

Rapid Buprenorphine Micro-Induction in Pregnant Patients with Opioid Use Disorder: A Retrospective Cohort Study

Jordan Needens, Rebecca Hicks, Emily Sloane, Laurel Thomas, Melissa Niehls, Kate Billups, Taylor Burke, Michael Derosa, David Chaffin, Jesse Cottrell*

Department of Obstetrics and Gynecology, Joan C. Edwards School of Medicine, Marshall University, Huntington, WV, USA
Email: *cottrellje@marshall.edu

How to cite this paper: Needens, J., Hicks, R., Sloane, E., Thomas, L., Niehls, M., Billups, K., Burke, T., Derosa, M., Chaffin, D. and Cottrell, J. (2026) Rapid Buprenorphine Micro-Induction in Pregnant Patients with Opioid Use Disorder: A Retrospective Cohort Study. *Open Journal of Obstetrics and Gynecology*, **16**, 1460-1464. <https://doi.org/10.4236/ojog.2026.1610132>

Received: September 14, 2026

Accepted: October 11, 2026

Published: October 14, 2026

Copyright © 2026 by author(s) and Scientific Research Publishing Inc.
This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).
<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

We aimed to evaluate whether a rapid buprenorphine micro-induction protocol reduces hospital length of stay and readmission rates in pregnant patients with opioid use disorder (OUD). A retrospective cohort study of pregnant patients with OUD admitted between January 2020 and December 2021 was performed. Primary outcomes were hospital length of stay and readmission rates. Ninety-eight patients were included. Forty-five (45.9%) underwent rapid buprenorphine micro-induction. Mean hospital length of stay was 2.63 ± 1.95 days in the rapid induction group compared with 3.37 ± 4.96 days in historical controls. Readmission rates were 20% in the rapid induction cohort versus 63.6% in traditional induction groups. Rapid buprenorphine micro-induction was associated with clinically meaningful reductions in hospital length of stay and readmission rates in pregnant patients with OUD.

Keywords

Pregnancy, Opioid Use Disorder, Buprenorphine, Micro-Induction, Substance Abuse

1. Introduction

Opioid use disorder (OUD) in pregnancy has risen significantly in the United States and is associated with adverse maternal and neonatal outcomes, including preterm birth, fetal growth restriction, placental abruption, and fetal demise [1] [2]. Medication-assisted treatment (MAT) with methadone or buprenorphine is the standard of care and improves maternal engagement in prenatal care while reducing illicit opioid use and neonatal withdrawal severity [2].

Despite established benefits, initiation of buprenorphine can be challenging due to the requirement that patients enter a state of moderate withdrawal prior to induction, which may prolong hospitalization and contribute to treatment discontinuation or readmission [3].

We implemented a rapid sublingual buprenorphine micro-induction protocol in pregnant patients with OUD to reduce inpatient length of stay and improve continuity of MAT. This study evaluates outcomes associated with this protocol compared with traditional induction strategies.

2. Methods

This retrospective cohort study was conducted at Cabell Huntington Hospital (CHH) and included pregnant patients with OUD admitted between January 2020 and December 2021. Pregnant patients were identified through obstetric triage and inpatient admission records, and eligibility was determined based on pregnancy status with documented opioid use disorder or opioid dependence during the study period. Inclusion criteria included an index admission of a pregnant patient with substance use disorder presenting for OUD who was planning to continue prenatal care with the university OB/GYN practice. Exclusion criteria included those who were not planning to continue prenatal care with our practice. Patients were categorized according to their medication-assisted treatment (MAT) approach, including rapid buprenorphine micro-induction, traditional buprenorphine induction, methadone conversion, or no MAT initiation (withdrawal/detoxification). A historical cohort of 53 patients treated between 2013 and 2018 was included for comparison of delayed induction outcomes. Our historical cohort was similar in demographic details and managed by the same Maternal-Fetal Medicine physician at an academic hospital.

Traditional buprenorphine induction at our institution assesses for subjective and objective signs of withdrawal, with initiation of buprenorphine based on reported patient symptoms. Dosing of buprenorphine is at physician discretion, taking into account the substance abuse history, clinical assessment, and severity of withdrawal symptoms. Methadone conversion is initiated at 40mg per day regardless of patient withdrawal status. The rapid buprenorphine micro-induction protocol examined in this study began with 2 mg of sublingual buprenorphine, with dose escalation by 2 mg every 4 hours as tolerated until a maintenance dose of 8 mg twice daily was achieved. Dosing adjustments for this study were guided strictly by the protocol detailed in **Figure 1**.

Primary outcomes included hospital length of stay, measured in days, and readmission rates for continuation of MAT. Readmission was defined as an inpatient stay for substance use disorder during pregnancy. Continuous variables were summarized using means and standard deviations. Between-group comparisons were performed using t-tests, with statistical significance defined as $p < 0.05$. SAS was utilized for statistical analysis, version 15.0 (Cary, NC, USA). The study was approved by the Institutional Review Board at Marshall University (1850036-4).

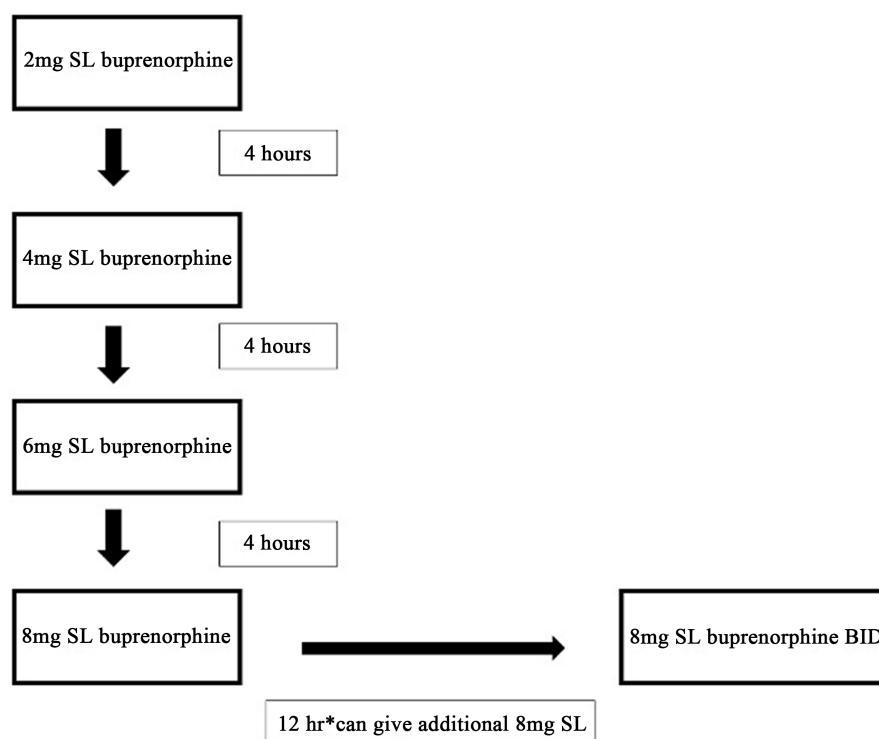


Figure 1. Rapid buprenorphine micro-induction protocol.

3. Results

A total of 98 pregnant patients with opioid use disorder were included in the analysis. The treatment distribution consisted of 45 patients (45.9%) undergoing rapid buprenorphine micro-induction, 26 (26.5%) receiving traditional buprenorphine induction, 10 (10.2%) undergoing methadone conversion, and 17 (17.3%) managed with withdrawal without initiation of medication-assisted treatment.

Among patients treated with rapid buprenorphine micro-induction, 36 of 45 (80%) completed MAT initiation during a single admission, while 9 of 45 (20%) required readmission. The mean length of stay for the rapid induction group was 2.63 ± 1.95 days compared with 3.37 ± 4.96 days in the historical delayed induction cohort; however, this difference was not statistically significant ($p = 0.2975$). A single outlier admission complicated by MRSA bacteremia was excluded from the length-of-stay analysis.

Readmission rates were lower in the rapid induction group (20%) compared with the traditional induction group (63.6%), indicating a reduction in subsequent hospital utilization associated with rapid induction (**Figure 2**).

4. Discussion

In this retrospective cohort study, rapid buprenorphine micro-induction was associated with shorter hospital length of stay and lower readmission rates compared with traditional induction approaches in pregnant patients with opioid use disorder.

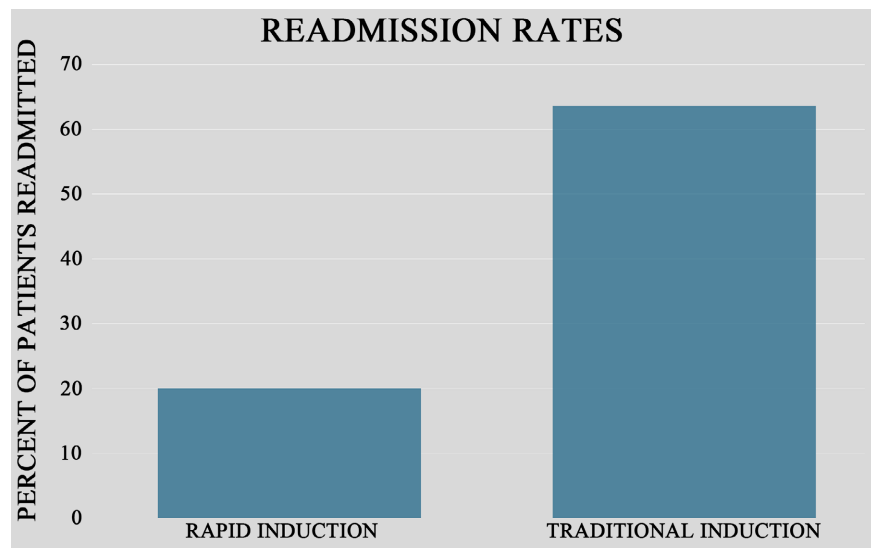


Figure 2. Comparison of readmission rates following rapid versus traditional buprenorphine induction.

Standard buprenorphine induction requires patients to reach moderate withdrawal prior to initiation, which can be distressing and prolong hospitalization [3]. Additionally, premature administration can precipitate acute withdrawal due to buprenorphine's high receptor affinity [4]. Micro-induction strategies, including the Bernese method, allow for gradual receptor transition by introducing buprenorphine while full opioid agonists are still present [5]. Our protocol implements a standardized rapid escalation strategy, achieving maintenance dosing within approximately 12 - 24 hours.

Although the reduction in length of stay did not reach statistical significance, the observed differences in both hospitalization duration and readmission rates are clinically meaningful, particularly in a population with high healthcare utilization and elevated risk of treatment discontinuation.

These findings support the feasibility of rapid buprenorphine micro-induction as an inpatient strategy for pregnant patients with OUD. Prospective studies with larger sample sizes are needed to confirm these findings and evaluate maternal and neonatal outcomes. Limitations to our study include the retrospective single-center design and limited sample size, which may reduce statistical power and generalizability. Our study is also hampered by the lack of maternal and neonatal outcomes long-term, and the inability to capture readmissions during pregnancy at outside hospitals. Furthermore, non-random treatment allocation and differing treatment periods also limits our study.

Rapid buprenorphine micro-induction may reduce hospital length of stay and readmission rates in pregnant patients with opioid use disorder and appears to be a feasible inpatient strategy for MAT initiation.

Permission to Reuse and Copyright

No copyright material is included in this manuscript.

Acknowledgements

We acknowledge the Translational Sciences Core of COBRE/ACCORD, Clinical, and Translational Sciences Department, Joan C Edwards School of Medicine, Marshall University for analytics support.

Data Availability Statement

All data supporting the findings of this study are available upon reasonable request.

Author Contributions

All authors agree to be accountable for the content of the work. Each author was responsible for the conceptualization, investigation, administration, writing, review and editing of the manuscript.

Conflicts of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

References

- [1] Ruley, M. and Coustasse, A. (2019) Prenatal Opioid Maintenance in the United States and Its Effect on Neonatal Abstinence Syndrome. *The Health Care Manager*, **38**, 258-266. <https://doi.org/10.1097/hcm.0000000000000268>
- [2] Forray, A. (2016) Substance Use during Pregnancy. *F1000Research*, **5**, 887. <https://doi.org/10.12688/f1000research.7645.1>
- [3] Button, D., Hartley, J., Robbins, J., Levander, X.A., Smith, N.J. and Englander, H. (2021) Low-dose Buprenorphine Initiation in Hospitalized Adults with Opioid Use Disorder: A Retrospective Cohort Analysis. *Journal of Addiction Medicine*, **16**, e105-e111. <https://doi.org/10.1097/adm.0000000000000864>
- [4] Oakley, B., Wilson, H., Hayes, V. and Lintzeris, N. (2021) Managing Opioid Withdrawal Precipitated by Buprenorphine with Buprenorphine. *Drug and Alcohol Review*, **40**, 567-571. <https://doi.org/10.1111/dar.13228>
- [5] Vogel, M., Hämmig, R., Kemter, A., Strasser, J., von Bardeleben, U., Gugger, B., et al. (2016) Use of Microdoses for Induction of Buprenorphine Treatment with Overlapping Full Opioid Agonist Use: The “Bernese Method”. *Substance Abuse and Rehabilitation*, **7**, 99-105. <https://doi.org/10.2147/sar.s109919>