ED visits and admissions that occur within 30 days of discharge result in a reimbursement penalty (average 0.71% decrease) to the hospital that initially treated the patient. This places a significant financial burden on hospitals and patients to absorb the cost differences.

Possible interventions to mitigate this include, improved patient communication and updated discharge instructions regarding postoperative expectations, wound

care, and pain management regimens. Another possibility is to provide same day on-site services to address issues so that patients may avoid an ED visit and hopefully prevent an unplanned admission. Small interventions and improved communication can go a long way towards reducing unplanned admissions, saving time and money, and improving patient care and satisfaction.

Service Line	Admitted/ED visit within 24 hours	Total Cases	%	OR (95% CI)	p-value
Orthopedic	26	4,224	0.62	Reference	
Breast	1	647	0.15	0.25 (0.03 - 1.85)	0.17
Colorectal	9	1,010	0.89	1.45 (0.68 - 3.11)	0.34
ENT	22	1,454	1.51	2.48 (1.41 - 4.39)	***0.002***
Minimally Invasive Surgery	6	680	0.88	1.44 (0.59 - 3.51)	0.43
Neurosurgery	1	32	3.13	5.21 (0.69 - 39.59)	0.11
Obstetrics/Gynecology	11	1,646	0.67	1.09 (0.54 - 2.20)	0.82
Plastic Surgery	1	245	0.41	0.66 (0.9 - 4.90)	0.69
Surgical Oncology	1	90	1.11	1.81 (0.24 - 13.51)	0.56
Urology	15	1,043	1.44	2.36 (1.24 - 4.64)	***0.009***
Vascular	0	112	0.00	0 (0 - inf)	0.97
Other	2	293	0.68	1.11 (0.26 - 4.70)	0.89

Table 1. Risk of admission based on type of surgery. OR calculated with orthopedic surgery as a reference.

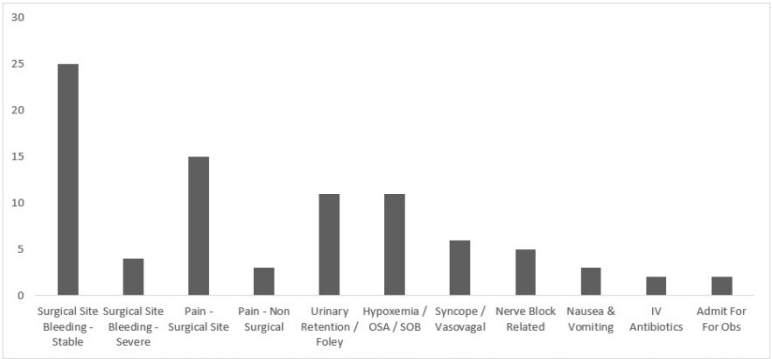

Figure 1. Causes of hospital admission or ED visits within 24 hours following outpatient surgery. Causes with ≤1 occurrence excluded.

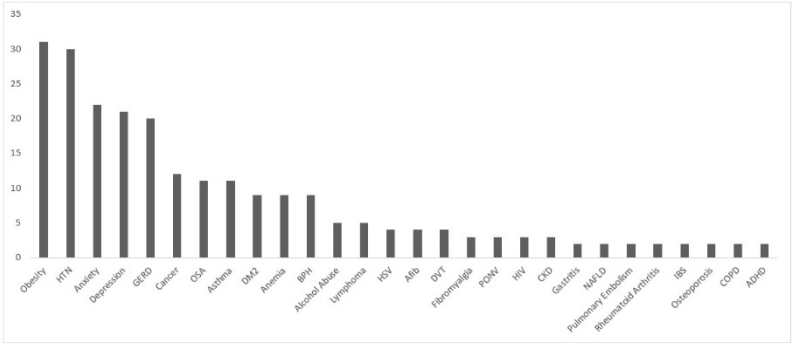

Figure 2. Comorbidities associated with patients who required unplanned care following outpatient surgery. Comorbidities with ≤1 occurrence excluded.

Abstract Body2:

We aimed to identify outpatient surgeries with the highest odds for unplanned hospitalization and ED visits postoperatively, common causes for admission, and associated patient comorbidities. Data was collected from an outpatient facility over a 3-year period. Compared to orthopedic surgery, patients undergoing ear nose and throat (OR 2.48, 95% CI: 1.41 - 4.39) and urologic (OR 2.36, 95% CI: 1.24 - 4.64) surgeries had increased odds for admission. The most common cause for admission was minor surgical bleeding (26.3%), pain related to surgery (15.8%), urinary retention (11.6%), and hypoxemia (11.6%). The most common patient comorbidities were obesity (32.6%), hypertension (31.6%), anxiety (23.2%), and depression (22.1%).

Session Number: P02

Session Title: Practice Management 2021 ePosters

Presentation Number: EA04

Topic 1: 1.1 Quality Improvement

Publishing Title: Causes and Cost of Unplanned Admissions from an Outpatient Surgery

Author Block: **J. Pham**[1], S. Vig[2], R. A. Gabriel[3];
[1]Perioperative Anesthesia, University of California San Diego, San Diego, CA, [2]San Diego, CA, [3]University of California, San Diego, San Diego, CA.

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Purpose Hospital and emergency department (ED) admissions after outpatient surgery can be costly to patients and healthcare facilities. We aimed to identify surgeries with the highest odds for unplanned hospitalization and ED visits postoperatively. We also sought to identify the most common post-surgical complications and comorbidities associated with patients requiring additional care. The goal is to use the data to develop interventions to help prevent unplanned post-surgical admissions.

Methods Data was collected from all patients that underwent surgery at our freestanding surgery center from March 2018 to October 2020. The primary outcome of interest was admission to hospital or ED immediately after surgery up to postoperative day 1 (POD1). Data collected included, surgical procedure, service line, cause of admission, age, body mass index, and medical history. We performed logistic regression to analyze the association between service line and admission. The odds ratio (OR) and 95% confidence interval (CI) was presented, in which a p-value <0.05 was considered statistically significant.

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Other	2	293	0.68	1.11 (0.26 - 4.70)	0.89

Table 1. Risk of admission based on type of surgery. OR calculated with orthopedic surgery as a reference.

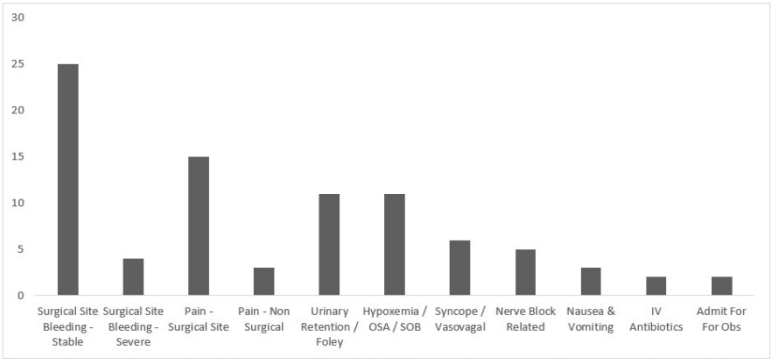


Figure 1. Causes of hospital admission or ED visits within 24 hours following outpatient surgery. Causes with ≤1 occurrence excluded.

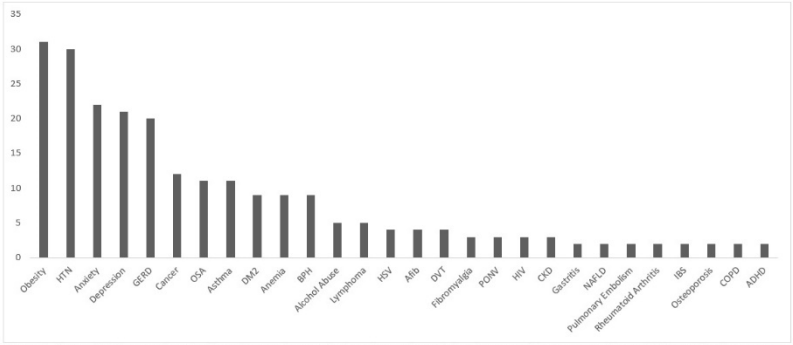


Figure 2. Comorbidities associated with patients who required unplanned care following outpatient surgery. Comorbidities with ≤1 occurrence excluded.

Abstract Body2:

We aimed to identify outpatient surgeries with the highest odds for unplanned hospitalization and ED visits postoperatively, common causes for admission, and associated patient comorbidities. Data was collected from an outpatient facility over a 3-year period. Compared to orthopedic surgery, patients undergoing ear nose and throat (OR 2.48, 95% CI: 1.41 - 4.39) and urologic (OR 2.36, 95% CI: 1.24 - 4.64) surgeries had increased odds for admission. The most common cause for admission was minor surgical bleeding (26.3%), pain related to surgery (15.8%), urinary retention (11.6%), and hypoxemia (11.6%). The most common patient comorbidities were obesity (32.6%), hypertension (31.6%), anxiety (23.2%), and depression (22.1%).

Session Number: P03

Session Title: Practice Management 2021 ePosters

Presentation Number: EA04

Topic 1: 1.1 Quality Improvement

Publishing Title: Causes and Cost of Unplanned Admissions from an Outpatient Surgery

Author Block: **J. Pham**[1], S. Vig[2], R. A. Gabriel[3];
[1]Perioperative Anesthesia, University of California San Diego, San Diego, CA, [2]San Diego, CA, [3]University of California, San Diego, San Diego, CA.

Abstract Body:

Purpose Hospital and emergency department (ED) admissions after outpatient surgery can be costly to patients and healthcare facilities. We aimed to identify surgeries with the highest odds for unplanned hospitalization and ED visits postoperatively. We also sought to identify the most common post-surgical complications and comorbidities associated with patients requiring additional care. The goal is to use the data to develop interventions to help prevent unplanned post-surgical admissions.

Methods Data was collected from all patients that underwent surgery at our freestanding surgery center from March 2018 to October 2020. The primary outcome of interest was admission to hospital or ED immediately after surgery up to postoperative day 1 (POD1). Data collected included, surgical procedure, service line, cause of admission, age, body mass index, and medical history. We performed logistic regression to analyze the association between service line and admission. The odds ratio (OR) and 95% confidence interval (CI) was presented, in which a p-value <0.05 was considered statistically significant.

Results During this period, a total of 11,476 cases were performed, in which 95 patients (0.83%) were admitted postoperatively (25 were admitted to the hospital and 70 presented to the ED by POD1). Compared to orthopedic surgery, patients undergoing ear nose and throat (OR 2.48, 95% CI: 1.41 - 4.39) and urologic (OR 2.36, 95% CI: 1.24 - 4.64) surgeries had increased odds for admission (Table 1. $p < 0.05$). The most common cause for admission was minor surgical bleeding (26.3%), pain related to surgery (15.8%), urinary retention (11.6%), and hypoxemia (11.6%) (Figure 1). The most common patient comorbidities were obesity (32.6%), hypertension (31.6%), anxiety (23.2%), and depression (22.1%) (Figure 2).

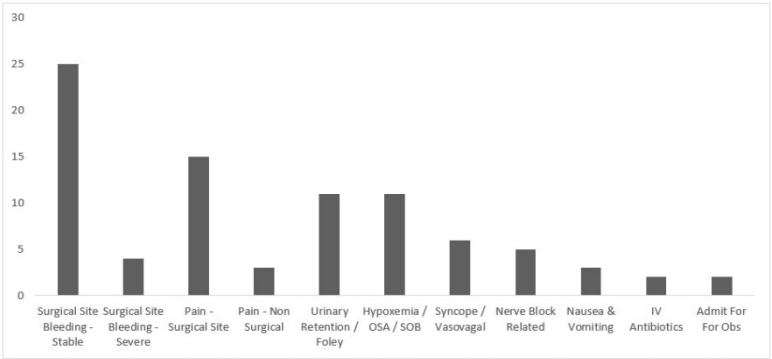
Discussion The average cost of an ED visit ranges from $1,016 to $1,389 (as of 2017), a hospital admission averages $22,543, and ambulance services add an extra $400-$1200. Additionally, ED visits and admissions that occur within 30 days of discharge result in a reimbursement penalty (average 0.71% decrease) to the hospital that initially treated the patient. This places a significant financial burden on hospitals and patients to absorb the cost differences.

Possible interventions to mitigate this include, improved patient communication and updated discharge instructions regarding postoperative expectations, wound

care, and pain management regimens. Another possibility is to provide same day on-site services to address issues so that patients may avoid an ED visit and hopefully prevent an unplanned admission. Small interventions and improved communication can go a long way towards reducing unplanned admissions, saving time and money, and improving patient care and satisfaction.

Service Line	Admitted/ED visit within 24 hours	Total Cases	%	OR (95% CI)	p-value
Orthopedic	26	4,224	0.62	Reference	
Breast	1	647	0.15	0.25 (0.03 - 1.85)	0.17
Colorectal	9	1,010	0.89	1.45 (0.68 - 3.11)	0.34
ENT	22	1,454	1.51	2.48 (1.41 - 4.39)	***0.002***
Minimally Invasive Surgery	6	680	0.88	1.44 (0.59 - 3.51)	0.43
Neurosurgery	1	32	3.13	5.21 (0.69 - 39.59)	0.11
Obstetrics/Gynecology	11	1,646	0.67	1.09 (0.54 - 2.20)	0.82
Plastic Surgery	1	245	0.41	0.66 (0.9 - 4.90)	0.69
Surgical Oncology	1	90	1.11	1.81 (0.24 - 13.51)	0.56
Urology	15	1,043	1.44	2.36 (1.24 - 4.64)	***0.009***
Vascular	0	112	0.00	0 (0 - inf)	0.97
Other	2	293	0.68	1.11 (0.26 - 4.70)	0.89

Table 1. Risk of admission based on type of surgery. OR calculated with orthopedic surgery as a reference.



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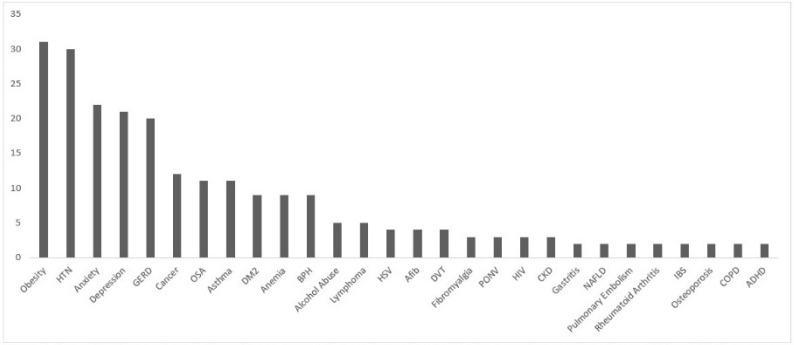

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We aimed to identify outpatient surgeries with the highest odds for unplanned hospitalization and ED visits postoperatively, common causes for admission, and associated patient comorbidities. Data was collected from an outpatient facility over a 3-year period. Compared to orthopedic surgery, patients undergoing ear nose and throat (OR 2.48, 95% CI: 1.41 - 4.39) and urologic (OR 2.36, 95% CI: 1.24 - 4.64) surgeries had increased odds for admission. The most common cause for admission was minor surgical bleeding (26.3%), pain related to surgery (15.8%), urinary retention (11.6%), and hypoxemia (11.6%). The most common patient comorbidities were obesity (32.6%), hypertension (31.6%), anxiety (23.2%), and depression (22.1%).

Session Number:	P01
Session Title:	Practice Management 2021 ePosters
Presentation Number:	EA09
Topic 1:	1.1 Quality Improvement
Publishing Title:	A Study of an Academic Chronic Pain Clinic Workflow Using Value-Added Versus Non Value-Added Analysis
Author Block:	**S. Wang**, T. D. Emerick; Department of Anesthesiology and Perioperative Medicine, University of Pittsburgh Medical Center, Pittsburgh, PA.
Abstract Body:	**Introduction** Increased wait times and decreased face time with physicians are correlated with lower patient satisfaction and reduced "confidence in [the] care provider".[1,2] The challenge of managing wait is magnified in the academic setting due to patient complexity, urgent new referrals from recent hospital discharges, and a constant flux of trainees who are unfamiliar with the clinic. Using Value-Added vs Non Value-Added (VA vs NVA) Analysis, a component of Lean Six Sigma methodology, we aim to improve the patient experience in an academic chronic pain clinic by minimizing NVA time and identifying bottlenecks in the workflow. This analysis is designed to demonstrate how to create and utilize a VA vs NVA chart and can serve as a baseline efficiency measurement for future analysis. There is minimal published literature on the application of a VA vs NVA analysis in an academic chronic pain clinic. **Method** This study was approved by the UPMC Quality Improvement Committee (#2976). Over 5 days, nursing staff recorded how much time return patients diagnosed with "abdominal pain" spent in the UPMC Chronic Pain Clinic: scheduled appointment time (adjusted for late arrivals), check-in time, exam room wait time for the resident/fellow/NP (R/F/NP), evaluation by R/F/NP, room wait time for the attending, and evaluation by attending. At check in, patients also complete the Collaborative Health Outcomes Information Registry (CHOIR) survey. The mean duration of each process was calculated and categorized as VA, Value-Enabled (VE), or NVA. VA activities are associated with direct patient care. VE activities enable future patient care but do not involve direct patient care. The initial data collection occurred in 2016 for a separately approved QI clinic efficiency analysis; however, VA versus NVA time was not analyzed or considered and is the purpose of this new QI approval. **Results** Data was analyzed on 22 patients using the above parameters. A VA vs. NVA chart was produced (Table 1). The mean total time spent in clinic per patient was 59 mins. The VA/VE time was 30 min. On average, VA/VE time comprised of 5 (±9) min of check-in and survey time, 14 (±6) min of R/F/NP evaluation, and 10 (±11) min of attending physician evaluation. NVA time comprised of 20 (±14) mins of waiting time for the R/F/NP and 9 (±10) mins waiting for the attending. The highest variability was seen in the first exam room waiting period. **Discussion** Half of the time spent in clinic was NVA wait time. The first exam

room wait for the R/F/NP had the most NVA time and the greatest variability. Although wait time is sometimes unavoidable, previous studies demonstrated that perceived wait time is reduced when the waiting area is comfortable and patients are proactively informed of delays.[3,4] A digital queuing and notification system can anticipate patient arrival and notify patients of delays, allowing them to wait in a more comfortable setting, such as the hospital café, reducing the impact of NVA activity.[5] In the COVID-19 era, minimizing NVA time also reduces the number of patients in the office. Limitations of this study include not tracking in-office transportation times, and inability to distinguish between time used to complete the CHOIR survey and further waiting time. Nevertheless, by applying VA vs NVA to a chronic pain clinic, we can improve both patient satisfaction and workflow efficiency.

$$MISSING OR BAD GRAPHIC SPECIFICATION (38DFB8CB-B5DF-4638-890A-1F019202AB6D) $$

Process Step	Process Name	Type	Begin Time	Operation Time	End Time	VA or Enabled?	VA Total
1	Check-in / survey	Process	0:00	0:05	0:05	Yes	0:05
2	Exam room waiting time	Delay	0:05	0:20	0:25	No	0:05
3	Resident / fellow / NP visit	Process	0:25	0:14	0:39	Yes	0:19
4	Exam room waiting time	Delay	0:39	0:09	0:48	No	0:19
5	Attending visit	Process	0:48	0:10	0:59	Yes	0:30

Abstract Body2:

Using Value-Added vs Non Value-Added (VA vs NVA) Analysis, a component of Lean Six Sigma methodology, we aim to improve the patient experience in an academic chronic pain clinic by minimizing NVA time and identifying bottlenecks in the workflow. This analysis is designed to demonstrate how to create and utilize a VA vs NVA chart and can serve as a baseline efficiency measurement for future analysis.

Session Number:	P02
Session Title:	Practice Management 2021 ePosters
Presentation Number:	EA09
Topic 1:	1.1 Quality Improvement
Publishing Title:	A Study of an Academic Chronic Pain Clinic Workflow Using Value-Added Versus Non Value-Added Analysis
Author Block:	**S. Wang**, T. D. Emerick; Department of Anesthesiology and Perioperative Medicine, University of Pittsburgh Medical Center, Pittsburgh, PA.
Abstract Body:	**Introduction** Increased wait times and decreased face time with physicians are correlated with lower patient satisfaction and reduced "confidence in [the] care provider".[1,2] The challenge of managing wait is magnified in the academic setting due to patient complexity, urgent new referrals from recent hospital discharges, and a constant flux of trainees who are unfamiliar with the clinic. Using Value-Added vs Non Value-Added (VA vs NVA) Analysis, a component of Lean Six Sigma methodology, we aim to improve the patient experience in an academic chronic pain clinic by minimizing NVA time and identifying bottlenecks in the workflow. This analysis is designed to demonstrate how to create and utilize a VA vs NVA chart and can serve as a baseline efficiency measurement for future analysis. There is minimal published literature on the application of a VA vs NVA analysis in an academic chronic pain clinic. **Method** This study was approved by the UPMC Quality Improvement Committee (#2976). Over 5 days, nursing staff recorded how much time return patients diagnosed with "abdominal pain" spent in the UPMC Chronic Pain Clinic: scheduled appointment time (adjusted for late arrivals), check-in time, exam room wait time for the resident/fellow/NP (R/F/NP), evaluation by R/F/NP, room wait time for the attending, and evaluation by attending. At check in, patients also complete the Collaborative Health Outcomes Information Registry (CHOIR) survey. The mean duration of each process was calculated and categorized as VA, Value-Enabled (VE), or NVA. VA activities are associated with direct patient care. VE activities enable future patient care but do not involve direct patient care. The initial data collection occurred in 2016 for a separately approved QI clinic efficiency analysis; however, VA versus NVA time was not analyzed or considered and is the purpose of this new QI approval. **Results** Data was analyzed on 22 patients using the above parameters. A VA vs. NVA chart was produced (Table 1). The mean total time spent in clinic per patient was 59 mins. The VA/VE time was 30 min. On average, VA/VE time comprised of 5 (±9) min of check-in and survey time, 14 (±6) min of R/F/NP evaluation, and 10 (±11) min of attending physician evaluation. NVA time comprised of 20 (±14) mins of waiting time for the R/F/NP and 9 (±10) mins waiting for the attending. The highest variability was seen in the first exam room waiting period. **Discussion** Half of the time spent in clinic was NVA wait time. The first exam

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Session Number:	P03
Session Title:	Practice Management 2021 ePosters
Presentation Number:	EA09
Topic 1:	1.1 Quality Improvement
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Author Block:	**S. Wang**, T. D. Emerick; Department of Anesthesiology and Perioperative Medicine, University of Pittsburgh Medical Center, Pittsburgh, PA.

Abstract Body:

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Using Value-Added vs Non Value-Added (VA vs NVA) Analysis, a component of Lean Six Sigma methodology, we aim to improve the patient experience in an academic chronic pain clinic by minimizing NVA time and identifying bottlenecks in the workflow. This analysis is designed to demonstrate how to create and utilize a VA vs NVA chart and can serve as a baseline efficiency measurement for future analysis.

Session Number: P01

Session Title: Practice Management 2021 ePosters

Presentation Number: EA08

Topic 1: 1.1 Quality Improvement

Publishing Title: Evaluation of Anesthesia Providers' Perception of a PACU Emergence and Extubation Initiative Improving OR Efficiency at a Large Pediatric Center

Author Block: **B. Pellatt**[1], V. N. O'Reilly-Shah[2], S. Flack[3];
[1]Anesthesiology, University of Washington, Seattle, WA, [2]Seattle, WA, [3]Seattle Children's Hospital, Seattle, WA.

Abstract Body: Introduction: One of the major revenue agents in hospitals are the operating rooms. They are expensive to operate and therefore operating room (OR) efficiency is important. To improve end of surgery to out of OR times and assist with improving OR turnover times, our hospital started an anesthesia PACU emergence and extubation initiative to expedite patient exit from the OR. The PACU was staffed with an attending anesthesiologist and the OR anesthesia providers were encouraged to bring their patients to the PACU for emergence when clinically appropriate. Methods: After 3-months of running this initiative, the anesthesia faculty (n = 32) were e-mailed a survey that included eight, four-point Likert-scale and two open-ended questions. The Likert-scale questions covered whether PACU emergence was being discussed during OR huddles and prior to end of surgery, whether anesthesia providers felt their patients could be safely extubated in the OR and had proper support, if providers valued quick turnover times and felt PACU emergence improved efficiency. The additional open-ended questions focused on potential obstacles limiting its utility. Results: Of those surveyed, 90% stated PACU emergence was “rarely” (60%) or “never” (30%) discussed at pre-operative huddle. Eighty-seven percent of providers “agreed” (53%) and “strongly agreed” (34%) their patients could be safely extubated in the PACU. Furthermore, the majority of providers thought that quick OR turnover times were “very important” (53%) or “extremely important” (28%) in their daily practice. However, when questioned about whether the new initiative improved OR turnover time and efficiency, only 47% “agreed” and 15% “strongly agreed”. The main obstacles reported in the open-ended questions were the complexity of patients, lack of privacy in PACU for emergence, properly timed emergence being just as fast and negative impact on resident education. The biggest point reported was patient emergence and extubation was only a small part and not the major problem. There are other nursing delays in leaving the room and prolonged cleaning times between cases. Finally, surgeons can assist with giving members of the OR staff a timely notice when nearing end of case. Discussion: The key narrative points from the survey were PACU emergence and extubation is valued by providers when appropriate, but most seem to prefer timing extubation in the OR. There are more factors contributing to long turnover times in the OR and anesthesia is just one piece of the puzzle.

There needs to be better planning and communication with surgeons at both the preoperative huddle and at the end of cases. There also needs to be improved nursing efficiency at end of cases and improvement in cleaning room times. Lastly, our hospital is a large academic, learning center and this new initiative may negatively impact learning which is concerning to anesthesia providers. With the survey results our action plan is to disseminate the findings to anesthesiology for educational purposes emphasizing agreement with the principle that this is one part of a causal chain of inefficiency, along with a PowerPoint illustrating the results. We also plan to disseminate key points to surgeons and nurses to emphasize OR huddle planning and encourage active communication in the operating room.

Abstract Body2:

We performed a survey of anesthesia providers' perception of a new PACU emergence and extubation initiative to improve surgical closure to out of room times and overall OR efficiency. Overall, perception was positive of the new initiative, but many providers reported obstacles to its regular use and many viewed prolonged emergence as one part of a causal chain of inefficiency.

Session Number:	P02
Session Title:	Practice Management 2021 ePosters
Presentation Number:	EA08
Topic 1:	1.1 Quality Improvement
Publishing Title:	Evaluation of Anesthesia Providers' Perception of a PACU Emergence and Extubation Initiative Improving OR Efficiency at a Large Pediatric Center
Author Block:	**B. Pellatt**[1], V. N. O'Reilly-Shah[2], S. Flack[3]; [1]Anesthesiology, University of Washington, Seattle, WA, [2]Seattle, WA, [3]Seattle Children's Hospital, Seattle, WA.
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Topic 1:	1.1 Quality Improvement
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Author Block:	**B. Pellatt**[1], V. N. O'Reilly-Shah[2], S. Flack[3]; [1]Anesthesiology, University of Washington, Seattle, WA, [2]Seattle, WA, [3]Seattle Children's Hospital, Seattle, WA.
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There needs to be better planning and communication with surgeons at both the preoperative huddle and at the end of cases. There also needs to be improved nursing efficiency at end of cases and improvement in cleaning room times. Lastly, our hospital is a large academic, learning center and this new initiative may negatively impact learning which is concerning to anesthesia providers. With the survey results our action plan is to disseminate the findings to anesthesiology for educational purposes emphasizing agreement with the principle that this is one part of a causal chain of inefficiency, along with a PowerPoint illustrating the results. We also plan to disseminate key points to surgeons and nurses to emphasize OR huddle planning and encourage active communication in the operating room.

Abstract Body2:

We performed a survey of anesthesia providers' perception of a new PACU emergence and extubation initiative to improve surgical closure to out of room times and overall OR efficiency. Overall, perception was positive of the new initiative, but many providers reported obstacles to its regular use and many viewed prolonged emergence as one part of a causal chain of inefficiency.

Session Number: P01

Session Title: Practice Management 2021 ePosters

Presentation Number: EA01

Topic 1: 1.4 Research in Perioperative Management

Publishing Title: Anesthesia Practice Value Model: A Novel Tool to Assess Practice Value

Author Block: **S. Solomon**[1], S. Law[2], J. Taylor[3], H. Chow[4], R. Saffary[5], A. Macario[6]; [1]UT Health San Antonio, San Antonio, TX, [2]Burlington, ON, CANADA, [3]London, UNITED KINGDOM, [4]Stanford Medical School, Saratoga, CA, [5]Palo Alto, CA, [6]Stanford, CA.

Abstract Body: **Introduction**: There has been a continued trend of group consolidation in anesthesiology. While there are many variables that contribute to a decision to sell a practice, it is important to understand the objective value of the business, factors that affect the structure of a deal, and the long-term effects. We built the Practice Value Model for group leaders to understand the value generated by their practice in a standardized fashion. Gross Profit per FTE (PFTE) and the average value per ASA Unit generated were calculated after overhead and Merged Unit Value (MUV) appropriate for different practice settings with and without additional operating costs associated with a post-acquisition scenario. The Salary Value Model was generated for individual anesthesiologists to roughly estimate the value of a lump sum acquisition offer. **Methods**: The Practice Value Models were developed to demonstrate the direct value of anesthesiology practices in different practice environments on a per-FTE productivity basis (2018 MGMA Survey). Using a low (40/60) and high (60/40) commercial to Medicare payor mix and 25th, 50th and 75th percentile revenue per ASA unit in America (2018 MGMA Survey), we calculated the PFTE and MUV for inpatient, outpatient and ambulatory care practice settings. We assumed an additional 20% operating cost with the corresponding PFTE and MUV in a post-acquisition scenario. The Salary Value Model demonstrates the current value of 10 years' worth of earning horizon at varying future salary levels and varying size of lump sum buyout payments from a potential acquirer. Assumptions included defining revenue based on productivity, defining operating costs of the practice, standardizing vacation, and taking into account an annual investment return for the acquirer. We chose not to include inflation, additional employee benefits or a facility stipend in our calculations. **Results**: Gross profit and pay on a per-FTE basis increased with higher ASA unit generating practice setting, higher payer mix and increased group productivity (Figure 1). Other variables in the model included commercial revenue rates, percent managed care business, additional overhead for the acquirer and time horizon for the model. Future annual salary and lump-sum buyout payments were inversely proportional to the Present Value calculation, with an increase in lump-sum buyout payments decreasing the future annual salary potential in the time horizon. **Discussion**: There are many complex variables that contribute to a

decision to sell an anesthesia practice. Focusing on fundamental economic variables may provide early insight on the short- and long-term consequences of the structure of the deal. While our model achieves the basic structure of anesthesia value, it does not take into account geopolitical factors, future production value of group owners, or extrinsic macroeconomic forces. Professional economic consultation should always take place after exploratory assessment.

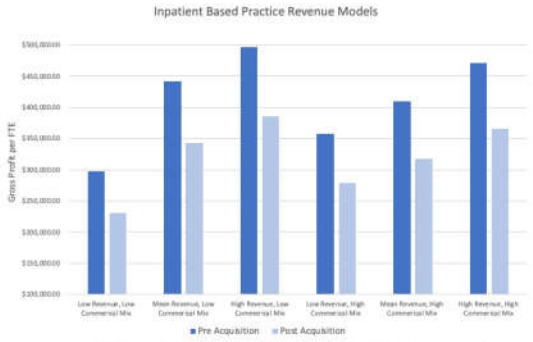

Figure 1: A Value Model for inpatient anesthesia practice settings depend on revenue and commercial payer mix. Gross Profit per FTE is decreased after an acquisition.

Abstract Body2: Group consolidation in anesthesiology is a continued trend. There is a need for group managers and anesthesiologists to assess practice value based on revenue and cost factors before an acquisition. We developed the Practice Value Model as an initial tool to assess practice value.

Session Number: P02

Session Title: Practice Management 2021 ePosters

Presentation Number: EA01

Topic 1: 1.4 Research in Perioperative Management

Publishing Title: Anesthesia Practice Value Model: A Novel Tool to Assess Practice Value

Author Block: **S. Solomon**[1], S. Law[2], J. Taylor[3], H. Chow[4], R. Saffary[5], A. Macario[6]; [1]UT Health San Antonio, San Antonio, TX, [2]Burlington, ON, CANADA, [3]London, UNITED KINGDOM, [4]Stanford Medical School, Saratoga, CA, [5]Palo Alto, CA, [6]Stanford, CA.

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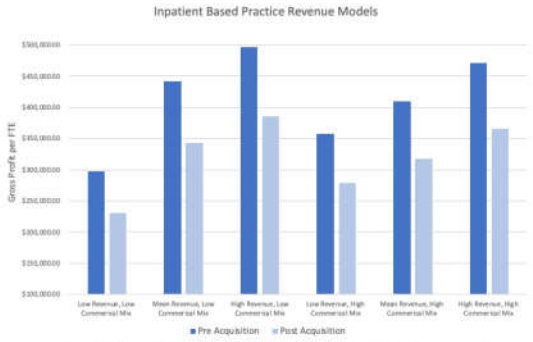

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Group consolidation in anesthesiology is a continued trend. There is a need for group managers and anesthesiologists to assess practice value based on revenue and cost factors before an acquisition. We developed the Practice Value Model as an initial tool to assess practice value.

Session Number: P03

Session Title: Practice Management 2021 ePosters

Presentation Number: EA01

Topic 1: 1.4 Research in Perioperative Management

Publishing Title: Anesthesia Practice Value Model: A Novel Tool to Assess Practice Value

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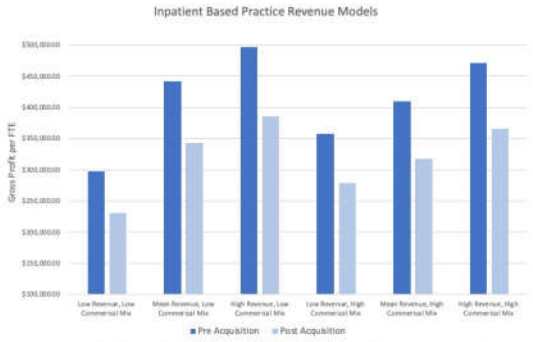

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Session Number: P01

Session Title: Practice Management 2021 ePosters

Presentation Number: EA02

Topic 1: 1.4 Research in Perioperative Management

Publishing Title: Novel Anesthesia Staffing Model for Multihospital Health System Optimization

Author Block: **E. Lebovitz**[1], R. D. Ball[2], M. Nanez[3], M. E. Hudson[3];
[1]Anesthesiology and Perioperative Medicine, University of Pittsburgh Medical Center, Pittsburgh, PA, [2]Gibsonia, PA, [3]University of Pittsburgh Medical Center, Pittsburgh, PA.

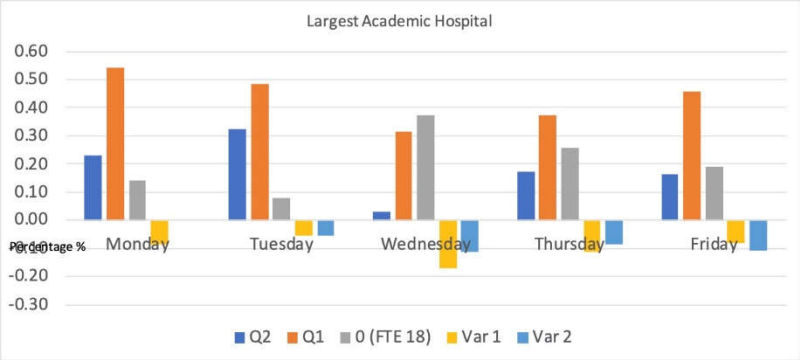
Abstract Body: Surgical volume can be highly variable due to seasonality, predicted events like professional meetings, and unpredicted events such as Covid-19. Anesthesia staffing models have emerged to provide coverage for this variability; however, adequate flexibility remains elusive. Our aim in this analysis is to efficiently allocate daily expected resource usage and minimize staff overtime costs across multiple parallel resources such as anesthesiologists and operating rooms, to conserve valuable resources and provide optimal patient care.

Strategic planning results in yearly anesthesiologist full-time equivalent (FTE) allotment per hospital based on historical averages and expected operating room needs. Academic faculty have non-clinical days ("NCDs") that are distributed throughout the year for academic pursuits such as research, teaching, and educational pursuits. Clinical faculty generate additional time compensation ("Comp days") that are given as time off throughout the year as the schedule permits. In our hospital system, 1.0 FTE faculty are contracted for 230 clinical assignments (CAs) yearly. One (1) CA equates to 9 hours of work.

In order to allocate faculty to sites around the system, our goal is to empower local site chief anesthesiologists to flex-up and flex-down providers as necessary up to the day prior. We have termed these designations as a Q-call shift and a variable shift, respectively. At our largest clinical site, we start each weekday with 20 FTE with a maximum of 50 anesthetizing locations. On review of FY2019, our actual average sites starting was 44.71 ± 3.75 anesthetizing locations. To better address our need, we adopted a novel staffing model involving two Q call shifts and two variable shifts per day (Figure 1). Q-calls were compensated at 0.5 CA while variables were paid at $100/shift. Q-calls had an 32.16% conversion rate and variable shifts had a 8.69% conversion rate. Q-calls expected to convert per year was 520 * 32% = 166. Variables expected to convert was 520 * 8.69% = 45. Together, the potential cost savings for this novel staffing methodology was $387,708.65 without a decrement in adequate staffing compared to baseline.

Our goal with this new model is to help overcome surgical scheduling inefficiencies by developing and vetting a new model for more efficient, fluid anesthesia staffing. While the greatest gains in cost savings can be seen in the future as providers are able to fill gaps across the system, matching staffing needs

with clinical demands remains a daily constraint. Having too many anesthesiologists leads to inefficiency and wasted costs, as these staff could be utilized more efficiently on higher volume days. Too few anesthesiologists leads to the possibility of closing necessary operating rooms limiting potential revenue generation or paying expensive overtime rates. In addition to being budget beneficial, this model fits into current contractual obligations and enables providers to better schedule educational efforts where needed.



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Session Number: P02

Session Title: Practice Management 2021 ePosters

Presentation Number: EA02

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Publishing Title: Novel Anesthesia Staffing Model for Multihospital Health System Optimization

Author Block: **E. Lebovitz**[1], R. D. Ball[2], M. Nanez[3], M. E. Hudson[3];
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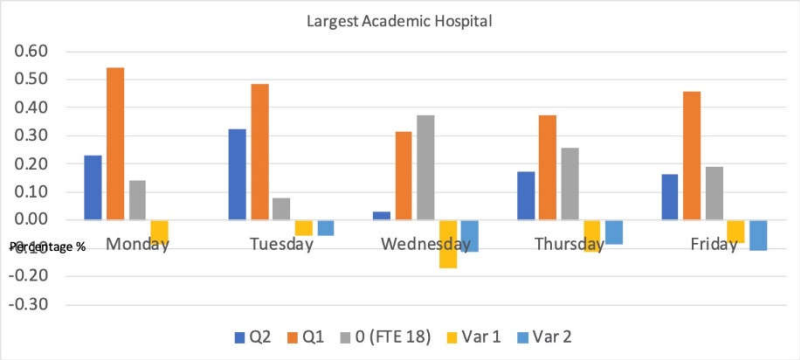

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Session Title: Practice Management 2021 ePosters

Presentation Number: EA02

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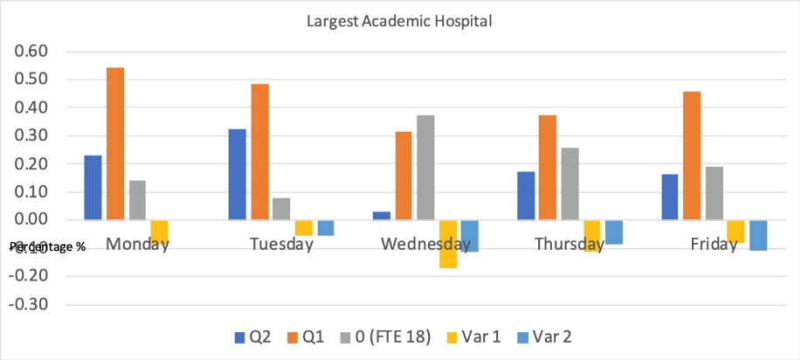

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Session Number:	P01
Session Title:	Practice Management 2021 ePosters
Presentation Number:	EA11
Topic 1:	1.3 Challenging Cases and their Innovative Solutions in Practice Management
Publishing Title:	Temporary Staffing Model of An Anesthesiology Department in a Major Academic Medical Center during Initial COVID-19 Surge in New York City
Author Block:	**J. Yeh**[1], W. Chin[2], J. T. Kim[2], A. D. Rosenberg[2], M. Y. Lee[3]; [1]Anesthesiology, NYU Langone Health, New York, NY, [2]New York, NY, [3]New York University Langone Medical Center, New York, NY.
Abstract Body:	From March through May of 2020, New York City experienced an unprecedented surge of hospitalizations due to COVID-19. During that time, hospitals across the city had to confront the following issues simultaneously:•Caring for a surge of COVID-19 patients•Expanding ICU capacity•Procuring / preserving extremely limited PPE supplies•Maintaining / reinforcing staffing needs•Obtaining and operating vital equipment such as ventilators Our department was in a unique position to address many of our hospital's main concerns. By redesigning our staffing model as the surge arrived and constantly adjusting as new situations arose, we were able to provide our hospital with extremely valuable resources and services to combat the COVID-19 surge.When the surge was first anticipated, the OR schedule was reduced by more than 50% for a week. During that week, we reduced our staff working hours by rotating many of our staff to 'home standby' instead of reporting in person. Additionally, staff was relieved as early as possible to limit crowding of office area. We also started to design our emergency staffing model in anticipation of the peak surge.After the first week, our hospital initiated an emergency mode with only emergency cases permitted to in the OR. Consequently, our department quickly adopted a 12-hour shift, 7-days a week staffing model.The 12-hour shifts provided several advantages: 1.Allowed staff to work longer hours but fewer days, reducing potential infection by limiting the:•Number of commutes needed per week•Number of staff interactions when at work•Number of PPE used / wasted per day2.Allowed us to eliminate overtime and call pay, as we were no longer generating adequate revenue to support extra pay3.Allowed easier tracking and balancing of work load across different subspecialty pods to minimize disparities4.Allowed easier scheduling / re-scheduling, as staff requirement varied greatly day-to-day. In particular:•Instead of staffing the varied work shifts that we usually employed, we simplified it to only two types of shifts (day/night)•It allowed individual pod leaders to make their own shift schedule, which allows more fine-tuning and easier balancing, instead of one person making the schedule for the whole department•It made replacements easier, as we anticipated a significant number of staff becoming sick and unable to work• It made adding / subtracting shifts to/from any given day easier, as staffing requirement in the OR varied greatly In addition to the 12-hour shift model, we

also divided the department into various groups / pods to facilitate scheduling and specialize in clinical care. In addition to various subspecialty teams, we assembled:· An ‘ICU assist’ team to assist in ICU management, as our hospital desperately needed more ICU attendings. This was done in addition to assigning all critical care trained anesthesiologists to full-time ICU staff· An ‘airway/ventilation/procedure/prone’ (AVPP) team to provide 24/7 support for the above-mentioned tasks throughout our hospital· An ‘anesthesia ventilators management’ team when our anesthesia machines were employed in the ICU as ventilators due to the lack of ICU ventilators After the new staffing model launch, the teams were adjusted weekly, until emergency mode was lifted. We also had a group of staff ensuring adequate PPE supplies. They are responsible for organizing N95 fit tests and education sessions on proper use of CAPR/PAPR.Daily virtual meetings were held with various leadership positions across campuses, to confront challenges and adopt changes. We also updated staff members daily via email briefings, in order to maintain constant communications and address concerns, which was vital for boosting staff confidence.COVID-19 brought us difficult challenges. Through innovative staffing model, with dedicated staff and teamwork, we were able to navigate through the surge safely, while providing our hospital with invaluable resources to combat COVID-19 surge.

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Author Block:	**J. Yeh**[1], W. Chin[2], J. T. Kim[2], A. D. Rosenberg[2], M. Y. Lee[3]; [1]Anesthesiology, NYU Langone Health, New York, NY, [2]New York, NY, [3]New York University Langone Medical Center, New York, NY.
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also divided the department into various groups / pods to facilitate scheduling and specialize in clinical care. In addition to various subspecialty teams, we assembled:· An ‘ICU assist’ team to assist in ICU management, as our hospital desperately needed more ICU attendings. This was done in addition to assigning all critical care trained anesthesiologists to full-time ICU staff· An ‘airway/ventilation/procedure/prone’ (AVPP) team to provide 24/7 support for the above-mentioned tasks throughout our hospital· An ‘anesthesia ventilators management’ team when our anesthesia machines were employed in the ICU as ventilators due to the lack of ICU ventilators After the new staffing model launch, the teams were adjusted weekly, until emergency mode was lifted. We also had a group of staff ensuring adequate PPE supplies. They are responsible for organizing N95 fit tests and education sessions on proper use of CAPR/PAPR.Daily virtual meetings were held with various leadership positions across campuses, to confront challenges and adopt changes. We also updated staff members daily via email briefings, in order to maintain constant communications and address concerns, which was vital for boosting staff confidence.COVID-19 brought us difficult challenges. Through innovative staffing model, with dedicated staff and teamwork, we were able to navigate through the surge safely, while providing our hospital with invaluable resources to combat COVID-19 surge.

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Session Number:	P03
Session Title:	Practice Management 2021 ePosters
Presentation Number:	EA11
Topic 1:	1.3 Challenging Cases and their Innovative Solutions in Practice Management
Publishing Title:	Temporary Staffing Model of An Anesthesiology Department in a Major Academic Medical Center during Initial COVID-19 Surge in New York City
Author Block:	**J. Yeh**[1], W. Chin[2], J. T. Kim[2], A. D. Rosenberg[2], M. Y. Lee[3]; [1]Anesthesiology, NYU Langone Health, New York, NY, [2]New York, NY, [3]New York University Langone Medical Center, New York, NY.
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Session Number: P01

Session Title: Practice Management 2021 ePosters

Presentation Number: EA06

Topic 1: 1.4 Research in Perioperative Management

Publishing Title: The Impact of COVID-19 Pandemic on Operating Room Utilization and Anesthesia Group Productivity in Academic Medical Centers, Community Hospitals, Pediatric Hospital, and Ambulatory Surgery Centers

Author Block: **S. Wang**, N. K. Shah, E. E. Lebovitz, M. E. Hudson;
University of Pittsburgh Medical Center, Pittsburgh, PA.

Abstract Body:

Introduction The COVID-19 pandemic has put unprecedented strain on hospitals across the nation. The shift in medical demand from elective and preventative care to critical care is especially evident in the operating room (OR), impacting productivity and utilization of resources. In this study, we examine the effect of COVID-19 on case length, case complexity, OR utilization, and MD productivity for academic medical centers (AMCs), community hospitals (COMs), pediatric hospitals, and ambulatory surgery centers (ASCs) in the UPMC system. Understanding how different facilities respond to COVID-19 can help us predict the changing demand through 2020-21 and more effectively allocate resources.

Method Deidentified Cerner Surginet data was collected from 4 AMCs, 4 COMs, 1 pediatric hospital, and 5 ASCs in the UPMC network between March-September 2020. Using inpatient COVID-19 cases, the months were categorized as peak 1 (March-April), steady-state (May-June), and peak 2 (July-September).[1] For each period and facility type, the case length (h/case), complexity in total ASA units (tASA/case), OR utilization (h/OR/d), and MD productivity (tASA/MD/d) was measured and compared to their respective pre-COVID baselines.

Result Average case length and complexity for all facilities increased during peak 1 and decreased in steady-state. All facilities trended towards baseline in peak 2, except for the pediatric hospital, which experienced an increase in tASA/case in peak 2 (Figure 1). OR utilization and MD productivity was close to baseline or decreased for both AMCs and COMs for all periods (Figure 2 & 3). These two metrics trended upward for pediatric hospital and were highly volatile for ASCs.

Discussion The effect of COVID-19 inpatient cases on case length, complexity, OR utilization, and MD productivity varied depending on the facility type. AMCs and COMs responded similarly: both initially saw increased case length and complexity but decreased OR utilization and MD productivity. They then trended towards baseline over time likely due to the consolidation of case volume.[2,3] The pediatric hospital continued to have high OR utilization and MD productivity. ASCs experienced the most volatility in OR utilization and MD productivity during these periods likely due to the relatively high percentage of elective cases. Our study is limited in its ability to compare metrics between institutions; therefore, we compared each institution to its own baseline.[4,5] The current (December) volume of inpatient COVID cases have more than quadrupled since

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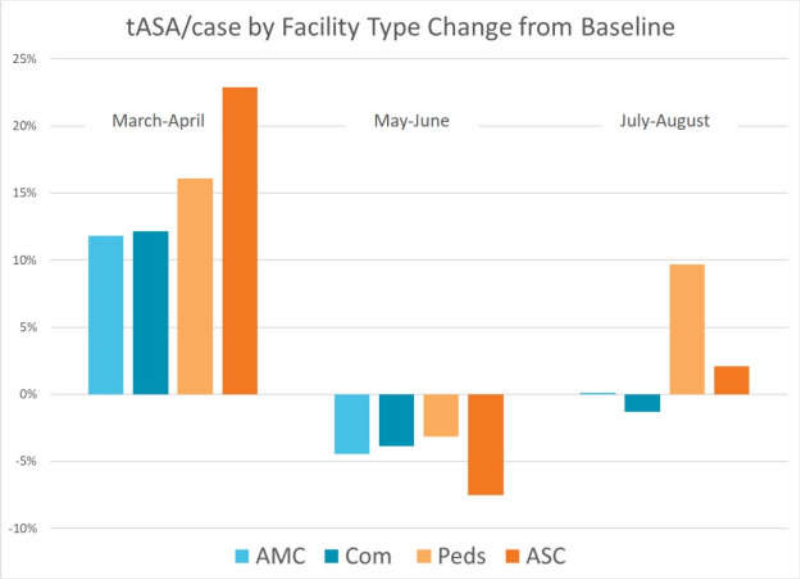

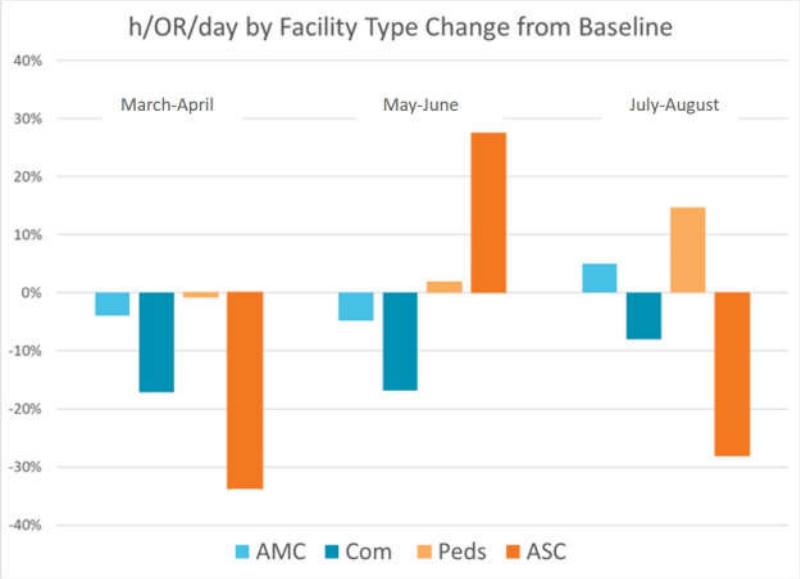

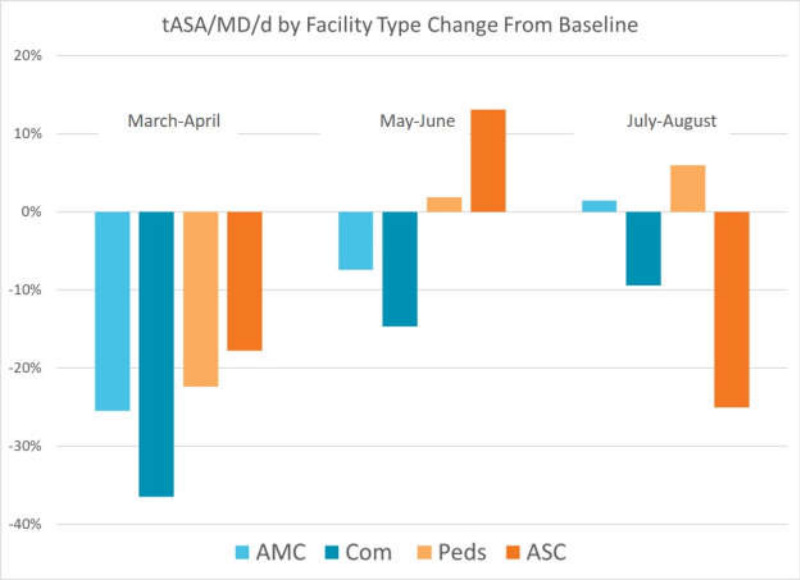

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Session Number: P02

Session Title: Practice Management 2021 ePosters

Presentation Number: EA06

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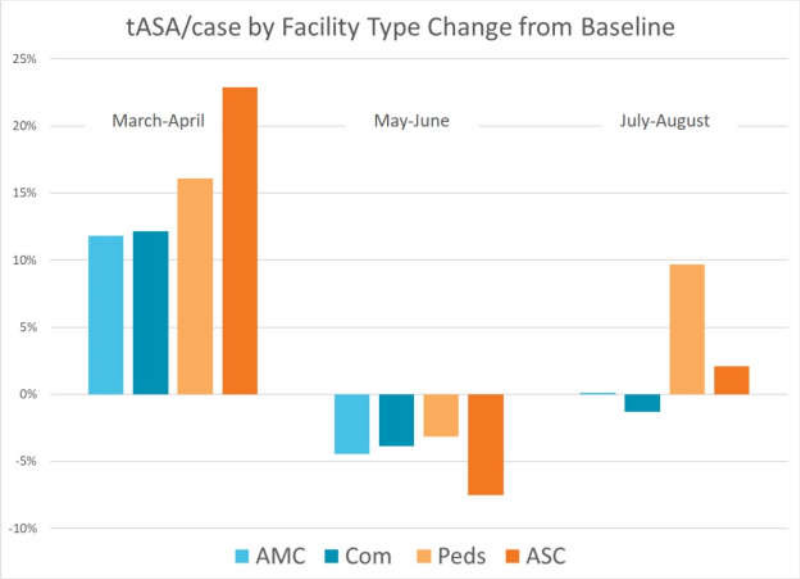

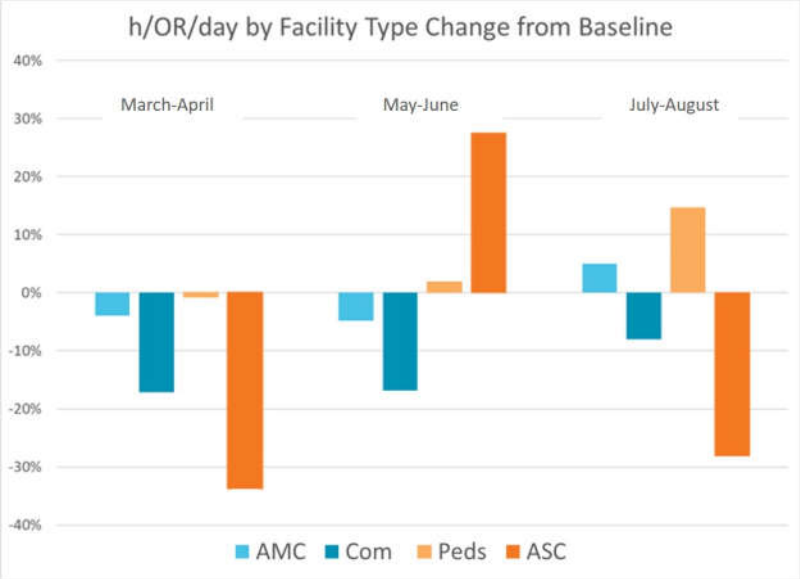

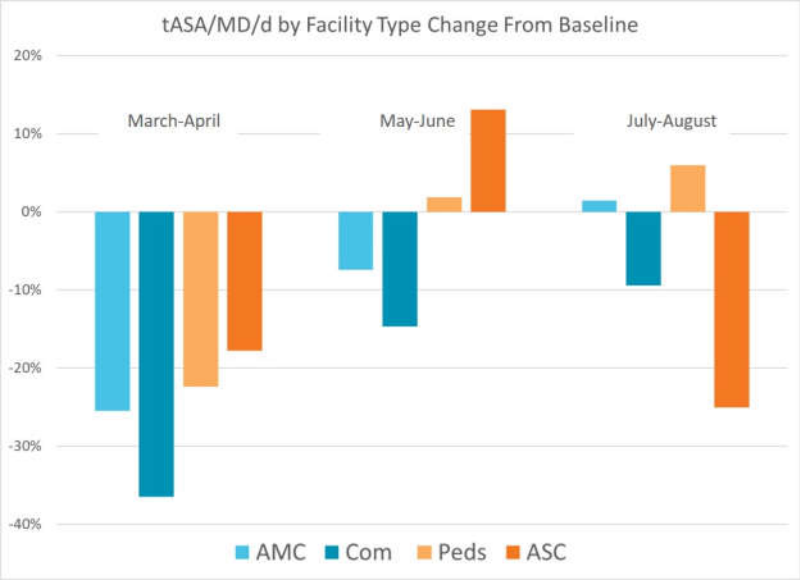

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Session Number: P03

Session Title: Practice Management 2021 ePosters

Presentation Number: EA06

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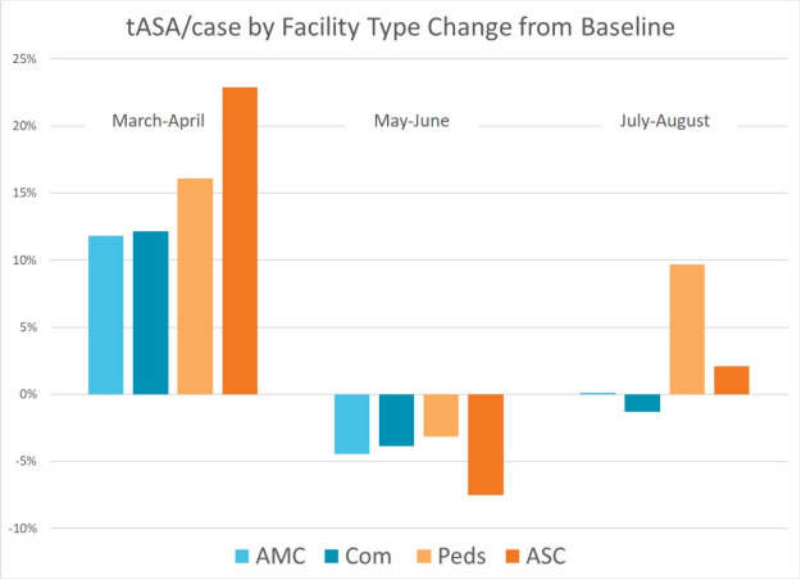

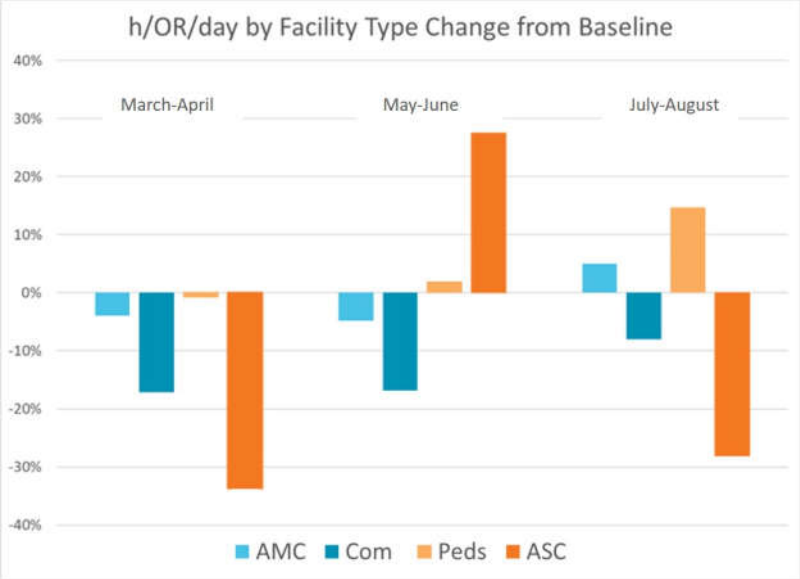

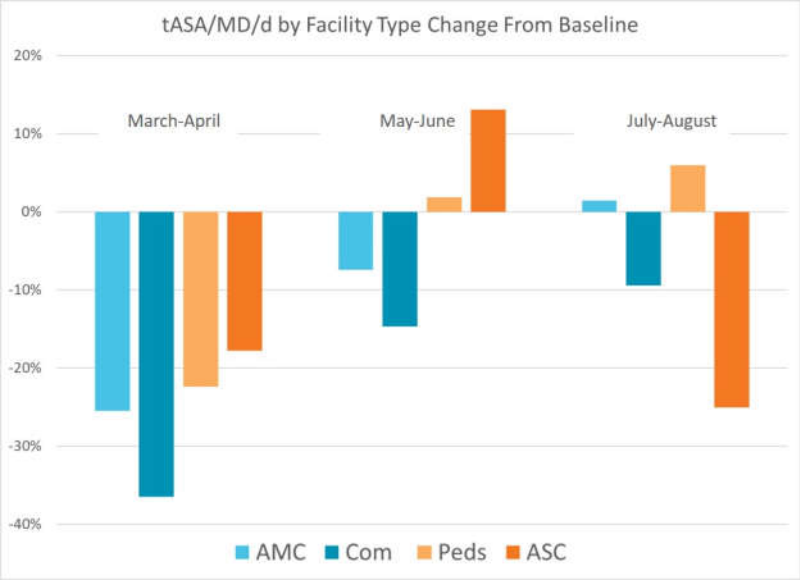

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Session Number: P01

Session Title: Practice Management 2021 ePosters

Presentation Number: EA03

Topic 1: 1.1 Quality Improvement

Publishing Title: Timing and Redosing of Prophylactic Antibiotics in the Prevention of Surgical Site Infections

Author Block: **C. Ji**[1], G. C. Lynde[2];
[1]Department of Anesthesiology, Emory University School of Medicine, Atlanta, GA, [2]Department of Anesthesiology, Emory University School of Medicine, Decatur, GA.

Abstract Body:
Title Timing and redosing of prophylactic antibiotics in the prevention of surgical site infections

Introduction Surgical site infections (SSIs) account for 3% of annual healthcare-associated mortality.[1] Although adherence to the Surgical Care Improvement Project's (SCIP) SSI-related recommendations have improved over the decades, SSIs continue to be significant source of morbidity and mortality.[2] Current standard of care dictates all antibiotics be given within one hour prior to surgical incision, with the exception of vancomycin and fluoroquinolones, which are given within two hours prior to incision due to their longer infusion times. Studies have been unable to define an optimal interval within these time frames. Furthermore, few studies to date have thoroughly assessed the relationship between redosing compliance and SSI risk.[2,3,4]

Methods Data on 15,000 cases performed from 1/2015 to 12/2019 were collected from Emory Healthcare's Clinical Data Warehouse (CDW) and the American College of Surgeon's National Surgical Quality Improvement Project (NSQIP) databases. The surgical specialties included in this study are general surgery, cardiac, gynecology, neurosurgery, orthopedics, otolaryngology (ENT), plastics, thoracic, urology, and vascular. Data obtained include patient covariates (age, gender, race/ethnicity, ASA score, functional health status, BMI, diabetes, smoker, hematocrit/anemia, and perioperative immunosuppressant use), surgery types and characteristics (case duration, postop length of stay, ASA-RVG base units, emergent/elective), prophylactic antibiotic, antibiotic timing, antibiotic first redose compliance, and surgical site infection outcomes (superficial, deep, organ space). We performed sequential ordinal logistic regressions to identify the significance of each factor in the development of SSI.

Results Analysis of data shows vancomycin administration in patients with comorbidities such as diabetes and recent history of smoking is associated with an increased rate of surgical site infections (Table 1). Our findings also suggest that redose compliance for non-vancomycin antibiotics may not be associated with a decrease in surgical site infection rates.

Discussion To this date, this retrospective cohort study is one of the largest studies conducted to identify an optimal time frame for different prophylactic antibiotic

administrations. Our preliminary results identify significant differences in SSI rates among patients given vancomycin versus other antibiotics. Administration of vancomycin less than 30 minutes before incision is also associated with higher SSI rates, reflecting the need to obtain adequate tissue levels to prevent SSI.

References 1. Surgical Site Infection (SSI) Event. CDC: National Healthcare Safety Network: Procedure-associated Module. Jan 2020. Atlanta, GA. https://www.cdc.gov/nhsn/pdfs/pscmanual/9pscssicurrent.pdf. 2. Hawn MT, Richman JS, Vick CC, et al. Timing of Surgical Antibiotic Prophylaxis and the Risk of Surgical Site Infection. JAMA Surg. 2013;148(7):649-657. doi:10.1001/jamasurg.2013.134. 3. Anderson DJ. Prevention of surgical site infection: beyond SCIP. AORN J. 2014;99(2):315-319. doi:10.1016/j.aorn.2013.11.007. 4. Wound Occurrences. ACS NSQIP Operations Manual, 78-89. Jul 2019. Chicago, IL.

Table 1. Summary of Patient and Procedure Characteristics and Presence of SSI

Characteristics	Surgical Cases (n=)	% of Total	# SSI	% SSI
Total	15089	100	633	4.20
Antibiotic Type				
Vancomycin	579	3.84	25	4.32
Levofloxacin	147	0.97	6	4.08
Others	14363	95.19	602	4.19
Redose Compliance for Vancomycin				
Compliant	0	0.00	0	n/a
Non-Compliant	1	0.01	0	0
Redose Not Indicated	579	3.84	25	4.32
Redose Compliance for All Other Antibiotics				
Compliant	1440	9.54	138	9.58
Non-Compliant	783	5.19	60	7.66
Redose Not Indicated	11585	76.78	410	3.54
No Data	702	4.65	21	2.99
Gender				
Male	5437	36.03	193	3.55
Female	9650	63.95	440	4.56
Age at Time of Surgery (years)				
18-29	775	5.14	24	3.10
30-39	1344	8.91	50	3.72
40-49	2389	15.83	131	5.48
50-59	2863	18.97	126	4.40
60-69	3341	22.14	130	3.89
70-79	2216	14.69	81	3.66
80-89	646	4.28	13	2.01
90-99	58	0.38	2	3.45
100-109	2	0.01	0	0.00
BMI (kg/m^2)				
<18	258	1.71	8	3.10
vancomycin only	579	3.84	25	4.32
all other antibiotics	252	1.67	8	3.17
18-24.9	3954	26.20	152	3.84
vancomycin only	166	1.10	5	3.01
all other antibiotics	3788	25.10	147	3.88
25-29.9	4608	30.54	163	3.54
vancomycin only	178	1.18	8	4.49
all other antibiotics	4430	29.36	155	3.50
30+	6249	41.41	309	4.94
vancomycin only	229	1.52	12	5.24
all other antibiotics	6020	39.90	297	4.93
Diabetes				
Yes	2465	16.34	112	4.54
vancomycin only	130	0.86	7	5.38
all other antibiotics	2335	15.47	105	4.50
No	12624	83.66	521	4.13
vancomycin only	449	2.98	18	4.01
all other antibiotics	12175	80.69	503	4.13
Smoker within 1 year				
Yes	1674	11.09	91	5.44
vancomycin only	91	0.60	5	5.49
all other antibiotics	1907	12.64	101	5.30
No	10950	72.57	430	3.93
vancomycin only	488	3.23	20	4.10
all other antibiotics	12603	83.52	507	4.02
Steroid/Immunosuppressant Use within 1 month				
Yes	1121	7.43	44	3.93
vancomycin only	68	0.45	1	1.47
all other antibiotics	1053	6.98	43	4.08
No	13968	92.57	589	4.22
vancomycin only	511	3.39	24	4.70
all other antibiotics	13457	89.18	565	4.20
ASA Classification				
1	942	6.24	18	1.91
2	5238	34.71	215	4.10
3	7721	51.17	351	4.55
4	1184	7.85	49	4.14
5	4	0.03	0	0.00
ASA-RVG Base Units				
0-5	2324	15.40	91	3.92
6-10	8470	56.13	367	4.33
11-15	1091	7.23	42	3.85
16-20	2	0.01	0	0
21-25	12	0.08	0	0
26-30	1	0.01	0	0
Emergency Procedure				
Yes	703	4.66	27	3.84
No	14386	95.34	606	4.21
Surgical Specialty				
General Surgery	7193	47.67	332	4.62
Gynecology	1692	11.21	119	7.03
Neurosurgery	986	6.53	21	2.13
Orthopedics	2167	14.36	39	1.80
Plastics	1326	8.79	64	4.83
Vascular	1059	7.02	32	3.02
Others	666	4.41	26	3.90
Wound Classification				
1 (Clean)	8955	59.35	225	2.51
2 (Clean/Contaminated)	4854	32.17	342	7.05
3 (Contaminated)	602	3.99	39	6.48
4 (Dirty/Infected)	678	4.49	27	3.98

Abstract Body2: Surgical site infections (SSIs) continue to account for 3% of annual healthcare-associated mortality, despite improved adherence to Surgical Care Improvement Project's (SCIP) SSI-related recommendations. Studies have been unable to define an optimal interval within recommended prophylactic antibiotic administration time frames, and few studies have thoroughly assessed the effects of redosing compliance on SSI risks. This retrospective observational study is one of the largest studies conducted to identify an optimal time frame and assess the effects of redosing compliance.

Session Number: P02

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Presentation Number: EA03

Topic 1: 1.1 Quality Improvement

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Introduction Surgical site infections (SSIs) account for 3% of annual healthcare-associated mortality.[1] Although adherence to the Surgical Care Improvement Project's (SCIP) SSI-related recommendations have improved over the decades, SSIs continue to be significant source of morbidity and mortality.[2] Current standard of care dictates all antibiotics be given within one hour prior to surgical incision, with the exception of vancomycin and fluoroquinolones, which are given within two hours prior to incision due to their longer infusion times. Studies have been unable to define an optimal interval within these time frames. Furthermore, few studies to date have thoroughly assessed the relationship between redosing compliance and SSI risk.[2,3,4]

Methods Data on 15,000 cases performed from 1/2015 to 12/2019 were collected from Emory Healthcare's Clinical Data Warehouse (CDW) and the American College of Surgeon's National Surgical Quality Improvement Project (NSQIP) databases. The surgical specialties included in this study are general surgery, cardiac, gynecology, neurosurgery, orthopedics, otolaryngology (ENT), plastics, thoracic, urology, and vascular. Data obtained include patient covariates (age, gender, race/ethnicity, ASA score, functional health status, BMI, diabetes, smoker, hematocrit/anemia, and perioperative immunosuppressant use), surgery types and characteristics (case duration, postop length of stay, ASA-RVG base units, emergent/elective), prophylactic antibiotic, antibiotic timing, antibiotic first redose compliance, and surgical site infection outcomes (superficial, deep, organ space). We performed sequential ordinal logistic regressions to identify the significance of each factor in the development of SSI.

Results Analysis of data shows vancomycin administration in patients with comorbidities such as diabetes and recent history of smoking is associated with an increased rate of surgical site infections (Table 1). Our findings also suggest that redose compliance for non-vancomycin antibiotics may not be associated with a decrease in surgical site infection rates.

Discussion To this date, this retrospective cohort study is one of the largest studies conducted to identify an optimal time frame for different prophylactic antibiotic

administrations. Our preliminary results identify significant differences in SSI rates among patients given vancomycin versus other antibiotics. Administration of vancomycin less than 30 minutes before incision is also associated with higher SSI rates, reflecting the need to obtain adequate tissue levels to prevent SSI.

References 1. Surgical Site Infection (SSI) Event. CDC: National Healthcare Safety Network: Procedure-associated Module. Jan 2020. Atlanta, GA. https://www.cdc.gov/nhsn/pdfs/pscmanual/9pscssicurrent.pdf. 2. Hawn MT, Richman JS, Vick CC, et al. Timing of Surgical Antibiotic Prophylaxis and the Risk of Surgical Site Infection. JAMA Surg. 2013;148(7):649-657. doi:10.1001/jamasurg.2013.134. 3. Anderson DJ. Prevention of surgical site infection: beyond SCIP. AORN J. 2014;99(2):315-319. doi:10.1016/j.aorn.2013.11.007. 4. Wound Occurrences. ACS NSQIP Operations Manual, 78-89. Jul 2019. Chicago, IL.

Table 1. Summary of Patient and Procedure Characteristics and Presence of SSI

Characteristics	Surgical Cases (n=)	% of Total	# SSI	% SSI
Total	15089	100	633	4.20
Antibiotic Type				
Vancomycin	579	3.84	25	4.32
Levofloxacin	147	0.97	6	4.08
Others	14363	95.19	602	4.19
Redose Compliance for Vancomycin				
Compliant	0	0.00	0	n/a
Non-Compliant	1	0.01	0	0
Redose Not Indicated	579	3.84	25	4.32
Redose Compliance for All Other Antibiotics				
Compliant	1440	9.54	138	9.58
Non-Compliant	783	5.19	60	7.66
Redose Not Indicated	11585	76.78	410	3.54
No Data	702	4.65	21	2.99
Gender				
Male	5437	36.03	193	3.55
Female	9650	63.95	440	4.56
Age at Time of Surgery (years)				
18-29	775	5.14	24	3.10
30-39	1344	8.91	50	3.72
40-49	2389	15.83	131	5.48
50-59	2863	18.97	126	4.40
60-69	3341	22.14	130	3.89
70-79	2216	14.69	81	3.66
80-89	646	4.28	13	2.01
90-99	58	0.38	2	3.45
100-109	2	0.01	0	0.00
BMI (kg/m^2)				
<18	258	1.71	8	3.10
vancomycin only	579	3.84	25	4.32
all other antibiotics	252	1.67	8	3.17
18-24.9	3954	26.20	152	3.84
vancomycin only	166	1.10	5	3.01
all other antibiotics	3788	25.10	147	3.88
25-29.9	4608	30.54	163	3.54
vancomycin only	178	1.18	8	4.49
all other antibiotics	4430	29.36	155	3.50
30+	6249	41.41	309	4.94
vancomycin only	229	1.52	12	5.24
all other antibiotics	6020	39.90	297	4.93
Diabetes				
Yes	2465	16.34	112	4.54
vancomycin only	130	0.86	7	5.38
all other antibiotics	2335	15.47	105	4.50
No	12624	83.66	521	4.13
vancomycin only	449	2.98	18	4.01
all other antibiotics	12175	80.69	503	4.13

Characteristics	Surgical Cases (n=)	% of Total	# SSI	% SSI
Smoker within 1 year				
Yes	1674	11.09	91	5.44
vancomycin only	91	0.60	5	5.49
all other antibiotics	1907	12.64	101	5.30
No	10950	72.57	430	3.93
vancomycin only	488	3.23	20	4.10
all other antibiotics	12603	83.52	507	4.02
Steroid/Immunosuppressant Use within 1 month				
Yes	1121	7.43	44	3.93
vancomycin only	68	0.45	1	1.47
all other antibiotics	1053	6.98	43	4.08
No	13968	92.57	589	4.22
vancomycin only	511	3.39	24	4.70
all other antibiotics	13457	89.18	565	4.20
ASA Classification				
1	942	6.24	18	1.91
2	5238	34.71	215	4.10
3	7721	51.17	351	4.55
4	1184	7.85	49	4.14
5	4	0.03	0	0.00
ASA-RVG Base Units				
0-5	2324	15.40	91	3.92
6-10	8470	56.13	367	4.33
11-15	1091	7.23	42	3.85
16-20	2	0.01	0	0
21-25	12	0.08	0	0
26-30	1	0.01	0	0
Emergency Procedure				
Yes	703	4.66	27	3.84
No	14386	95.34	606	4.21
Surgical Specialty				
General Surgery	7193	47.67	332	4.62
Gynecology	1692	11.21	119	7.03
Neurosurgery	986	6.53	21	2.13
Orthopedics	2167	14.36	39	1.80
Plastics	1326	8.79	64	4.83
Vascular	1059	7.02	32	3.02
Others	666	4.41	26	3.90
Wound Classification				
1 (Clean)	8955	59.35	225	2.51
2 (Clean/Contaminated)	4854	32.17	342	7.05
3 (Contaminated)	602	3.99	39	6.48
4 (Dirty/Infected)	678	4.49	27	3.98

Abstract Body2: Surgical site infections (SSIs) continue to account for 3% of annual healthcare-associated mortality, despite improved adherence to Surgical Care Improvement Project's (SCIP) SSI-related recommendations. Studies have been unable to define an optimal interval within recommended prophylactic antibiotic administration time frames, and few studies have thoroughly assessed the effects of redosing compliance on SSI risks. This retrospective observational study is one of the largest studies conducted to identify an optimal time frame and assess the effects of redosing compliance.

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Topic 1: 1.1 Quality Improvement

Publishing Title: Timing and Redosing of Prophylactic Antibiotics in the Prevention of Surgical Site Infections

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