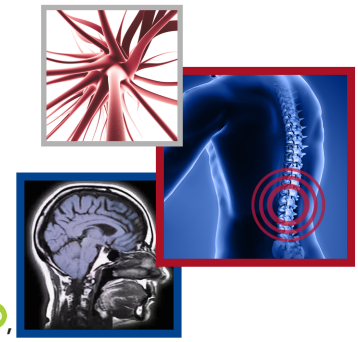
Research Article

For reprint orders, please contact: reprints@futuremedicine.com

Pain Management



Obstetricians' prescribing practices for pain management after delivery

A Dhanya Mackeen[1], Richard S Vigh[1], Lisa Bailey Davis[2], Mohamed Satti[1], Nicole Cumbo[3], Abigail M Pauley[4], Krista S Leonard[4], Mark Stephens[5], Tammy E Corr[6], RW Roeser[7], Timothy Deimling[3], Richard S Legro[3], Jaimey M Pauli[3] & Danielle Symons Downs*[,8]

[1]Department of Obstetrics & Gynecology, Division of Maternal-Fetal Medicine, Geisinger, Danville, PA 17822, USA

[2]Department of Population Health Sciences, Geisinger, Danville, PA 17822, USA

[3]Department of Obstetrics & Gynecology, Penn State Health, Milton S Hershey Medical Center, Penn State College of Medicine, Hershey, PA 17033, USA

[4]Exercise Psychology Laboratory, Department of Kinesiology, The Pennsylvania State University, University Park, PA 16802, USA

[5]Department of Family & Community Medicine, Penn State College of Medicine, University Park, PA 16802, USA

[6]Department of Pediatrics, Division of Neonatal-Perinatal Medicine, Penn State Milton S. Hershey Medical Center, Penn State College of Medicine, Hershey, PA 17033, USA

[7]Department of Human Development and Family Studies, College of Health and Human Development, Pennsylvania State University, University Park, PA 16802, USA

[8]Departments of Kinesiology, College of Health & Human Development, & Obstetrics & Gynecology, Penn State College of Medicine, The Pennsylvania State University, University Park, PA 16802, USA

*Author for correspondence: Tel.: +1 814 863 0456; dsd11@psu.edu

Aim: To examine postpartum opioid prescribing practices. **Materials & methods:** Obstetricians were interviewed about opioids: choice of opioid, clinical factors considered when prescribing, thoughts/beliefs about prescribing, and typical counseling provided. Inductive thematic analyses were used to identify themes. **Results:** A total of 38 interviews were analyzed. Several key points emerged. The choice of opioid, dosing and number of pills prescribed varied widely. The mode of delivery is the primary consideration for prescribing opioids. All providers would prescribe opioids to breastfeeding women. Some providers offered counseling on nonopioid treatment of pain. **Discussion:** At two large tertiary centers in Pennsylvania, the 38 physicians interviewed wrote 38 unique opioid prescriptions. Patient counseling addressed short-term pain management, but not the chronic overuse of opioids.

Plain language summary: We wanted to look at the way opioid pain drugs are provided to mothers after the birth of their children and see what doctors tell mothers about the pain drugs. We interviewed doctors and asked which opioid pain drug they would choose, what made them prescribe the drug, the thoughts about giving mothers the drug and what they told the mothers about the drug. We then looked at all the responses to look for patterns in how doctors gave pain drugs to mothers. Our team interviewed 38 doctors. Some key points were seen; first is that the choice of opioid pain drug, dose and number of pills prescribed was different from doctor to doctor; second is that whether the baby was delivered vaginally or by cesarean was the main factor upon which doctors based their decisions for giving opioid pain drugs. Whether a mother was taking medications that help with addiction, the doctor's assessment of the mother's pain and the doctor's thoughts on the mother's risk of opioid addiction were also considered. All doctors would give opioid pain drugs to breastfeeding mothers. Finally, some doctors talked to mothers about using other medications for pain, but not about the overuse of opioid pain drugs. At our two hospital centers in Pennsylvania, the 38 doctors gave opioid pain drugs to mothers in 38 different ways. Doctors said that opioids are necessary after cesarean, but not after vaginal birth, unless there is a problem. A mother's history and social situation inform decision making. Doctors talk to mothers about short-term pain, but not about the overuse of opioid pain drugs.

First draft submitted: 13 October 2021; Accepted for publication: 23 February 2022; Published online: 15 March 2022

Keywords: cesarean • childbirth • opioid • pain management • postpartum • qualitative

Future Medicine

During the 1990s, opioid prescribing practices in the USA were shaped in ways that led to the rise of the current opioid epidemic [1,2]. For many individuals, their first exposure to opioids occurs after surgery. Over 1.2 million reproductive-age women undergo cesarean delivery every year [3]. Their postoperative pain control is commonly achieved with prescription opioids [4–7], which may increase their risk for opioid dependence and opioid use disorder [8–10]. Persistent opioid use has ranged from 1:300 to 1:50 after cesarean in previously opioid-naive women, based on insurance claims data [4,11]. National obstetric organizations have only recently issued guidelines that begin to direct healthcare providers' opioid prescribing practices for postpartum pain control; and adoption of these guidelines has not yet been extensively examined [12].

In a separate publication, we examined providers' beliefs regarding applying opioid risk screening tools and professional guidelines to inform clinical decision making for prescribing opioids [13]. We found that most providers were not using professional guidelines to inform clinical decisions, were not assessing a woman's readiness to receive opioids and that there were significant barriers to implementing nonpharmacological pain management therapies [13]. Therefore, providers were basing opioid prescribing decisions on other factors; research is needed to provide insight into the clinical thought process that drives these prescribing practices. This insight may offer new opportunities to develop best practices for prescribing pain medications after delivery, alternative nonpharmacological pain management strategies, and nonopioid analgesics as first-line interventions to reduce maternal opioid exposure. To address these knowledge gaps, in this study, we applied qualitative research methods to explore obstetric providers perspectives on prescribing opioids postpartum, clinically centered and patient-centered factors that influence provider decision, counseling provided when opioids are prescribed and specifics regarding the prescription (choice of opioid, dose and number of pills prescribed).

Materials & methods

This study was designed to better understand provider beliefs, practices and clinical insight for prescribing opioids after childbirth and factors associated with opioid prescriptions, and to identify if there was a standardized approach to prescribing opioids. It was approved by The Pennsylvania State University Institutional Review Board (IRB; cat. no. 00009937) and Geisinger IRB (2018–0518). Semi-structured interviews were conducted from May 2019 to March 2020 with 42 obstetricians who provided care at one of two large academic healthcare systems in central Pennsylvania. Obstetric physicians in the two healthcare systems were notified of the opportunity to participate. As prescribing privileges for midwives and other nonphysician obstetric personnel vary across sites, we chose to limit our sample to physicians. Only physician providers currently treating postpartum patients and able to prescribe pain medications were invited to participate. Eligible and interested participants were scheduled for the interview, which took place at the healthcare facility or by phone (participant's choice). The two who conducted interviews (M Satti and N Cumbo) were trained in qualitative research methods. Participants received a copy of the consent and interview questions. Participants were aware they would remain anonymous to those transcribing and coding the recordings, that they had the option of refraining from answering any question(s), and that nonidentifying results would be published. Audio-recording was initiated following consent. The interview guide was developed by members of our team with expertise in conducting mixed methods studies. The guide was based on rigorous use of qualitative methods and procedures that we have used in past studies to develop the moderator guides [14–16]. Pilot testing of the interview guide was conducted with an attending physician. Interview questions aimed to elicit responses concerning thoughts/beliefs about prescribing opioid and pain medicines: after childbirth (both cesarean and vaginal delivery), for women who were managed with buprenorphine monoproduct or methadone maintenance during pregnancy and who intended to breastfeed. Interviewers also assessed factors considered when deciding to prescribe opioids after delivery and typical counseling or clinical advice provided when prescribing opioids after delivery. Participants discussed their views and the moderator prompted and asked clarifying questions based on the participant's responses. A digital voice recorder was used to record the interviews; trained research staff transcribed each interview verbatim and then coded the transcription using QSR International NVivo software (version 12 Plus) to generate themes. Inductive thematic analyses allowed higher-order and lower-order themes to naturally emerge from the data [14]. A sample of 42 providers allowed for data saturation in which little or no new information was produced after coding the interviews. Specifically, based on the procedures of Vaismoradi and colleagues [17], relevant text was highlighted and condensed into themes, which were then labeled with a code (lower-order theme). Similar codes were categorized to create a higher-order theme. Following Lingard's [18]

Table 1. Participant demographics (n = 38† obstetric providers).

Descriptive	Mean ± SD	Range	n (%)
Sex			
Female	–	–	24 (63)
Male	–	–	14 (37)
Current position			
Attending	–	–	29 (76)
Resident	–	–	9 (24)
Age (years)	41.7 ± 13.2	28.0–70.0	–
Time in current position (years)	5.9 ± 7.2	12.0–26.0	–
Attending	5.9 ± 7.1	0.13–26.0	29 (76)
Resident	3.0 ± 0.7	2.0–4.0	9 (24)
Time practicing obstetrics and gynecology (years)	11.3 ± 11.5	0.5–40.0	–
Attending	13.7 ± 12.3	0.5–40.0	29 (76)
Resident	3.0 ± 0.7	2.0–4.0	9 (24)

†Data are missing for the four participants whose interviews could not be transcribed.
SD: Standard deviation.

recommendations, quotations that were illustrative, succinct and representative of the data were selected for each theme. This process was completed by two independent coders (A Pauley and K Leonard) who had previous training and extensive experience in transcript coding; disagreements between the coders were discussed with a third person (D Symons Downs) until there was 100% agreement. Participants were also asked what they typically prescribe when prescribing opioids after delivery.

Results

Participant & interview characteristics

Of the obstetric care providers at both institutions who were contacted, 60 who met inclusion/exclusion criteria responded and 18 subsequently declined participation (for lack of time or interest in participation). Out of the 42 interviews conducted, four were discarded due to poor sound quality, thus 38 (90.5%) were transcribed: 22 from one institution and 16 from the other. Responses from 29 attendings and nine residents were included. All participants answered all questions. The majority of respondents were female (64%), mean age 41.7 years and had, on average, been in practice for 11.8 years and in their current position for 5.9 years (Table 1). Interviews lasted an average of 15 min per participant.

Prescription of opioids

Participants indicated their preferred prescriptions for pain control, including choice of medication, dose, frequency of dosing, duration (days) within which the prescription should be used, number of pills dispensed and number of refills. Of the 38 examples of preferred prescriptions, all were unique and differed with the exception of refills. All providers were consistent in not prescribing any refills, with the exception of eight providers who did not state their practice with regards to refills. A large percentage of providers prescribed oxycodone (63%, n = 24); one prescribed oxycodone or hydrocodone; three prescribed oxycodone or oxycodone with acetaminophen; seven prescribed oxycodone with acetaminophen; two prescribers opted for tramadol and one for acetaminophen with codeine. All but nine prescribed up to 20 pills. Three did not disclose the number of pills they dispense. The lowest number of pills dispensed was five and the maximum dose was 30–40 pills to be used over 6 weeks.

Interview responses

Factors that influence providers decisions to prescribe opioids emerged as clinically centered factors and patient-centered factors.

Factors that influence providers decisions to prescribe opioids

Providers considered several factors in their decision to prescribe opioids. These factors can be placed into two broad categories, clinically centered factors and patient-centered factors. The former is discrete, objective data, such as mode of delivery or history of buprenorphine or methadone maintenance. The latter is data obtained from

the subjective patient experience, such as patient pain, provider assessment of patient pain and the patient's social situation.

Clinically centered factors

The mode of delivery was the primary factor that influenced providers' beliefs about the use of opioids for pain management postpartum. There were three main subthemes regarding the prescription of opioids post-cesarean delivery: opioids were necessary for pain control, limited opioids could be prescribed and nonopioids should be the primary source of pain control. The majority of providers believed that opioids for pain management were necessary after cesarean and sometimes indicated after a vaginal delivery, specifically if there were complications (e.g., significant perineal laceration).

> "*I think about the route of delivery. Anyone who has had a C-section, I always think about it every time. For people who have had a vaginal delivery, I rarely think about it unless the patient has complained to me in the postpartum period that they are unable to have adequate pain relief afterward.*"
> "*I think it is necessary because it is a major surgery. . . if you just prescribe Tylenol and a NSAID, it does not cover their pain as much, so they most of the time need something additional for their pain, especially after a C-section.*"

Many of the providers felt that nonopioid pain medicines, including ketorolac, ibuprofen and acetaminophen were sufficient after vaginal delivery and that opioids should not be prescribed. One provider felt that women should be prescribed opioids even after vaginal deliveries, without indicating that there needed to be a complication such as a laceration.

Medication assisted treatment is another factor that providers considered when deciding whether to provide opioids. Higher order themes that arose in consideration of this factor included opioids would still be prescribed, opioids would not be prescribed and consultation with a specialist would be recommended. A woman's history of being managed with buprenorphine or methadone during pregnancy did not sway most providers' beliefs about the need to manage pain.

> "*I will still prescribe opioids to women who are on Subutex or methadone. I think that is their baseline pain control and then just like any other patient they would need something for that.*"

While most providers would prescribe opioids for this group of patients, there were a fair amount that would not prescribe opioids for patients with this history, and others that would consult a pain management specialist.

> "*I am usually very conservative with patients who have a history of Subutex or methadone. If I can help it, I try not to give them any opioid at all. I usually just try to give them their methadone or their Subutex and then ibuprofen to add and then that's it.*"
> "*Well, I hesitate if they do have a history of drug abuse in the past or if they are on methadone or Subutex. . . I would do everything not to write a prescription.*"

All providers stated they would prescribe opioids to breastfeeding mothers, either stating that they considered opioids to be of minimal risk or that they would specifically counsel about the potential risk to the infant. Some providers also counseled women about the risk of maternal lethargy and the importance of having another adult present to help care for the infant in this case.

> "*There is not a lot of it transmitted through the breast milk and the amounts that we are giving is going to be below the therapeutic dose for infants.*"
> "*I certainly would counsel them about the potential for their baby to become sleepy or lethargic, because there is going to be passage of opioids into the breast milk, but I also think that breastfeeding is so important for women and their babies as is pain control for getting people back on their feet.*"

Patient-centered factors

Patient-centered factors, taken as a whole, contributed less to decision making about opioids than clinically centered factors. Patient-centered factors such as their level of pain, requests for pain medication, social factors and concern about drug seeking behavior may influence provider decision making about prescribing opioids.

Regarding the level of pain, many providers indicated that pain scales are helpful tools to determine whether opioids should be initiated.

> "*We use pain scales and pain scores. I think the pain score is really helpful to figure out when opioids should be initiated. . . . you will have a certain pain level score that will correlate with when opioids should be utilized, that that helps.*"

A provider's assessment of a patient's subjective pain (e.g., sometimes there is a discordance between patient reported pain level and the patient's behavioral response to pain) was also applied when determining appropriate treatment of pain postpartum.

> "*I do a clinical assessment. 'How is the patient responding to activity? [I encourage] getting people up out of the bed?' I think getting them showered, eating regular food, doing normal activity goes a long way toward helping the pain. And, if they are not actually able to progress to normal activities at a very rapid rate then I think that is when those people may benefit from some opioid pain relief.*"

One provider mentioned that one should consider the patient's social situation and home life when deciding whether to prescribe opioids.

> "*. . . looking at her social background, maybe this is an element of prejudice, I am not sure, but is she in a supportive home, does she have risks of abuse of the medication and weighing that against how much she objectively needs it.*"

Counseling regarding opioid prescriptions

When asked about the typical counseling or clinical advice they give when prescribing opioids after delivery, some providers stated they discuss the appropriate use of opioids (e.g., use sparingly, proper storage and disposal guidelines), relay warnings or cautions about use of opioids (e.g., the risk of overuse or addiction, not to drive while using opioids and not to mix opioids with alcohol or other medications) and side effects (e.g., constipation, drowsiness, may need help with caring for the baby). Many discussed using nonopioid options first to help decrease the need for opioids.

> "*Try all kinds of other things first. . . heat packs or warm shower if its back pain. Then see about the ibuprofen and Tylenol and if that does not cut it, then move on up to the opioid. But it is not the first thing they should reach for.*"

Discussion

This study aimed to understand providers beliefs and prescribing practices regarding postpartum pain management. Though no provider prescribed opioids with refills, the doses, recommended frequency of use and number of pills prescribed varied: no two prescriptions were identical. The mode of delivery was the key factor that the providers in this study considered when deciding whether to prescribe opioids postpartum. Current medication assisted treatment can influence provider decision regarding pain control, as larger doses of opioids are typically necessary for acute pain control for patients maintained on methadone or buprenorphine. Breastfeeding did not influence whether opioids would be prescribed. These clinically centered factors influenced provider decisions more than patient-centered factors. However, the provider's assessment of patient pain (despite the patient's complaints of pain) and provider's perception of the patient's likelihood of abuse (based on social factors) play a role in determining postpartum pain management. Some providers offer counseling when prescribing opioids, including suggesting that patients first utilize nonopioid options.

Remarkably, our study showed a lack of standardization in opioid prescribing practices; of the 38 obstetric providers that were interviewed, there were 38 different approaches to prescribing opioids after delivery. The heterogeneity of the approaches has been noted previously [19] and provides some insight into the problem of the national opioid epidemic. Within the local community in central Pennsylvania where the large academic healthcare systems from this study reside, among pregnancy-related hospital stays, the rate of opioid use disorder ranged mostly between 10 and 20/1000 in 2017, depending on the county (e.g., the rate reached a high of 32.5% in Mifflin county) [20]. In 2018, opioids were involved in 65% of all Pennsylvania overdose deaths [21]. It is likely that some of these deaths originated from prescription opioid exposure. For example, Bateman *et al.* found multiple risk factors (e.g., active tobacco use, history of cocaine use, antidepressant use, benzodiazepine use) for persistence

of maternal opioid use in opioid-naive women after delivery and concluded that in their retrospective cohort of 80,000 women, one in 300 (0.36%) women went on to develop persistence of opioid use due to postpartum exposure [4]. In contrast, Peahl *et al.*'s retrospective review of peripartum opioid prescriptions for 988,000 women revealed a more significant risk, with one in 50 (2.2%) opioid-naive women developing persistence of opioid use after peripartum exposure. The authors noted a significant, modifiable risk factor: prescriptions being written and filled prior to delivery (adjusted odds ratio 1.40, 95% CI: 1.05–1.87). The other risk factors listed were similar to those of Bateman *et al.*, including tobacco use, psychiatric diagnoses and a history of substance use [11].

At our tertiary centers, many providers focused on clinically centered factors (such as mode of delivery) over patient-centered factors (such as level of pain) upon which to base whether they prescribed opioids postpartum. We observed that only rarely did a provider prescribe opioid pill quantities that would necessitate around the clock use at the maximum dose to complete the prescribed pills within the prescribed time frame (e.g., 20–30 pills to be used over 2–3 days). We also explored whether the providers responses varied by demographic factors (i.e., sex, age, resident vs attending physician and years of experience). However, there was insufficient variability across the characteristics to warrant further stratification of the results.

The judicious prescription of opioids should reduce unnecessary opioid exposure. Recent clinical quality improvement initiatives that employed techniques such as setting patient expectations for postpartum pain, multimodal nonopioid analgesia, avoiding routine inpatient opioid orders after delivery and patient input in the number of prescribed tablets at time of discharge have demonstrated success in reducing postpartum opioid use [22,23]. One possible judicious approach in the utilization of opioids is described in the WHO analgesic ladder, which introduced a set of guidelines for stepwise management of cancer related pain in 1986 [24]. Briefly, the guidelines describe a progression of *per oral* medications individualized to the analgesic needs of each patient. Their use is designed to provide adequate pain relief. The ladder starts with an initial pain assessment and, if necessary, the administration of nonopioid medications (with or without adjuvant therapy). Upon reassessment of the pain level, if necessary, the use of an opioid for mild to moderate pain is given (with or without nonopioid or adjuvant therapy). Finally, if upon reassessment the pain persists, an opioid for moderate to severe pain is given (with or without nonopioid or adjuvant therapy). Given the American College of Obstetricians and Gynecologists acknowledgement of the WHO analgesic ladder framework as a reasonable way to judiciously use opioids for postpartum pain control, there is an important need for research to further support the evidence base to use this approach [8,12].

A targeted strategy directed toward women and healthcare providers may help decrease the risk of opioid exposure after childbirth. This strategy should include education on nonpharmacological interventions for pain management, utilization of nonopioid medications for the first line treatment of pain, standardization of opioid prescriptions and improved counseling of patients regarding the possible short and long-term effects of opioid use. Further education regarding the postpartum management of patients taking medication assisted treatment, such as the monitoring and adjustment of methadone and buprenorphine and possible increased opioid dosing needs for acute postpartum pain, should also be incorporated into practice settings [25]. Future research directions may include a follow-up review of this exploratory trial with a much larger group of obstetric care providers. If followed as a cohort, changes in prescribing postpartum opioid prescribing practices could be explored over time. A further research opportunity also exists in studying the implementation of the WHO analgesic ladder in the postpartum pain management setting.

Our study has multiple strengths. This study attempted to identify obstetric providers beliefs and prescribing practices for pain management after childbirth. These novel findings can provide unique insight for developing best practice recommendations for pain management prescribing practices after childbirth. In addition, all interviewers were trained in qualitative methods for conducting semi-structured interviews.

Our study also has some limitations. Inherent to qualitative research, the findings presented are the product of the authors inductive analysis and may not be replicable. Likewise, the participants were conveniently selected and not intended to represent the entire field of US obstetric care providers. Given the variability of prescribing patterns among the providers in our study, the recent introduction of postpartum pain management guidelines, the absence of national opioid prescribing guidelines, variability in state guidance, reporting systems, training and institutional practices, a larger, randomly selected population may offer only incremental external validity to the practices and opinions of the field. The goal of this study was to better understand providers perspectives for prescribing prescription pain medications after delivery and clinically centered and patient-centered factors that influenced provider decisions; it was not to conduct a quantitative analysis of institutional rates of prescribing in relation to clinical variables. And as part of this qualitative study design, we did not corroborate providers responses

to actual outcome data (e.g., the prescriptions they write, clinical outcomes) because of our desire to maintain participant anonymity.

Conclusion

There is no standard approach to postpartum opioid prescriptions. Introduction of a standard postpartum opioid prescription may be an appropriate way to decrease postpartum opioid exposure. Providers view clinical factors (e.g. mode of delivery) as more important than patient centered factors (e.g. level of pain). This should be taken into consideration as policy makers consider developing guidance for postpartum opioid prescribing practices. Current counseling focuses more on short-term risks, but should be broadened to also review possible long-term risks associated with opioid use, including addiction. Factors such as counseling regarding breastfeeding and management of patients on long-term maintenance opioids should also be addressed by policy.

Summary points

- Persistent opioid use ranges from 1:300 to 1:50 after cesarean delivery in previously opioid-naive women.
- We investigated the clinical decision-making process in obstetricians opioid prescribing practices for pain management after delivery.
- In a separate publication, we showed that most physician providers were not using professional guidelines to inform clinical decisions in prescribing opioids.
- Interviewers asked obstetricians about the choice of opioid, clinical factors considered as well as thoughts and beliefs about prescribing opioids and typical counseling practices.
- We then applied qualitative research methods to explore providers' perspectives on prescribing opioids postpartum, clinically centered and patient-centered factors that influence providers' decisions and the counseling provided when opioids are prescribed.
- The choice of opioid, dosing and the number of pills prescribed varied widely: at two large tertiary centers, 38 providers wrote 38 different opioid prescriptions.
- Providers considered many factors in prescribing opioids, including mode of delivery, presence of medication assisted treatment, level of pain and provider's perceptions of the patient's risk for becoming addicted to opioids.
- Patient counseling addressed short-term pain management, but not the chronic overuse of opioids.

Study site locations

Geisinger Medical Center, PA, USA; Hershey Medical Center, PA, USA.

Financial & competing interests disclosure

The project described was supported by The Pennsylvania State University Social Science Research Institute Consortium to Combat Substance Abuse and the Clinical and Translational Science Institute, National Center for Advancing Translational Sciences, National Institutes of Health, through Grant UL1 TR002014. Information presented in this manuscript has not been presented at any meetings. There have been no previous posting or publications of earlier versions of this manuscript. The authors have no other relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript apart from those disclosed.

No writing assistance was utilized in the production of this manuscript.

Disclaimer

The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Ethical conduct of research

The authors state that they have obtained appropriate institutional review board approval or have followed the principles outlined in the Declaration of Helsinki for all human or animal experimental investigations. In addition, for investigations involving human subjects, informed consent has been obtained from the participants involved. The Pennsylvania State University Institutional Review Board (IRB; CATS #00009937; https://www.research.psu.edu/irb); Geisinger IRB (2018-0518; https://www.geisinger.edu/research/research-and-innovation/resources/human-research-protection-program-hrpp).

References

Papers of special note have been highlighted as: • of interest

1. Joint Commission Resources, Inc. Joint commission on accreditation of healthcare organizations: pain standards for 2001 (2001). www.jointcommission.org/-/media/tjc/documents/resources/pain-management/2001_pain_standardspdf.pdf
2. Baker DW. History of the joint commission's pain standards: lessons for today's prescription opioid epidemic. *JAMA* 317(11), 1117–1118 (2017).

• **A heavily cited article reviews the history of the pain guidelines issued by The Joint Commission.**

3. Martin J, Hamilton B, Osterman M, Driscoll AK. National vital statistics reports-births: final data for 2018. 68(13), 1–47 (2019).
4. Bateman B, Franklin J, Bykov K *et al.* Persistent opioid use following cesarean delivery: patterns and predictors among opioid-naive women. *Am. J. Obstet. Gynecol.* 215(3), 353e1–353e18 (2016).

• **A heavily cited study that demonstrates that one in 300 opioid-naive women will develop persistent opioid use after postpartum opioid exposure.**

5. Jarlenski M, Bodnar LM, Kim JY *et al.* Filled prescriptions for opioids after vaginal delivery. *Obstet. Gynecol.* 129(3), 431–437 (2017).
6. Lavoie A, Toledo P. Multimodal postcesarean delivery analgesia. *Clin. Perinatol.* 40(3), 443–455 (2013).
7. Bateman BT, Cole NM, Maeda A *et al.* Patterns of opioid prescription and use after cesarean delivery. *Obstet. Gynecol.* 130(1), 29–35 (2017).
8. American College of Obstetricians and Gynecologists 742 summary: postpartum pain management. *Obstet. Gynecol.* 132(1), 252–253 (2018).
9. Chapman SL, Wu LT. Postpartum substance use and depressive symptoms: a review. *Women Health* 53(5), 479–503 (2013).
10. Osmundson S, Wiese A, Min J *et al.* Delivery type, opioid prescribing, and the risk of persistent opioid use after delivery. *Am. J. Obstet. Gynecol.* 220(4), 405–407 (2019).
11. Peahl AF, Dalton VK, Montgomery JR *et al.* Rates of new persistent opioid use after vaginal or cesarean birth among us women. *JAMA Netw. Open* 2(7), e197863 (2019).
12. American College of Obstetricians and Gynecologists. Pharmacologic stepwise multimodal approach for postpartum pain management: ACOG clinical consensus no. 1. *Obstet. Gynecol.* 138(3), 507–517 (2021).

• **A new practice guideline from a national obstetric body giving the first guidelines on postpartum pain management.**

13. Downs DS, Pauley AM, Leonard KS *et al.* Obstetric physicians' beliefs and knowledge on guidelines and screening tools to reduce opioid use after childbirth. *Obstet. Gynecol.* 137(2), 325–333 (2021).
14. Downs DS, Smyth JM, Heron KE *et al.* Beliefs about using smartphones for health behavior change: an elicitation study with overweight and obese rural women. *J. Technol. Behav. Sci.* 4(1), 33–41 (2019).
15. Rauff EL, Downs DS. Mobile health technology in prenatal care: understanding Ob/Gyn providers' beliefs about using technology to manage gestational weight gain. *J. Technol. Behav. Sci.* 4(1), 17–24 (2019).
16. Bailey-Davis L, Kling SMR, Cochran WJ *et al.* Integrating and coordinating care between the women, infants, and children program and pediatricians to improve patient-centered preventive care for healthy growth. *Transl. Behav. Med.* 8(6), 944–952 (2018).
17. Vaismoradi M, Jones J, Turunen H, Snelgrove S. Theme development in qualitative content analysis and thematic analysis. *J. Nurs. Educ. Pract.* 6(5), 100–110 (2016).
18. Lingard L. Beyond the default colon: effective use of quotes in qualitative research. *Perspect. Med. Educ.* 8(6), 360–364 (2019).
19. Badreldin N, Grobman WA, Chang KT, Yee LM. Opioid prescribing patterns among postpartum women. *Am. J. Obstet. Gynecol.* 219(1), 103e1–103e8 (2018).
20. Long J. Statewide maternal hospital stays opioid use rates 2000 to present, PA health care cost containment council (phc4). (2017). https://data.pa.gov/Opioid-Related/Statewide-Maternal-Hospital-Stays-Opioid-Use-Rates/snh2-smit
21. National Institute on Drug Abuse. Pennsylvania: opioid-involved deaths and related harms. (2020). www.drugabuse.gov/drug-topics/opioids/opioid-summaries-by-state/pennsylvania-opioid-involved-deaths-related-harms
22. Prabhu M, Dubois H, James K *et al.* Implementation of a quality improvement initiative to decrease opioid prescribing after cesarean delivery. *Obstet. Gynecol.* 132(3), 631–636 (2018).
23. Holland E, Bateman BT, Cole N *et al.* Evaluation of a quality improvement intervention that eliminated routine use of opioids after cesarean delivery. *Obstet. Gynecol.* 133(1), 91–97 (2019).
24. Jadad AR, Browman GP. The WHO analgesic ladder for cancer pain management. Stepping up the quality of its evaluation. *JAMA* 274(23), 1870–1873 (1995).

• **A heavily cited systematic review evaluate of the effectiveness of the WHO analgesic ladder.**

25. American College of Obstetricians and Gynecologists. Committee opinion no. 711: opioid use and opioid use disorder in pregnancy. *Obstet. Gynecol.* 130(2), e81–e94 (2017).

• **An important practice guideline on the management of opioid use disorder in pregnancy.**