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**A Retrospective Evaluation of
Pain Management of the Postpartum Inpatient after Birth**

Doctoral Project

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NURS 595: Reflective Practice

Chair: Dr. Denise Dawkins

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Abstract

A multimodal plan of care to manage pain can effectively help reduce the risk of opioid dependency and addiction. The concerns about the rise in the rate of new persistent opioid use among women exposed in postpartum indicate a need for a practice change in managing pain after birth. This retrospective study evaluated the impact of implementing a multimodal plan of care in treating the pain of the postoperative postpartum patient. A notable finding was that fewer milligrams of opioids were administered after a practice change. The mean total was significantly different between the pre-and post-group, with a higher percentage of non-opioids administered to treat and manage postoperative postpartum pain. The literature and this retrospective review have shown that it is possible to manage and treat postoperative postpartum pain using a multimodal plan of care to decrease the overall need for opioids.

Keywords: Opioids; Multimodal; Postoperative postpartum

A Retrospective Evaluation of Pain Management of the Postpartum Inpatient after Birth

Approximately 136 Americans die daily from an opioid drug overdose (NCDAS, 2022). In addition, the literature has noted that some patients who are prescribed opioids for chronic noncancer pain misuse them and progress to develop an opioid use disorder (Shah et al., 2017). In 2012, approximately 259 million opioid prescriptions were written (American Society of Addiction Medicine, 2016). In 2015, the estimated opioid epidemic cost the United States 504 billion dollars (CBS News, 2017). With the impact of the opioid epidemic, finding ways to combat the opioid crisis is imperative. An effort to improve pain management is necessary. A multimodal plan of care to manage pain has been shown to effectively help reduce the risk of opioid dependency and save lives.

Women and Opioid Usage

The Center for Disease Control and Prevention has called attention to the increase in opioid overdose in women in the United States (Mack et al., 2013). Inadequate treatment of postpartum pain early in the recovery phase can be associated with increased opioid use (Carvalho & Butwick, 2017). Approximately 1.3 million women undergo a cesarean delivery annually and are often prescribed opioid analgesics during their inpatient stay and discharge (Bateman et al., 2016). Cesarean birth is one of the most common major surgeries in the United States; two concerns associated are excess prescribing of opioids and the risk of chronic opioid usage.

The overprescribing of opioids in the obstetric population has contributed to the opioid epidemic (Osmundson et al., 2019). In the United States, new persistent opioid use after exposure has increased among women after childbirth (Peahl et al., 2019). For some women of reproductive age, the initial exposure to opioids is from illicit use, and for many others, the exposure occurs in a hospital setting. The concerns about the rise in the rate of new persistent

opioid use among women exposed in maternity indicate a need for a practice change in managing pain after birth. The American College of Obstetricians & Gynecologists (ACOG) recommends implementing a multimodal approach to help reduce the use of opioids in the postpartum period (ACOG Committee, 2018).

Multimodal Treatment Plan

A multimodal plan of care is an alternative method to treating pain. The goal is to decrease the overall need for opioids to reduce the risk of dependency and addiction. An optimal approach for providing an effective postpartum analgesia treatment plan is significant in minimizing the risk of opioid misuse (Blitz et al., 2020). A multimodal pain management plan can include a scheduled nonsteroidal anti-inflammatory drug and acetaminophen with opioids reserved for severe breakthrough pain (Sutton & Carvalho, 2017). Valentine (2015) determined that administering scheduled acetaminophen with opioids as needed (PRN) compared to opioids plus acetaminophen as needed (PRN) resulted in post-cesarean patients taking fewer opioids. Implementing a multimodal analgesic treatment plan can help reduce opioid usage and the related side effects, such as drowsiness, nausea, vomiting, pruritus, constipation, and transference to breastmilk (ACOG, 2018) that may occur when taking excessive amounts.

The evidence in the literature has shown the benefits a multimodal approach can have on postpartum pain management. However, the available resources are limited, and few facilities are currently implementing the treatment plan. Blitz et al. (2020) evaluated a quality improvement intervention aimed at proactively providing pain relief by using a multimodal treatment plan comparing as-needed medication with around-the-clock oxycodone use to control pain; and noted being the first study for making this type of comparison. The retrospective cohort study included 19,192 postpartum patients, both cesarean and vaginal, who delivered a singleton

newborn at ≥ 37 weeks of gestation. The study showed that scheduled multimodal analgesia was associated with increased satisfaction with pain control after cesarean delivery.

The retrospective design and sample selection from one facility limits the ability for generalization. However, the purpose and the results of the study provided pertinent information that may be applicable at other facilities. The study population was predominately white, which lacked diversity and representation. Overall, the results indicated that there was a significant downward trend in the percentage of patients receiving oxycodone noted among both cesarean (0.004% decrease per month; $p < .006$) and vaginal deliveries (0.005% decrease per month; $p < .0001$) before implementation of the scheduled pain management protocol (Blitz et al., 2020). In addition, there was an increase in oxycodone exposure noted for vaginal delivery in this study (Blitz et al., 2020).

In a quasi-experimental study, Valentine et al. (2015) compared pain management to determine if scheduled acetaminophen decreases opioid use compared to as-needed acetaminophen combined with an opioid. They performed a retrospective chart review on 240 women who underwent cesarean delivery before and after a clinical practice change. The participants were divided into two groups. “The first Group (As-Needed Group, $n=120$) received combination oral opioid-acetaminophen analgesics as needed for breakthrough pain. The second Group (Scheduled Group, $n=120$) received oral acetaminophen 650 mg every 6 hours with oral oxycodone as needed for breakthrough pain” (Valentine et al., 2015). The Scheduled Group result reported decreased opioid use with acetaminophen intake being more consistent and used 9.1 ± 2.1 mg (95% CI 5.0 – 13.2, $p < 0.0001$) fewer morphine equivalents than the As-Needed Group. Although the sample size for this study was small, the results presented applicable information supporting a multimodal plan for postoperative postpartum patients.

Despite the evidence supporting a multimodal plan of care to treat pain, implementation is not consistent in the Obstetrics inpatient care setting. This Doctor of Nursing Practice (DNP) project aims to evaluate the impact of implementing a multimodal plan of care in treating the pain of the postoperative postpartum patient. The external investigator reviewed a retrospective comparison of the pain management before and after a practice change to evaluate any identified difference in the milligrams of opioids consumed to determine an administration baseline during both time events. Staff education and reinforcement are essential to facilitate consistent implementation of the multimodal plan that utilizes an adult learning theory as the framework.

Learning Theory

Learning theories can provide a foundation for educational practices and can be used to understand how people gain knowledge and skills (Butts & Rich, 2018, p. 200). Implementing a learning theory in healthcare can help enhance and improve patient care and staff education. Research data revealed success with education and intervention programs with learning theories (Clark et al., 2009). Learning theories can help educate individuals, groups, or communities to problem solve, change health habits, and affect behavior (Quinn, 2007 as cited in Aliakbari et al., 2015).

Learning theories can be classified into three general groups: behaviorism, cognitivism, and constructivism. *Behaviorism* reinforces the desired behavior when learning a new skill; *cognitivism* creates awareness with a focus on the thinking and understanding of new skills; *constructivism* recognizes the comprehension and knowledge of the learner; group discussions can help shape and strengthen perspectives (Aliakbari et al., 2015). Finally, the andragogy approach focuses on the adult learner incorporating principles and assumptions that include the learning environment and process (Beeson, 2018).

Malcolm Shepherd Knowles, an American educator, theory of andragogy promotes individual development and an approach to facilitating learning (Simbar, 2004 as cited in Aliakbari et al., 2015). Andragogy is the art and science of helping adults learn by acknowledging adult learners as self-directed and autonomous (Henschke, J, 2011). Integrating an adult learning theory such as *andragogy* in healthcare education is essential because of its significance to evidence-based practice, instructional strategies, enhancement in learning, acknowledgment of learning differences, and learning outcomes (Mukhalalati & Taylor, 2019). Hence, building from a learning theory can strengthen the educational foundation and promote an environment conducive to learning.

Knowles's adult learning theory approach utilized in patient education is also essential to helping patients understand, retain, and respond to the information given/received. Information that is meaningful and relevant can motivate change when fully understood. Each given moment is a learning and teaching opportunity, and teach-back is a great way to evaluate patient progress and understanding. Healthcare professionals must realize that all adults do not learn or comprehend the same way. Understanding the general principles of the adult learning theory can effectively be used in educational activities, patient interactions, management, employee training, health programs, and health care (Aliakbari et al., 2015). Receiving information that is relevant and self-directed is significant when teaching adult learners. Andragogy can help direct the teaching strategy for both the staff and patient education on the multimodal treatment plan of care. Therefore, Knowles' learning theory is suitable for the adult learner and a helpful guide to developing and supporting objectives to enhance the learning experience to increase awareness, knowledge, and understanding.

Methods

Design

This retrospective study reviewed the pain management protocol implemented for post-cesarean patients before and after a practice change. Data was collected and evaluated during a three-month time frame while on site.

Setting

The project took place in the Maternal Child Health Department (MCH) at Kaiser Permanente in Southern California, which serves the Inland Empire community. The inpatient acute-care facility is a teaching hospital with twenty Postpartum beds, eight Labor and Delivery suites, four Triage beds, and two Operating Rooms. There are approximately 250 deliveries a month and averaging around 3000 deliveries annually. The MCH Department's current C-section rate of 20.5% meets Leapfrog's (Hospital Safety Grade) standard of 23.9% or less (The Leapfrog Group, 2021).

The team members at this facility include one Nursing Director, 30 Physicians, 15 Certified Nurse Midwives, three Nursing Managers, and two Nursing Assistant Managers. There are 200 staff members in the MCH Department: 182 Registered Nurses, six Scrub Technicians, and 12 Unit Secretaries who cover Labor & Delivery, Postpartum, and the Neonatal Intensive Care Unit.

Participants

The participant sample criteria for this project included term postoperative cesarean patients \geq 37 weeks of gestation, who received a spinal-epidural who are 18 years or older, singleton delivery admitted to the Maternal Child Health Department that was prescribed opioids as a pain management treatment plan. Vaginal deliveries were excluded from this study; typically, they are not prescribed opioids to treat postpartum pain. Other excluded conditions are patients who had: Chorioamnionitis, General Anesthesia, ICU transfers, Opioid/Nsaid allergies, Postpartum

Hemorrhage, Positive Urine Toxicology, Preterm delivery (< 37 weeks), as these factors may affect their pain scores.

Data

The data was collected from the electronic medical records (EMR) to review the total milligrams of opioids and analgesics administered each 24 hours during the postoperative postpartum hospital stay shown in (Table 1). The opioid oral morphine milligram equivalent (MME) conversion factors used are shown in (Appendix A). The pain medication dosage and frequency references are shown in (Appendix B). The data collection occurred in a time frame of three months while on site.

Procedures

The process began with reviewing the current pain management policy and existing medication order set for the multimodal plan of care treating the postoperative postpartum patient. Next, there was an assessment of the implementation of the protocol.

Data was reviewed by the external investigator while on-site using a Kaiser Permanente Laptop that was password protected and encrypted. Information from the EMR on medication and dosages administered for pain was extracted and transferred to a spreadsheet for analysis.

Analysis

Intellectus Statistics software was used for input, storage, and analysis of the data. Descriptive analyses were used to determine the mean and standard deviation of milligrams administered before and after a practice change. A t-test was used to determine whether there was a significant difference in the milligrams administered between the pre-and post-groups. The opioid oral morphine milligram equivalent (MME) conversion factors were used to calculate the total milligram of opioids administered during the postoperative postpartum stay and then compared

to determine if fewer dosages of opioids were administered after a practice change. A two-tailed Mann-Whitney two-sample rank-sum test was conducted to examine if there were significant differences in the total non-opioids administered between the pre-and post-group.

Results

There was a total of 150 term postoperative cesarean participants included in this retrospective evaluation. The participants were divided into two groups. There were 75 participants evaluated before and 75 participants after a policy and practice change. The maternal demographics, obstetrics variables, frequencies, and percentages are presented in (Table 2). The majority of the sample included primiparous Latino (37.5%) women with a primary cesarean and spinal epidural. The average age of the participants was $30.8 \pm$ years, and the gestational age of 39.3 weeks. The summary statistics for interval and ratio variables for maternal and obstetrical age are presented in (Table 3).

Levene's test was conducted to assess whether the total opioid oral morphine milligram equivalent (MME) variance was equal between the two groups. The result of this test was significant based on an alpha value of .05, $F(1, 148) = 12.40$, $p < .001$, suggesting that it was unlikely that the variance is equal for each category of the pre-and post-group, indicating the assumption of homogeneity of variance was violated.

Two-Tailed Independent Samples t-test for Total Oral Opioid Milligram Administered

The two-tailed independent samples *t*-test result for the total oral opioid milligram administered was significant ($p < .001$). This value indicates that the null hypothesis can be rejected and suggests that the total opioid oral (MME) mean findings were significantly different between the two groups (Table 4). The profile plot of the means shows that fewer milligrams of opioids were administered to the post-group after a practice change (Figure 1).

Two-Tailed Independent Samples t-test for Total Non-Opioid Milligram Administered

The *p-value* for the total non-opioid milligram administered were: Toradol IV ($p = .058$), Tylenol IV ($p = .073$), Motrin PO ($p < .001$), and Tylenol PO ($p = .002$) indicating the administration of oral analgesics was higher (Table 4). A comparison of the non-opioid milligram administered between the two groups is presented in (Figure 2).

Two-Tailed Mann-Whitney *U* test for Total Non-Opioid Milligram Administered

The Mann-Whitney Rank-Sum Test was significant for the following non-opioid milligrams administered: Toradol IV (pre-group median = 90.00, post-group median = 120.00, $p = .048$), Tylenol IV (pre-group median = 0.00, post-group median = 0.00, $p = .001$), Motrin PO (pre-group median = 2,400.00, post-group median = 600.00, $p < .001$), and Tylenol PO (pre-group median = 1,300.00, post-group median = 2,275.00, $p = .015$). The results suggests that there was a significant difference in the distribution of non-opioids between the two groups (Table 5).

Discussion

This retrospective study evaluated the impact of implementing a multimodal plan of care in treating the pain of the postoperative postpartum patient. This program evaluation compared two groups to determine the total dosage of opioids administered each 24 hours to treat postoperative postpartum pain and evaluated if fewer opioids were administered after a practice change. The opioid oral morphine milligram equivalent (MME) conversion factors were used to calculate the total milligram of opioids administered during the postoperative postpartum stay.

A notable finding after a practice change was that the mean total of the opioid oral morphine milligram equivalent (MME) was significantly different between the pre-and post-group. Fewer opioids were administered to the post-group, with a higher percentage of non-opioids being administered to treat postoperative postpartum pain.

Valentine et al. (2015) looked at comparing pain management treatment to determine if scheduled acetaminophen decreases opioid use compared to as-needed acetaminophen combined with an opioid. The Scheduled Group result reported decreased opioid use with acetaminophen intake being more consistent and used 9.1 ± 2.1 mg (95% CI 5.0 – 13.2, $p < 0.0001$) fewer morphine equivalents than the As-Needed Group. Scheduled dosing of analgesics can provide a consistent therapeutic concentration to reduce the total dosage of opioids administered in the postpartum period. Acetaminophen has an opioid-sparing effect that could result in less opioid use, has fewer side effects, and is compatible with breastfeeding (Valentine et al., 2015).

Evaluation of the implementation of an enhanced recovery after surgery (ERAS) program for elective cesarean delivery at Kaiser Permanente in Northern California had significant findings. The daily inpatient morphine equivalents decreased from 10.7 to 5.4 with increased use of multimodal analgesia from 9.7% to 88.8%, reporting acceptable pain scores significantly higher from 82.1% to 86.4% ($P < .001$) after the ERAS program was implemented (Hedderson et al., 2019).

The evidence in the literature has shown the positive benefits a multimodal approach can have on postpartum pain management. An effort to limit opioid exposure by promoting optimal health, safety, and well-being is the best and safest practice for both the mother and newborn. The goal is to decrease the overall need for opioids to reduce the risk of dependency and addiction among postpartum women. The recent pandemic was the catalyst for implementing a pain management practice change in the Maternal Child Health Department at Kaiser Permanente in Southern California. Evidence has shown that it is possible to manage postoperative postpartum pain using a multimodal plan of care and should be implemented first, then provide opioids only for breakthrough medication if needed (Hedderson et al., 2019).

A limitation of this study did not allow for an opportunity to interview the patients about their pain management care because this was a retrospective review. Another limitation was that although the initial pain score before medicating the patient was documented, the reassessment pain score was not available for review. However, it was noted that the post-group pain scores before medicating were much lower than the pre-group pain scores suggesting that scheduled analgesics managed the pain more effectively than the as-needed analgesics combined with opioids.

Conclusion

The concerns about the rise in the rate of new persistent opioid use among women exposed in postpartum indicate a need for a practice change in managing pain after birth. This retrospective evaluation of pain management of the Postpartum Inpatient after birth demonstrated that fewer milligrams of opioids were administered or needed when postoperative postpartum patients were placed on scheduled non-opioids to treat pain. Staff and patient education can help to increase knowledge to facilitate awareness and understanding of a multimodal treatment plan. An effort to improve pain management is necessary, and a multimodal plan of care to manage postoperative postpartum pain can be an effective way to reduce the risk of opioid use, dependency, and addiction.

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Table 1*Comparison Table of Total Milligrams Administered Before and After a Practice Change*

(Cesarean Birth)	<u>Pre-Practice Change</u>	<u>Post-Practice Change</u>
Variables	As-needed Non-Opioids (with Opioids As-needed)	Scheduled Non-Opioids (with Opioids As-needed)
(Dosage per day/24hr)		
Opioids (PO)		
Hydrocodone 5mg*		
Hydrocodone 10 mg*		
Oxycodone 5mg*		
Oxycodone 10mg*		
Non-Opioids (IV, PO)		
Acetaminophen IV 1000 mg		
Acetaminophen IV 750 mg		
Acetaminophen PO 650 mg		
Acetaminophen PO 1000 mg		
Ketorolac IVP 30 mg		
Ibuprofen PO 600 mg		
Ibuprofen PO 800 mg		

Note. *Indicate that the acetaminophen dose in the opioids will be added to the total acetaminophen dose for the 24-hour period. Acetaminophen 325 mg*/tablet

Table 2*Frequency Table for Maternal Demographics and Obstetric Variables*

Variable	Pre and Post Group	
	Pre	Post
Ethnicity		
Latino	35 (46.67%)	40 (53.33%)
White	21 (28.00%)	15 (20.00%)
Filipino	1 (1.33%)	7 (9.33%)
Black	8 (10.67%)	7 (9.33%)
Asian	2 (2.67%)	2 (2.67%)
American-Indian	1 (1.33%)	0 (0.00%)
Chinese	3 (4.00%)	0 (0.00%)
Asian-Indian	3 (4.00%)	3 (4.00%)
Vietnamese	1 (1.33%)	0 (0.00%)
Arab	0 (0.00%)	1 (1.33%)
Total	75 (100.00%)	75 (100.00%)
Parity		
Para 1	38 (50.67%)	42 (56.00%)
Para 2	25 (33.33%)	12 (16.00%)
Para 3	5 (6.67%)	17 (22.67%)
Para 4	6 (8.00%)	4 (5.33%)
Para 5	1 (1.33%)	0 (0.00%)
Total	75 (100.00%)	75 (100.00%)
Delivery Type: Primary/Repeat Cesarean		
Primary	48 (64.00%)	46 (61.33%)
Repeat	27 (36.00%)	29 (38.67%)
Total	75 (100.00%)	75 (100.00%)
Anesthesia Type: Epidural/Spinal		
EP	30 (40.00%)	31 (41.33%)
SP	45 (60.00%)	44 (58.67%)
Total	75 (100.00%)	75 (100.00%)
<i>Note.</i> Due to rounding error, percentages may not sum to 100%.		

Parity is the number of births given with a gestational age of 24 weeks or more living or stillborn.

Table 3

Summary Statistics Table for Maternal Age and Gestational Age

Variable	<i>M</i>	<i>SD</i>	<i>n</i>	Min	Max
Age					
Pre	30.51	5.23	75	19.00	44.00
Post	31.11	4.69	75	18.00	43.00
Gestational Age					
Pre	39.37	1.09	75	37.10	41.50
Post	39.25	1.06	75	37.00	41.40

Note. '-' indicates the statistic is undefined due to constant data or an insufficient sample size.

Table 4

Two-Tailed Independent Samples t-Test for Total Opioid Oral Morphine Milligram Equivalent MME by Pre and Post Group

Variable	Pre		Post		<i>t</i>	<i>p</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Total Opioid Oral Morphine Milligram Equivalent MME	27.13	20.77	8.43	14.27	6.43	< .001	1.05

Note. N = 150. Degrees of Freedom for the *t*-statistic = 131.13. *d* represents Cohen's *d*.

Two-Tailed Independent Samples t-Test for Total Non-Opioid Milligram Administered by Pre and Post Group

Variable	Pre		Post		<i>t</i>	<i>p</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Toradol IV Total Mg Administered	80.80	56.23	98.00	53.88	-1.91	.058	0.31
Tylenol IV Total Mg Administered	186.67	691.52	393.33	712.07	-1.80	.073	0.29
Motrin PO Total Mg Administered	2,256.00	1,574.99	1,258.67	1,248.90	4.30	< .001	0.70
Tylenol PO Total Mg Administered	1,425.67	943.59	2,135.00	1,658.14	-3.22	.002	0.53

Note. N = 150. Degrees of Freedom for the *t*-statistic = 148. *d* represents Cohen's *d*.

MME = morphine milligram equivalent

Table 5

Two-Tailed Mann-Whitney Test for Total Non-Opioid Milligram Administered by Pre and Post Group

Variable	Mean Rank		<i>U</i>	<i>z</i>	<i>p</i>
	Pre	Post			
Toradol IV Total Non-Opioid Mg Administered	68.69	82.31	2,302.00	-1.98	.048
Tylenol IV Total Non-Opioid Mg Administered	67.52	83.48	2,214.00	-3.27	.001
Motrin PO Total Non-Opioid Mg Administered	88.79	62.21	3,809.50	-3.80	< .001
Tylenol PO Total Non-Opioid Mg Administered	66.89	84.11	2,166.50	-2.44	.015

Figure 1

The mean of Total Opioid Oral Morphine Milligram Equivalent MME by Pre and Post Group

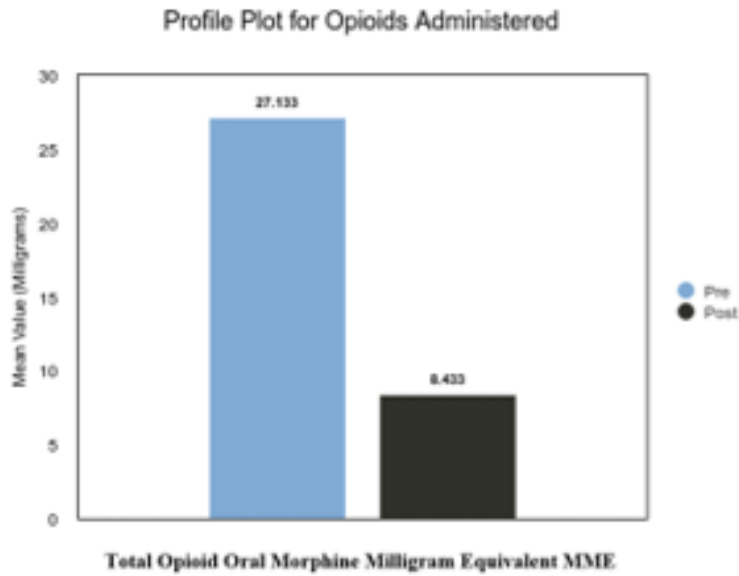
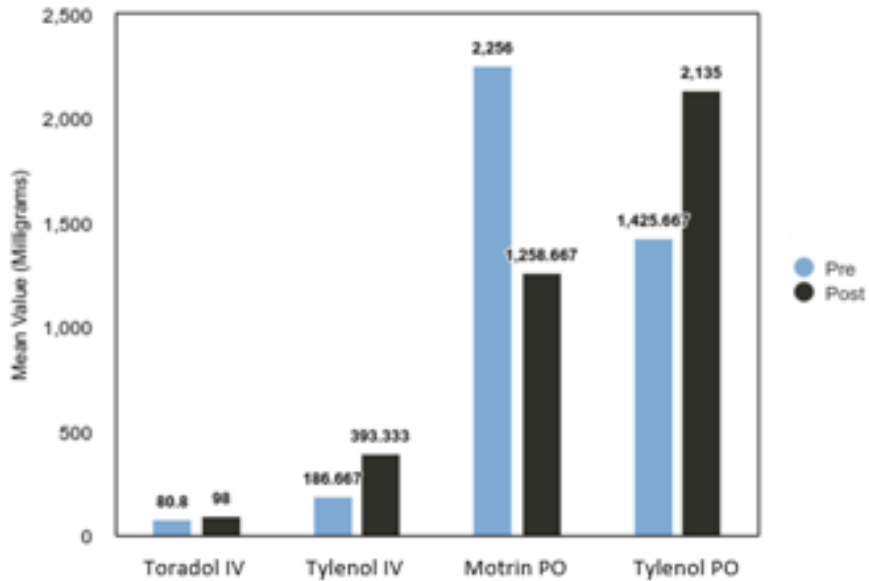


Figure 2

The mean of Total Non-Opioid Administered by Pre and Post Group



Appendix A

The Opioid Oral Morphine Milligram Equivalent (MME) Conversion Factors

<u>Type of Opioid (strength units)</u>	<u>MME Conversion Factor</u>
Buprenorphine film/tablet ³ (mg)	30
Buprenorphine patch ⁴ (mcg/hr)	12.6
Buprenorphine film (mcg)	0.03
Butorphanol (mg)	7
Codeine (mg)	0.15
Dihydrocodeine (mg)	0.25
Fentanyl buccal or SL tablets, or lozenge/troche ⁵ (mcg)	0.13
Fentanyl film or oral spray ⁶ (mcg)	0.18
Fentanyl nasal spray ⁷ (mcg)	0.16
Fentanyl patch ⁸ (mcg)	7.2
Hydrocodone (mg)	1
Hydromorphone (mg)	4
Levorphanol tartrate (mg)	11
Meperidine hydrochloride (mg)	0.1
Methadone ⁹ (mg)	3
>0, <= 20	4
>20, <=40	8
>40, <=60	10
>60	12
Morphine (mg)	1
Opium (mg)	1
Oxycodone (mg)	1.5
Oxymorphone (mg)	3
Pentazocine (mg)	0.37
Tapentadol ¹⁰ (mg)	0.4
Tramadol (mg)	0.1

Appendix B

The Pain Medication Dosage and Frequency Reference

Opioids (PO)

Hydrocodone 5 mg/Acetaminophen 325 mg (Norco) every 4 hours prn moderate pain
Hydrocodone 10 mg/Acetaminophen 325 mg (Norco) every 6 hours prn severe pain
Oxycodone 5 mg/Acetaminophen 325 mg (Percocet) every 6 hours prn moderate pain
Oxycodone 10 mg/Acetaminophen 325 mg (Percocet) x1 prn severe pain

Non-Opioids (IV, PO)

Acetaminophen (IV) 1000 mg Q6H x1 dose followed by Acetaminophen 650 mg PO every 6 hours
Acetaminophen (IV) 750 mg Q6H x1 dose followed by Acetaminophen 650 mg PO every 6 hours
Acetaminophen (PO) 650 mg every 6 hours prn mild pain - not to be ordered if patient is on ATC
Ketorolac IVP 30 mg every 6 hours scheduled x4 doses followed by Ibuprofen 600 mg PO every 6 hours
Ibuprofen PO 600 mg every 6 hours scheduled ATC not PRN
Ibuprofen PO 800 mg every 8 hours scheduled ATC not PRN

ATC: Around the Clock

