

# The Postpartum Period as a Point of Prevention for Opioid Misuse: A Commentary

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## Abstract

The nationwide increase in opioid use has led to an epidemic in the United States, resulting in an increase of opioid-related overdose deaths and opioid analgesic prescriptions over the last two decades. The risk of long-term opioid use post-surgery increases when patients are treated with opioid analgesics compared to their counterparts. Guidelines state that opioid analgesics are not always necessary and should be prescribed for the lowest effective dose only as long as pain is expected to be severe; however, over-prescription is common with general populations showing that half the amount of prescribed opioids do not get used by patients. Obstetric delivery is one of the most common procedures experienced among women who are pregnant. Recent evidence shows that many variations exist in opioid prescription rates during postpartum across states, ranging from 7% to 53% with differences in dosages for greater than 280 morphine milligram equivalents following uncomplicated vaginal delivery, indicating opportunities to develop guidelines on postpartum opioid use but also to improve prescription safety as well as to prevent an unnecessary increase in prescription opioid misuse among postpartum women. Telemedicine for monitoring substance use is increasingly common for substance use treatment programs and electronic technology is also being explored to screen and deliver brief interventions to treat substance use, drinking, and smoking in maternal populations. Given the myriad psychosocial risk factors associated with the postpartum period and the introduction of opioids to many opiate-naïve patients during this time, obstetric delivery may be an optimal time for upstream opioid misuse prevention using mobile technology. The objective of this commentary is to describe the prevalence of maternal opioid use and importance of addressing it with a study to prevent development of maternal opioid misuse.

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## Keywords

Opioid Misuse, Postpartum, Prevention, Mobile Technology, Addiction

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### 1. Introduction

The nationwide increase in opioid use has led to an epidemic in the United States (Martins et al., 2017), resulting in an increase of opioid-related overdose deaths and opioid analgesic prescriptions over the last two decades (Dart et al., 2015; Paulozzi, Jones, Mack, & Rudd, 2011). The risk of long-term opioid use post-surgery increases when patients are treated with opioid analgesics compared to their counterparts (Alam et al., 2012; Bateman et al., 2016; Deyo et al., 2017; Shah, Hayes, & Martin, 2017). Guidelines state that opioid analgesics are not always necessary and, when used, they should be prescribed for the lowest effective dose only as long as pain is expected to be severe (Javaher & Mai, 2015); however, over-prescription is common with general populations showing that half the amount of prescribed opioids do not get used by patients (Bates, Laciak, Southwick, & Bishoff, 2011; Bicket, Long, Pronovost, Alexander, & Wu, 2017).

Obstetric delivery is one of the most common procedures experienced among women who are pregnant (Martin, Hamilton, Osterman, Driscoll, & Drake, 2018). Recent evidence shows that many variations exist in opioid prescription rates during postpartum across states, ranging from 7% to 53% with differences in dosages for greater than 280 morphine milligram equivalents following uncomplicated vaginal delivery (Becker, Gibbins, Perrone, & Maughan, 2018). Since 2002, prescription opioid use and misuse have significantly increased among women who are pregnant and non-pregnant, showing over 31% increase in past-month heroin use among women of childbearing age (Substance Abuse and Mental Health Services Administration, 2015). Although women treated for opioid use disorders with opioid agonist therapy show better maternal and infant outcomes, evidence-based criteria for treating women with opioid use disorders is largely absent (Klaman et al., 2017). Women with opioid use disorder have multiple co-occurring substance use and mental health issues, including co-use of other substances, tobacco use, psychiatric disorders, family and social issues, and sexual health complications (Hand, Short, & Abatemarco, 2017). These indicate opportunities to develop guidelines on postpartum opioid use but also to improve prescription safety as well as to prevent an unnecessary increase in prescription opioid misuse among postpartum women (Becker et al., 2018).

### 2. Description of the Recent Pilot Study on Pain Medication Use

A recent study in the United States (Morgan, Walther, & Lane, 2019) used a mobile application technology to track pain and usage of opiates and non-steroidal anti-inflammatory medications (NSAID) that manage pain. The mobile applica-

tion uses elements of gamification to encourage patients to delay medications when appropriate and to decrease dosages as able. Patients are asked to rate their pain level and, if appropriate, encouraged to delay opioid medication intake or use an alternative (e.g., an NSAID or acetaminophen), followed by earning points.

Univariate analyses were conducted to examine the distribution of participant responses related to acceptability, namely ease of use and logistical feasibility for both patients and clinicians. The feasibility of the mobile application was examined by group-level rates of opioid use and habit-forming behaviors. Preliminary results included time to delay of next opioid use, time to reduction of opioid use, overall consumption of prescribed opioids, and plasma concentration and tolerance levels with regard to opioids. A total of eight participants underwent outpatient surgeries have tried using the application post-surgery with five male and three female patients. Seven of them began delaying the next opioid dose and took less than the recommended dosage within 24 hours post-operation. They took less than half the prescribed opioids and consumed less than two-third of the recommended opioids to manage their pain, decreasing their plasma concentration and reducing the risk of habit-forming behaviors. A total of 180 oxycodone pills were prescribed across the seven patients with only 39 pills (21%) having been taken leaving 141 pills unused. Future research efforts should include a randomized controlled trial to determine if and how much of these behaviors can be attributed to application usage.

### 3. Comparisons with Other Technologies

Mobile technology has been explored in treating alcohol use among obstetric populations (Washio, Frederick, Archibald, Bertram, & Crowe, 2017). Alcohol use can be detected by breathalyzer, which has been available for mobile use connected to Wifi for transmitting GPS, facial recognition results, and blood alcohol concentrations (BAC) (Skipper et al., 2014). The small community project described in Washio et al. (2017) was implemented by community stakeholders (schools and the state government) in the United States to remotely monitor prenatal alcohol use via mobile breathalyzer and provide weekly financial incentives for alcohol abstinence. The project was in collaboration with social services providing case management for women who are pregnant and use alcohol. Four participants showed over 90% monitoring compliance, and none provided alcohol-positive breath samples (Washio et al., 2017).

Computerized behavioral interventions are more common to treat maternal substance, alcohol, and tobacco use, compared to mobile technology use (Ondersma et al., 2012; Ondersma et al., 2015, 2018). Computerized behavioral interventions are usually provided in a brief form such as a single session. The computer program has a three-dimensional, mobile, emotionally expressive animated narrator reading materials regarding pros and cons of substance use and related issues, as well as query in interest in changing substance use with an optional goal setting. The program is individually tailored so that it navigates the

participants according to whether they are ready to abstain and set up a goal to achieve.

#### 4. Future Directions

Telemedicine for monitoring substance use is increasingly common for substance use treatment programs with opioid agonist therapy to reach populations in rural settings or those with transportation barriers (Eibl et al., 2017). Electronic technology is also being explored to screen and deliver brief interventions to treat substance use, drinking, and smoking in maternal populations (Ondersma et al., 2012; Ondersma et al., 2015, 2018; Washio et al., 2017). As described in the study above (Morgan et al., 2019), simply tracking their pain level and getting encouragement and motivation to delay pain medication intake might also help immediate postpartum women to prevent an unnecessary increase in prescription opioid misuse post-delivery. Given the myriad psychosocial risk factors associated with the postpartum period and the introduction of opioids to many opiate-naïve patients during this time, obstetric delivery may be an optimal time for upstream opioid misuse prevention, and use of mobile technology may increase user and provider engagement to properly manage pain medication.

#### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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