



# Innovative approaches to reduce unintended pregnancy and improve access to contraception among women who use opioids

Sarah H. Heil<sup>a,b,c,\*</sup>, Heidi S. Melbostad<sup>a,b</sup>, Catalina N. Rey<sup>a,c</sup>

<sup>a</sup> Vermont Center on Behavior and Health, University of Vermont, United States of America

<sup>b</sup> Department of Psychological Sciences, University of Vermont, United States of America

<sup>c</sup> Department of Psychiatry, University of Vermont, United States of America

## ARTICLE INFO

### Keywords:

Opioid  
Opioid use  
Opioid use disorder  
Unintended pregnancy  
Contraception  
Family planning

## ABSTRACT

Dramatic increases in the rate of opioid use disorder (OUD) during pregnancy have been paralleled by substantial increases in the number of neonates diagnosed with neonatal abstinence syndrome (NAS). Women with OUD have reliably reported high rates of unintended pregnancy and a number of studies also indicate they desire easier access to contraception. Recent statements from the Centers for Disease Control and Prevention and the American Academy of Pediatrics/American College of Obstetricians and Gynecologists have drawn increased attention to efforts to prevent unintended pregnancy and improve access to contraception among women with OUD. We briefly review a number of innovative clinical approaches in these areas, including efforts to integrate family planning services into substance use disorder (SUD) treatment and other settings that serve people with OUD and interventions that aim to make family planning a higher priority among women with OUD. Results suggest many of these approaches have led to increases in contraceptive use and may aid in efforts to reduce unintended pregnancy and improve access to contraception among women with OUD now and in the future.

## 1. Introduction

Nationally, the prevalence of maternal opioid use disorder (OUD) at hospital delivery more than quadrupled from 1999 to 2014 (Haight et al., 2018). A parallel trend has been observed in the number of neonates diagnosed with neonatal abstinence syndrome (NAS) who require extended hospitalization for monitoring and possible pharmacological treatment, with rates increasing from 7 cases per 1000 admissions in 2004 to 27 cases per 1000 admissions in 2013 among neonates admitted to neonatal intensive care units (NICUs; Tolia et al., 2015). Extended hospitalization comes with attendant costs: on average, an uncomplicated term infant is in the hospital for three days with an average cost per admission of \$3,500 vs. 19 days and \$37,600 for an infant with NAS admitted to the NICU (Milliren et al., 2018). The higher costs associated with longer stays combined with increasing incidence has driven aggregate costs to unprecedented levels, nearly 90% of which are paid for by public insurance (Milliren et al., 2018).

Recent statements from the Centers for Disease Control and Prevention (CDC) and the American Academy of Pediatrics (AAP) with the support of the American College of Obstetricians and Gynecologists (ACOG) have called for increased efforts to reduce opioid use during pregnancy and NAS (Ko et al., 2017; Patrick et al., 2017). Both present

a number of strategies, but of particular interest to us are those emphasizing the benefits of preventing unintended pregnancy and improving access to contraception among women who use opioids. Women with OUD consistently report high rates of unintended pregnancy (> 75%; Heil et al., 2011; Black et al., 2012; Meschke et al., 2018; Smith et al., 2019; Welle-Strand et al., 2013). Many who state they do not want to get pregnant report not using contraception or using less effective methods like condoms and that they want easier access to contraception (Terplan et al., 2015; Robinowitz et al., 2016). Nevertheless, this is an area that has historically not received much scientific attention. However, a number of innovative clinical approaches aimed at increasing access to contraception and other family planning services among women with OUD and other substance use disorders (SUDs) have been examined in recent years. In this commentary, we provide a narrative review of some of this novel work.

## 2. Interventions

### 2.1. Co-locating family planning services with settings that serve people with SUDs

Most efforts have aimed at improving access and have attempted to

\* Corresponding author at: UHC MS #482, 1 South Prospect St., Burlington, VT 05401, United States of America.

E-mail address: [sarah.heil@uvm.edu](mailto:sarah.heil@uvm.edu) (S.H. Heil).

<https://doi.org/10.1016/j.ypmed.2019.105794>

Received 14 March 2019; Received in revised form 3 July 2019; Accepted 6 August 2019

Available online 06 August 2019

0091-7435/ © 2019 Elsevier Inc. All rights reserved.

do so by integrating family planning services in settings that serve people with OUD and other SUDs, such as SUD treatment clinics, the criminal justice system, and syringe exchange programs. Some others have integrated SUD treatment into reproductive health settings.

### 2.1.1. Integrating family planning services into SUD treatment settings

To our knowledge, the first effort to integrate family planning services into SUD treatment settings took place in the late 1980s as part of a CDC-funded demonstration project in 13 methadone maintenance and other SUD treatment sites in Philadelphia, PA, but rates of contraceptive uptake were not reported (Armstrong et al., 1991). A more recent demonstration project that specifically targeted postpartum women in SUD treatment did report on contraceptive uptake (Elko and Jansson, 2011). This project took place in Baltimore, MD, at the Center for Addiction and Pregnancy, a comprehensive SUD treatment and perinatal care clinic for pregnant and parenting women, and included a 6-week group education module as well as individual counseling once antepartum and once postpartum to assist women in initiating a method if desired. All methods were provided at no cost to the women and implants, injections, and pills were all available on-site. Over the four years of the project, nearly 700 women were seen. Seventy percent requested a method antepartum and 68% received a method postpartum. More specifically, 47% requested one of the most effective methods (tubal ligation, implant, or IUD) and 32% received one of these methods postpartum.

### 2.1.2. Integrating family planning services into the criminal justice system

Since only about 30% of people with OUD are in treatment (McCance-Katz, 2018), we need to think more broadly about other settings where this population can be reached. One possibility is the criminal justice system, where a high percentage of prisoners and inmates have OUD (e.g., Bronson et al., 2017). A pre-post study examining integration of family planning into the criminal justice system was made possible by a planned change in contraceptive service availability at the Rhode Island state prison, which holds all pretrial and sentenced inmates in the state (Clarke et al., 2006). Most (69%) of the women incarcerated at this prison return to the community within four days. During Phase 1 of the study, a nurse educator met with incarcerated women and offered them referrals for contraceptive services at a community health clinic after their release. During Phase 2, contraceptive services, including provision of IUDs, injections, pills and patch, were offered to women during their incarceration. Within 4 weeks of their release, significantly more Phase 2 participants initiated use of a contraceptive method vs. Phase 1 participants (39% vs. 4%, respectively). Subsequent reports have demonstrated the safety and feasibility of providing contraception, including the most effective long-acting reversible contraceptive (LARC) methods (i.e., IUDs and implants), to incarcerated women in both urban (e.g., Sufrin et al., 2015) and rural (e.g., McNeely et al., 2018) areas of the US.

### 2.1.3. Integrating family planning services into syringe exchange programs

Syringe exchange programs (SEPs) are another setting that serves people with OUD (e.g., Des Jarlais et al., 2015). One of the most innovative ideas using this approach was a demonstration project conducted in downtown Baltimore, MD, where a public health, academic, and community partnership was formed to add family planning services to two mobile syringe exchange vans operating in the “red light district” where there are a number of exotic dance clubs (Moore et al., 2012). Services offered included pregnancy testing, pregnancy options counseling, contraceptive counseling, and provision of contraceptive methods (emergency contraception, contraceptive injections, pills, and condoms). Women made 220 visits to the vans in the first 21 months of the program, and 63% of these visits involved provision of contraception, primarily contraceptive injections. This method requires users to receive injections every three months to maintain protection from pregnancy. A follow-up study looking at contraceptive injection

continuation in this group over the next year found that 36% received a second injection at the van at three months, 16% at six months, 12% at nine months, and 7% at 12 months (Martin et al., 2014). More recently, Tschann et al. (in press) used a similar approach in Hawaii, offering contraceptive injections at a mobile syringe exchange van. However, only one woman received an injection during the six-month demonstration period. The authors speculate that providers may not have been able to appropriately discuss family planning in this setting and that family planning services may not have been sufficiently integrated into the SEP to benefit from the trusting relationships SEP staff had developed with clients.

### 2.1.4. Integrating SUD treatment into obstetric settings

While most efforts to improve access have aimed to do so by integrating family planning services in settings that serve people with SUDs, a novel variation on this approach has been to bring SUD treatment into reproductive health settings by expanding the scope of practice of these providers to include SUD treatment. Given high rates of unintended pregnancy among women with OUD, this strategy may be a particularly effective one for addressing secondary prevention, that is, initiating contraception postpartum in an effort to avoid another unintended pregnancy. Obstetrician-gynecologist colleagues in our academic medical center developed such a program in the early 2000s (described in part in Meyer et al., 2012). Consistent with their primary specialty training, they provide services such as prenatal and postpartum care, breastfeeding education and support, family planning counseling, and screening for sexually transmitted infections, but have also completed buprenorphine waiver training that allows them to provide office-based buprenorphine, including buprenorphine inductions and maintenance dosing and pregnancy-specific dosing. An interdisciplinary and cross-agency team that includes maternal and neonatal care providers, addiction specialists, child welfare services, corrections, and representatives of the maternal child health department and other departments in the state health department helps provide coordinated, comprehensive care (SAMHSA, 2016). A recent retrospective chart review examined whether this integration 1) increased postpartum contraceptive uptake, 2) increased the likelihood that the next pregnancy was intended, and 3) decreased the interpregnancy interval among women with two consecutive deliveries at this hospital (Collier et al., 2019). Four times as many women in integrated care received a LARC method postpartum as compared to women whose reproductive and SUD care were not integrated (24% vs. 6%). This was of borderline statistical significance ( $p = .05$ ), perhaps due to the sample size ( $n = 34$  women with integrated care). There were no differences in pregnancy intention or interpregnancy interval.

More recently, five board-certified obstetrician-gynecologists at Magee-Womens Hospital in Pittsburgh, PA opened the Pregnancy Recovery Center (Krans et al., 2018). Comprehensive perinatal care including family planning counseling is combined with office-based buprenorphine treatment as well as assistance with housing, childcare, and other psychosocial issues common in this population. A larger retrospective cohort study of 71 Pregnancy Recovery Center patients found they were significantly more likely to receive a LARC method postpartum as compared to women who received buprenorphine from more traditional programs (24% vs. 13%, respectively; Krans et al., 2018). Overall, results from these two studies suggest that integrating SUD treatment into obstetric settings does increase LARC uptake, but that that alone may not be sufficient to ensure better longer-term outcomes like optimal interpregnancy intervals.

### 2.1.5. Expanding these efforts

Results of efforts to integrate family planning and SUD treatment and other settings and services have generally been positive, likely because they overcome common barriers experienced by women with OUD and other SUDs such as transportation difficulties and concerns about being stigmatized (e.g., MacAfee et al., under revision;

Robinowitz et al., 2016). It is also important to note that patients and providers have routinely supported this type of integration (Black et al., 2012; MacAfee et al., under revision; Robinowitz et al., 2016; Tschann et al., in press; Zollman et al., 2019). However, there are issues that may make more widespread adoption more difficult. Undoubtedly, one is financing, although the move towards medical home models of care may facilitate integration of family planning services into SUD treatment settings.

## 2.2. Interventions to make family planning a higher priority among women with SUDs

Two other groups have attempted to increase contraceptive use and reduce the rate of unintended pregnancy among women with SUDs by employing counseling approaches that aim to make family planning more of a priority for this population. Randomized trials testing these interventions have recently been completed and outcomes are forthcoming. The first is “Sex and Female Empowerment” (SAFE), a motivational interviewing (MI)-based intervention developed at the University of North Carolina at Chapel Hill (Jones, 2016). MI is a directive, patient-centered style of counseling that tries to change behavior by helping patients explore and resolve ambivalence, in this case ambivalence about pregnancy planning (MacAfee et al., 2019). SAFE was delivered in three 1-hour sessions in a SUD treatment setting and participants who wanted a contraceptive method were offered an escort and transportation to the local health department.

The second is “Sexual Health Initiative, Navigation and Empowerment” (SHINE), a brief peer-navigator style intervention for clinics that offer medication treatment for OUD developed at the University of Colorado Denver (Rinehart et al., 2018). Studies have shown that female friends and family members are a valued means of obtaining information about contraceptives (Anderson et al., 2014; Brown et al., 2019; Levy et al., 2015); peer navigators may be seen as more relatable and closer to a friend, given shared experiences with addiction, than a health care provider. SHINE peer navigators met with participants twice to work through a pamphlet developed to educate participants about contraceptive options and help them develop a plan around family planning including referral to local family planning providers.

### 2.2.1. Expanding these efforts

Assuming efficacy is demonstrated, some possible barriers to implementation of these interventions might include those common to integration of any new service into SUD treatment settings including financial concerns, time constraints, and competing priorities in clinics that are often low in resources. Additional barriers may be more specific to this area, such as SUD staff questioning whether they have sufficient knowledge about family planning issues and feeling uncomfortable talking to patients about contraception.

## 2.3. Combining co-location and efforts to make family planning a higher priority

Our group's efforts to increase contraceptive use and reduce unintended pregnancy among women with OUD combines co-location of family planning services into SUD treatment settings and an approach to make family planning a higher priority among women with SUDs. We and others have come at this issue from the perspective of behavioral economics (see review by Ashton et al., 2015), a field that integrates psychological science with economic principles and has identified a number of cognitive biases that often lead people to make health decisions that are not in line with their stated goals. This approach is based on empirical evidence demonstrating that people with SUDs place disproportionate weight on more immediate gains and losses at the expense of longer-term outcomes (see review in Bickel et al., 2014). This framework would suggest that women with OUD who

do not want to get pregnant often choose not to use contraception or choose the lower literal and figurative costs of using condoms over the much higher literal and figurative costs of choosing one of the more effective methods because the consequences of an unintended pregnancy are far in the future and therefore do not carry as much weight in present day decision-making.

The scientific literature also shows that therapeutic interventions that leverage this bias by offering relatively immediate financial rewards contingent upon choices consistent with people's stated longer-term goals can be highly effective at changing otherwise recalcitrant behavior. Our group recently tested an intervention informed by behavioral economic theory and aimed at promoting effective contraceptive use among women in opioid agonist treatment at risk of unintended pregnancy (Heil et al., 2016). Thirty-one women were assigned (initial 5 consecutively, subsequent 26 randomly) to either an experimental intervention or to usual care. Participants in the experimental condition received a two-component intervention that was delivered in a clinic co-located with their opioid agonist treatment clinic. The first component was based on the World Health Organization's (WHO) (2005) contraception initiation protocol, which recommends contraceptives (in this study, pills patches, rings, injections, IUDs, and implants) be given to women free of charge and that women have the option to initiate any method immediately on-site. The second component was financial incentives (vouchers exchangeable for goods and services) contingent on attending 13 follow-up visits over 6 months to help manage side effects and adherence issues. It is important to note that financial incentives were based solely on attendance at follow-up visits and not on contraceptive use. Financial incentives contingent on attendance have repeatedly been shown to increase adherence with counseling and other health appointments among people with SUDs (e.g., Schacht et al., 2017; Sigmon and Stitzer, 2005; Weaver et al., 2014), in part by making the gains associated with these visits more salient and of greater value. To approximate usual care in most SUD treatment settings, participants in usual care received an informational booklet about contraception and a list of local family planning providers and were offered condoms and a dose of emergency contraception. Significantly more women in the experimental vs. usual care control conditions initiated prescription contraceptive use (100% vs. 29%) and reported prescription contraceptive use at 1-month (63% vs. 13%), 3-month (88% vs. 20%), and 6-month (94% vs. 13%) assessments. None of the participants in the experimental condition became pregnant during the 6-month protocol vs. three women (20%) in the usual care control condition.

We recently completed enrollment in a fully randomized dismantling trial aimed at replicating the results from the initial trial and extending them by adding a third condition in which participants receive the WHO contraception initiation protocol, but not the financial incentives for attending follow-up visits (“WHO alone”). This will allow us to determine how much of the effect of the two-component intervention is due to free, on-site provision of prescription contraceptives and how much is due to the financial incentives. The trial also includes a 12-month follow-up to quantify longer-term effects of these interventions on contraceptive behavior and a cost-effective analysis. Results from this study are forthcoming.

Of interest, Vanthuyne et al. (2016) reported on a pre-post demonstration project at a London hospital's community SUD treatment clinic prompted by the low rates of follow-up when patients were referred to a nearby sexual health clinic (seven patients in 7.5 months). Providers first co-located a full-service sexual and reproductive health clinic into the SUD treatment clinic which operated for 4 h each week. During approximately the first six months, they saw an estimated 80 patients, performed 10 cervical smears, and provided 11 women with one of the more effective contraceptive methods offered (injection, IUD, and implant). During the next six months, they added low-magnitude grocery store vouchers and made them contingent on completing an STI screening (£2 or ~US\$2.50) or on having a cervical smear or receiving

a contraceptive injection, implant, or IUD (£5 or ~ US\$6.30). Use of financial incentives is consistent with England's National Institute for Care and Clinical Excellence (NICE) 2007 guidelines that state that low magnitude financial incentives (less than £10 or ~ US\$13.00) "should be considered to encourage harm reduction for people at risk of physical health problems ... resulting from their drug misuse" (NICE, 2007) and was approved by the hospital's Clinical Ethics Advisory Committee. During the second six-month period, the number of patients seen and cervical smears performed were nearly identical, but the number of more effective contraceptive methods provided increased by almost half to 16, almost exclusively an increase in implant insertions.

### 2.3.1. Expanding these efforts

Although there are only two published studies, results of these combination interventions have been positive and the magnitude of the effect larger than co-location alone. In addition to the small size of the literature, other barriers to implementation of these types of interventions likely revolve around the ethics of financial incentives in this context and the feasibility of the interventions in the real world. The ethics of financial incentives have been debated, primarily as part of a "For Debate" series in the journal *Addiction* (see Lucke and Hall, 2012 and six associated comments). It was universally agreed that financial incentives should never be provided contingent on sterilization and generally agreed that there are conditions under which it is ethical to provide modest incentives for contraceptive education and/or use. Relatedly, to our knowledge there is little research on contraceptive coercion by partners or providers among women with SUDs and prevalence estimates vary widely (< 10% to 55%; Cannon et al., 2018; Zollman et al., 2019). More research is sorely needed in this area.

Regarding feasibility, the Vanthuyne et al. (2016) report provides evidence of feasibility albeit in a country with a very different health care system. That said, it should be noted that the Affordable Care Act authorized US states to provide financial incentives to Medicaid beneficiaries contingent on their participation in preventive health services such as attending diabetes prevention classes, smoking cessation counseling sessions, and Weight Watchers meetings (see <https://innovation.cms.gov/initiatives/mipcd/>). Results from the initial demonstration projects suggested beneficiaries used more of these preventive services if they received a financial incentive and in some cases, there was evidence that health outcomes also improved (RTI International, 2017). As a result, there appears to be some potential for adoption of these types of interventions in the US in the future.

## 3. Conclusions

Increasing rates of opioid misuse among women of reproductive age coupled with reliably high rates of unintended pregnancy among women who use opioids have contributed to unprecedented rates of NAS. Calls for reducing NAS have advocated for efforts that prevent unintended pregnancy and improve access to contraception among women who use opioids. Researchers have been examining a number of innovative approaches and results to date suggest many of these approaches have led to increases in contraceptive use and may aid in efforts to reduce unintended pregnancy and improve access to contraception among women with OUD now and in the future.

## Acknowledgements

None.

## Funding

This work was supported by grants from the National Institute on Drug Abuse (R01DA036670, R01DA047867 and T32DA07242).

## Declaration of competing interest

The authors declare there are no conflicts of interest.

## References

- Anderson, N., Steinauer, J., Valente, T., Koblentz, J., Dehlendorf, C., 2014. Women's social communication about IUDs: a qualitative analysis. *Perspect. Sex. Reprod. Health* 46 (3), 141–148.
- Armstrong, K.A., Kenen, R., Samost, L., 1991. Barriers to family planning services among patients in drug treatment programs. *Fam. Plan. Perspect.* 23 (6), 264–266.
- Ashton, L., Giridhar, N., Holcombe, S.J., Madon, T., Turner, E., 2015. A review of behavioral economics in reproductive health. UC Berkeley: Center for Effective Global Action White Papers. Retrieved from: <https://escholarship.org/uc/item/3m51m11s>.
- Bickel, W.K., Koffarnus, M.N., Moody, L., Wilson, A.G., 2014. The behavioral- and neuro-economic process of temporal discounting: a candidate behavioral marker of addiction. *Neuropharmacology* 76, 518–527.
- Black, K.L., Stephens, C., Haber, P.S., Lintzeris, N., 2012. Unplanned pregnancy and contraceptive use in women attending drug treatment services. *Aust. N. Z. J. Obstet. Gynaecol.* 52 (2), 146–150.
- Bronson, J., Stroop, J., Zimmer, S., Berzofsky, M., 2017. Drug Use, Dependence, and Abuse Among State Prisoners and Jail Inmates, 2007–2009. Bureau of Justice Statistics, Washington, DC Retrieved March 10, 2019, from: <https://www.bjs.gov/content/pub/pdf/dudasppi0709.pdf>.
- Brown, B.P., Chor, J., Hebert, L.E., Webb, M.E., Whitaker, A.K., 2019. Shared negative experiences of long-acting reversible contraception and their influence on contraceptive decision-making: a multi-methods study. *Contraception* 99, 228–232.
- Cannon, L., Kusunoki, Y., Dalton, V., Harfmann, R., Boyd, C., MacAfee, L., 2018. Coercive Experiences and Sexual-/Reproductive Health Outcomes Among Women With Opioid Used Disorders. Poster Presented at the Annual Meeting of the American Public Health Association, San Diego, CA.
- Clarke, J.G., Rosengard, C., Rose, J.S., Hebert, M.R., Peipert, J., Stein, M.D., 2006. Improving birth control service utilization by offering services prerelease vs post-incarceration. *Am. J. Public Health* 96 (5), 840–845.
- Collier, K.W., MacAfee, L.K., Kenny, B.M., Meyer, M.C., 2019. Does co-location of medication assisted treatment and prenatal care for women with opioid use disorder increase pregnancy planning, length of interpregnancy interval, and postpartum contraceptive uptake? *J. Subst. Abuse. Treat.* 98, 73–77.
- Des Jarlais, D.C., Nugent, A., Solberg, A., Feelemyer, J., Mermin, J., Holtzman, D., 2015. Syringe service programs for persons who inject drugs in urban, suburban, and rural areas — United States, 2013. *MMWR Morb. Mortal. Wkly Rep.* 64 (48), 1337–1341.
- Elko, A., Jansson, L.M., 2011. Contraception in drug-dependent women: a novel approach. *Soc. Work. Ment. Health* 9 (6), 445–455.
- Haight, S.C., Ko, J.Y., Tong, V.T., Bohm, M.K., Callaghan, W.M., 2018. Opioid use disorder documented at delivery hospitalization — United States, 1999–2014. *MMWR Morb. Mortal. Wkly Rep.* 67 (31), 845–849.
- Heil, S.H., Jones, H.E., Arria, A., Kaltenbach, K., Coyle, M., Fischer, G., Stine, S., Selby, P., Martin, P.R., 2011. Unintended pregnancy in opioid-abusing women. *J. Subst. Abuse. Treat.* 40 (2), 199–202.
- Heil, S.H., Hand, D.J., Sigmon, S.C., Badger, G.J., Meyer, M.C., Higgins, S.T., 2016. Using behavioral economic theory to increase use of effective contraceptives among opioid-maintained women at risk of unintended pregnancy. *Prev. Med.* 92, 62–67.
- Jones HE. Sex and Female Empowerment (SAFE): improving women's sexual health while in substance use disorder treatment. (2016). Part of the Health Care Reform and Integration: Women's Reproductive Health in SUD Treatment Focus Session. Paper Presented at the 47th Annual American Society of Addiction Medicine Annual Conference, Baltimore, MD.
- Ko, J.Y., Wolicki, S., Barfield, W.D., Patrick, S.W., Broussard, C.S., Yonkers, K.A., Naimon, R., Iskander, J., 2017. CDC Grand Rounds: public health strategies to prevent neonatal abstinence syndrome. *MMWR Morb. Mortal. Wkly Rep.* 66 (9), 242–245.
- Krans, E.E., Bobby, S., England, M., Gedekoh, R.H., Chang, J.C., Maguire, B., Genday, P., English, D.H., 2018. The Pregnancy Recovery Center: a women-centered treatment program for pregnant and postpartum women with opioid use disorder. *Addict. Behav.* 86, 124–129.
- Levy, K., Minnis, A.M., Lahiff, M., Schmittiel, J., Dehlendorf, C., 2015. Bringing patients' social context into the examination room: an investigation of the discussion of social influence during contraceptive counseling. *Womens Health Issues* 25 (1), 13–21.
- Lucke, J.C., Hall, W.D., 2012. Under what conditions is it ethical to offer incentives to encourage drug-using women to use long-acting forms of contraception? *Addiction* 107 (6), 1036–1041.
- MacAfee, L.K., Dalton, V., Terplan, M., 2019. Pregnancy intention, risk perception, and contraceptive use in pregnant women who use drugs. *J. Addict. Med.* 13 (3), 177–181.
- MacAfee, L.K., Harfmann, R.F., Cannon, L.M., Minadeo, L., Kolenic, G., Kusunoki, Y., & Dalton, V.K. (under revision). Substance Use Treatment Patient and Provider Perspectives on Accessing Sexual and Reproductive Health Services.
- Martin, C.E., Han, J.J., Serio-Chapman, C., Chauk, P., Terplan, M., 2014. Injectable contraceptive continuation among female exotic dancers seeking mobile reproductive health services. *J. Health Care Poor Underserved* 25 (3), 1317–1327.
- McCance-Katz, E.F., 2018. The National Survey on Drug Use and Health (NSDUH): 2017. [Webcast]. Slides retrieved from: <https://www.samhsa.gov/data/sites/default/files/nsduh-ppt-09-2018.pdf>.
- McNeely, C.A., Hutson, S., Sturdivant, T.L., Jabson, J.M., Isabell, B.S., 2018. Expanding contraceptive access for women with substance use disorders. *J. Public Health*

- Manag. Pract. 1.
- Meschke, L.L., McNeely, C., Brown, K.C., Prather, J.M., 2018. Reproductive health knowledge, attitudes, and behaviors among women enrolled in medication-assisted treatment for opioid use disorder. *J. Women's Health* 27 (10) (jwh.2017.6564).
- Meyer, M., Benvenuto, A., Howard, D., Johnston, A., Plante, D., Metayer, J., Mandell, T., 2012. Development of a substance abuse program for opioid-dependent nonurban pregnant women improves outcome. *J. Addict. Med.* 6 (2), 124–130.
- Milliren, C.E., Gupta, M., Graham, D.A., Melvin, P., Jorina, M., Ozonof, A., 2018. Hospital variation in neonatal abstinence syndrome incidence, treatment modalities, resource use, and costs across pediatric hospitals in the United States, 2013–2016. *Hosp. Pediatr.* 8 (1), 15–20.
- Moore, E.M., Han, J., Serio-Chapman, C., Mobley, C., Watson, C., Terplan, M., 2012. Contraception and clean needles: feasibility of combining mobile reproductive health and needle exchange services for female exotic dancers. *Am. J. Public Health* 102 (10), 1833–1836.
- National Institute for Health and Care Excellence, 2007. *Drug Misuse in Over 16s – Psychosocial Interventions (Clinical Guideline CG51)*. Retrieved from. <https://www.nice.org.uk/guidance/cg51/chapter/1-Guidance#formal-psychosocial-interventions>.
- Patrick, S.W., Schiff, D.M., Committee on Substance Use and Prevention, 2017. A public health response to opioid use in pregnancy. *Pediatrics* (3), 139.
- Rinehart, D., Leslie, S., Stowell, M., Thomas-Gale, T., Binswanger, I., 2018. Developing a Peer-led Sexual Health Navigation Intervention for Women in Opioid Medication-assisted Treatment. Poster Presented at the 35th Annual Research Meeting of AcademyHealth, Seattle, WA.
- Robinowitz, N., Muqueeth, S., Scheibler, J., Salisbury-Afshar, E., Terplan, M., 2016. Family planning in substance use disorder treatment centers: opportunities and challenges. *Subst. Use Misuse* 51 (11), 1477–1483.
- RTI International, 2017. *Medicaid incentives for prevention of chronic diseases*. Retrieved from. <https://downloads.cms.gov/files/cmml/mipcd-finalevalrpt.pdf>.
- Schacht, R.L., Brooner, R.K., King, V.L., Kidorft, M.S., Pierce, J.M., 2017. Incentivizing attendance to prolonged exposure for PTSD with opioid use disorder patients: a randomized controlled trial. *J. Consult. Clin. Psychol.* 85 (7), 689–701.
- Sigmon, S.C., Stitzer, M.L., 2005. Use of low-cost incentive intervention to improve counseling attendance among methadone-maintained patients. *J. Subst. Abuse Treat.* 29 (4), 253–258.
- Smith, C., Morse, E., Busby, S., 2019. Barriers to reproductive healthcare for women with opioid use disorder. *J. Perinat. Neonatal Nurs.* 33 (2), E3–E11.
- Substance Abuse and Mental Health Services Administration, 2016. *Substance Abuse and Mental Health Services Administration, A collaborative approach to the treatment of pregnant women with opioid use disorders*. In: HHS Publication No. (SMA) 16-4978. Substance Abuse and Mental Health Services Administration, Rockville, MD Available at. <http://store.samhsa.gov/>.
- Sufrin, C., Oxnard, T., Goldenson, J., Simonson, K., Jackson, A., 2015. Long-acting reversible contraceptives for incarcerated women: feasibility and safety of on-site provision. *Perspect. Sex. Reprod. Health* 47 (4), 203–211.
- Terplan, M., Hand, D.J., Hutchinson, M., Salisbury-Afshar, E., Heil, S.H., 2015. Contraceptive use and method choice among women with opioid and other substance use disorders: a systematic review. *Prev. Med.* 80, 23–31.
- Tolia, V.N., Patrick, S.W., Bennett, M.M., Murthy, K., Sousa, J., Smith, P.B., Clark, R.H., Spitzer, A.R., 2015. Increasing incidence of the neonatal abstinence syndrome in U.S. neonatal ICUs. *N. Engl. J. Med.* 372 (22), 2118–2126.
- Tschann, M., Wright, T., Lusk, H., Giorgio, W., Colon, A., Kaneshiro, B., 2019;al., n.d. Understanding the family planning needs of female participants in a syringe exchange program: a needs assessment and pilot project. *J. Addict. Med.* (in press).
- Vanhuynne, A., Mundt-Leach, R., Boyd, A., Broughton, S., Pittrof, R., 2016. Sexual and reproductive healthcare provided onsite in an inner-city community drug and alcohol service. *J. Fam. Plann. Reprod. Health Care* 42 (2), 152–154.
- Weaver, T., Metrebian, N., Hellier, J., Pilling, S., Charles, V., Little, N., Poovendran, D., Mitcheson, L., Ryan, F., Bowden-Jones, O., Dunn, J., Glasper, A., Finch, E., Strang, J., 2014. Use of contingency management incentives to improve completion of hepatitis B vaccination in people undergoing treatment for heroin dependence: a cluster randomised trial. *Lancet* 384 (9938), 153–163.
- Welle-Strand, G.K., Skurtveit, S., Jones, H.E., Waal, H., Bakstad, B., Bjarkø, L., Ravndal, E., 2013. Neonatal outcomes following in utero exposure to methadone or buprenorphine: a national cohort study of opioid-agonist treatment of pregnant women in Norway from 1996 to 2009. *Drug Alcohol Depend.* 127 (1–3), 200–206.
- World Health Organization (WHO), 2005. “Decision-making Tool for Family Planning Clients and Providers” Prepared by the World Health Organization and the INFO Project at the Johns Hopkins Bloomberg School of Public Health/Center for Communication Programs (CCP). CCP and WHO, Baltimore, MD and Geneva.
- Zollman, G., O'Meara, A., Heil, S.H., 2019. Family Planning Among Female Syringe Exchange Clients. Poster Presented at the 81st Annual Scientific Meeting of the College of Problems of Drug Dependence, San Antonio, TX.