



## Evidence-Based protocol for buprenorphine management during the intrapartum period

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### Abstract

Opioid dependence during pregnancy has increased substantially, mirroring trends in the general population. Buprenorphine is commonly prescribed for pregnant individuals with opioid use. However, governing bodies provide insufficient guidance, resulting in wide variability in peripartum management and inconsistencies within existing hospital systems. We aim to identify noncompliance and develop a standardized protocol for use throughout the community to promote uniform and equitable care for a vulnerable patient population. A retrospective chart review and data analysis were conducted to assess current intrapartum buprenorphine management practices at the major obstetric care center in Western New York. Data were stratified by age, race, ethnicity, and insurance provider to identify statistically significant differences in practice patterns that may reflect provider bias or systemic inconsistencies in care. Descriptive statistics were analyzed using SPSS 30.0. Analysis revealed substantial variability in buprenorphine management. Buprenorphine was continued during labor for most patients; however, approximately one-third had dose modifications or interruptions. Neuraxial anesthesia was used in over 70% of deliveries, although modality selection varied widely. Differences in buprenorphine management and pain control strategies were observed across age, race, ethnicity, and insurance groups, underscoring the lack of a standardized approach and potential inequities in care. Peripartum management of buprenorphine is inconsistent and varies widely in clinical practice, with potential risks to patient care. The proposed protocol, informed by key elements of established guidelines from other institutions, aims to standardize intrapartum buprenorphine management and improve the quality, safety, and equity of care for this vulnerable population.

**Keywords:** Buprenorphine, Peripartum management, Opioid use disorder in pregnancy, Standardized clinical protocol, Health care equity

### Introduction

Opioid Use Disorder (OUD) in pregnancy has escalated dramatically in recent years, paralleling the epidemic observed in the general population. OUD is a chronic, treatable disease that can be managed successfully by combining medications with behavioral therapy and recovery support [1, 2], which enables those with OUD to regain control of their health and their lives. Short-term treatment programs aimed at abstinence are associated with high relapse rates and generally do not facilitate patients' stable long-term recovery [3].

Opioid agonists, such as methadone or buprenorphine, are commonly prescribed as pharmacotherapy for pregnant individuals seeking to manage their opioid addiction. Opioid agonist pharmacotherapy prevents opioid withdrawal symptoms and the health complications associated with nonmedical opioid use by reducing relapse risk [4]. Additionally, opioid agonist pharmacotherapy

improves adherence to prenatal care and addiction treatment programs [5]. Opioid agonist pharmacotherapy in combination with prenatal care has been demonstrated to reduce the risk of obstetric complications and reduce the severity of neonatal opioid withdrawal syndrome.

Buprenorphine acts on the same mu-opioid receptors as heroin and morphine, but functions as a partial rather than full agonist (i.e., methadone), making overdose less likely [6, 7]. Treatment with buprenorphine has become relatively preferred during pregnancy and the peripartum period as it has fewer drug interactions than methadone, can be prescribed on an outpatient basis, does not require daily visits to an opioid treatment program, and requires fewer dosage adjustments throughout pregnancy [7]. In addition, several trials have demonstrated that consistent treatment with buprenorphine throughout pregnancy decreases the severity of neonatal opioid withdrawal syndrome.

Despite impressive advancements in addiction medicine, little guidance is provided on how to manage buprenorphine maintenance therapy in special settings, such as the intrapartum period [8-10]. Academic institutions such as the American College of Obstetricians & Gynecologists and the Cleveland Clinic have published recommendations and reference materials on the topic, but very few healthcare networks have developed protocols for physicians to implement and adhere to in the intrapartum setting [11]. This lack of clarity from governing bodies and lack of research on gravid individuals has resulted in a great degree of variability in how medical providers care for patients who are prescribed buprenorphine during pregnancy.

The focus of our research was to assess the current methods of buprenorphine management during the intrapartum period used by Kaleida Health medical providers (primarily anesthesiologists and obstetrician-gynecologists). This research was conducted via a retrospective chart review of patients admitted for intrapartum care at local hospitals to analyze individual patient interventions and outcomes related to buprenorphine management. This data was stratified by age, race, ethnicity, sex, gender, and insurance provider to identify statistically significant differences in practice methodologies and/or to elucidate provider biases that may be hindering patient care.

As there is no formally established standard of care for the intrapartum management of buprenorphine in the Western New York region, research directed at identifying gaps and incongruencies that currently exist within our hospital systems is paramount. Multiple hospital systems across diverse geographic regions have implemented standardized intrapartum management protocols for patients receiving buprenorphine. This study aimed to develop a comprehensive, evidence-based intrapartum buprenorphine management protocol by synthesizing key components from existing, established protocols. This newly established protocol for buprenorphine management will be disseminated throughout the Buffalo community to provide uniform and equitable care to one of our most vulnerable populations.

## Methods

### Study design and institutional review board approval

This study was conducted as a retrospective chart review of pregnant patients receiving maintenance buprenorphine therapy who delivered within the Kaleida Health system in Western New York. Prior to data collection, the study protocol was reviewed and approved by the Institutional Review Board (IRB) of the University at Buffalo, Jacobs School of Medicine and Biomedical Sciences. Given the retrospective nature of the study and the use of de-identified data, the requirement for informed consent was waived.

### Patient population

The study population included all patients with a documented diagnosis of opioid use disorder who were maintained on buprenorphine therapy and admitted for intrapartum care at Kaleida Health-affiliated hospitals during the defined study period. Patients were identified through Electronic Medical Record (EMR) queries using medication records and diagnostic codes. Individuals were excluded if buprenorphine use could not be confirmed, if delivery occurred outside the health system, or if key intrapartum data were incomplete or unavailable.

### Data collection

Data were extracted retrospectively from the EMR using a standardized data abstraction tool. Collected variables included patient demographics (age, race, ethnicity, and insurance status), obstetric characteristics, documented buprenorphine dosing and administration during labor, intrapartum analgesia and anesthesia modalities, and coordination of care among obstetric, anesthesia, and addiction medicine services. Documentation regarding dose continuation, modification, or interruption of buprenorphine therapy during labor was specifically reviewed. Data abstraction was performed by trained investigators, with periodic cross-checking to ensure consistency and accuracy.

### Data management

All collected data were de-identified prior to analysis

and stored on secure, password-protected institutional servers in accordance with IRB and Health Insurance Portability and Accountability Act (HIPAA) requirements. Each patient was assigned a unique study identifier to maintain confidentiality. Data quality checks were performed to identify missing values, outliers, and inconsistencies prior to statistical analysis.

### Statistical analysis

Descriptive statistics were used to summarize patient demographics and intrapartum management practices. Continuous variables were reported as means with standard deviations or medians with interquartile ranges, as appropriate, while categorical variables were reported as frequencies and percentages. Stratified analyses were conducted based on age, race, ethnicity, and insurance status to evaluate differences in buprenorphine management and analgesia practices. Statistical analyses were performed using IBM SPSS Statistics for MacOS, version 30.0 (IBM Corp., Armonk, NY). Statistical significance was defined using a two-sided alpha level of 0.05.

### Results

A total of 115 patients receiving maintenance buprenorphine therapy who delivered within the Kaleida Health system during the study period were included in the analysis. Patient demographic characteristics, including age, race, ethnicity, and insurance status, are summarized in Table 1. The study population was demographically diverse, with representation across multiple racial and ethnic groups and a predominance of publicly insured patients.

**Table 1.** Patient demographics

| Characteristics | n(%)      |
|-----------------|-----------|
| Age ≤30         | 53 (46.1) |
| Age >30         | 62 (53.9) |
| White           | 95 (82.6) |
| Non- white      | 20 (17.4) |

### Intrapartum buprenorphine management

Considerable variability was observed in intrapartum buprenorphine management practices. While

buprenorphine was continued during labor for 99 patients (86.1%), a substantial proportion (13.9%) experienced dose adjustments or interruptions. Dose adjustments of buprenorphine included increases, decreases, and usage of split dosing. Timing and documentation of buprenorphine administration varied widely, and coordination between obstetric, anesthesia, and addiction medicine teams was inconsistent. No single management strategy predominated across all cases, underscoring the absence of a standardized clinical approach.

### Analgesia and anesthesia practices

Intrapartum analgesia and anesthesia modalities also demonstrated heterogeneity (Table 2). Neuraxial anesthesia was the most commonly utilized pain management strategy, though the specific modality varied, including epidural, spinal, combined spinal-epidural, and multimodal approaches. Use of supplemental opioid and non-opioid analgesics differed significantly among patients, with no consistent protocol guiding pain management for individuals maintained on buprenorphine. A substantial proportion (17%) of the patients received opioid agonist-antagonist (e.g., Nalbuphine) during the intrapartum period.

**Table 2.** Peripartum characteristics

|                     |                    | n (%)      |
|---------------------|--------------------|------------|
| Delivery Type       | Vaginal Delivery   | 76 (66.1)  |
|                     | Cesarean Delivery  | 38 (33.0)  |
| Anesthesia Modality | Epidural           | 69 (90.8)  |
|                     | Spinal / CSE       | 5 (6.6)    |
|                     | General Anesthesia | 2 (2.6)    |
| Analgesia Modality  | NSAID              | 113 (98.3) |
|                     | Ketorolac          | 43 (37.4)  |
|                     | Acetaminophen      | 47 (40.9)  |
|                     | Nalbuphine         | 20 (17.4)  |

### Coordination of community support services

Inconsistencies were observed, as services such as lactation consultations and social work consultations were not consistently provided to patients during their hospital admission.

**Stratified analyses:** Intrapartum buprenorphine

management and analgesic strategies were stratified by age, race, ethnicity and insurance status (Table 3). These findings suggest that patient-level demographic factors may influence clinical decision-making, raising concerns for potential inequities in care delivery. Collectively, the data reveal substantial practice variability and highlight critical gaps in standardized intrapartum management for pregnant patients receiving buprenorphine.

**Table 3.** Intrapartum buprenorphine management stratified by race and insurance type

|                |                   | Continued n (%) | Interrupted n (%) |
|----------------|-------------------|-----------------|-------------------|
| Race           | White             | 83 (87.4)       | 12 (12.6)         |
|                | Non-White         | 16 (80.0)       | 4 (20.0)          |
| Insurance Type | Public Insurance  | 83 (87.4)       | 12 (12.6)         |
|                | Private Insurance | 16 (80.0)       | 4 (20.0)          |

**Note.** Percentages calculated using valid cases within each insurance category. race categories collapsed due to small subgroup sizes

## Discussion

The findings from this study demonstrate variability in intrapartum buprenorphine management. This is despite the national consensus that buprenorphine should be continued throughout pregnancy, labor, and the postpartum period [8, 12-14]. Although most patients in our cohort were continued on buprenorphine during labor, a notable proportion experienced interruption or modification of therapy. This demonstrates a lack of standardized proceedings in the Western New York region. There is a need for a formalized intrapartum protocol. Institutions with established guidelines and protocols all adhere to similar intrapartum buprenorphine management which can be summarized into four core principles [11, 15, 16].

The first principle consists of universal screening for opioid use that is delivered within a trauma-informed and non-stigmatizing framework. Universal screening is recommended to ensure early identification of substance use and allow for proper referrals for treatment [11, 17]. If a patient were to test positive on screening, an assessment for opioid use disorder (OUD) using DSM-5 criteria should be

carried out. Additionally, assessments for co-occurring mental health conditions and polysubstance use should be conducted as comorbidities are common.

The second principle states that buprenorphine initiation and continuation should be implemented for all patients diagnosed with OUD. This is emphasized across all established guidelines. The discontinuation or withdrawal from buprenorphine during pregnancy, intrapartum and postpartum period is strongly discouraged due to an increased risk of relapse and adverse maternal and fetal outcomes [11, 16]. Our study had critical deviations from this standard with patients failing to continue buprenorphine during labor. During the intrapartum period, all institutions place an emphasis on maintaining the patient's buprenorphine dose, as interruption or tapering may precipitate withdrawal and destabilize treatment.

The third principle describes pain management strategies that favor neuraxial anesthesia and multimodal analgesia. Buprenorphine's high opioid receptor affinity calls for these strategies to be utilized. Additionally, opioid agonist-antagonists such as butorphanol and nalbuphine should be avoided, as they may precipitate withdrawal [11, 18]. The heterogeneity in anesthesia modalities that our study presents reflects the lack of intrapartum planning.

The fourth principle delineates postpartum and neonatal care. New mothers in the postpartum period should be continued on buprenorphine, screened for postpartum mood disorders, and linked to addiction and behavioral health services. Neonates with in-utero opioid exposure should be monitored for neonatal opioid withdrawal syndrome, with preference for non-pharmacologic interventions such as rooming-in and breastfeeding, when appropriate [11, 17]. With regards to breastfeeding, all patients should be given a lactation consult.

These principles provide the framework to inform a proposed institutional protocol with a mission to reduce practice variability, mitigate potential inequities in care, and improve maternal and neonatal outcomes across the Western New York region (Figure 1.)

| Intrapartum Management Key Strategies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>- Continue maintenance buprenorphine dose</li> <li>- Medication Assisted Treatment (i.e. buprenorphine) alone is typically <b>NOT</b> sufficient for pain management during labor and delivery</li> <li>- Avoid use of opioid agonist-antagonist agents (i.e. butorphanol, nalbuphine, etc.) due to risk of precipitated withdrawal</li> <li>- Consider split dosing of total dose to offer improved pain management (i.e. switching from 6mg BID -&gt; 4mg TID but maintaining total daily dose of 12mg)</li> <li>- Patients may require increased doses of opioids for analgesic effect</li> <li>- Offer epidural and/or spinal anesthesia, when appropriate</li> </ul>                 |                                                                                                                                                                                                                                                                                                                                                                     |
| Vaginal Delivery                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | C-Section                                                                                                                                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>- Buprenorphine should <b>NOT</b> be discontinued in anticipation of labor</li> <li>- Optimize non-opioid medications for pain relief including NSAIDs and acetaminophen</li> <li>- Ensure medications ordered are scheduled <i>instead</i> of PRN</li> <li>- Opioids may be utilized in special cases such as third/fourth degree tears or per provider discretion</li> <li>- If opioids are indicated, a short course of oxycodone or hydrocodone/acetaminophen should be used</li> </ul>                                                                                                                                                                                               | <ul style="list-style-type: none"> <li>- Buprenorphine should <b>NOT</b> be discontinued in anticipation of a C-section</li> <li>- Institutional protocols should be followed for intraoperative pain management</li> <li>- Postoperative pain management should be managed with a short course of oxycodone or hydrocodone/acetaminophen should be used</li> </ul> |
| Postpartum Management Key Strategies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>- Ensure patient has prescription to continue maintenance buprenorphine dose at discharge and has follow up appointment with addiction medicine specialist</li> <li>- Post partum time period is a high-risk time for relapse. Consider prescribing naloxone upon discharge</li> <li>- Encourage breastfeeding in patients on buprenorphine and offer lactation consult. Evidence suggests minimal transfer of buprenorphine in breast milk</li> <li>- Offer wrap-around services (when appropriate) including WIC, counseling, PCP follow up, social work consult, etc.</li> <li>- Discuss contraceptive options with patients and ensure plan is in place prior to discharge</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                     |

**Fig 1.** Intrapartum and postpartum management for pregnant patients with opioid use disorder

## Conclusion

Our findings suggest substantial inconsistencies in the care for intrapartum patients who are prescribed buprenorphine. Implementing an institutional protocol would provide equitable care for this

population. Next steps include proposing our protocol to obstetric and anesthesia providers in Western New York who can facilitate the necessary changes. Future directions include analyzing health outcomes of pregnant patients prescribed buprenorphine after the protocol is in place and then comparing to health outcomes prior to the

implementation of the protocol. This comparison would highlight the power of standardized buprenorphine management in light of positive health outcomes.

## Acknowledgements

None

**Funding:** No Funding was requested for this project. None was disclosed by any of the authors.

**Conflicts of Interest:** None

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