BYRD, DOLLY PRESSLEY, Ph.D. Drug Screening Practices and Policies of Labor and Delivery Units in the Southeastern United States: Considerations, Implications, and Unintended Consequences. (2020)
Directed by Dr. Robin Bartlett. 144 pp.

The purpose of this study was to investigate the types of drug screening practices and policies adopted by Labor & Delivery (L&D) units across the southeastern United States. Enacted in 2003, the *Keeping Children and Families Safe Act* Public Law 108-150 requires hospitals receiving federal funds to develop perinatal drug screening protocols to identify infants with illicit substance exposures in-utero in order to provide appropriate treatment and facilitate reporting to Child Protective Services (CPS) or Department of Social Services (DSS). Despite this legislative mandate, there are no standardized clinical recommendations to guide policy formulation or implementation, and hospitals have adopted various institution-specific policies. This dissertation project explored (a) what drug screening protocols L&D units across the southeastern United States implement for women in labor; (b) whether adoption of selective drug testing protocols differs based on institution type, hospital size, or predominant payer source; (c) what maternal or newborn risk factors trigger drug testing on selective screening protocols; and (d) whether maternal and newborn risk factors that trigger testing differ based on hospital characteristics.

Two separate, complementary manuscripts are included in this dissertation. The first manuscript describes an outcomes project that surveyed L&D administrative personnel regarding perinatal drug testing policies adopted at their institutions. Additionally, an integrative literature review manuscript explored the various types of

perinatal substance use screening protocols, whether guidance on best practices or approaches were available, and identified typical maternal or newborn risk factors that precipitated drug testing. This project was guided by an intersectional theoretical framework to examine whether perinatal selective drug screening protocols serve as a form of structural discrimination that marginalize pregnant women of color, low social location, or with illicit substance use.

This outcomes project used a descriptive quantitative cross-sectional research design with purposive sampling to query institutional L&D units across seven southeastern states. A 34-item questionnaire created by the principal investigator collected hospital characteristics (e.g., facility type, predominant payor source) and demographic data of the patient population served. Additionally, survey items sought information regarding hospital drug screening policies implemented and criteria for toxicology testing. A sample of 49 L&D nurse managers and Women's Services Directors completed the online survey. Participants responded from all seven states of interest, representing institutions of various sizes ranging from 25 to 1,500 hospital beds. The majority of respondents (63.3%) were from not-for-profit facilities with Medicaid as the predominant payor source (87%). Over three-quarters (80.4%) of survey participants reported formal perinatal drug testing policies adopted by their L&D units.

Based on the survey employed for this dissertation, hospitals most frequently adopted selective drug testing policies, protocols that require toxicology testing if established maternal or newborn risk factors are present. Current illicit substance use, past history of drug use, or medication assisted treatment (e.g., Methadone or

buprenorphine) most frequently triggered drug testing. Some selective drug testing

protocols also included other obstetrical or behavioral risk factors as criteria for testing.

There were no differences in institution type, hospital size, or predominant payor sources

for L&D adoption of selective drug testing protocols. Risk factors triggering testing on

selective protocols did not differ based on these hospital characteristics. These

exploratory findings provide a foundation for further research examining selective drug

testing protocols and could inform hospital policy development and implementation

practices. Future development of best clinical practice recommendations and standardized

protocol guidelines could help ensure such policies are equitably applied to all women,

reducing risk of implicit bias or disproportionate CPS or DSS referrals for women of

color or low social location.

DRUG SCREENING PRACTICES AND POLICIES OF LABOR AND DELIVERY

UNITS IN THE SOUTHEASTERN UNITED STATES: CONSIDERATIONS,

IMPLICATIONS, AND UNINTENDED CONSEQUENCES

by

Dolly Pressley Byrd

A Dissertation Submitted to
the Faculty of The Graduate School at
The University of North Carolina at Greensboro
in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Greensboro
2020

Approved by

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APPROVAL PAGE

This dissertation, written by Dolly Pressley Byrd, has been approved by the following committee of the Faculty of The Graduate School at The University of North Carolina at Greensboro.

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ACKNOWLEDGMENTS

I would like to express my gratitude for my community of family, friends, and colleagues who have graciously supported this pursuit over the past three and a half years. To Dr. Robin Bartlett, thank you for serving as my committee chair, academic advisor, faculty, and mentor. I am sure you have advocated for me in many other ways of which I am not even aware. Your consistent encouragement (and gentle prodding when I needed it most) helped nurture this small seedling of an idea into an organized, expansive project, and my true hope is that work evokes changes in both policy and nursing practice. To Dr. Lynne Lewallen and Dr. Debra Wallace, I am not only grateful for your service as my committee members and classroom instruction, but for the countless ways you have informed my ideas of nursing theory, policy, and leadership. Thank you. To Dr. Elizabeth Buys, you have allowed me time away from clinical practice to pursue this goal and graciously agreed to serve on my committee. I am so grateful for the time and energy you have invested in my continued growth and development—both professional and personal. I would like to thank Dr. Tom McCoy for his statistical consultation and thoughtful, patient responses to numerous email inquiries. Additionally, I am grateful to Jonas Philanthropies for inclusion in the Jonas Scholar 2018-2020 cohort and the Dianne S. Moore Midwifery Scholarship of the American College of Nurse-Midwives Foundation for funding my outcomes project.

Next, I would like to acknowledge the women and families of western North Carolina for whom I have had the privilege of caring for these last fifteen years. This

endeavor would not have been possible if not for the determination to ensure that these women have equitable access to safe, quality healthcare. They have taught me about agency, resiliency, and self-determination. I have had the privilege of receiving disclosures of some of their most guarded personal stories of trauma, abuse, and substance use. My ardent hope is that my lifelong work will substantiate their often-marginalized and overlooked perspectives to the majority mainstream—both in my clinical practice and nursing research.

Finally, this doctoral journey is dedicated to my sweet family whose patience, unwavering support, and encouragement is so deeply appreciated. Words cannot fully express my gratitude for all the ways you have contributed to this project—dishes washed, laundry done, continued forgiveness for every time I uttered, "Can you give me just a few more minutes, I am almost done?" and proceeded to work for hours more. Ellery and Evan, I initially had hesitations about returning to school during your formative years. My main solace was that this pursuit would instill in you both appreciation for hard work, determination, and life-long learning. To my beloved partner Brian, thank you for inspiring me for the past 23 years. You encourage me to abandon my misgivings, take leaps of faith, and counter the risks I would often intentionally avoid. You believe in me and my ability to do things I often deem impossible. I love you deeply.

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**CHAPTER I**

**INTRODUCTION**

Over the past decade, opioid misuse, resultant addictions, and the steep rise in accidental overdose incidence have prompted a national conversation regarding substance use disorders and their sequelae. Federal funds have been earmarked to counter this crisis, and policymakers, clinicians, and public health officials have instituted policies and protocols to attempt to quell alarming substance use trends (U.S. Congress, 2015, 2016, 2018). While the media promotes the message that this "epidemic" crosses all educational, income, age, and gender boundaries, documented racial, ethnic, and gender disparities exist (Azadi & Dildy, 2008; Brauer, 2017). Epidemiologic data depict substance of choice among these distinct groups, and behavioral medicine and addiction specialists recommend treatment specific to cultural backgrounds and needs (Substance Abuse and Mental Health Services Administration [SAMHSA], 2014).

To address the needs of this special population and other gender-specific needs, the 114th U.S. Congress (2016) approved the *Comprehensive Addiction and Recovery Act* (CARA) and appropriated $181 million toward its implementation. Comprised of a compilation of several bills, this Act addresses addiction and recovery from an evidence-based, multipronged approach. CARA legislation supports the expansion of drug courts and alternative diversion programs that advocate treatment rather than criminal/judicial system entanglement and promotes medication-assisted treatment options such as

methadone or buprenorphine (Fornili & Fogger, 2017). Of this total sum, $15.93 million

was explicitly earmarked for the particular treatment needs of pregnant and parenting

women for the creation of pilot program grants for state substance use agencies to expand

family-based nonresidential treatment options for women with substance use disorders.

Additionally, the reunification of families with children in foster care or custodial kinship

placements is encouraged, when circumstances are deemed "safe and appropriate" (U.S.

Congress, 2016). Title V of the Act also requires Health and Human Services to

investigate and produce best practices to care for substance-exposed newborns or those

exhibiting substance withdrawal symptoms, and demands states develop plans to address

the comprehensive health needs and treatment of these newborns. Despite these efforts to

address this public health predicament, pregnant women who use substances illicitly

often feel derided and shamed by both clinicians and public perception. Likewise, while

CARA authorizes and funds opportunities for increased access to treatment, barriers to

seeking care persist, and within this pregnant subgroup, women with racial, ethnic, and

economic disparities suffer disproportionately.

<div align="center">**Purpose of the Study**</div>

The purpose of this study is to investigate the types of drug screening practices

and policies employed by Labor & Delivery (L&D) units across the southeastern United

States. In an attempt to identify pregnant women using illicit substances, the American

College of Obstetricians and Gynecologists (ACOG, 2017) recommends screening all

women at the onset of pregnancy for substance use either verbally or with written

validated tools (e.g., 4Ps or 4Plus) and offering advice or brief intervention for those

women who screen positive. However, little evidence exists in the literature to assess the level of fidelity to which providers adhere to this clinical recommendation. Moreover, little guidance is given regarding drug screening/testing women upon arrival to the hospital in labor. With the overwhelming implications of the current opioid crisis, many hospitals have either instituted screening/testing protocols or revised existing policies in an attempt to identify infants who may undergo neonatal abstinence syndrome (NAS) so that they may receive medical treatment and possible Neonatal Intensive Care Unit (NICU) admission. Few hospitals have adopted universal screening protocols, and some institutions employ selective or targeted or risk-based screening options. Other hospitals or birth centers may not have established any formal policy for screening or testing (Roberts, Zahnd, Sufrin, & Armstrong, 2015).

Consequently, many pregnant women are selected for testing based on provider suspicion or concern. Some research demonstrates that employing selective or risk-based strategies often tags ethnic and minority women disproportionately, generating disparate numbers of Department of Social Services referrals among these subgroups (Roberts et al., 2015). The plan for this project was to survey L&D units across seven southeastern states to discover what screening/testing options are employed, generating data for future research investigating whether selective protocols either target or increase inequities among women of color or low social location. Of the few studies that have examined hospital drug screening protocols, most have been specific to singular metropolitan districts or individual states. This study was the first to provide descriptive statistical detail across a wide, multi-state geographical region. Additionally, the data gathered has

been analyzed to determine if particular screening policies are more equitable across all

pregnant populations—possibly recommending best practices for consideration in

perinatal screening protocol development, revision, or implementation.

**Conceptual Definitions**

Researchers Polak, Kelpin, and Terplan (2019) propose the following conceptual

definitions commonly used in discourse relating to illicit substance use:

*Screening*—Short instruments (either verbal or written) used to identify substance

use and determine appropriate brief intervention. Screening tools typically rely on

patients' self-report and strategic decisions to disclose risk-laden substance use

behaviors.

*Substance Misuse*—Harmful use of substances for non-medical purposes

*Substance Use*—Consumption of any type of licit or illegal substance

*Substance Use Disorder*—Diagnostic and Statistical Manual of Mental Disorders

(DSM-V) diagnosis whereby individuals meet determined cognitive, behavioral, and

physiological symptom criteria consistent with continued substance use despite

experiencing significant substance-related sequelae.

*Testing*—Analysis of a biological specimen (e.g., urine, blood, meconium, etc.) to

detect drug use.

Historically, medical screening consists of "the systematic application of a test, or

inquiry, to identify individuals at sufficient risk of a specific disorder to warrant further

investigation or direct preventive action, amongst persons who have not sought medical

attention on account of symptoms of that disorder" (UK National Screening Committee,

1998, p. 12). Regarding screening for illicit substance use in pregnant populations, ACOG (2015) guidelines refer to the use of a validated written instrument or verbal inquiry and specifically state that biological testing is not required. However, when exploring the existing literature regarding screening and/or testing practices utilized by L&D units in the United States, the terms screening and testing are used interchangeably, and in the hospital setting screening often refer to biologic testing with either maternal or infant specimens—or in some instances, both. For this dissertation, this author will simulate the greater body of literature, and the terms screening and testing will be used interchangeably unless explicitly stated otherwise—referring to the biological assay of maternal or infant samples.

### Background and Significance

During the past decade, the overall U.S. unintended pregnancy rate reached 51% (Finer & Zolna, 2014). While many women who consume illicit substances recreationally may abruptly stop use once their pregnancies are confirmed, some women with substance use disorders struggle to abstain. Research indicates that approximately 5% of pregnant women use illicit substances, while 15% of women continue to drink alcohol throughout their pregnancies (Yonkers et al., 2010; Yonkers, Howell, Gotman, & Rounsaville, 2011). However, recent evidence postulates that these rates are vastly underreported, and the actual incidence of illicit drug use may range from 13 to 26% (Garg et al., 2016). Historic statistical trends suggest that maternal opioid substance use has increased by 127% since 1998 (Ailes et al., 2015; Wanderer, Bateman, & Rathmell, 2014). Recent addiction medicine research has begun to examine and differentiate between recreational substance

use and compulsive misuse detrimental to one's health and well-being. In his groundbreaking research, Heyman (2013) asserts that the average age of first illicit drug use occurs around 20 years old. If these patients opt for recovery, they typically do so by age 30. This research suggests that most women who misuse illicit substances are doing so during their reproductive prime. Demographic variables correlated with prenatal opioid abuse include White race, women ages 20-34 years old, low social location, lower educational attainment, familial history of substance abuse, and depressive disorders (Maeda, Bateman, Clancy, Creanga, & Leffert, 2014; Massey et al., 2012).

Well documented in the media, the prevalence of illicit substance use (especially opioid pain relievers) has risen dramatically over the past two decades (Krans & Patrick, 2016). This crisis has enveloped users without regard for sex, race, ethnic, or economic boundaries (Hui, Angelotta, & Fisher, 2017). Furthermore, when considering maternal risks of substance use (and opioid misuse specifically), research posits that the adjusted odds ratio of maternal death during hospitalization is 4.6 times more likely for women with opioid abuse or dependence. Similarly, these women are more than twice as likely to experience cardiac arrest (Maeda et al., 2014).

Pregnant women who continue illicit substance use not only pose harm to themselves (e.g., addiction, Hepatitis C and HIV transmission, and overdose), but to their unborn fetuses as well. In 2009, 400,000 infants were exposed to alcohol or illicit substance in utero (Young et al., 2009). While NAS secondary to intrauterine narcotic exposure is increasingly common, other complications may develop from persistent maternal use (Maeda et al., 2014). Fetal manifestations of maternal substance abuse

include lower infant birth weights and fetal growth restriction, reduced fetal head circumference, suspected impact on infant growth and development, placental abruption, preterm labor, and/or oligohydramnios (Maeda et al., 2014; Sharpe & Kuschel, 2004).

Additional to these medical comorbidities, the resultant costs to the healthcare system are astronomical. Women with opioid use disorders have longer hospital stays and incur higher per-hospitalization costs (Roper & Cox, 2017). Similarly, the influx of infants with NAS requiring NICU admission delivers an additional financial burden. Hospital charges for NAS affected infants almost quadrupled from 2000 to 2009, rising from $190 million to $720 million (Casper & Arbour, 2013). NAS infants incurred a mean hospital charge of $93,400 in 2012 dollars (Patrick, Davis, Lehmann, & Cooper, 2015; SAMHSA, 2018). As state Medicaid payors disbursed 81% of hospital costs associated with the treatment of infants with substance exposures and subsequent NAS, policymakers, public health professionals, and clinicians alike have implemented numerous programs, policies, and treatment guidelines to quell these steep costs (National Institute on Drug Abuse [NIDA], 2015).

**Provider Implicit Bias**

As evidenced in the literature, substance use in pregnancy is not bounded by race, socioeconomic status, or educational attainment, but categorically cuts across these societal divides without discrimination or bias (Hui et al., 2017; Rodriguez & Smith, 2019). Unfortunately, society at large often perceives substance use among pregnant women through a narrow lens, conjuring a stereotypical image of these individuals. Currently, pregnant women with opioid use disorders are more likely to be White,

younger, and Medicaid-insured (Maeda et al., 2014). Before the onset of this current crisis, women using opioids tended to be White and older. Statistics also reveal that they were well educated and privately insured, with shifts in demographic use trends occurring in the mid-2000s (Maeda et al., 2014). Recognition of these associated demographic factors informs improved clinical practice and health policy, promoting optimal outcomes. Some studies suggest that physicians may treat patients preferentially and/or be more likely to prescribe opioid analgesia to patients with race or ethnic, socioeconomic, or educational backgrounds similar to their own (Pletcher, Kertesz, Kohn, & Gonzales, 2008; Shavers, Bakos, & Sheppard, 2010; Tamayo-Sarver et al., 2003). Consequently, this phenomenon implies that some medical providers may unknowingly contribute to the current opioid crisis by writing narcotic prescriptions discriminately for educated White women.

**Historical Legal Precedents**

Other than comprising risk-laden behavior with deleterious health effects, illicit substance use (just as the term implies) is unlawful. Although alcohol and tobacco use also pose risks to the exposed fetus (e.g., low birth weight, prematurity, fetal alcohol spectrum disorder, etc.), these substances are both legal and more socially tolerated. The United States has had a long, controversial history of legal entanglements, specifically involving substance use by pregnant women. In 1997, the case *Whitner v. South Carolina* defined a viable fetus as within the conceptual definition of a child and convicted and incarcerated defendant Cornelia Whitener for criminal child neglect for cocaine usage during her pregnancy. Despite an appeal, the SC Supreme Court upheld Whitener's lower

court conviction and rejected the defendant's arguments that the verdict violated her rights to due process and privacy guaranteed by the Fourteenth Amendment of the U.S. Constitution (SC Supreme Court, 1997).

Emboldened by the ruling of *Whitner v. South Carolina*, some cities and states implemented policies for drug testing pregnant women and mandating report of positive results to local law enforcement officers (American Civil Liberties Union [ACLU], 2018). In Charleston, South Carolina, the Medical University of South Carolina (MUSC), the City of Charleston Police Department, and the Charleston County Solicitor's Office instituted one such policy. Named the Interagency Policy on Cocaine Abuse in Pregnancy, the guideline permitted medical personnel to secretly test urine for prenatal cocaine use from a segment of pregnant women that met certain predetermined criteria (Center for Reproductive Rights, 2018). After obtaining biological specimens without these patients' consent, positive urine test results were then reported to city police for arrest on charges of drug possession, child neglect, and distribution of drugs to a person under 18 years old (the unborn fetus). Reports surfaced of pregnant women arrested prenatally or shortly after giving birth, with some women still robed in soiled, bloody hospital gowns. One woman reported laboring throughout her delivery handcuffed to her hospital gurney (Center for Reproductive Rights, 2018). In October 2000, the U.S. Supreme Court heard arguments in the legal case titled *Ferguson v. City of Charleston*, and ruled in favor of the plaintiff, Crystal Ferguson (ACLU, 2018). The Court ruled that MUSC's policy violated her Fourth Amendment protections by procuring the urine drug screen without her consent, and serves as the foundation for other arguments regarding

policing drug use in pregnancy. Medical professionals, public policy advocates, and researchers have since asserted that punishing women for illicit substance use in pregnancy deters entry into prenatal care and substance use treatment programs. Additionally, state actions to police pregnant women represent misguided, and perhaps illegal policy implementation (ACLU, 2018).

**Punitive Policies and Legislation**

Disclosure of illicit substance use to healthcare providers is crucial for the pregnant patient and her fetus. While many patients recognize that disclosed medical information is privileged and protected, some states endorse mandatory reporting laws and punitive mandates with far-reaching repercussions that may dissuade disclosure (Pinch, 2000). Potential untoward consequences often prevent pregnant women who face the fear of legal repercussions from initiating prenatal care or disclosing illicit substance use, precluding them from possible treatment options or interventions to improve both maternal and fetal outcomes (Krans & Patrick, 2016). Furthermore, these state-mandated structural barriers disproportionately disadvantage women of racial and ethnic minorities as well as women with low or no income (Hui et al., 2017). Although literature asserts that illicit substance use among pregnant women is equivalent across all racial and economic subgroups, minority women of color are more likely to be targeted for DSS referrals (Hui et al., 2017).

Despite the rulings in *Whitner v. South Carolina* and *Ferguson v. The City of Charleston*, a handful of states require mandatory maternal or newborn screening for opioid use (Association of State and Territorial Health Officials [ASTHO], 2014).

According to information obtained from the Guttmacher Institute (2018), 23 states and

the District of Columbia deem illicit substance use in pregnancy to constitute child abuse

under child-welfare statutes, while three states consider use basis for civil commitment.

Similarly, 24 states require clinicians to report suspected illicit drug use, and eight states

mandate drug testing for fetal exposure if use suspected. Conversely, 19 states funded

substance use treatment programs specifically for their population of pregnant women.

Seventeen states and the District of Columbia prioritize treatment of pregnant women in

state-funded programs. See Appendix A for a complete listing of these policies delineated

by state actions and priorities (Guttmacher Institute, 2018). (Of note, policies occupying

the left half of the table represent more punitive approaches toward illicit substance use

by pregnant women while columns on the right side of the table employ a public health

approach aimed toward treatment.)

**Ethical Considerations for Drug Testing in Vulnerable Populations**

Given the legal implications of toxicology screening for both pregnant and

parenting women and their children, responsible clinicians and nurses must apply testing

protocols judiciously and with fidelity. According to ACOG Committee Opinion Number

633 (ACOG, 2015),

> Routine screening for substance use disorder should be applied equally to all
> people, regardless of age, sex, race, ethnicity, or socioeconomic status. Routine
> screening for substance use disorder can be accomplished by way of validated
> questionnaires of conversations with patients. Routine laboratory testing of
> biological samples is not required. (p. 1529)

Furthermore, when biologic testing is warranted, best practices mandate that patients are notified of the intent to test and that informed written consent is obtained. All patients must be treated with dignity and respect, and providers should attempt to establish and maintain a therapeutic alliance. Healthcare personnel must educate themselves regarding state and federal legislation mandating reporting and local resources or treatment referral protocols for clients with positive screens or confirmatory toxicological testing (ACOG, 2015).

**Formulation of Drug Testing Policies in U.S. Hospitals**

Although toxicology testing has long been implemented to detect substance use in both general and pregnant populations, more recent attention has been directed toward the development of institutional protocols. While universal screening guidelines or criteria for testing do not exist, many hospitals have formulated and implemented their own selective, risk-based screening strategies. Universal drug testing protocols for pregnant women presenting in labor are not common, with exorbitant associated costs cited as deterrents to implementation (Kohsman, 2016). Of note, one hospital system in Ohio did implement a universal testing strategy given the high rate of opioid use and neonatal absence syndrome in the region, and retrospective data analysis determined that approximately 20% of positive toxicology screens resulted from women who would not have met previous selective criteria to warrant testing (Wexelblatt et al., 2015).

Establishment of hospital protocols may foster quality improvement, diminish inconsistency in clinical care and practice, and contain institutional costs (Zellman, Fair, Houbé, & Wong, 2002). Zellman et al. (2002) assert that effective drug screening

protocols should contain the following components: encourage communication among members of the healthcare team, including obstetric and neonatal providers and bedside nursing staff; provide guidance for treatment referral and reporting; offer guidelines for maternal and/or infant screening, criteria for testing, and preferred biological samples to be used; and delineate consent (either verbal or written) for both maternal and fetal testing. Additionally, policies should include original draft and revision dates, and stipulate whether physician, certified nurse-midwife, or other advanced practice provider order is required to trigger testing (Zellman et al., 2002).

While enormous effort is spent investigating clinical outcomes for substance-exposed infants, there exists a dearth of knowledge regarding screening policies and their criteria for toxicology testing, protocol formulation and effectiveness, and fidelity to which healthcare providers and nurses adhere to policy implementation. Current clinical outcome data often rely upon either maternal self-report of substance use or positive toxicology testing resulting from widely variable screening practices (Yonkers et al., 2011). Existing outcome data may demonstrate skewed, underrepresentation of actual maternal drug use, with a portion of the pregnant population using illicit substances avoiding detection. White women of financial means or higher educational levels could escape discovery of their drug use as providers' implicit biases may not associate illicit substance use among populations with social characteristics like their own. This scholarly inquiry employs the intersectionality theoretical framework to examine whether hospitals with differing institutional characteristics (e.g., private versus public institution) or patient demographics (e.g., race/ethnicity or payor source) tend to employ certain drug

screening strategies and whether women of minority or low social location are

disproportionately affected by these policies.

## Intersectionality

The term *intersectionality* first appeared in African-American feminist literature

in 1989 (Crenshaw, 1989). Coined by attorney Kimberle Crenshaw in her legal briefings,

the phrase began to populate academic and scholarly work across a multitude of

disciplines. Intersectionality refers to the complex convergence of race/ethnicity, gender,

social location, social structure, and identity, and does not regard these categories as

simply either additive or multiplicative (Bauer, 2014; Caiola, Docherty, Relf, & Barroso,

2014). Furthermore, early proponents of the concept asserted that individual experiences

had typically been viewed through a singular narrow lens—reflecting the experiences and

views of the observers/scholars through their own specific social context (Caiola et al.,

2014; Collins, 1994). This theoretical approach, touted as a theory, concept, approach,

and/or paradigm, does not derive its origins from one predominant discipline—rather

multidisciplinary contributions from feminist theory, African-American studies,

sociology, and critical theory are cited (Caiola, 2015; Caiola et al., 2014; Van Herk,

Smith, & Andrew, 2011).

The theoretical framework of intersectionality rests on three central propositions

or constructs (Caiola et al., 2014; Weber, 2006). First, broad social categorizations such

as race/ethnicity, class, or position are not rigid or fixed, but flexible identities that result

from social and historical roots particular to that individual or group. Second, multilevel

power dynamics develop, and advantage the dominant social group benefitting from

greater availability and access to resources. As these power dynamic relationships persist,

the dominant group perspective becomes entrenched while the oppressed group becomes

more marginalized—their social positions and perspectives undervalued and vulnerable.

The third principal proposition addresses the simultaneity of all social categorizations and

maintains that they are not merely additive or multiplicative (Bauer, 2014; Caiola et al.,

2014; Weber, 2006). The experience of the young White pregnant woman who uses illicit

substances likely differs greatly from her young White male counterpart—not only does

her gender differentiate her story, but the social construct of pregnancy or motherhood

also adds another dimensional experience or effect.
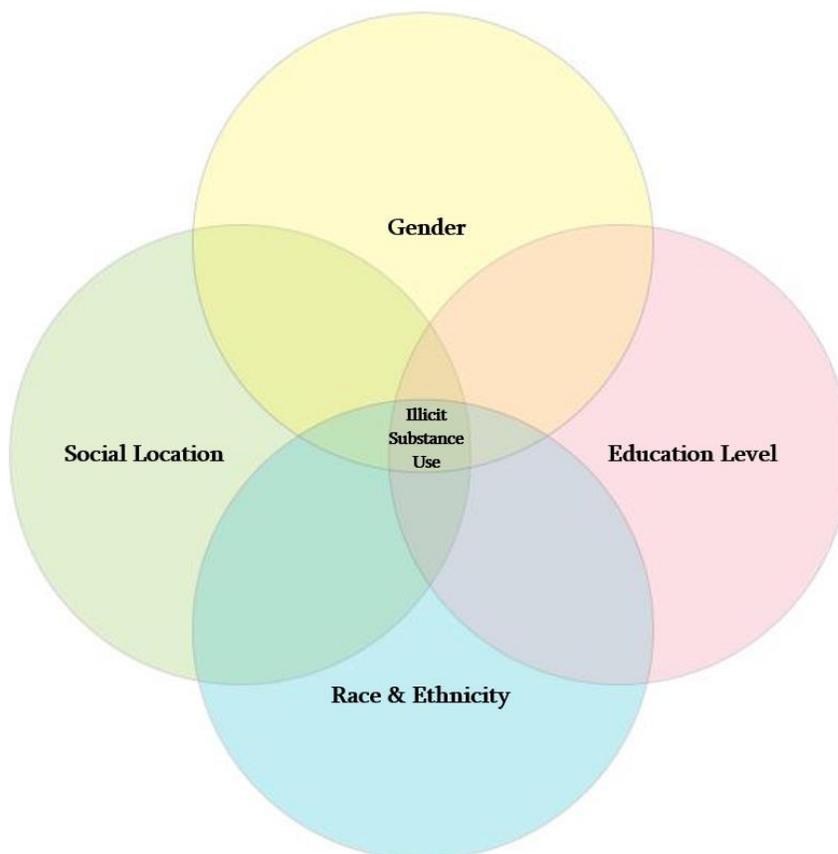


Figure 1. Intersecting Characteristics of Pregnant Women Using Illicit Substances.

Several social and structural factors impede the optimal care of substance-using pregnant women. As previously noted, gender roles differentiate the experience of men and women with substance use disorders. As Collins (1994) so deftly articulates, gender roles heretofore have been typically dichotomized into two opposite constructs—men work outside of the home to provide for their families while women care for their families in the home. This antiquated concept does not reflect current demographic trends with many pregnant women either also working outside the home or account for women who may not be currently partnered. Other social or structural factors that impact these women are the prejudice and stigma encountered both in their communities of origin or from their health care providers. Despite evidence that substance use disorders have biologic and physiologic origins and should be treated as a chronic disease, many perceive substance use as a poor choice or bad behavior (Morse, 2018). While illicit substance use alone is often derided and stigmatized, these women's pregnant and/or parenting identities often ensure harsher scrutiny, bias, and shame. Additionally, pregnant women who have experienced adverse childhood events, trauma, or co-occurring mental health diagnoses may disproportionately comprise a significant portion of pregnant women with substance or opioid use disorders—more research is necessary to investigate. Evidence has also determined that women's progression from the first use of substances to chemical dependence is significantly more accelerated than for their male counterparts, a phenomenon known as telescoping (Greenfield, Back, Lawson, & Brady, 2010; NIDA, 2018).

Lastly, political systems with punitive legislation and hospitals with discriminatory screening policies further marginalize these women, dissuading them from seeking treatment and often delaying entry into prenatal care—structural factors that must be ameliorated to help ensure optimal outcomes and address health inequities (Guttmacher Institute, 2018; SAMHSA, 2018). Researcher Nicole Mason (2010) expounded upon the work initiated by Crenshaw, offering systems-level forms of intersectionality—namely structural, institutional, and political intersectionality (Figure 2).
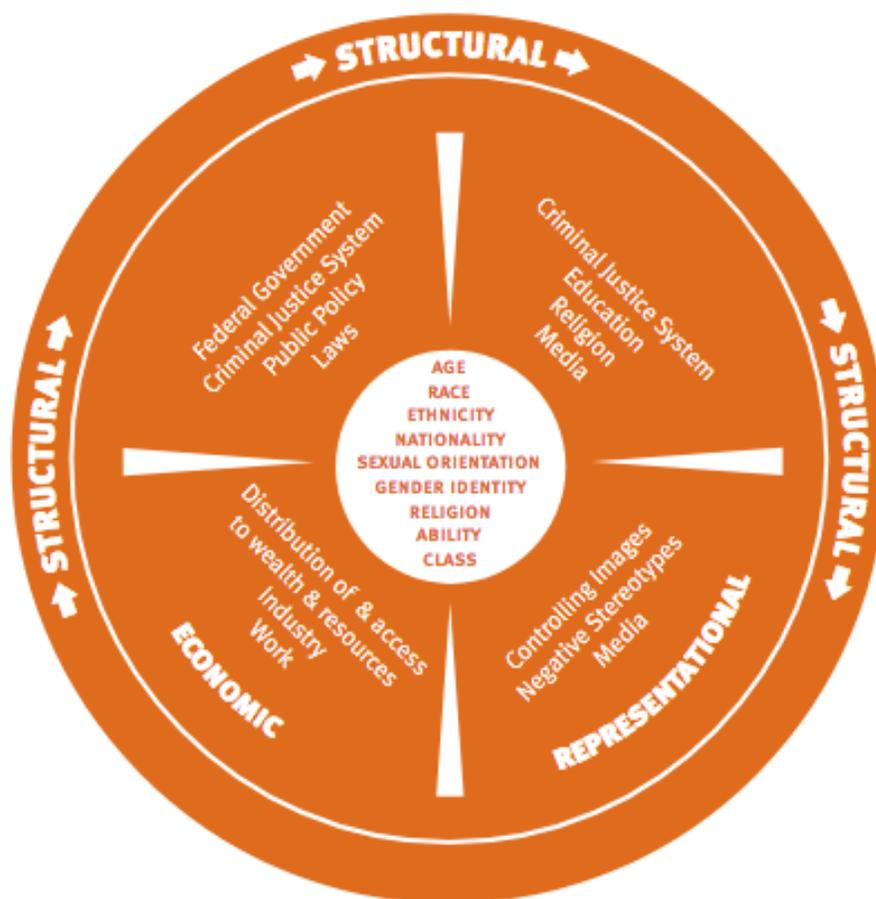


Figure 2. Intersectional Approach for Policy and Social Change. Source: Mason (2010), p. 6.

Structural intersectionality examines how interconnected systems and structures further disadvantage certain populations. Institutional intersectionality considers how organizations restrict, deny, or disproportionately impact vulnerable subgroups (Mason, 2010). Finally, political intersectionality scrutinizes how dominant cultural norms and paradigms inform public policy and legislation. With the current opioid crisis, national attention directed toward illicit substance use has overshadowed larger, more complex societal problems such as poverty, housing instability or homelessness—upstream factors that instigate or exacerbate illicit substance use (Birchfield, Scully, & Handler, 1995). Punitive criminalization of maternal substance use deters women from seeking prenatal and well-woman care and contributes to adverse neonatal outcomes.

**Intersectionality in Nursing Literature**

While intersectionality as a conceptual framework has become more widely used in both feminist theory and social justice literature since its inception in the late 1980s and early 1990s, this theoretical lens has only recently begun to be used to examine health research and inequities (Rogers & Kelly, 2011). Moreover, according to the extensive literature search by this author, most nursing research employing this paradigm has been published only in the last decade. In the nursing literature, an intersectional approach has been utilized more often in narrative inquiry, discursive articles, or qualitative research articles examining perspectives of marginalized women and adolescents. Examples of populations to which this theoretical lens has been applied include African-American women with HIV, Latinas experiencing intimate partner violence, Muslim women, incarcerated and/or homeless mothers, and LGBTQ

adolescents and women (Benbow, Forchuk, & Ray, 2011; Caiola, 2015; Caiola et al., 2014; Clark & Saleh, 2019; Damaskos, Amaya, Gordon, & Burrows Walters, 2018; Kelly, 2009, 2011; Salma, Hunter, Ogilvie, & Keating, 2018). Fewer quantitative research articles cited an intersectional framework, with many of these studies occurring outside of the United States (Drange & Karlsen, 2016; Höglund, Carlsson, Holmström, & Kaminsky, 2016; Rakovski & Price-Glynn, 2010).

## Aims and Research Questions

This intersectional theoretical framework lends itself to the logical application for this dissertation—both on the patient and systems levels for policy and social change. Through the author's own clinical experiences and observations, many poor White women, women of color, and those of low social location are often disproportionately tested for illicit substances during their L&D admissions. Conversely, some White women with financial privilege or educational advantage may use their social determinants to avoid perinatal drug testing despite the presence of risk factors that would typically trigger screening. Historically, biomedical research has often examined health processes or diseases from either a race, ethnicity, socioeconomic, or gendered perspective (Rogers & Kelly, 2011). This intersectional lens guided the development of my research questions, study methods, and data collection by providing inclusion of marginalized and vulnerable populations whose complex perspectives are often overlooked by the White middle-class majority. As many nurses in the U.S. workforce find themselves within this social and economic realm, a discussion and dissemination of the findings in this investigation may encourage clinicians, nurses, and the nurse

managers responsible for hospital policy development and implementation to consider minority patient perspectives outside of the predominant social context—ensuring these policies do not structurally discriminate or have other unintended consequences.

The purpose of this dissertation was to garner a better understanding of institutional perinatal drug screening policies in L&D units across the southeastern United States and to assess whether selective perinatal drug screening protocols disproportionately disadvantage women of color or low social location. Collection of this rich descriptive data better informs clinical practice and evokes policy change if some institutional policies do structurally discriminate and/or exacerbate health inequities. This dissertation aim and research questions follow.

**Aim:** Determine the types of perinatal drug screening protocols typically implemented and whether hospital characteristics or patient demographics are associated with particular policy types.

**Research Question 1:** What drug screening practices and policies do Labor & Delivery units across the southeastern United States implement for women who present in labor?

**Research Question 2:** Does the adoption of selective drug testing protocols differ based on institution type, hospital size, and predominant payer source?

**Research Question 3:** If hospitals employ selective perinatal screening protocols, what maternal or newborn risk factors trigger drug testing?

**Research Question 4:** Do maternal and newborn risk factors that trigger perinatal screening differ based on hospital characteristics?

# CHAPTER II

# LITERATURE REVIEW

## Introduction

Maternal consumption of alcohol, tobacco, and illicit substances during pregnancy poses potential significant harms for the exposed fetus (Farst, Valentine, & Hall, 2011; Maeda et al., 2014; Oral & Strang, 2006). In-utero exposure to alcohol, tobacco, and other illicit recreational substances is associated with increased risk for fetal growth restriction, placental abruption, oligohydramnios, preterm labor, low infant birth weights, and impacts on delayed infant and childhood development (Farst et al., 2011; Maeda et al., 2014). The consequences of these exposures extend beyond delivery as these infants are often discharged home to mothers or families affected by substance use disorders who may struggle with receiving effective treatment, navigating relations with Child Protective Services, or encounter entanglements with the legal system. Identifying pregnant patients using illicit substances and their exposed fetuses present an opportunity for coordination of care and treatment from the onset of discovery by healthcare providers—ensuring more optimal outcomes for mothers and their affected infants.

Concerns regarding the identification of fetal substance exposure became more pronounced in the mid-1990s with the increasing prevalence of crack cocaine use in the United States (Oral & Strang, 2006). By identifying maternal use and fetal exposures, effective early interventions can be coordinated. In the early 1990s, California and

Virginia passed legislation mandating that hospitals develop and implement perinatal

screening protocols to identify illicit substance use among their pregnant populations

(Oral & Strang, 2006; Zellman et al., 2002). Over the following decade, most states did

not mandate uniform or standardized drug screening and testing policies, and many

individual hospitals chose to create their own unique protocols—attributing to lack of

consistency across cities, counties, states, and the nation (Oral & Strang, 2006). In 2003,

an amendment to the *Child Abuse and Treatment Act* (CAPTA) appropriated funds for

the *Keeping Children and Families Safe Act*. This federal legislation requires states to

implement policies and/or procedures for identification, reporting, and safety planning for

substance-exposed infants in order to receive federal block grant monies (Farst et al.,

2011). However, perinatal substance use screening strategies continue to vary among

hospitals and communities across states (Wood, Smith, & Krasowski, 2017). The purpose

of this integrative literature review is to examine the types of perinatal substance use

screening protocols utilized, whether guidance on best practices or approaches is

available, and identify typical maternal or newborn risk factors that may precipitate drug

testing.

## Methods

For this review, standard methodologies outlined by the Preferred Reporting

Items for Systematic Reviews and Meta-Analysis Equity Extension were followed

(Welch et al., 2012). Literature searches of bibliographic databases PubMed, CINAHL,

Google Scholar, MEDLINE, and Social Work Abstracts with predetermined criteria were

executed to query results for the terms prenatal substance use, maternal and newborn

drug screening, and hospital protocol. Boolean searches of both free text and indexed terms were utilized. Established inclusion criteria for review consisted of either maternal or newborn screening for substance exposures at the time of entry to intrapartum care. While earlier antenatal screening for maternal illicit substance use is deemed best clinical practice, early screening and intervention are not the focus of this investigation. Articles related to perinatal substance use or intrapartum screening protocols outside of the United States were excluded. Initial searches were restricted to literature published within the last five years. However, after a dearth of results were retrieved, these constraints were removed to view all results produced over the past 2 decades—coinciding with the commencement and culmination of the current opioid crisis (Kolodny et al., 2015). One hundred forty-six publication titles and abstracts were initially screened, and complete references obtained if the title and/or abstract suggested either relevance or insufficient information to assess. After repeated database queries were exhausted, manual citation searches of retrieved articles' reference lists were examined to evaluate whether other pertinent resources could be gleaned or had been overlooked, yielding an additional 30 articles for review. Twenty-one full-text articles were then read and key findings synthesized in this integrative review. This extensive literature review yielded 13 publications on perinatal maternal or newborn screening for illicit substance exposures. Of these articles, eight publications were quantitative studies containing original research, four articles provided a general overview of the topic, and one publication presented clinical case findings. All articles were available in English (see Figure 3).
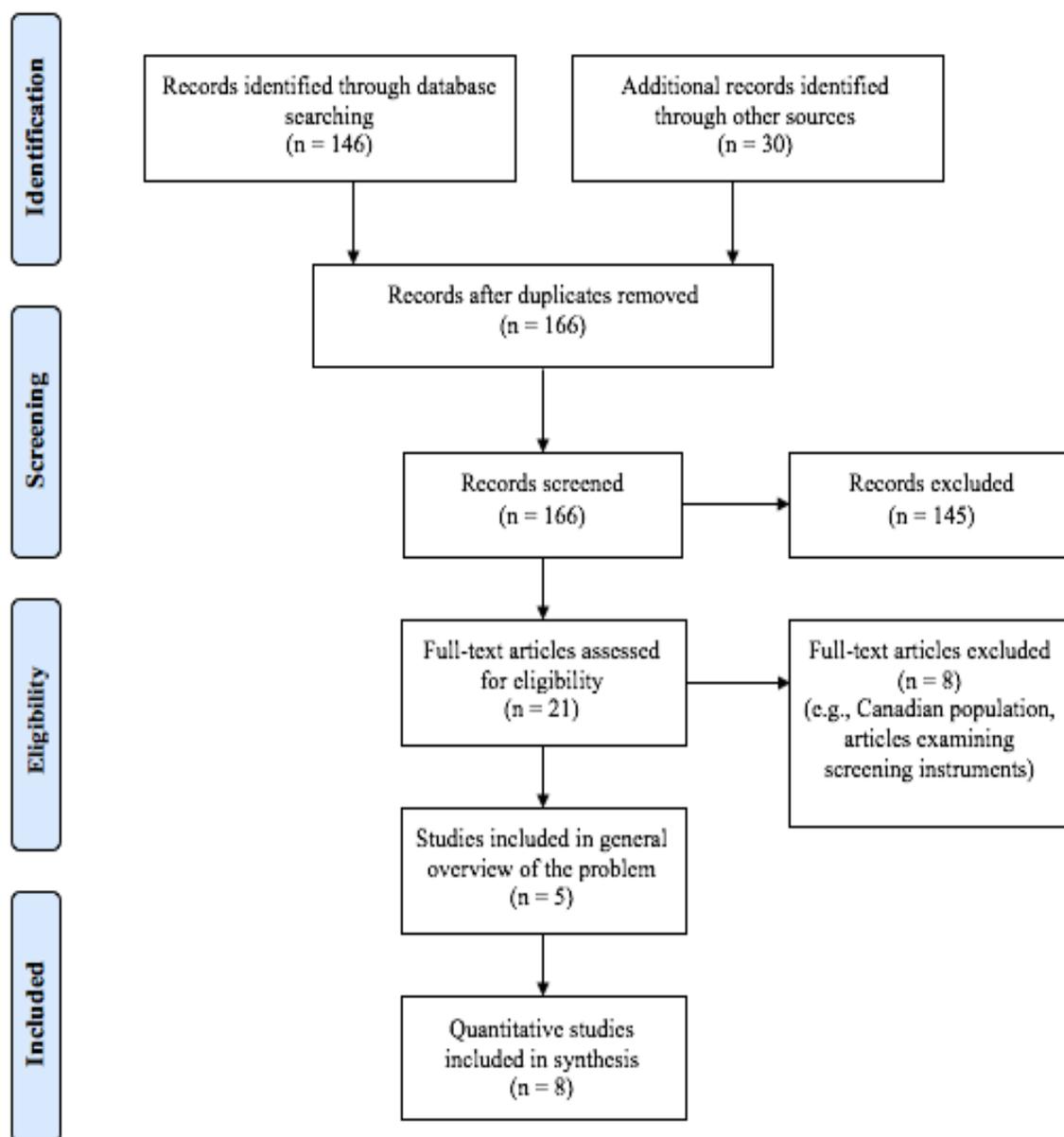
Figure 3. Literature Search Results.

## Results

**Best Practices Guidelines for Institutional Policy and Protocol Creation**

Literature promotes the development of standardized hospital protocols as an effective means for establishing operational measures to reduce variability or drift in

clinical practice, improving the quality of patient care, and containing escalating healthcare costs (Zellman et al., 2002). Comprehensive hospital protocols include key components such as identification of originating agency, department, or committee; draft dates and timeline for review and revision; and instructions for intradepartmental communication and responsibilities regarding reporting and referral. Furthermore, perinatal substance use screening protocols should include maternal and newborn factors that precipitate testing, guidelines for consent to test, preferred screening method or biological source, appropriate time intervals for screening, and whether an obstetric provider order is required to test (Zellman et al., 2002).

Researchers Zellman et al. (2002) conducted a cross-sectional survey of a convenience sample of 806 U.S. hospitals regarding their institutional perinatal substance use screening protocols—the lone example of a study scrutinizing policy components found in the literature. This investigation yielded a 63% response rate of hospitals queried and found that only 166 of 510 respondent institutions reported perinatal substance screening protocols in place. States with legislatively mandated legal consequences or reporting requirements were more likely to have implemented uniform protocols. Of those hospitals with protocols, review of submitted policies revealed that most were poorly drafted. Most protocols (85%) did not delineate rules for notification of key personnel regarding positive toxicology test results, and only 1% mandated that the obstetrics provider be informed of positive results. Furthermore, 59.2% of respondent institutions did not address the issue of maternal consent before testing. Institutions reporting more affluent patient demographics were more likely to require maternal

consent before testing. Contrary to the researchers' *a priori* assumptions, hospitals with predominately White populations and higher delivery volumes were more likely to have instituted a screening protocol (Zellman et al., 2002).

**Screening versus testing.** In a study examining various perinatal drug screening protocols in Maryland, Miller, Lanham, Welsh, Ramanadhan, and Terplan (2014) were the only authors in this review to differentiate between maternal drug *screening* and perinatal drug *testing* by providing operational definitions for these methods. For their investigation, the authors defined *screening* as either "an interview or written instrument method for identifying substance use," while they delineated *testing* as "laboratory analysis of biological specimens" (Miller et al., 2014, p. 661). Authors of this study determined that while all respondent hospitals did universally screen pregnant patients for illicit substance use upon admission, few institutions utilized reliable instruments previously validated in pregnant populations (Miller et al., 2014). All other articles cited in this review used the terms *screening* and *testing* interchangeably, requiring scrutiny of each study's methods to ascertain that each referred to maternal and newborn drug testing.

**Maternal consent for testing.** As previously indicated, robust perinatal drug testing protocols should seek maternal consent before administration of toxicology tests (ACOG, 2015; Polak et al., 2019; Zellman et al., 2002). Maternal consent should include discussion of implications for both the patient and newborn should testing reveal positive results. Five of the quantitative studies identified in this review did address whether maternal consent was obtained before testing. In a study surveying 31 Maryland birthing

hospital testing practices, 61% of respondent hospitals reported that mothers were *informed* of toxicology screening, while only 32% of institutions *obtained maternal consent* before testing (Miller et al., 2014). In a similar study, Birchfield et al. (1995) determined that 80% of hospital respondents never obtained maternal consent before testing newborns, and 73% of labor and delivery units did not consent pregnant patients before performing toxicology testing. Of note, three studies conducted in Iowa examined newborn toxicology testing, and that state's law does not require maternal consent if fetal substance exposure is suspected. However, some authors raise ethical concerns regarding the adoption of newborn testing as a proxy for maternal illicit substance screening employed to avoid the complex sensitivities associated with acquiring maternal consent (Polak et al., 2019).

**Biologic assays.** Several biological sources may be used for the detection of illicit substance use. Urine, blood, infant meconium, hair, and umbilical cord tissue are the most common samples submitted for testing (Farst et al., 2011; Wood et al., 2017). Some biological samples offer specific advantages for analysis. For example, both maternal and newborn urine may be collected easily in a non-invasive manner. Pregnant patients are often requested to supply a urine sample upon hospital admission, while infants may have collection bags placed in their diapers shortly after delivery. Newborn meconium samples reflect fetal substance exposures several weeks before delivery and are often more accurate than newborn urine collections (Farst et al., 2011). In recent years, newborn umbilical cord tissue has been collected for testing as it provides a longer window for the detection of substance exposures. An umbilical cord segment is cut after delivery of the

placenta (tissue typically designated as biological waste), affording another non-invasive collection technique. Of note, both umbilical cord tissue and meconium specimen toxicology results take longer to process, and may not be available before hospital discharge of the mother and infant (Polak et al., 2019).

While maternal urine samples are often utilized for maternal drug screens, this biologic assay may yield both false-positive and false-negative results (Farst et al., 2011; Polak et al., 2019). Best practice guidelines dictate that all positive urine toxicology results should be submitted for confirmatory analysis utilizing either gas chromatography mass spectrometry or liquid chromatography tandem mass spectrometry (Polak et al., 2019). Polak et al. (2019) recommend confirmatory testing when toxicology results differ from maternal self-report if less sensitive testing methods do not differentiate from certain drug classes and their metabolites, or when clinical consequences depend on the validity of the results.

**Testing Approaches**

Lack of recognition of maternal illicit substance use by clinicians is common (Azadi & Dildy, 2008). Patients and healthcare providers would benefit from strategies to improve the identification of affected patients. Once substance use is identified, providers should inform patients of therapeutic options and precipitate treatment referrals—improving both maternal and neonatal outcomes (Wexelblatt et al., 2015). Literature findings demonstrate three alternate approaches utilized at the time of delivery for the identification of mothers and newborns with illicit substance exposures. These methods follow.

**Universal screening/testing of all patients at delivery hospitalization.**

Universal screening protocols test every maternal patient for illicit substances upon hospital admission for delivery without discrimination. Illicit substance use occurs at similar rates among all socioeconomic classes, ages, races, and ethnic groups (Azadi & Dildy, 2008; Brauer, 2017; Rodriguez & Smith, 2019). Advocates of universal drug testing assert that this practice may eliminate discriminatory screening practices, inconsistencies, biases, and reporting disparities (Birchfield et al., 1995). Conversely, opponents cite social work agencies' capacity and overburdened caseloads, costs, and government overreach as costly consequences of universal testing. The American Academy of Pediatrics (AAP) and ACOG do not currently recommend universal testing (Wood et al., 2017).

Two quantitative studies in this review identified individual hospital systems that employed universal screening approaches (Azadi & Dildy, 2008; Wexelblatt et al., 2015). Both institutions were geographically situated in large metropolitan centers and cited disproportionate trends in substance use among their respective patient populations. Researchers Azadi and Dildy (2008) conducted their research at a public inner-city university hospital in the southeastern United States that served predominantly African-American women (74% of the participants in this study). In their retrospective chart analysis, 90% of patients presenting in labor had urine drug screens obtained at delivery admission. (Of note, not all patients were screened, as this hospital protocol required maternal consent before testing.) In this review, 19% of pregnant patients tested positive for one or more illicit substances. Marijuana (17.2%) was the most commonly detected

substance, followed by benzodiazepines (5.7%), cocaine (3.1%), and opioids (2.6%). One limitation of this study was that these researchers were unable to differentiate whether patients' benzodiazepine and opioid use pertained to substance misuse as opposed to legitimately obtained prescriptions from a medical provider for a diagnosed complaint (Azadi & Dildy, 2008).

Consistent with the methodologic approach utilized by Azadi and Dildy (2008), researchers Wexelblatt et al. (2015) conducted a retrospective chart analysis of 2,956 mother-infant dyads delivering over 19 months after their institution adopted a universal drug screening protocol to test every pregnant patient at delivery. Previously, the hospital had utilized a selective drug screening approach. (See the following *Selective or targeted screening approach* section for typical protocol details.) Consistent with other previously published maternal illicit substance use prevalence rates, 5.4 % of women in this study tested had positive urine toxicology screens. However, statistical analysis indicated that 20% of mothers with positive toxicology tests did not present with precipitating risk factors that would have triggered the selective or targeted testing approach previously employed—missing identification of both maternal and newborn patients that would benefit from treatment and referral. Unlike the analysis conducted by Azadi and Dildy (2008), Wexelblatt et al. (2015) did not specify whether maternal consent was obtained before testing.

Additional to these two studies conducted at individual hospitals, another quantitative study surveyed all birthing hospitals in the state of Maryland regarding their maternal and newborn illicit substance screening approaches (Miller et al., 2014). Miller

et al. (2014) conducted a 25-item telephone survey of nurse managers and perinatal social workers and attained a 91% response rate with 31 hospitals completing the verbal questionnaire. Forty-five percent (*n*=14) of respondent hospitals employed universal maternal screening protocols, but only 7% universally screened newborn patients. Mothers were informed of the decision to test at 61% of hospitals in this sample, but only 32% of institutions obtained maternal consent before the screening. After completion of statistical analysis, study findings suggest that mandated state reporting requirements in the absence of universal screening protocols discriminate against urban women using cocaine and heroin versus prescription opioids as healthcare personnel indiscriminately test certain pregnant subgroups (Miller et al., 2014). While this investigation queried institutional characteristics (e.g., hospital size and type, annual number of deliveries), patient demographics (e.g., payor source, race/ethnicity, or educational status) were not obtained, a limitation that could have more broadly informed the state of practice and whether other screening and/or reporting disparities existed (Miller et al., 2014).

Finally, a more dated report investigated screening practices at 49 Chicago area birthing hospitals (Birchfield et al., 1995). Only eight of the respondent institutions (16.3%) indicated the incorporation of universal screening protocols. These authors advocated that universal screening should be implemented in states with punitive actions for maternal substance use to avoid testing and reporting inequities. They advocated for the removal of punishment and fostering disclosure through supportive and therapeutic patient-provider relationships (Birchfield et al., 1995).

**Selective or targeted screening approach.** Citing cost and institutional capacity concerns as deterrents to universal testing, some hospitals adopt selective or targeted drug screening approaches. Individual institutions identify maternal or newborn risk factors that trigger or precipitate testing. In hospitals where selective screening is employed, a risk assessment should be executed with the objective assessment of medical and psychosocial criteria (Farst et al., 2011; Oral et al., 2012). The AAP endorses selective screening, suggesting individual hospitals consider adopting a formal policy for both maternal and infant screens in an attempt to reduce variability in implementation, reduce provider/nurse bias, and comply with state and local law (Wood et al., 2017).

Five quantitative studies identified addressed selective screening protocols, three of which occurred in Iowa birthing hospitals (Oral et al., 2012; Oral & Strang, 2006; Wood et al., 2017). Three of these articles addressed newborn screening only, but the presence of maternal risk factors could also trigger newborn drug testing. In one Iowa-based study, researchers Oral et al. (2012) conducted a retrospective chart review of mother-newborn dyads and divided the sample group into two cohorts. Group I consisted of 121 dyads, where every newborn received drug testing. Group II comprised of 107 randomly selected dyads from every 25th delivery that did not receive testing. Between-group comparisons revealed Group I mothers were more likely to have Medicaid or lack health insurance, be of younger maternal age, have lower levels of educational attainment, be unmarried, and have unplanned pregnancies. A retrospective review of Group II revealed that 46.7% of newborns of mothers with documented risk factors that should precipitate screening were not tested, while 35.5% of newborns with indicated

characteristics were not tested. Statistical analysis revealed that hospital staff biases promoted more testing among single mothers with less than high school educations after controlling for other covariates (Oral et al., 2012). All three Iowa-based studies promoted incorporation of selective screening protocols, but only one study insisted that implementation should be accompanied by staff trainings to ensure protocol fidelity and ameliorate suboptimal practices that did not necessarily improve patient care (Oral et al., 2012; Oral & Strang, 2006; Wood et al., 2017). Each of these studies comprised of homogenous populations, which could be cited as a limitation in these investigations.

Additional to the three Iowa-based studies, two other investigations surveyed delivery hospitals in a mid-Atlantic state and a large, densely populated Midwestern city. In their statewide hospital survey, Miller et al. (2014) determined that 48% ($n$=15) of respondent Maryland institutions employed selective screening protocols. In their city-wide sample of 49 Chicago birthing hospitals, Birchfield et al. (1995) did not explicitly report the number of hospitals with selective screening protocols at the time of her study but did state that most hospitals (approximately 90% of respondent institutions) screened based on risk factors or provider suspicion. In both articles, these authors warn that selective perinatal drug testing protocols are often discretionary and inequitably applied to patients, failing to detect some patients with substance use disorders while reinforcing stigma, bias, and shame among others (Birchfield et al., 1995; Miller et al., 2014). In addition to physical characteristics or clinical diagnoses, some social indicators/ determinants of health are cited as reasons to test. Table 1 lists a sampling of maternal

and newborn risk factors that trigger drug testing, as reported in articles retrieved in this

review.

Table 1

Risk Factors That Trigger Selective Drug Screening

| Maternal Risk Factors | Newborn Risk Factors |
|---|---|
| Reported history of illicit substance use | Signs of withdrawal or substance exposure |
| History of incarceration | Low birth weight |
| History of sex work | Fetal growth restriction |
| Intimate partner violence | Small head circumference |
| Multiparity with >3 live births | Prematurity < 37 weeks gestational age |
| CPS/DSS removal of children from the home | Congenital anomalies |
| Homelessness | |
| Significant mental illness | |
| Late entry to/insufficient prenatal care | |
| Tobacco use in pregnancy | |
| Alcohol use in pregnancy | |
| Depression | |
| Unexplained acute hypertension | |
| Unexplained stroke or myocardial infarction | |
| Placental abruption | |
| Precipitous labor < 3 hours | |
| Sexually transmitted infection | |
| Signs of withdrawal or active drug use | |
| Current medication-assisted therapy | |
| Self-pay | |
| Medicaid payment | |
| Social factors (low income, nationality or ethnicity, and/or place of residence) [*] | |

*Note.* [*] Birchfield et al. (1995) cite low income, nationality or ethnicity, and place of residence as reported precipitants triggering perinatal drug testing (Birchfield et al., 1995; Oral & Strang, 2006; Wallman, Smith, & Moore, 2011)

**Random testing triggered by clinician discretion or suspicion.** With wide

recognition that perinatal substance use and fetal exposures are sometimes overlooked,

literature increasingly addresses structured drug testing approaches rather than random

testing based on provider suspicion to inform clinical practice better (Wallman et al., 2011; Wood et al., 2017). Additionally, traditional screening approaches relying on clinical discretion could become less common as they are associated with lower rates of drug testing and may not comply with states' legislative mandates (Wood et al., 2017). None of the articles yielded in this review were solely dedicated to a discussion of random perinatal drug testing based on provider suspicion alone. However, four studies included provider suspicion or clinical discretion as to either a triggering factor in their selective screening protocols or as an additional alternative testing rationale (Birchfield et al., 1995; Miller et al., 2014; Oral & Strang, 2006; Wood et al., 2017). Of note, while 60% of respondent Iowa institutions in one study conducted newborn drug testing based on provider suspicion, 15% of those birthing hospitals reported policy that elected not to test infants at all (Oral & Strang, 2006). Similarly, one Midwestern metropolitan hospital also incorporated a hospital policy never to test (Birchfield et al., 1995). These authors never discussed rationales for decisions not to test.

## Discussion

While recent federal legislation requires states to establish policies identifying substance-exposed newborns, lack of standard guidelines, or uniform practice recommendations presents gaps in translation from policy to clinical practice (Wood et al., 2017). This literature review examines the types of drug screening protocols implemented by various institutions, whether these protocols contained policy components to ensure they were robust and equitably applied, and identifies risk factors that may precipitate testing in selective screening protocols. The results of this review

confirm gaps in the translation of policy to clinical practice. Furthermore, while many hospitals employ selective screening protocols, evidence exists that these protocols are not implemented with fidelity, and provider and nurse bias may determine whether mothers and newborns are screened regardless of risk factors.

Articles retrieved for this review demonstrated some robust survey methodologies that could be cited as study strengths. All the survey studies reported high institutional response rates ranging from 63%-98% (Birchfield et al., 1995; Miller et al., 2014; Oral & Strang, 2006; Wood et al., 2017; Zellman et al., 2002). However, some study limitations were also evident. As previously reported, research on perinatal drug screening protocols is sparse and dated. Many of the studies cited in this review are historic references stemming from concerns regarding maternal cocaine abuse in the 1990s with fewer articles addressing the formulation or revision of protocols despite the increased prevalence of maternal opioid use over the past 2 decades. Furthermore, many of these individual studies were comprised of homogenous populations (e.g., Iowa birthing hospitals) or metropolitan university hospitals and did not encompass large multistate regions to assess variations in clinical practice related to diverse demographics. A broader inquiry may be helpful to determine more current practices across a larger geographic region.

## Conclusion

Finally, recognition of the harmful consequences of fetal substance exposures has prompted clinicians, hospital administrators, and policymakers to establish various perinatal drug screening protocols to identify at-risk newborns. Despite well-intentioned

policy mandates that require identification, reporting, and safety planning for substance-exposed infants, uniform guidelines or best practice recommendations for perinatal drug testing do not exist. Additionally, clinical considerations and legal consequences vary state to state, creating wide divergences in policy and practice. Although some states continue to criminalize maternal substance use in pregnancy, the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN), the American College of Nurse Midwives (ACNM), the American Psychiatric Association (APA), the American Academy of Pediatrics (AAP), the American Medical Association (AMA), and the American College of Obstetricians and Gynecologists (ACOG) promote public health approaches encouraging treatment and referral rather than punitive policy stances (ACNM, 2018; AWHONN, 2015; House, Coker, & Stowe, 2016). Moreover, positive maternal or infant toxicology results present opportunities to address substance use with patients and offer brief intervention or treatment referral—affording the chance for recovery and improving infants' postnatal environment and successful family outcomes (Wood et al., 2017). The development of uniform screening strategies and best practice guidelines could ensure standardized implementation of perinatal drug testing protocols that encourage adherence to fidelity and reduce testing and reporting disparities.

# CHAPTER III

# METHODOLOGY

For completion of degree requirements, this nurse scholar elected to pursue the dissertation manuscript option. The student proposed to complete two manuscripts with the intention to submit for publication consideration. Methodologies for each manuscript are detailed below.

## Manuscript 1

**Proposed Manuscript Title**

The proposed manuscript title is "Drug Screening Practices and Policies of Labor and Delivery Units Across the Southeastern United States."

**Design**

This project utilized a descriptive quantitative cross-sectional research design with purposive sampling to query institutional policies in Labor & Delivery (L&D) units across the southeastern United States. Given the current opioid crisis, some hospitals have revisited their perinatal drug screening protocols for women who present in labor. These policies attempt to identify infants at risk of NAS and possible NICU admission. While ACOG recommends verbal screening for substance use of every pregnant patient, standardized guidelines do not exist for biologic screening or testing for this population. Individual L&D units or hospitals within health system networks may determine whether or what screening and testing protocols will be implemented. This research specifically

sought descriptive data regarding institution-specific policy creation and

operationalization of drug screening practices, specific illicit substances of interest,

patient attributes and/or medical conditions that activate selective testing protocols for

ordering or collection of biologic assays, preferred biologic specimen source (urine,

serum, or infant cord toxicology), and hospital characteristics data and populations

served. These data were obtained through electronic dissemination of a Qualtrics®

Survey Software instrument with questions created by the Principal Investigator to collect

information of interest (Qualtrics, Provo, UT).

**Setting, Sample, and Recruitment**

This research investigated toxicology screening practices and protocols in L&D

units across seven southeastern states. This region was thoughtfully selected, as literature

often cites this geographic area as having widened health disparities (Southeast

Community Research Center, 2017). Additionally, many states in the southeastern United

States have been disproportionately impacted by the current opioid crisis, as evidenced

by increased numbers of overdose deaths and opioid prescriptions per person per capita

data (Centers for Disease Control and Prevention [CDC], 2017). Florida, North Carolina,

and Tennessee had age-adjusted drug overdose deaths statistically higher than the

national average in 2017 (Hedegaard, Miniño, & Warner, 2018). Furthermore, NAS

incidence in rural regions has increased from 1.2 to 7.5 infants per 1,000 births compared

to increases from 1.4 to 4.8 infants per 1,000 births in urban settings (Rodriguez & Smith,

2019). Florida, North Carolina, and Tennessee report higher rates of NAS than the 2016

national NAS rate of 7.0 per 1,000 newborn hospitalizations—at 7.4, 9.4, and 18.0,

respectively. Alabama was one of four states that do not report these data (Healtcare Cost and Utilization Project [HCUP], 2019). For this investigation, states identified within the southeastern U.S. sampling region include North Carolina, South Carolina, Tennessee, Georgia, Alabama, Mississippi, and Florida.

Lists of hospitals with L&D units were constructed from individual state Department of Health Services data. Prospective survey participants (L&D nurse administrators and/or perinatal social workers) were contacted via telephone before survey deployment to confirm names and contact information and to promote an increased response rate. Email address contact information for electronic survey recipients was compiled in a systematic database. These specific nurse administrators and/or perinatal social workers were chosen as they are most likely to have access to key hospital characteristics and patient demographic data as well as knowledge of current institutional perinatal drug testing protocols. The University of North Carolina at Greensboro (UNCG) Institutional Review Board (IRB) approval was requested before study commencement and administration of this survey, and determination made that this investigation did not constitute human studies research.

**Measurement**

A 34-item questionnaire created by the Principal Investigator queried institutional characteristics and demographic data of the patient population served. The investigator designed the instrument based on clinical experience, a priori assumptions, and an extensive literature review. Survey items gathered hospital characteristic data regarding institution type, payor sources, and populations served; types of drug screening policies

implemented and criteria for testing; and rationale and historical context for policy development. (See Appendix C for instrument items.)

Before the dissemination of this survey, the tool was administered to a convenience sample of two L&D nurse managers to assess both face and content validity and to determine whether any items needed revision. Subsequently, two UNCG faculty members with measurement and survey creation expertise reviewed the questionnaire to assess item quality (e.g., absence of double-barrel questions, data ranges did not overlap). Next, the survey was distributed for feasibility testing to a small cohort of respondents who did not possess any content expertise, but with some knowledge of measurement and instrument design. Specifically, these respondents assessed the ease of survey completion on both computers and mobile devices, item appropriateness (e.g., poorly worded or double-barreled questions), and aesthetic design. The survey was updated to reflect the feedback received.

**Data Collection**

Data collection was accomplished by a web-based survey utilizing Qualtrics® Survey Software. In order to ensure data accuracy and integrity, only one survey was disseminated per institution, avoiding duplicate responses from the same facility. An electronic cover letter with the UNCG letterhead was attached to the survey with the purpose of the study and participant eligibility, as well as instructions for completion, date due, risk and benefits of participation, and incentive for completion. The UNCG IRB information sheet template was utilized for this cover letter and stated that completion of the survey confers consent. Qualtrics® Survey Software estimated time to completion of

the instrument to be seven minutes. Pilot trials of questionnaire testing yielded similar completion time results. After initial electronic deployment, reminder emails were sent at 2- and 4-week intervals to encourage participant survey completion. For respondents indicating that they desired consideration for an incentive for survey completion, 33 survey participants received a $20 Amazon gift card for their participation. Gift cards were distributed electronically to the email address provided by the survey respondents. The assessment tool was open for 5 weeks, and participants responded asynchronously at their convenience.

**Data Analysis**

Data collected from this survey was electronically transferred from Qualtrics® Survey Software to IBM® SPSS® Statistics Version 26 (SPSS, Chicago, IL) for analysis. Descriptive and categorical bivariate analyses were utilized to evaluate survey responses.

**Research Question 1**: What drug screening practices and policies do Labor and Delivery units across the southeastern United States implement for women who present in labor?

--Frequencies, counts, means, percentages, and other descriptive statistics were performed to analyze sample hospital characteristic data.

**Research Question 2:** Does the adoption of selective drug testing protocols differ based on institution type, hospital size, and predominant payer source?

--Bivariate analyses were conducted to determine whether institution type, hospital size, and predominant payor source increase the odds that hospital facilities implement certain maternal drug screening protocols—selective/targeted

versus universal or random screening per provider discretion. Odds ratios with 95% confidence intervals were reported.

**Research Question 3:** If hospitals employ selective perinatal screening protocols, what maternal or newborn risk factors trigger drug testing?

--Frequencies, counts, means, percentages, and other descriptive statistics were performed to analyze sample hospital characteristics and patient demographic data.

**Research Question 4:** Do maternal and newborn risk factors that trigger perinatal screening differ based on hospital characteristics?

--Fisher's exact test statistic was used to determine whether relationships exist between maternal and newborn risk factors that trigger screening and hospital characteristics (private versus public, predominant payor source).

**Data Management**

Data obtained were numerically coded for each variable and a master codebook created. Missing data were examined and reported in analyses. Thoughtful survey design using best practice advice was employed, and individual items scrutinized to ensure the reduction of missing data. Free-text options were provided for several items. The Principal Investigator stored survey results on a password-protected Mac computer and utilized Box @UNCG for online data storage on the university server. Survey respondents and names of institutional affiliations were not associated with lines of data. Qualtrics® Survey Software anonymity function was enabled, ensuring IP addresses were not captured.

**Human Subjects Protections**

While granular, patient-level data were not obtained during this project, hospital administrative personnel were surveyed regarding hospital practices and policies as well as patient population demographic data. As information reported pertained to hospital policy and protocol and did not request sensitive data, there was minimal potential harm posed to survey respondents. Participants did receive any direct benefit from this study. Respondents contributed to the state of the science as the collection of comprehensive data could inform and/or standardize future institutional drug screening policies and could decrease inequitable application in targeted population subgroups. As these survey respondents received the questionnaire via electronic distribution, signed consent was not obtained, but conferred by access and completion of the survey. The UNCG IRB information sheet template was utilized to ensure compliance with human subjects' protections. Identifiable data was not reported. Respondents did not incur any negative repercussions associated with participation in this study.

## Manuscript 2

**Proposed Manuscript Title**

The title of this proposed manuscript is "Integrative Review of Hospital Drug Testing Protocols for Women Presenting in Labor."

**Design**

The purpose of this integrative literature review was to examine the types of perinatal substance use screening protocols utilized, whether guidance on best practices or approaches are available, and identify typical maternal or newborn risk factors that

may precipitate drug testing. Findings from this investigation addressed two of the author's research questions:

**Research Question 1:** What drug screening practices and policies do Labor & Delivery units across the southeastern United States implement for women who present in labor?

**Research Question 3:** If hospitals employ selective perinatal screening protocols, what maternal or newborn risk factors trigger drug testing?

--An intensive integrative review utilizing systematic methods was conducted to retrieve quantitative studies in the literature to query what types of perinatal drug screening protocols are utilized for women presenting in labor, components of sound hospital drug testing policies, and what risk factors trigger testing. Included articles were critically appraised for inclusion and results synthesized into a manuscript format.

**Methods**

The nurse scholar applied Bettany-Saltikov's (2012) framework to conduct this literature review utilizing systematic methods. Inclusion and exclusion criteria were determined, and outcome measures explored before commencement of the literature searches. Inclusion criteria consisted of peer-reviewed manuscripts published in the English language that (a) are either randomized controlled trials, clinical controlled trials, cohort studies, or retrospective analyses; (b) examine pregnant women and newborns as primary subjects; (c) involve selective or targeted drug screening/testing protocols, universal drug screening/testing strategies, or screening/testing protocols based on

provider bias or clinical suspicion; and (d) were conducted between the years 1995 and 2019. Initial searches were restricted to literature published within the last 5 years. However, after a dearth of results were retrieved, these constraints were removed to view all results produced over the past two decades—coinciding with the commencement and culmination of the current opioid crisis (Kolodny et al., 2015). Manuscripts were excluded if (a) studies were conducted outside of the United States; (b) they involved males or only non-pregnant women; (c) they were qualitative studies, commentaries, or individual case studies; or (d) they examined fetal alcohol syndrome (FAS) or spectrum disorder (FASD). FAS and FASD comprise a broad spectrum of disorder with both observed physical manifestations affecting infants' appearance as well as behavioral and learning deficits that may not be apparent until the child is older; hence, the rationale for exclusion from this investigation. Literature searches of bibliographic databases PubMed, CINAHL, Google Scholar, MEDLINE, and Social Work Abstracts with predetermined criteria were executed to query results for the terms prenatal substance use, maternal and newborn drug screening, and hospital protocol. Boolean searches of both free-text and indexed terms were utilized. (Of note, truncations of above keywords were included for the CINAHL and Social Work Abstracts searches.)

After exhaustive searches of these databases were completed, all yielded manuscript titles and abstracts were initially screened for inclusion and exclusion criteria. The remaining articles were then read in full-text format. Next, data were extracted from these publications and organized into a literature matrix for comparison. Once data extraction was completed, findings were synthesized and summarized. Fidelity to the

PRISMA-Equity extension guidelines was maintained throughout the entirety of the systematic review (Welch et al., 2012). While earlier antenatal screening for maternal illicit substance use is deemed best clinical practice, early screening and intervention are not the focus of this integrative review.

**Summary**

To quell the current opioid epidemic, policymakers across the United States have proposed and passed assorted legislation to address illicit substance use among pregnant women and their exposed newborns. In response to these mandates, hospitals across communities, states, and the nation have implemented various protocols in an attempt to identify substance-exposed newborns in order to provide optimal medical treatment and coordination of care. Unfortunately, gaps exist in the translation of these policies to clinical practice. While some states authorize reprisals for pregnant patients using illicit substances, numerous nursing and medical professional organizations decry this punitive approach and advocate for public policy that emphasizes compassionate, therapeutic care without judgment. The purpose of this dissertation is to conduct a descriptive cross-sectional survey to query institutional perinatal drug screening policies in L&D units across the southeastern United States. Results from this investigation were synthesized into manuscripts to be submitted for publication consideration. These descriptive data were utilized to depict variation in practice across communities in several states and scrutinize whether these well-intentioned perinatal screening protocols inadvertently exacerbate reporting inequities. These results may inform the current state of practice,

make recommendations for improved clinical guidelines for perinatal drug testing, and/or

advocate for meaningful policy change.

## CHAPTER IV

## DRUG SCREENING PRACTICES AND POLICIES OF LABOR AND DELIVERY UNITS ACROSS THE SOUTHEASTERN UNITED STATES

Planned Journal for Submission: *Maternal and Child Health Journal*

### Abstract

**Objectives**

This study investigated drug screening policies adopted by Labor & Delivery (L&D) units across the southeastern United States. Hospitals receiving federal funds must develop perinatal drug screening protocols to identify infants with illicit substance exposures, provide appropriate treatment, and facilitate reporting to Child Protective Services (CPS). Despite this legislative mandate, there are no standardized clinical recommendations to guide policy formulation or implementation. This project explored (a) what drug screening protocols L&D units implement for women in labor; (b) whether adoption of selective drug testing protocols differs based on hospital characteristics; (c) what maternal/newborn risk factors trigger drug testing on selective screening protocols; and (d) whether maternal/newborn risk factors that trigger testing differ based on hospital characteristics.

**Methods**

This study queried L&D units across seven southeastern states. A 34-item questionnaire collected hospital characteristics, patient demographic data, and information regarding drug screening policies implemented and criteria for testing.

**Results**

Forty-nine L&D administrators completed the online survey. Participants responded from institutions ranging in size from 25 to 1,500 hospital beds. Most respondents (63.3%) were from not-for-profit facilities with Medicaid as the predominant payor source (87%). Hospitals most frequently adopted selective drug testing policies. Current or past history of drug use and medication-assisted treatment most frequently triggered drug testing. Some selective drug testing protocols also included other obstetrical or behavioral risk factors as criteria for testing. There were no differences in institution type, hospital size, or predominant payor sources for L&D adoption of selective drug testing protocols. Risk factors triggering testing on selective protocols did not differ based on hospital characteristics.

**Conclusions for Practice**

These exploratory findings provide a foundation for further research examining drug testing protocols and could inform hospital policy development and implementation. Development of standardized protocol guidelines could help ensure such policies are equitably applied to all women, reducing the risk of implicit bias and ensuring optimal maternal and infant health outcomes.

*Keywords:* Intersectionality, labor, neonatal abstinence syndrome, organizational policy, substance abuse detection

## Introduction

**Background**

Over the past 2 decades, the United States has encountered a crippling opioid epidemic. In 2018 alone, 10.3 million Americans misused prescription opioids, and 47,600 deaths were attributed to opioid overdoses (Health and Human Services, 2019). Epidemiologic data reveal that substance use crosses all racial, ethnic, and social location sectors, and the incidence of maternal illicit substance use during pregnancy is estimated to be 5.4% (Brauer, 2017; Wood et al., 2016). Health professionals, policymakers, and public health officials have formulated policies in an attempt to identify and effectively treat substance-exposed infants (U.S. Congress, 2015, 2016, 2018). Enacted in 2003, the *Keeping Children and Families Safe Act* Public Law 108-150 mandates that states implement protocols to recognize these substance exposures, notify Child Protective Services of affected infants, and develop discharge plans to follow at-risk newborns and provide appropriate interventions in order to receive federal funding (Child Welfare Information Gateway, 2016; U.S. Congress, 2003).

Despite this federal mandate, no standard guidelines or best practice recommendations for identification and care of substance-exposed newborns exists, leaving individual hospitals to navigate these challenges and implement their own institutional policies. In an attempt to identify substance-exposed infants, many hospitals have instituted screening/testing protocols or revised existing policies to recognize infants

at risk for neonatal abstinence syndrome (NAS) so that they may receive specialized medical treatment. Although the American College of Obstetricians and Gynecologists (ACOG) and the American Academy of Pediatrics (AAP) caution against universal toxicology testing for multiple reasons (e.g., inability to detect some substances, false positive results without confirmatory testing, inability to determine recency of last use, and variation in state and local reporting requirements), some hospitals have adopted universal drug testing protocols (AAP, 2017; ACOG, 2015, 2017). While some institutions employ selective/targeted or risk-based screening options, other facilities have not established any formal policy for screening or testing (Roberts et al., 2015). Consequently, many pregnant women are selected for testing based on provider suspicion or concern. Some research has demonstrated that employing selective or risk-based strategies often disproportionately tag ethnic and minority women, generating disparate numbers of Child Protective Services (CPS) referrals among these subgroups (Roberts et al., 2015).

**Study Setting and Rationale**

The purpose of this exploratory research was to query L&D nurse administrators across seven southern states regarding types of drug testing protocols utilized by their institutions. This region was selected as many of these southeastern states have been disproportionately impacted by the current opioid crisis, as evidenced by both increased numbers of overdose deaths and opioid prescriptions per person (CDC, 2017). In 2017, Florida, North Carolina, and Tennessee had age-adjusted drug overdose deaths statistically higher than the national average (Hedegaard et al., 2018). NAS incidence in

rural regions has increased from 1.2 to 7.5 infants per 1,000 births compared to increases from 1.4 to 4.8 infants per 1,000 births in urban settings (Rodriguez & Smith, 2019). Florida, North Carolina, and Tennessee report higher rates of NAS than the 2016 national NAS rate of 7.0 per 1,000 newborn hospitalizations—at 7.4, 9.4, and 18.0, respectively. Alabama is one of only four states that do not report these data (HCUP, 2019). Furthermore, none of these selected states opted to adopt Medicaid expansion, further limiting access to maternity services and substance use treatment (Kaiser Family Foundation, 2019). Literature review demonstrates evidence of similar research investigating hospital drug testing protocols applied to pregnant patients, but these projects were contained to smaller geographic areas—city or statewide surveys (Birchfield et al., 1995; Miller et al., 2014; Oral et al., 2012; Oral & Strang, 2006; Wexelblatt et al., 2015; Wood et al., 2017).

**Theoretical Framework**

This project aimed to scrutinize hospital drug screening protocols through an intersectional lens. Intersectionality, a phrase initially coined by activist Kimberle Crenshaw, first appeared in African-American feminist theory literature in 1989. Intersectionality refers to the complex convergence of race/ethnicity, gender, social location, social structure, and identity, and does not regard these categories as simply either additive or multiplicative (Bauer, 2014; Caiola et al., 2014). One predominant construct of this theory asserts that multilevel power dynamics develop and advantage the dominant social group benefitting from greater availability and access to resources. As these power dynamic relationships persist, the dominant group perspective becomes

entrenched while the oppressed group becomes more marginalized—their social positions and perspectives undervalued and vulnerable.

Political systems with punitive legislation and hospitals with discriminatory screening policies further marginalize pregnant women with substance use disorders, dissuading them from seeking treatment and often delaying entry into prenatal care—structural factors that must be ameliorated to help ensure optimal outcomes and address health inequities (Guttmacher Institute, 2018; SAMHSA, 2018). Mason (2010) expounded upon the work initiated by Crenshaw, offering systems level forms of intersectionality—namely structural, institutional, and political intersectionality. Structural intersectionality examines how interconnected systems and structures further disadvantage certain populations. Institutional intersectionality considers how organizations restrict, deny, or disproportionately impact vulnerable subgroups (Mason, 2010). Finally, political intersectionality describes how dominant cultural norms and paradigms inform public policy and legislation. This study considered hospital perinatal drug screening policies through an institutional intersectionality lens, exploring whether selective drug testing protocols disproportionately impact pregnant minorities or women of low social location.

**Objectives**

The overall aims of this exploratory investigation were two-fold: (a) survey L&D units across seven southeastern states to discover what screening/testing options were employed; and (b) determine whether selective screening protocols differ based on hospital characteristics, inadvertently targeting or increasing inequities among women of

color or low social location, and serving as a mechanism of structural discrimination.

Specific research questions were:

> **Research Question 1:** What drug screening practices and policies do L&D units
>
> across the southeastern United States implement for women who present in labor?
>
> **Research Question 2:** Does the adoption of selective drug testing protocols differ
>
> based on institution type, hospital size, and predominant payer source?
>
> **Research Question 3:** For hospitals employing selective perinatal screening
>
> protocols, what maternal or newborn risk factors trigger drug testing?
>
> **Research Question 4:** Do maternal and newborn risk factors that trigger perinatal
>
> screening differ based on hospital characteristics (predominant payor source or
>
> institution type)?

## Methods

### Study Design

This project used a descriptive quantitative cross-sectional research design with purposive sampling to query institutional L&D units across seven southeastern states (AL, FL, GA, MS, NC, SC, and TN). Lists of hospitals with L&D units were constructed from individual state Department of Health Services data. Prospective survey participants (L&D nurse administrators and Women's Services Directors) at these facilities were contacted via telephone to confirm contact information and promote an increased survey response rate. L&D nurse managers and Women's Services Directors were selected to receive the survey invitation, as these key hospital personnel possess knowledge of unit policies, hospital characteristics, and pertinent patient demographic data. Email addresses

for 313 electronic survey recipients were compiled in a systematic database created by the investigator for survey distribution.

**Survey Instrument**

A 34-item questionnaire created by the principal investigator collected hospital characteristics (e.g., facility type, predominant payor source) and demographic data of the patient population served. Additionally, survey items sought information regarding hospital drug screening policies implemented and criteria for toxicology testing. The investigator designed the instrument based on clinical experience, a priori assumptions, and an extensive literature review. Before survey dissemination, the tool was administered to a convenience sample of two L&D nurse managers to assess both face and content validity. Subsequently, two university faculty members with measurement and survey creation expertise reviewed the questionnaire to assess item quality (e.g., absence of double-barrel questions, data ranges did not overlap). Before survey deployment, the questionnaire was also distributed to a small cohort of eight respondents who did not possess any content expertise, but with some knowledge of measurement and instrument design for feasibility testing. This testing was performed on both personal computers and mobile devices to ensure the survey was adaptable to either technologic mode, increasing ease of access and use for prospective survey respondents.

**Data Collection**

Three hundred thirteen electronic survey invitations were deployed utilizing Qualtrics® Survey Software (Qualtrics, Provo, UT) during September 2019. Only one survey was disseminated per institution, avoiding duplicate responses from the same

facility to ensure data accuracy and integrity. Qualtrics® Survey Software anonymity

function was enabled, ensuring IP addresses were not captured. During this original

distribution, 46 email invites were blocked and marked undeliverable. An attempt was

made to contact those bounced email recipients, and alternate email addresses were

obtained for 24 of those receivers initially blocked. Email reminders regarding this

project were sent 2 weeks after initial survey deployment and 72 hours before survey

close. Forty-nine participants completed the survey, a response rate of 16.8%. Survey

respondents were eligible to receive a $20 Amazon gift card for participation. Eligible

recipients indicated their interest in incentive receipt by completing a final survey

question directing them to enter their preferred email address for electronic gift card

distribution. As information reported pertained to hospital policy and protocol and did not

request sensitive data or personal health information, The University of North Carolina at

Greensboro (UNCG) Institutional Review Board (IRB) determined that this investigation

did not constitute humans studies research.

**Data Analysis**

The purpose of this statistical analysis was to investigate the relationship between

hospital adoption of selective drug screening protocols and potential predictors of

predominant payor source (Medicaid versus private insurance), hospital size (total

number of hospital beds), and institution type (not-for-profit versus private facility).

Descriptive statistics were used to calculate means, standard deviations, or frequencies

and percentages. Continuous variables were evaluated for outliers using boxplots. The

Mann-Whitney test was performed to analyze hospital size (a continuous variable

reported as total number of hospital beds) as one respondent institution with 1500 beds

represented an extreme outlier in data collected. Categorical bivariate analyses were

utilized to assess independent variables of predominant payor source and institution type.

Chi-square statistic and Fisher's exact tests were used to analyze whether risk factors

triggering selective drug screening protocols differed based on hospitals' predominant

payor source or facility type. A two-sided $p$-value of <0.05 was considered statistically

significant. Data collected from Qualtrics® Survey Software were electronically

transferred to IBM® SPSS® Statistics Version 26 (IBM Corp., Armonk, NY) for

analysis.

**Missing Data**

Eighty-six email invitation recipients accessed the Qualtrics survey, but 36 of

those potential respondents opened the electronic survey without recording a single

response. Missing data for recipients who completed the survey was calculated at 8% for

two variables—predominant payor source and existence of a formal L&D drug testing

policy. All other questions on the survey were completed by 100% of the respondents.

The cause of the missing data for the two items is unknown and assumed to be missing at

random. Listwise deletion was used for all analyses.

<p align="center">**Results**</p>

**Hospital Characteristics**

Forty-nine respondents (16.8%) provided hospital characteristics and patient

demographic data representative of all seven states of interest. Hospital response rates

from individual states ranged from 6.1% to 32.7%. Most hospitals identified as not-for-

profit facilities (63.3%), while other respondents reported their institutions as community

hospitals (20.4%) and/or privately owned hospitals (14.3%). Seven respondent

institutions (14.3%) were tertiary care centers, and four hospitals (8.2%) represented

academic centers providing medical resident education. The mean number of hospital

beds was 267 with median number of 147 beds (*SD*=292), with a range of 25-1,500

patient beds. The median number of L&D beds was 9 (*SD*=12). Almost three-fourths

(71.4%) of respondents reported less that 1,500 births per year at their facilities, and the

most frequent response (36.7%) was 100-500 births per year. Over 80% of respondents

reported hospital adoption of formal drug testing protocols for women presenting in

labor, while 19.6% denied the existence of any established policy. Less than one-third

(28.6%) of respondents reported having Level 3 or 4 NICUs at their facilities. Most

participating hospitals (87.0%) reported Medicaid as their predominant payor source (see

Table 2).

Table 2

Characteristics of Respondent Hospitals (*N*=49)

| Hospital Characteristic | *n* (%) or Median (Min, Max) |
|---|---|
| State | |
| Alabama | 3(6.1) |
| Florida | 9 (18.4) |
| Georgia | 7 (14.3) |
| Mississippi | 4 (8.2) |
| North Carolina | 16 (32.7) |
| South Carolina | 4 (8.2) |
| Tennessee | 6 (12.2) |

Table 2

Cont.

| Hospital Characteristic | *n* (%) or Median (Min, Max) |
|---|---|
| Institution Type[§] | |
|     Tertiary care center | 7 (14.3) |
|     Community hospital | 10 (20.4) |
|     Academic center/Residency education | 4 (8.2) |
|     Private hospital | 7 (14.3) |
|     Not-for-profit facility | 31 (63.3) |
|     State hospital | 1 (2.0) |
|     Birth center | 1 (2.0) |
|     Other | 1 (2.0) |
| Total No. of Hospital Beds | 147 (25, 1500) |
| No. of L&D[†] Beds | 9 (3, 80) |
| No of Births | |
|     <100 births/yr | 1 (2.0) |
|     100-500 births/yr | 18 (36.7) |
|     501-1,000 births/yr | 10 (20.4) |
|     1,001-1,500 births/yr | 7 (14.3) |
|     1,501-2,000 births/yr | 4 (8.2) |
|     2,001-2,500 births/yr | 2 (4.1) |
|     >2,500 births/yr | 7 (14.3) |
| Level 3 or 4 NICU[‡] | |
|     Yes | 14 (28.6) |
|     No | 35 (71.4) |
| Predominant Payor Source[*] | |
|     Medicaid | 40 (87.0) |
|     Private Insurance | 6 (13.0) |
| L&D Drug Testing Policy[*] | |
|     Yes | 37 (80.4) |
|     No | 9 (19.6) |

*Note.* [§]Respondents reported all applicable hospital types. Sum of responses >100%
[†]L&D = Labor & Delivery
[‡]NICU = Neonatal Intensive Care Unit
[*]*n* = 46

**Types of Drug Testing Policies Employed**

Survey participants were asked to select what type of drug testing policy was employed to test pregnant women for substance use when presenting in labor. Respondents selected one of four available choices: (a) universal testing for every patient upon arrival to unit; (b) selective screening policies that are triggered only when certain risk factors are present; (c) random patient selection based on healthcare provider or RN suspicion; or (d) no formal policy exists. Operational definitions were provided for each answer choice (see Appendix C). Over half of survey respondents (63.3%) reported the adoption of selective drug screening protocols. Nine participants (18.4%) indicated universal testing of all pregnant patients presenting in labor, and seven respondents (14.3%) reported testing women for substance use based on clinician or RN suspicion. Two facilities indicated that no formal drug screening policy was implemented at their institution. See Table 3.

Table 3

Hospital Drug Testing Protocols Employed ($N$=49)

| Protocol Type | $n$ (%) |
|---|---|
| Universal screening protocol | 9 (18.4) |
| Selective/Targeted screening protocol | 31 (63.3) |
| Random patient selection based upon provider or RN suspicion | 7 (14.3) |
| No formal protocol exists | 2 (4.1) |

*Note.* * Total exceeds 100% due to rounding.

**Hospital Characteristics and Incorporation of Selective Drug Screening Protocols**

When considering whether selective drug screening protocols could represent a mechanism of structural discrimination, the investigator analyzed whether hospitals with differing characteristics were more likely to adopt these protocols. Statistical analyses examined three separate criteria (predominant payor source, institution type, and hospital size) and whether these predictor variables were associated with the adoption of differing types of drug screening protocols. None of these predictor variables demonstrated statistical significance. As Table 4 demonstrates, neither predominant payor source (OR = 1.13; 95% CI = [0.18, 7.00]; $p$ = 1.000) or institution type (OR = 1.06; 95% CI = [0.16, 6.887]; $p$ = 1.000) were significantly associated with adoption of selective screening protocols. Distribution of hospital size as measured by number of beds ($p$ = 0.364) was the same for hospitals employing either selective screening protocols or other protocol types (universal screening, random screening at provider or nurse discretion, or absence of formal drug screening protocol).

Table 4

Differences in the Prevalence of Types of Drug Screening Protocols Utilized by Hospital Characteristics

| Hospital Characteristics | Selective Screening Protocol | | Other Screening Protocols | | | Odds Ratios | |
|---|---|---|---|---|---|---|---|
| | *n* | *%* | *n* | *%* | *p*[*] | *OR* | *95% CI* |
| Insurance Type (*n* = 45) | | | | | | | |
| Medicaid | 27 | 60.0 | 12 | 26.7 | 1.000 | 1.13 | (0.18, 7.00) |
| Private Insurance | 4 | 8.9 | 2 | 4.4 | | | |

Table 4

Cont.

| Hospital Characteristics | Selective Screening Protocol | | Other Screening Protocols | | | Odds Ratios | |
|---|---|---|---|---|---|---|---|
| | *n* | *%* | *n* | *%* | *p*[*] | *OR* | *95% CI* |
| Institution Type (*n* = 34) | | | | | | | |
| Not-for-Profit | 19 | 55.9 | 9 | 26.5 | 1.000 | 1.06 | (0.16, 6.87) |
| Private | 4 | 11.8 | 2 | 5.9 | | | |

*Note.* [*] significance set at *p*-value <0.05.

**Factors that Trigger Selective Screening Protocols**

Survey questions querying maternal and newborn risk factors that triggered

selective drug testing protocols were constructed after extensive literature review.

Sources typically cited factors including current or past history of substance use, obstetric

indications (e.g., preterm labor, placental abruption), or psychosocial indicators (e.g.,

history of intimate partner violence, homelessness or unstable housing, or late entry to

prenatal care). For this investigation, respondents indicating that their facility employed a

selective screening protocol were asked to select specific maternal or newborn risk

factors that triggered maternal toxicology testing at their hospital. All respondents

(100%) reported that illicit substance use during current pregnancy (either patient

disclosed or previously documented) triggered toxicology testing. Other than lack of

prenatal care (96.7%), the four most frequent indicators cited for triggering testing

involved substance use histories—known substance use in current pregnancy (100%),

patient appears drunk or chemically altered (93.3%), pregnant patients currently receiving

medication-assisted treatment such as methadone or buprenorphine (83.3%), or any past history of illicit substance use before pregnancy (80%).

Obstetric risk factors prompting drug testing included placental abruption (40%), preterm labor (30%), fetal growth restriction (3.3%), and infant admission to the NICU (3.3%). While late entry to, insufficient, or lapse in prenatal care triggered testing at 80% of respondent hospitals, other psychosocial considerations were less prevalent on selective screening protocols. Only 10% of surveyed institutions reported history of intimate partner violence and homelessness or unstable housing as considerations for drug testing. Lastly, respondents could select "other" as a response option with the ability to free text additional risk factors triggering testing. Over one-fourth (26.7%) of participants selected this response, citing additional risk factors such as fetal demise, precipitous delivery, seizure activity (respondent did not clarify whether maternal or fetal), sexually transmitted infection or other high-risk sexual behavior, and Department of Social Services (DSS)/Child Protective Services (CPS) involvement with or loss of custody of older children (see Figure 4).

Fisher's exact test analyses of maternal and newborn selective screening protocol triggers and predominant payor source and institution type did not yield any results of statistical significance, indicating that selective screening risk factors did not differ between not-for-profit versus private hospitals. Furthermore, selective screening criteria at facilities with Medicaid as the predominant payor source did not significantly differ from those with mostly privately insured patients (see Table 5).
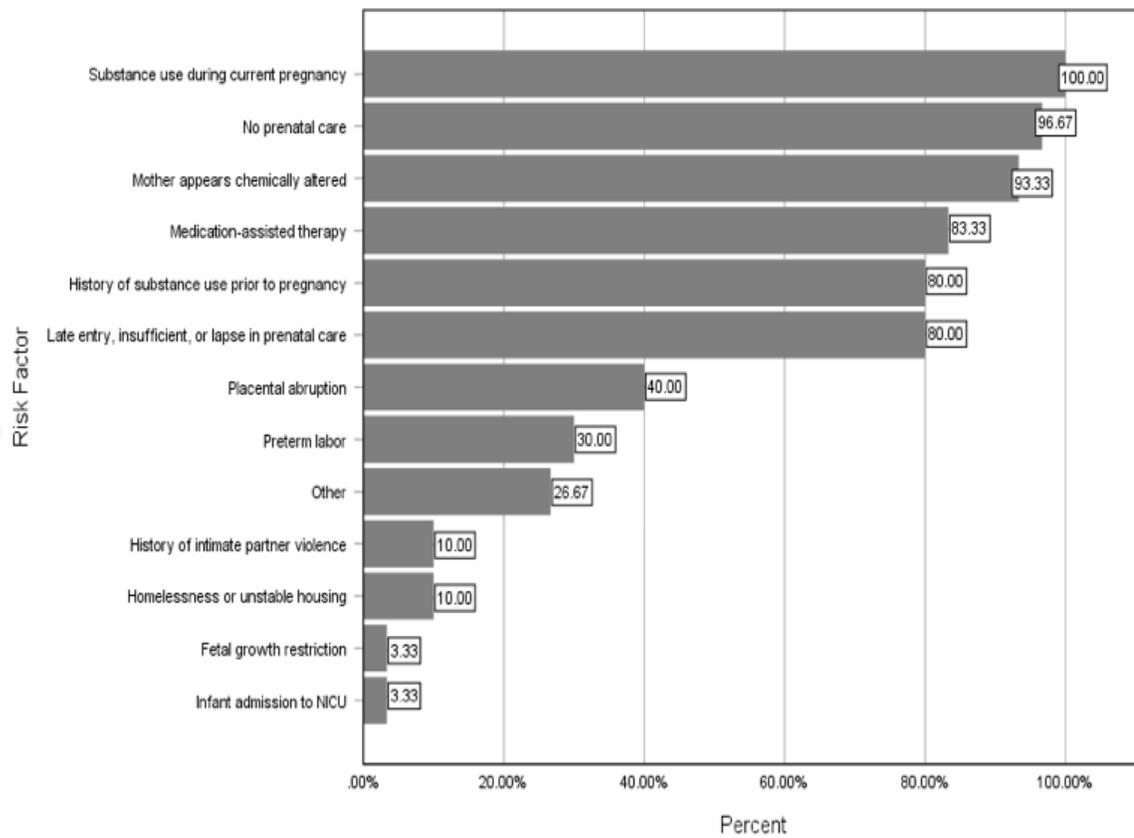
Figure 4. Risk Factors Triggering Selective Drug Testing Protocols (*n*=30).

Table 5

Selective Screening Protocol Risk Factor Incorporation by Payor Source and Institution Type

| Risk Factor Triggering Selective Screening Protocol | Predominant Payor Source | | | | Institution Type | | | |
|---|---|---|---|---|---|---|---|---|
| | Medicaid % (n) | Private Insurance % (n) | p* | Not Included in Policy % (n) | Not-for-Profit % (n) | Private % (n) | p* | Not Included in Policy % (n) |
| Past history of substance use | 72.4% (21) | 13.8% (4) | 1.000 | 13.8% (4) | 68.2% (15) | 18.2% (4) | 1.000 | 13.6% (3) |
| Substance use in current pregnancy | 83.3% (25) | 13.3% (4) | 1.000 | 3.3% (1) | 78.3% (18) | 17.4% (4) | 1.000 | 4.3% (1) |
| Medication assisted treatment | 75.9% (22) | 10.3% (3) | 0.467 | 13.8% (4) | 69.6% (16) | 13.0% (3) | 1.000 | 17.4% (4) |
| Patient appears drunk or altered | 80.0% (24) | 13.3% (4) | 1.000 | 6.7% (2) | 73.9% (17) | 17.4% (4) | 1.000 | 8.7% (2) |
| No prenatal care | 83.3% (25) | 13.3% (4) | 1.000 | 3.3% (1) | 82.6% (19) | 13.0% (3) | 0.174 | 4.3% (1) |
| Late entry to or insufficient prenatal care | 66.7% (20) | 13.3% (4) | 0.557 | 20.0% (6) | 69.6% (16) | 8.7% (2) | 0.194 | 21.7% (5) |
| History of intimate partner violence | 10.0% (3) | 0.0% (0) | 1.000 | 90.0% (27) | 13.0% (3) | 0.0% (0) | 1.000 | 87.0% (20) |
| Homelessness or unstable housing | 6.7% (2) | 3.3% (1) | 0.360 | 90.0% (27) | 4.3% (1) | 0.0% (0) | 1.000 | 95.7% (22) |
| Placental abruption | 43.3% (13) | 0.0% (0) | 0.113 | 56.7% (17) | 30.4% (7) | 13.0% (3) | 0.281 | 56.5% (13) |
| Fetal growth restriction | 6.7% (2) | 0.0% (0) | 1.000 | 93.3% (28) | 4.3% (1) | 0.0% (0) | 1.000 | 95.7% (22) |
| Preterm labor | 30.0% (9) | 3.3% (1) | 1.000 | 66.7% (20) | 21.7% (5) | 8.7% (2) | 0.557 | 69.6% (16) |

Table 5

Cont.

| Risk Factor Triggering Selective Screening Protocol | Predominant Payor Source | | | | Institution Type | | | |
|---|---|---|---|---|---|---|---|---|
| | Medicaid % (n) | Private Insurance % (n) | p* | Not Included in Policy % (n) | Not-for-Profit % (n) | Private % (n) | p* | Not Included in Policy % (n) |
| NICU admission | 3.3% (1) | 0.0% (0) | 1.000 | 96.7% (29) | 0.0% (0) | 0.0% (0) | — | 100.0% (23) |
| Other risk factor | 20.0% (6) | 0.0% (0) | 0.557 | 80.0% (24) | 17.4% (4) | 0.0% (0) | 1.000 | 82.6% (19) |

*Note.* * $p$-values reflect Fisher's exact tests for comparisons of payor source and institution type as some cells with expected counts <5.

**Additional Findings**

In addition to the initial research questions posed, other analyses yielded interesting results. Examination of the data revealed that most respondent institutions (58.5%) do not obtain maternal consent before submitting biologic specimens for toxicology testing. Of the 41.5% of participants indicating that maternal consent was always obtained before specimen collection or processing, most of those respondents (56.5%) reported that maternal consent was implied when those patients signed consent for treatment on general hospital admission paperwork. Only 8.7% of respondents obtained separate written consent specifically for toxicology testing, while 6.5% of hospitals acquired separate verbal consent. Furthermore, regarding medical and nursing staff education and instruction regarding specific protocol details and implementation, 41.9% of respondents reported formal in-service training for nursing staff. Fourteen respondents (32.6%) reported hospital reliance on written communication to disseminate policy details (e.g., email, newsletters, or bulletin board posts) to medical or nursing staff. Almost one-third of respondents (27.9%) reported no education or communication regarding existing institutional protocols.

## Discussion

**Key Results**

While previous literature demonstrates that some selective screening policies may disproportionately affect women of color or low social location, this investigation does not reveal any statistically significant differences in employment of these targeted protocols based on institution type, size, or predominant payor source. These findings

suggest that selective/targeted drug screening protocols do not serve as a mechanism for structural or institutional discrimination. The use of selective screening protocols was prevalent across hospitals in this investigation with varying characteristics; however, only 13% of respondent institutions reported private insurance as their predominant payor source. While Medicaid financed 50-67% of births across the seven states surveyed, perhaps hospitals serving privately insured women of higher social location were underrepresented in this sample (Kaiser Family Foundation, 2019). Additionally, 20% of survey respondents were affiliated with smaller community-based hospitals. Recent epidemiologic data depicts increased incidence of NAS in rural regions, suggesting that smaller, community based hospitals are increasingly affected by the current opioid crisis (Rodriguez & Smith, 2019).

While these study outcomes were not statistically significant, some results could have clinical significance. For example, hospitals with Medicaid as the predominant payor source were more likely to adopt selective drug testing protocols than facilities with patients who were predominantly privately insured. This warrants further consideration. Examining these findings with a larger sample size could help to better understand how payor mix may affect drug testing policies. In addition, other survey findings present opportunities for improved drug testing protocol formulation and implementation—namely the small number of facilities requiring maternal consent and the lack of clinical education given nursing staff and providers regarding policy components.

While selective/targeted screening policies themselves may not serve as a mechanism for structural discrimination, implicit biases of individual clinicians or nursing staff may allow such policies to be employed inequitably. Selective screening policies must be applied to all pregnant patients with fidelity regardless of patient race, social location, education level, or payor source. Furthermore, obtaining maternal consent for toxicology testing should be obtained before testing, affording women with illicit substance exposures the opportunity to disclose use and promoting participation in a plan of care that values patient agency and shared decision-making as well as providing the opportunity to refer for substance use treatment.

**Limitations**

Some limitations of this investigation are noted. Despite efforts to personally communicate with survey recipient L&D nurse managers and Women's Services Directors to garner project buy-in, the survey response rate was only 16.8%. Research suggests that web-based survey response rates among nurses and other healthcare professionals are declining, typically yielding rates less than 20% (Chizawsky, Estabrooks, & Sales, 2011). This Qualtrics survey produced similar results. Additionally, initial electronic survey distribution encountered technical difficulties as stringent hospital security Internet firewalls either blocked emails or disabled the embedded survey link. Attempts were made to call every blocked recipient to obtain alternate email addresses. Twenty-four of the 46 blocked email addresses were corrected, and the survey was redistributed to all recipients with survey hyperlinks that either permitted direct entry to the questionnaire or could be copied and pasted into a web browser. Despite these

remediations, the low survey response rate makes it difficult to determine if a type II error exists or in what ways non-respondents differed from respondents.

**Generalizability**

Given the variation in maternal drug testing protocols and differing patterns of substance use across geographic regions as well as the small sample size of respondents in this study, these results are not generalizable to the entire United States. Formulation of standard guidelines or best practice recommendations regarding who and how to test and educating clinicians about protocol criteria could better ensure that selective drug screening policies do not discriminate against marginalized or vulnerable pregnant women.

<div align="center">

**Conclusion**

</div>

Finally, despite well-intentioned policies implemented to identify and treat infants with in-utero illicit substance exposures, gaps in translation from policy to practice persist. With burdensome cost considerations and ACOG (2015) and AAP (2017) cautions against universal toxicology testing, most hospitals are more likely to employ selective drug screening protocols for pregnant women presenting in labor. Robust selective screening protocols must be based on scientific evidence, implemented with mechanisms to educate clinicians and nursing staff about their proper use, and regularly revisited and revised to ensure that these policies do not promote or exacerbate disparities in testing or referrals to CPS. In addition to compliance with AAP and ACOG recommendations, ethical and compassionate care dictates that maternal consent be obtained before maternal drug testing, affording these patients the agency and

opportunity to participate in their care. Thoughtful, informed consent practices also present the opportunity to offer and refer appropriate patients for treatment—promoting optimal maternal outcomes in addition to the fetal outcomes selective screening policies aim to improve.

**CHAPTER V**

**INTEGRATIVE REVIEW OF HOSPITAL DRUG TESTING PROTOCOLS FOR
WOMEN PRESENTING IN LABOR**

Planned Journal for Submission: *Journal of Obstetric, Gynecologic, and Neonatal
Nursing*

**Abstract**

**Objective**

This integrative review synthesizes existing literature regarding types of hospital

perinatal substance use screening protocols, whether guidance on best screening practices

or protocols exists, and identifies typical maternal/newborn risk factors that precipitate

drug testing.

**Data Sources**

Searches of bibliographic databases PubMed, CINAHL, Google Scholar,

MEDLINE, and Social Work Abstracts queried results for the terms prenatal substance

use, maternal and newborn drug screening, and hospital protocols. After database

searches were exhausted, manual citation searches of retrieved articles' reference lists

were examined for other pertinent resources.

**Study Selection**

Original research included in this review pertained to intrapartum hospital drug

screening protocols published since 1995 and available in English. Titles and/or abstracts

of 176 articles were reviewed, and 21 publications met conditions for full-text review. Thirteen articles met the eligibility criteria for inclusion.

**Data Extraction**

Data extracted from 13 articles compared various hospital drug screening protocols and pertinent components of these policies (e.g., consent requirements, risk factors triggering testing). Data included publication date, study design/methodology, setting, and pertinent study findings.

**Data Synthesis**

Key findings were categorized into two themes: *Best Practices Guidelines for Institutional Policy and Protocol Creation* and *Hospital Drug Testing Protocols*. Evidence asserts that robust hospital perinatal drug testing protocols should include maternal and newborn factors that precipitate testing, guidelines for maternal consent, preferred testing method and/or biological source, and appropriate time intervals for screening. Selective drug screening protocols should be applied equitably to all women or newborns meeting criteria.

**Conclusion**

Hospital drug screening protocols for laboring women vary widely across communities and would benefit from the development of national guidelines and best practice recommendations for implementation. Random drug screening practices may reinforce implicit biases and exacerbate stigma and shame regarding maternal illicit substance use—failing to optimize maternal and fetal outcomes for this marginalized population.

*Keywords:* Newborn, pregnancy, labor, neonatal screening, substance-related disorders, substance abuse detection, preclinical drug evaluation, surveys and questionnaires, informed consent

## Precis Statement

Hospital drug screening protocols for laboring women vary widely across communities and would benefit from the development of national guidelines and best practice recommendations for implementation.

## Callouts

### Callout 1

Identifying pregnant patients using illicit substances and their exposed fetuses presents an opportunity for coordination of care and treatment from the onset of discovery by nurses and their healthcare providers—ensuring optimal outcomes for mothers and their affected infants.

### Callout 2

Hospital perinatal substance use screening protocols should include maternal and newborn factors that precipitate testing, guidelines for consent to test, preferred screening method or biological source, appropriate

### Callout 3

While many hospitals employ selective screening protocols, evidence exists that these protocols are not implemented with fidelity, and provider and nurse bias may determine whether mothers and newborns are screened regardless of risk factors.

**Introduction**

Maternal consumption of alcohol, tobacco, and illicit substances (illegal drugs and misused prescription medications) during pregnancy poses potential significant harms for the exposed fetus (Farst et al., 2011; Maeda et al., 2014; Oral & Strang, 2006). In-utero exposure to these substances is associated with increased risk for fetal growth restriction, placental abruption, oligohydramnios, preterm labor, low infant birth weights, and impacts on delayed infant and childhood development (Farst et al., 2011; Maeda et al., 2014). The consequences of these exposures extend beyond delivery as these infants are often discharged home to mothers or families affected by substance use disorders who may struggle to receive effective treatment or care for their substance-exposed infant, navigate relationships with Child Protective Services, or encounter entanglements with the legal system. Identifying pregnant patients using illicit substances and their exposed fetuses presents opportunities for coordination of care and treatment from the onset of discovery by nurses and their healthcare providers—ensuring more optimal outcomes for mothers and their affected infants.

Concerns regarding the identification of fetal substance exposures became more pronounced in the mid-1990s with the increasing prevalence of crack cocaine use in the United States (Oral & Strang, 2006). In the early 1990s, California and Virginia passed legislation mandating hospitals to develop and implement perinatal screening protocols to identify illicit substance use among their pregnant populations (Oral & Strang, 2006; Zellman et al., 2002). In 2003, an amendment to the *Child Abuse and Treatment Act* (CAPTA) appropriated funds for the *Keeping Children and Families Safe Act* Public Law

108-150. This federal legislation requires states to implement policies and/or procedures for identification, reporting, and discharge safety planning for substance-exposed infants to receive federal block grant monies (Farst et al., 2011). Over the following decade, most states did not mandate uniform or standardized drug screening and testing policies, and many individual hospitals chose to create their own unique protocols—attributing to lack of consistency across cities, counties, states, and the nation (Oral & Strang, 2006; Wood et al., 2017). The purpose of this integrative literature review is to examine the types of hospital perinatal substance use screening protocols utilized, whether guidance on best practices or approaches is available, and identify typical maternal or newborn risk factors that precipitate drug testing.

## Methods

### Search Strategies and Outcomes

For this review, standard methodologies outlined by the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) Equity Extension were followed (Welch et al., 2012). Literature searches of bibliographic databases PubMed, CINAHL, Google Scholar, MEDLINE, and Social Work Abstracts with predetermined criteria were executed to query results for the terms *prenatal substance use*, *maternal and newborn drug screening*, and *hospital protocol*. Boolean searches of both free-text and indexed terms were utilized. After repeated database queries were exhausted, manual citation searches of retrieved articles' reference lists were performed to identify other pertinent resources and ensure articles were not overlooked.

One hundred and seventy-six publication titles and abstracts were initially screened, and complete references obtained if the title and/or abstract suggested either relevance or insufficient information to assess. Ten articles were duplicates and purged from the search. Twenty-one full-text articles were then read and key findings synthesized in this integrative review. This review yielded 13 publications pertaining to perinatal maternal or newborn screening for illicit substance exposures at the time of delivery. Eight publications pertained to original research investigating the adoption of various hospital perinatal drug screening protocols. Five articles addressed protocol components, policy implementation, and general overview of perinatal drug testing considerations.

**Inclusion/Exclusion Criteria**

Inclusion criteria for review consisted of either maternal or newborn screening for substance exposures at the time of entry to intrapartum care. Articles related to perinatal substance use or intrapartum screening protocols outside of the United States were excluded. Initial searches were restricted to literature published within the last 5 years. However, after few results were retrieved, these constraints were removed to view all results produced over the past two decades—coinciding with the commencement and culmination of the current opioid crisis (Kolodny et al., 2015). While earlier antenatal screening for maternal illicit substance use by reliable, validated tools (either verbal or written) is deemed best clinical practice, early prenatal screening and intervention is not the focus of this investigation and those articles were excluded. All articles were available in English.

Of the 13 full-text articles reviewed, eight publications were quantitative studies containing original research, four provided a general overview of the topic, and one article presented clinical case findings (see Figure 5). Five of the original research articles were cross-sectional survey designs with response rates ranging from 63-97% with the number of reporting institutions ranging from 31-510 hospitals. Three studies executed retrospective chart analyses of both maternal and maternal/infant dyads. The smallest number of cases included in these retrospective analyses was 462 maternal charts. The other two retrospective studies were comprised of 228 and 2956 maternal-infant dyads. Extracted data for each original research study are presented in Appendix B.
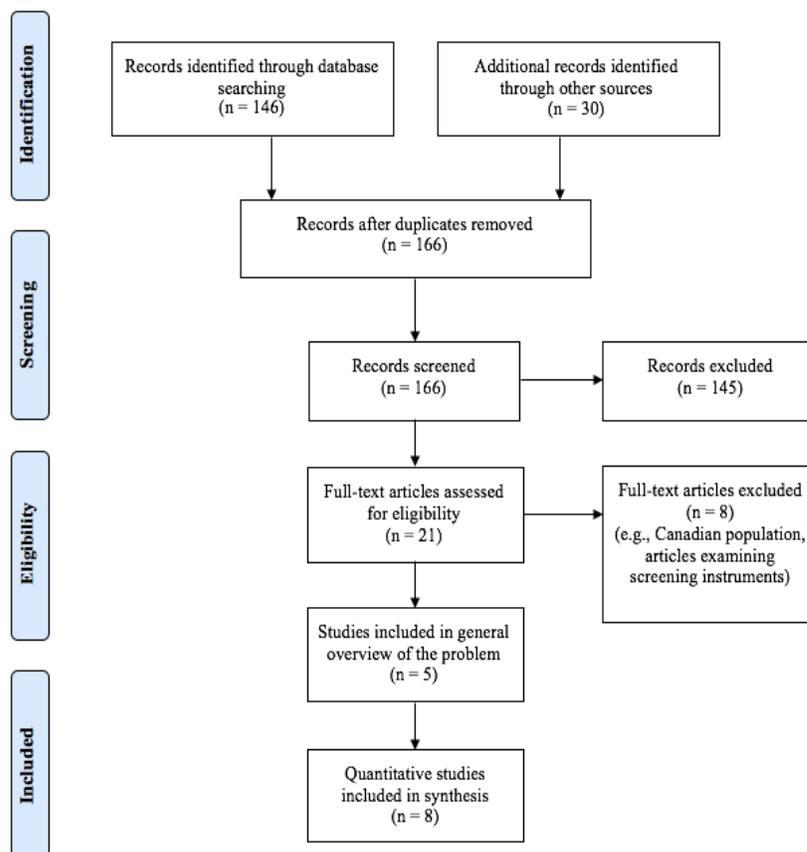


Figure 5. Literature Search Results.

**Results**

**Summary of Study Characteristics**

  **Best practices guidelines for institutional policy and protocol creation.**
Literature promotes the development of standardized hospital protocols as an effective means for establishing operational processes to reduce variability or drift in clinical practice, improving the quality of patient care, and containing escalating healthcare costs (Zellman et al., 2002). Comprehensive hospital protocols include key components such as identification of originating unit, department, or committee; draft dates and timeline for review and revision; and instructions for intradepartmental communication and responsibilities regarding reporting and referral. Furthermore, hospital perinatal substance use screening protocols should include maternal and newborn factors that precipitate testing, guidelines for consent to test, preferred screening method or biological source, appropriate time intervals for screening, and whether an obstetric provider order is required to test (Zellman et al., 2002).

  Zellman et al. (2002) conducted a cross-sectional survey of a convenience sample of 806 U.S. hospitals regarding their institutional perinatal substance use screening protocols—the lone example of a study scrutinizing policy components found. This investigation yielded a 63% response rate of hospitals queried and found that only 166 of 510 respondent institutions (32.5%) reported perinatal substance screening protocols in place. States with legislatively mandated legal consequences or reporting requirements were more likely to have implemented uniform protocols. Of those hospitals with protocols, review of submitted policies revealed that most were poorly drafted. Most

protocols (85%) did not delineate rules for notification of key personnel regarding positive toxicology test results, and only 1% mandated that the obstetrics provider be informed of positive results. Furthermore, 59.2% of respondent institutions did not address the issue of maternal consent before testing. Moreover, institutions reporting more affluent patient demographics were more likely to require maternal consent before testing. Contrary to the researchers' *a priori* assumptions, hospitals with predominantly White populations and higher delivery volumes were more likely to have instituted a screening protocol (Zellman et al., 2002).

*Screening versus testing.* In their study examining various perinatal drug screening protocols in Maryland, Miller et al. (2014) were the only authors in this review to differentiate between maternal drug *screening* and perinatal drug *testing* by providing operational definitions for these methods. For their investigation, *screening* was defined as either "an interview or written instrument method for identifying substance use," while *testing* was delineated as "laboratory analysis of biological specimens" (Miller, 2014, p. 661). The authors of this study determined that while all respondent hospitals did universally screen pregnant patients for illicit substance use upon admission, few institutions utilized reliable instruments previously validated in pregnant populations (Miller, 2014). All other articles cited in this review used the terms *screening* and *testing* interchangeably, requiring scrutiny of each study's methods to determine that each referred to maternal and newborn drug testing.

*Maternal consent for testing.* As previously indicated, robust perinatal drug testing protocols should seek maternal consent before administration of toxicology tests

(ACOG, 2015; Polak et al., 2019; Zellman et al., 2002). Maternal consent should include

discussion of implications for both the patient and newborn should testing reveal positive

results. Five of the quantitative studies identified in this review did address whether

maternal consent was obtained before testing. In a study surveying 31 Maryland birthing

hospital testing practices, 61% of respondent hospitals reported that mothers were

*informed* of toxicology screening, while only 32% of institutions *obtained maternal*

*consent before* testing (Miller et al., 2014). In an older yet similar study, Birchfield et al.

(1995) determined that 80% of hospitals never obtained maternal consent before testing

newborns, and 73% of labor & delivery units did not consent pregnant patients before

performing toxicology testing. Of note, three studies conducted in Iowa examined

newborn toxicology testing, and that state's law does not require maternal consent if fetal

substance exposure is suspected. However, some authors raise ethical concerns regarding

the adoption of newborn testing as a proxy for maternal illicit substance screening

employed to avoid the complex sensitivities associated with acquiring maternal consent

(Polak et al., 2019).

     ***Biologic assays.*** Several biological sources may be used for the detection of illicit

substance use. Urine, blood, infant meconium, hair, and umbilical cord tissue are the

most common samples submitted for testing (Farst et al., 2011; Wood et al., 2017). Some

biological samples offer specific advantages for analysis. For example, both maternal and

newborn urine may be collected easily in a non-invasive manner. Pregnant patients are

often requested to supply a urine sample upon hospital admission, while infants may have

collection bags placed in their diapers shortly after delivery. Newborn meconium samples

reflect fetal substance exposures several weeks before delivery, and are often more accurate than newborn urine collections (Farst et al., 2011). In recent years, newborn umbilical cord tissue has been collected for testing as it provides a longer window for the detection of substance exposures. An umbilical cord segment is cut after delivery of the placenta (tissue typically designated as biological waste), affording another non-invasive collection technique. Of note, both umbilical cord tissue and meconium specimen toxicology results take longer to process, and may not be available before hospital discharge of the mother and infant (Polak et al., 2019).

While maternal urine samples are often used for maternal drug screens, this biologic assay may yield both false-positive and false-negative results (Farst et al., 2011; Polak et al., 2019). Best practice guidelines dictate that all positive urine toxicology results should be submitted for confirmatory analysis utilizing either gas chromatography mass spectrometry or liquid chromatography tandem mass spectrometry (Polak et al., 2019). Polak et al. (2019) recommend confirmatory testing when toxicology results differ from maternal self-report if less sensitive testing methods do not differentiate from certain drug classes and their metabolites, or when clinical consequences depend on the validity of the results.

**Hospital drug testing protocols.** Lack of recognition of maternal illicit substance use by clinicians is common (Azadi & Dildy, 2008). Patients and healthcare providers would benefit from strategies to improve the identification of affected patients. Once substance use is identified, providers should inform patients of therapeutic options and initiate treatment referrals—potentially improving both maternal and neonatal outcomes

(Wexelblatt et al., 2015). Literature findings demonstrate three alternate approaches adopted for the identification of mothers and newborns with illicit substance exposures at time of delivery. These methods are as follows:

   ***Universal testing of all patients at delivery.*** Universal testing protocols test every maternal patient for illicit substance use upon hospital admission for delivery without discrimination. Illicit substance use occurs at similar rates among all socioeconomic classes, ages, races, and ethnic groups (Azadi & Dildy, 2008; Brauer, 2017; Rodriguez & Smith, 2019). Advocates of universal drug testing assert that this practice may eliminate discriminatory screening practices, inconsistencies, biases, and reporting disparities (Birchfield et al., 1995). Conversely, opponents cite social work agencies' capacity and overburdened caseloads, costs, and government overreach as costly consequences of universal testing. The American Academy of Pediatrics (AAP) or ACOG does not currently recommend universal testing (Wood et al., 2017).

   Two quantitative studies in this review identified individual hospital systems that employed universal testing approaches (Azadi & Dildy, 2008; Wexelblatt et al., 2015). Both institutions were geographically situated in large metropolitan centers and cited disproportionate trends in substance use among their respective patient populations. Azadi and Dildy (2008) conducted their research at a public inner-city university hospital in the southeastern United States that served predominately African-American women (74% of the participants in this study). In their retrospective chart analysis, 90% of patients presenting in labor had urine drug tests obtained at delivery admission. (Of note, not all patients were tested as this hospital protocol required maternal consent before

testing.) In this review, 19% of pregnant patients tested positive for one or more illicit

substances. Marijuana (17.2%) was the most commonly detected substance, followed by

benzodiazepines (5.7%), cocaine (3.1%), and opioids (2.6%). One limitation of this study

was that these researchers were unable to differentiate whether patients' benzodiazepine

and opioid use pertained to substance misuse as opposed to legitimately obtained

prescriptions from a medical provider for a diagnosed complaint (Azadi & Dildy, 2008).

Consistent with the methodologic described utilized by Azadi and Dildy (2008),

researchers Wexelblatt et al. (2015) conducted a retrospective chart analysis of 2,956

mother-infant dyads delivering over 19 months after their institution adopted a universal

drug testing protocol to test every pregnant patient at delivery. Previously, the hospital

had employed a selective drug screening approach. (See the following ***Selective or***

***targeted screening approach*** section for typical protocol details.) Consistent with other

previously published maternal illicit substance use prevalence rates, 5.4 % of women in

this study tested had positive urine toxicology screens (Brauer, 2017; Wexelblatt et al.,

2015; Wood et al., 2016). However, statistical analysis indicated that 20% of mothers

with positive toxicology tests did not present with precipitating risk factors that would

have triggered the selective or targeted testing approach previously employed—missing

identification of both maternal and newborn patients that would benefit from treatment

and referral. Unlike the analysis conducted by Azadi and Dildy (2008), Wexelblatt et al.

(2015) did not specify whether maternal consent was obtained before testing.

Additional to these two studies conducted at individual hospitals, another

quantitative study surveyed all birthing hospitals in the state of Maryland regarding their

maternal and newborn illicit substance screening approaches (Miller et al., 2014). Miller et al. (2014) conducted a 25-item telephone survey of nurse managers and perinatal social workers and attained a 91% response rate with 31 hospitals completing the verbal questionnaire. Forty-five percent (*n*=14) of respondent hospitals employed universal maternal testing protocols, but only 7% universally tested newborn patients. Mothers were informed of the decision to test at 61% of hospitals in this sample, but only 32% of institutions obtained maternal consent before screening. Study findings suggest that mandated state reporting requirements in the absence of universal testing protocols discriminate against urban women using cocaine and heroin versus prescription opioids as healthcare personnel indiscriminately test certain pregnant subgroups (Miller et al., 2014). While this investigation examined institutional characteristics (e.g., hospital size and type, annual number of deliveries), patient demographics (e.g., payor source, race/ethnicity, or educational status) were not obtained, a limitation that could have more broadly informed the state of practice and whether other screening and/or reporting disparities existed (Miller et al., 2014).

Finally, a more dated report investigated drug testing practices at 49 Chicago area birthing hospitals (Birchfield et al., 1995). Only eight of the respondent institutions (16.3%) indicated the incorporation of universal testing protocols. These authors advocated that universal testing should be implemented in states with punitive actions for maternal substance use to avoid testing and reporting inequities. They advocated for the removal of punishment and fostering disclosure through supportive and therapeutic patient-provider relationships (Birchfield et al., 1995).

***Selective or targeted screening approach.*** Citing cost and institutional capacity concerns as deterrents to universal testing, some hospitals adopt selective or targeted drug screening approaches. Individual institutions identify maternal or newborn risk factors that trigger testing. In hospitals where selective screening is adopted, risk assessment should be executed with an objective assessment of medical and psychosocial criteria (Farst et al., 2011; Oral et al., 2012). The AAP endorses selective screening, suggesting individual hospitals consider adopting formal policies for both maternal and infant screens in an attempt to reduce variability in implementation, reduce bias, and comply with state law (Wood et al., 2017).

Five quantitative studies identified addressed selective screening protocols (Birchfield et al., 1995; Miller et al., 2014; Oral et al., 2012; Oral & Strang, 2006; Wood et al., 2017), three of which occurred in Iowa birthing hospitals (Oral et al., 2012; Oral & Strang, 2006; Wood et al., 2017). Three of these articles addressed newborn screening only, but the presence of maternal risk factors could also trigger newborn drug testing. In one Iowa-based study, Oral et al. (2012) conducted a retrospective chart review of mother-newborn dyads and divided the sample group into two cohorts. Group I consisted of 121 dyads, where every newborn received drug testing. Group II was comprised of 107 randomly selected dyads from every 25th delivery that did not receive testing. Between-group comparisons revealed Group I mothers were more likely to have Medicaid or lack health insurance, be of younger maternal age, have lower levels of educational attainment, be unmarried, and have unplanned pregnancies. A retrospective review of Group II revealed that 46.7% of newborns of mothers with documented risk factors that

should precipitate screening were not tested, while 35.5% of newborns with indicated

characteristics were not tested. Statistical analysis revealed that hospital staff biases

promoted more testing among single mothers with less than high school educations after

controlling for other covariates (Oral et al., 2012). All three Iowa-based studies

advocated incorporation of selective screening protocols, but only one study insisted that

implementation should be accompanied by staff trainings to ensure protocol fidelity and

ameliorate suboptimal practices that did not necessarily improve patient care (Oral et al.,

2012; Oral & Strang, 2006; Wood et al., 2017). Each of these studies was comprised of

homogenous populations, which could be cited as a limitation of these investigations.

In addition to the three Iowa-based studies, two other investigations surveyed

delivery hospitals in a mid-Atlantic state and a large, densely populated midwestern city.

In their statewide hospital survey, Miller et al. (2014) determined that 48% ($n = 15$) of

respondent Maryland institutions employed selective screening protocols. In their city-

wide sample of 49 Chicago birthing hospitals, Birchfield et al. (1995) did not explicitly

report the number of hospitals with selective screening protocols at the time of their

study, but did state that most hospitals (approximately 90% of respondent institutions)

screened based on risk factors or provider suspicion. In both articles, these authors warn

that selective perinatal drug testing protocols are often discretionary and inequitably

applied to patients, failing to detect some patients with substance use disorders while

reinforcing stigma, bias, and shame, among others. In addition to physical characteristics

or clinical diagnoses, some social indicators/determinants of health are cited as reasons to

test. Table 6 lists a sampling of maternal and newborn risk factors that trigger drug

testing, as reported in articles retrieved in this review.

Table 6

Risk Factors That Trigger Selective Drug Screening

| Maternal Risk Factors | Newborn Risk Factors |
|---|---|
| Reported history of illicit substance use | Signs of withdrawal or substance exposure |
| History of incarceration | Low birth weight |
| History of sex work | Fetal growth restriction |
| Intimate partner violence | Small head circumference |
| Multiparity with >3 live births | Prematurity < 37 weeks gestational age |
| CPS/DSS removal of children from the home | Congenital anomalies |
| Homelessness | |
| Significant mental illness | |
| Late entry to/insufficient prenatal care | |
| Tobacco use in pregnancy | |
| Alcohol use in pregnancy | |
| Depression | |
| Unexplained acute hypertension | |
| Unexplained stroke or myocardial infarction | |
| Placental abruption | |
| Precipitous labor < 3 hours | |
| Sexually transmitted infection | |
| Signs of withdrawal or active drug use | |
| Current medication-assisted therapy | |
| Self-pay | |
| Medicaid payment | |
| Social factors (low income, nationality or ethnicity, and/or place of residence) [*] | |

*Note.* [*]Birchfield et al. (1995) cite low income, nationality or ethnicity, and place of residence as reported precipitants triggering perinatal drug testing
(Birchfield et al., 1995; Oral & Strang, 2006; Wallman et al., 2011)

**Random testing triggered by clinician discretion or suspicion.** With wide

recognition that perinatal substance use and fetal exposures are sometimes overlooked,

literature increasingly addresses structured drug testing approaches rather than random

testing based on provider suspicion to better inform clinical practice (Wallman et al.,

2011; Wood et al., 2017). Additionally, traditional screening approaches relying on

clinical discretion could become less common as they are associated with lower rates of

drug testing and may not comply with states' legislative mandates (Wood et al., 2017).

None of the articles in this review were solely dedicated to a discussion of random

perinatal drug testing based on provider suspicion alone. However, four studies included

provider suspicion or clinical discretion as either a triggering factor in their selective

screening protocols or as an additional alternative testing rationale (Birchfield et al.,

1995; Miller et al., 2014; Oral & Strang, 2006; Wood et al., 2017). Of note, while 60% of

respondent Iowa institutions in one study conducted newborn drug testing based on

provider suspicion, 15% of those birthing hospitals reported policy that elected not to test

infants at all (Oral & Strang, 2006). Similarly, one Midwestern metropolitan hospital also

incorporated a hospital policy never to test (Birchfield et al., 1995). These authors never

discussed rationales for decisions not to test.

## Discussion

Recognition of the harmful consequences of fetal substance exposures has

prompted clinicians, hospital administrators, and policymakers to establish various

perinatal drug screening protocols to identify at-risk newborns. Despite well-intentioned

policy mandates that require identification, reporting, and safety planning for substance-

exposed infants, uniform guidelines or best practice recommendations for perinatal drug testing do not exist. Additionally, clinical considerations and legal consequences vary state to state, creating wide divergences in policy and practice. Although some states continue to criminalize maternal substance use in pregnancy, the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN), the American College of Nurse Midwives (ACNM), the American Psychiatric Association (APA), American Medical Association (AMA), AAP, and ACOG promote public health approaches encouraging treatment and referral rather than punitive policy stances (ACNM, 2018; AWHONN, 2015; House et al., 2016). Moreover, positive maternal or infant toxicology results present opportunities to address substance use with patients and offer brief intervention or treatment referral—affording the chance for recovery and improving infants' postnatal environment and successful family outcomes (Wood et al., 2017). Successful maternal treatment may also protect the patient's future pregnancies, reducing the incidence of neonatal substance exposures. Development of uniform testing strategies and best practice guidelines could ensure standardized implementation of perinatal drug testing protocols that encourage adherence to protocol fidelity, reduce testing and reporting disparities, and ensure optimal treatment for both mothers and their infants.

In addition to development of standardized perinatal drug testing protocols, attention must be given to the promotion of proper nomenclature in the literature in order to avoid confusion regarding screening or testing methods. Throughout the body of literature concerning illicit substance use among pregnant and parenting women, the terms *screening* and *testing* are often used interchangeably. Efforts must be made to

promote consistent use of the labels *screening* versus *testing*. *Screening* typically

involves inquiry with a reliable, validated verbal or written instrument regarding the

subject or condition of interest, and relies upon patients' willingness to disclose this

information. Conversely, *testing* involves the analysis of a biologic specimen to confirm

suspected findings diagnostically (e.g., illicit substance use [Polak et al., 2019]). While

the American College of Obstetricians and Gynecologists (ACOG) recommends

universally screening pregnant women for illicit substance use at the first prenatal visit

and intermittently throughout pregnancy, the organization explicitly cautions against

universal toxicology testing (ACOG, 2017). L&D nurses are frequently responsible for

verbally screening patients for illicit substance use as a component of their

comprehensive health history intake processes during perinatal hospital admissions.

Subsequently, patients endorsing illicit substance use are often subjected to confirmatory

toxicology testing for current or recent use. These stepwise testing procedures are

classified as selective or targeted *screening* protocols but should be renamed selective or

targeted *testing* protocols to offer consistency in practice and reduce confusion.

**Limitations**

Articles retrieved for this review demonstrated some robust survey methodologies

that could be cited as study strengths. All the survey studies reported high institutional

response rates ranging from 63%-98% (Birchfield et al., 1995; Miller et al., 2014; Oral &

Strang, 2006; Wood et al., 2017; Zellman et al., 2002). However, some study limitations

were also evident. As previously reported, research pertaining to perinatal drug screening

protocols is sparse and dated. Many of the studies cited in this review are historic

references stemming from concerns regarding maternal cocaine abuse in the 1990s, with fewer articles addressing the formulation or revision of protocols, despite the increased prevalence of maternal opioid use over the past 2 decades. Furthermore, many of these individual studies were comprised of homogenous populations (e.g., Iowa birthing hospitals) or metropolitan university hospitals and did not encompass large multistate regions to assess variations in clinical practice related to diverse demographics. A broader inquiry may help determine more current practices across a larger geographic region. Moreover, this review is comprised of articles published from cross-sectional studies—some of which are dated and do not reflect changes in substance use patterns, the prevalence of specific substances, or evolving federal or state legislation with differing drug detection or reporting mandates. Finally, rich qualitative data regarding nurses' perceptions of implementation and equitable application of hospital drug testing policies could further inform nursing practice.

**Implications for Nursing Practice**

Comprehension of perinatal drug testing options and components of sound drug testing policies are imperative for nurses—for those nurse managers responsible for protocol development and implementation, and the bedside nurses responsible for equitable application. Both AAP (2017) and ACOG (2015) caution against universal drug toxicology testing for pregnant women presenting in labor and many hospitals institute selective screening protocols. Risk factors triggering testing varies widely among facilities, and these testing criteria must be evidence-based with a sound rationale for policy inclusion. While substance use-related criteria (e.g., history of illicit substance use

or medication-assisted treatment) and obstetric risk factors (e.g., preterm labor, fetal demise) seem to be logical elements to trigger testing, psychosocial factors (e.g., homelessness, mental health diagnoses, or history of intimate partner violence) may be more closely associated with social determinants of health. Selective screening protocols that consist of these psychosocial factors may reinforce nurse biases regarding this marginalized and vulnerable population.

Robust perinatal drug screening policies must be reviewed and revised regularly. Protocols should be implemented with training provided for both obstetric providers and nursing staff to ensure policy compliance and equitable application. Furthermore, policies should address requisites for maternal consent, the timing of specimen collection, and reporting requirements for positive results. Instructions should include the proper collection of biologic assays for testing and the sensitivity and specificity of testing parameters. Positive toxicology results should be sent for confirmatory testing, and clinicians and nurses alike must understand that false positive results may be produced. Lastly, nurses are trusted members of obstetric teams who establish rapport with their patients. Often responsible for verbally screening pregnancy patients for substance use upon hospital admission, nurses should be prepared to discuss positive screens, patient resources, and refer for treatment as needed. Comprehensive knowledge of their hospitals' perinatal drug testing protocols is essential to educate patients and answer questions regarding their application and consequences for positive results. Toxicology testing performed without maternal knowledge or consent may disrupt this therapeutic alliance.

**Conclusion**

Finally, while recent federal legislation requires states to establish policies identifying substance-exposed newborns, lack of standard guidelines or uniform practice recommendations presents gaps in translation from policy to clinical practice (Wood et al., 2017). This literature review examines the types of drug screening protocols implemented by various institutions, whether these protocols contained policy components to ensure they were robust and equitably applied, and identifies risk factors that may precipitate testing in selective screening protocols. The results of this review confirm gaps in the translation of policy to clinical practice. Furthermore, while many hospitals employ selective screening protocols, evidence exists that these protocols are not implemented with fidelity, and provider and nurse bias may determine whether mothers and newborns are screened regardless of risk factors.

**CHAPTER VI**

**DISCUSSION**

The purpose of this study was to investigate the types of drug screening practices and policies employed by Labor and Delivery (L&D) units across the southeastern United States. This chapter includes a summary of the project, a discussion of pertinent findings and conclusions, how the intersectionality theoretical framework informed this work, and the strengths and limitations of the study. Implications for nursing practice and future research are also considered.

**Summary of the Project**

The purpose of this study was to investigate the types of drug screening practices and policies adopted by L&D units across the southeastern United States. This project explored (a) what drug screening protocols L&D units across the southeastern United States implement for women in labor; (b) whether adoption of selective drug testing protocols differ based on institution type, hospital size, or predominant payer source; (c) what maternal or newborn risk factors trigger drug testing on selective screening protocols; and (d) whether maternal and newborn risk factors that trigger testing differ based on hospital characteristics.

Two separate, complementary manuscripts were included in this dissertation. The first manuscript describes an outcomes project that surveyed L&D administrative personnel regarding perinatal drug testing policies adopted at their institutions.

Additionally, an integrative literature review manuscript explored the various types of perinatal substance use screening protocols, whether guidance on best practices or approaches were available, and identified typical maternal or newborn risk factors that precipitated drug testing. This dissertation was guided by an intersectional theoretical framework to examine whether perinatal selective drug screening protocols serve as a form of structural discrimination that marginalizes pregnant women of color, low social location, or with illicit substance use.

Based on the survey employed for this dissertation and substantiated by the integrative literature review, hospitals most frequently adopted selective drug testing policies. Current illicit substance use, past history of drug use, or medication-assisted treatment (e.g., methadone or buprenorphine) most frequently triggered drug testing. Some selective drug testing protocols also included other obstetrical or behavioral risk factors as criteria for testing. In this outcomes study, there were no differences in institution type, hospital size, or predominant payor sources for L&D adoption of selective drug testing protocols. Risk factors triggering testing on selective protocols did not differ based on these hospital characteristics.

## Discussion of Findings

While this investigation did not find evidence of structural discrimination in selective or targeted perinatal drug screening policies, personnel responsible for policy formulation should thoughtfully consider which inclusion criteria trigger testing. Most survey participants reported that their institutions' selective screening policies contained a current or past history of illicit substance use as risk factors to prompt toxicology

testing. This finding seems to be a reasonable rationale for testing, as current use increases the risk of neonatal abstinence syndrome and literature demonstrates that substance users often underreport frequency and/or timing of last use (Garg et al., 2016). Less than half of respondents indicated that obstetrical risk factors sometimes associated with maternal substance use (e.g., preterm labor, placental abruption, fetal growth restriction) comprised criteria to test (Maeda et al., 2014; Sharpe & Kuschel, 2004). While only 10% of respondents reported psychosocial factors that triggered testing (e.g., homelessness or unstable housing, history of intimate partner violence), consideration must be given to whether these circumstances are more closely associated with these women's social determinants of health than a propensity for illicit substance use. Toxicology testing these women could further exacerbate health inequities rather than remediate them. Care must be taken to prevent the further marginalization of these vulnerable women. Dasgupta et al. (2018) assert that rigid, long-standing practices of prescription drug monitoring, toxicology testing, and narcotic contracts for pregnant women using illicit substances may perpetuate their perceptions of inequity. Instead, access to evidence-based strategies such as medication-assisted treatment, increasing the number of providers waivered to prescribe buprenorphine, and Medicaid expansion could encourage these patients to seek safe, effective treatment.

In addition to thoughtful consideration of selective screening protocol inclusion criteria, attention must be given to the promotion of proper nomenclature in the literature in order to avoid confusion regarding screening or testing methods. Throughout the body of literature concerning illicit substance use among pregnant and parenting women, the

terms *screening* and *testing* are often used interchangeably. Efforts must be made to promote consistent use of the labels *screening* versus *testing*. *Screening* typically involves inquiry with a reliable, validated verbal or written instrument regarding the subject or condition of interest, and relies upon patients' willingness to disclose this information. Conversely, *testing* involves the analysis of a biologic specimen to confirm suspected findings diagnostically (e.g., illicit substance use [Polak et al., 2019]). While the American College of Obstetricians and Gynecologists (ACOG) recommends universally screening pregnant women for illicit substance use at the first prenatal visit and intermittently throughout pregnancy, the organization explicitly cautions against universal toxicology testing (ACOG, 2017). L&D nurses are frequently responsible for verbally screening patients for illicit substance use as a component of their comprehensive health history intake processes during perinatal hospital admissions. Subsequently, patients endorsing illicit substance use are often subjected to confirmatory toxicology testing for current or recent use. These stepwise testing procedures are classified as selective or targeted *screening* protocols but should be renamed selective or targeted *testing* protocols to offer consistency in practice and reduce confusion.

In addition to these inconsistencies in terminology, the integrative literature review revealed three other key concepts. First, literature promotes the development of standardized hospital protocols as an effective means for establishing operational processes to reduce variability or drift in clinical practice, improving the quality of patient care, and containing escalating healthcare costs (Zellman et al., 2002). Hospital personnel responsible for policy formation must formulate evidence-based protocols

while considering unintended consequences that may exacerbate inequities. Second,

hospital administrators must devise robust implementation strategies that effectively

communicate new or revised policies to healthcare providers and nursing staff. Nurse

leaders are obligated to ensure that staff is well trained, both in protocol components and

implicit bias training to increase awareness and ensure policies are equitably applied.

Third, ethical principle dictates that maternal consent be obtained before toxicology

testing (ACOG, 2015). Clinical practice should shift from merely informing women of

drug testing, either before testing or after toxicology results received. Obtaining maternal

consent before testing provides that patient with the opportunity to disclose use, and

promotes shared decision-making and her sense of agency as a partner in her healthcare.

Finally, gaps in translations from public policy to clinical practice persist (House

et al., 2016). While some states (e.g., Alabama, Mississippi, Tennessee) have passed

legislation criminalizing illicit substance use in pregnancy, other states have embraced

public health approaches intended to identify newborns with substance exposures to offer

effective treatment to mothers and/or infants and optimize outcomes. House et al. (2016)

assert that "legislators' actions may be influenced by factors related to personal beliefs,

public opinion, economic pressures, and the feasibility of implementing

recommendations made by experts" (p. 1079). Conversely, public health professionals

and healthcare providers rely on evidence-based literature to inform clinical practice.

Regardless of individual states' punitive or public health approach, the *Keeping Infants*

*and Families Safe Act* (U.S. Congress, 2003) stipulates that the receipt of some federal

funds are contingent upon the development of plans to identify, treat, and refer cases of

neonatal illicit substance exposures to Child Protective Services (CPS) or the Department of Social Services (DSS). National guidelines or best practice recommendations to standardize perinatal selective or targeted drug testing protocols are needed to decrease disparities in translation from policy to practice. Availability of standardized testing protocols would assist hospital policymakers in the adoption of sound practices that do not increase stigma, disproportionately test minority women of color or low social location, or exacerbate health inequities.

## Intersectionality

When considering intersectionality and how this dissertation research was informed by this theoretical framework, the author revisited the three central tenets of intersectionality: (a) social categorizations (e.g., race, ethnicity, class, or position) are flexible, not rigid or fixed; (b) power dynamics develop that advantage the dominant group, and often marginalize the minority; and (c) simultaneity of all social categorizations are not merely additive or multiplicative. Specifically, this dissertation examined the second principle regarding power dynamics that advantage the dominant group and often marginalize the minority. In healthcare, nurses and other clinicians are often charged with developing well-intentioned policies that attempt to streamline or standardize processes and/or improve health outcomes. Regarding perinatal hospital drug testing policies, especially selective drug testing protocols, we must ensure that haphazard application of these policies does not exacerbated health inequities or further stigmatize substance use.

This intersectional framework provides a broad brush with which to vividly paint quantitative research. When considering social categorizations, the term *social location* offers an expansive, multidimensional view of a woman's placement in her community as well as her social determinants of health—more so than discrete, singular indicators of socioeconomic status, education, race, or gender. Finally, this author envisions a future research trajectory positioned at the intersection of maternal-child health, social justice, and health equity.

## Limitations

Time and diligence were spent constructing the database of southeastern hospitals with L&D units, L&D nurse managers' names, and their preferred email addresses. One contact person and their corresponding email was elicited per institution. Telephone calls to these nurse managers to obtain their email address often provided an opportunity to speak with these potential study participants to explain the project purpose and garner support.  Despite this robust purposive sampling technique, one limitation of this outcomes investigation was the low survey response rate of 16.8%. Research suggests that web-based survey response rates among nurses and other healthcare professionals are declining, typically yielding rates less than 20% (Chizawsky et al., 2011). This Qualtrics survey produced similar results.

While it is difficult to ascertain reasons for poor survey response rates, one confounding factor in this investigation may be attributed to problems with initial survey deployment. In the 3 days preceding planned distribution, multiple test preview emails were sent to test access and feasibility to three known colleagues who were not

participating in the project. Each of these email addresses included either university domain names (e.g., wcu.edu, uncg.edu) or other widely used domains (gmail.com). Each of these users accessed and navigated the survey without difficulty. On Wednesday, September 11th at 10:00 a.m., Qualtrics deployed the survey questionnaire to 313 nurse managers to work email addresses at their associated institutions. Forty-eight surveys were immediately blocked and/or "bounced" from delivery. Over the next few hours, two other survey recipients emailed the investigator to report that while they had received the survey invitation email, piped text with the embedded survey link was inactivated, prohibiting access to the survey tool. Some hospital internet firewalls prohibited the delivery of many survey invitations or quarantined the invitation in a protective email cache pending recipient acceptance.

Over the next 9 days, the intended recipients of these bounced emails were called, and attempts were made to either collect alternative email addresses or have intended recipients email the investigator, thereby signaling to their hospital internet security firewalls that the survey invitation was not spam. Meanwhile, UNCG internet technology (IT) technicians investigated the incident to determine possible remedies. Several individual hospital IT departments were notified, and in three instances survey email access delivered secondary to these efforts. IRB approval was obtained to send the survey invitation via an university email address in an attempt to navigate through hospital IT firewalls, eluding stringent firewalls blocking Qualtrics delivered messages as spam emails. The survey invitation was then sent from a university email account. Although

the survey invitation was intended to be delivered to 313 prospective institutions, it is unknown how many invitation emails were actually received and not quarantined.

The low survey response rate required a revised statistical analysis plan. The initial plan was to utilize a binomial logistic regression to address Research Question 2. Logistic regression requires large sample sizes to achieve adequate power. At survey close the number of responses was calculated, and after statistical consultation plans for logistic regression were abandoned, bivariate analyses were performed to determine whether adoption of selective drug screening protocols differed based on predominant payor source, hospital size, or institution type. One other limitation of this investigation is the cross-sectional study design, as hospital policy and best clinical practices are constantly changing and evolving.

Similarly, some hospitals had either closed their L&D units or replaced nurse managers or Women's Services Directors in the weeks between the collection of contact data and survey deployment. Finally, despite efforts to thoughtfully word survey questions to minimize social desirability bias or acquiescence, it is difficult to measure whether such participant biases confounded the study results. It is impossible to quantify the number of survey recipients who did not perceive illicit substance use to impact their patient population significantly, and in turn chose not to respond to the survey invitation.

### Implications for Nursing Practice

Nurse leaders and administrators serve on committees responsible for the formulation and implementation of unit-based drug testing protocols. Bedside nurses are charged with the application of these policies for their individual patients meeting

selected criteria. Nurses must be familiar with every policy component (e.g., criteria for testing, obtaining maternal consent, specimen collection and timing of test, reporting of positive results, and referral to treatment as appropriate) and apply their institution's chosen protocol with fidelity across populations.

Nurses must recognize their own implicit biases to avoid perpetuating lower thresholds to test women based on race, ethnicity, marital status, or social location (Kohsman, 2016). Additionally, nurses need not only to familiarize themselves with their own specific nursing association (e.g., ACNM, AWHONN) opinions and policy statements, but also be aware of those expressed by other obstetric and neonatal organizations (e.g., ACOG, AAP). Nurses must understand their duty to report positive toxicology tests to the ordering obstetric provider, neonatal care team, and appropriate hospital personnel responsible for communicating these results to CPS or DSS. Lastly, obstetric providers and nurses must consider the inherent complexities of interpreting and communicating results and the potential consequences or maternal use, especially in states enforcing punitive legal actions for pregnant and parenting women with substance use disorders.

In addition to these practical duties related to standard patient care, nurses must recognize the ethical implications of drug testing pregnant patients. Robust perinatal hospital drug testing protocols should have three ethical goals: (a) identify pregnant patients with substance use disorders for referral for treatment to improve their health outcomes and decrease substance exposures in future pregnancies; (b) facilitate observation and treatment for substance-exposed newborns, both in the immediate

neonatal period and early childhood development; and (c) reduce random profiling and

discrimination based on unsubstantiated or disproven risk factors related to demographic

characteristics or other social determinants of health (Kohsman, 2016). Ethical

considerations also dictate obtaining maternal consent before testing as best practice

standard (ACOG, 2015). Adherence to established perinatal drug testing protocols forces

nurses to examine and reconcile their own personal beliefs regarding maternal substance

use and fetal exposures, including patient autonomy and decision-making, assignment of

fetal personhood, and substance use as a chronic illness rather than a poor choice or

flawed personal behavior.

## Future Research

This descriptive quantitative research informs the current state of the science, the

first project to measure frequency with which selective or targeted drug testing or

universal testing protocols are employed. By examining what maternal or obstetric risk

factors are included in selective testing protocols, future research could determine how

closely associated these risk factors are to illicit drug use, with particular scrutiny paid to

those factors closely associated with psychosocial characteristics more closely aligned

with social determinants of health (e.g., late entry to prenatal care, homelessness or

unstable housing, intimate partner violence). Retrospective chart audits of hospital health

systems databases that have adopted selective drug testing protocols could assess the

fidelity with which maternal toxicology tests were obtained for women across

populations, including privately-insured patients or women with higher educational

attainment or social location. Conversely, a systematic literature review of publications

examining whether selective testing protocols disproportionately discriminate against women of color of low social location has not been undertaken. Additionally, focus groups and interviews of L&D nurses applying their institutions' drug testing protocol and/or pregnant women affected by those policies could provide rich qualitative data regarding perceptions, beliefs, barriers, and consequences of these maternal drug testing protocols. Lastly, current research explores the costs of caring for pregnant women with illicit substance use and infants with in-utero exposures (Whiteman et al., 2014). Research examining costs and cost-effectiveness of universal and targeted drug testing protocols would be beneficial. Similar studies have been conducted for maternal alcohol use and could also be applied to illicit substances, yielding more cost-effective policies and promoting less discriminatory practices (Gifford et al., 2010).

### Conclusion

With the current opioid crisis, national attention directed toward illicit substance use has overshadowed larger, more complex societal problems such as poverty, housing instability or homelessness—upstream factors that instigate or exacerbate illicit substance use (Birchfield et al., 1995). Navigating the complexities of public policy, economic considerations, and social determinants often complicates good clinical practice (Dasgupta et al., 2018). Equitable, evidence-based standardized perinatal hospital drug testing protocols must be developed to ensure quality access to care for all pregnant women while not exacerbating health inequities or disproportionately affecting women of color or low social location.

Nurses and other healthcare providers must recognize the intersection of pregnant and parenting women's circumstances as both mothers and patients with substance use disorders who are marginalized and have difficulty accessing quality healthcare. Nursing is recognized as the most honest and ethical profession, and nurses must ensure that these patients' vulnerable voices are heard (American Nurses Association, 2020). In congruence with an intersectional framework, nurses must ensure multilevel power dynamics do not solely advantage the dominant social group benefitting from greater availability and access to resources. If these dynamic power relationships persist, their dominant group perspective becomes entrenched while pregnant women with substance use disorders become more marginalized—their social positions and perspectives even more undervalued and vulnerable.

In conclusion, social or structural factors that impact pregnant women using illicit substances are the prejudice and stigma encountered either in their communities or by their health care providers. Despite evidence that substance use disorders have biologic and physiologic origins and should be treated as a chronic disease, many perceive substance use as a poor choice or bad behavior (Morse, 2018). While illicit substance use alone may be derided and stigmatized, pregnant women with substance use disorders often ensure harsher scrutiny, bias, and shame. As Kohsman (2016) so eloquently states, "substance abusers are women who have an addiction disorder (a chronic disorder) who happen to be pregnant—not women who are pregnant who happen to have an addiction" (p. 269). Punitive policies that perpetuate stigma and shame of pregnant and parenting

women with substance use disorders deters those women from seeking prenatal care,

contributing to adverse maternal and neonatal outcomes.

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# APPENDIX A

## STATE POLICIES ON SUBSTANCE USE DURING PREGNANCY

| State | Substance Use During Pregnancy Considered | | When Drug Use Diagnosed or Suspected, State Requires | | Drug Treatment for Pregnant Women | | |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| | Child Abuse | Grounds for Civil Commitment | Reporting | Testing | Targeted Program Created | Pregnant Women Given Priority Access in General Programs | Pregnant Women Protected from Discrimination in Publicly Funded Programs |
| AL | X | | | | | X | X |
| AK | | | X | | | | |
| AZ | X | | X | | | X | |
| AR | X | | X | | X | X | |
| CA | | | X | | X | | |
| CO | X | | X | | X | | |
| CT | | | | | X | | |
| DE | | | | | | X | |
| DC | X | | X | | | X | |
| FL | X | | | | X | | X |

| State | Substance Use During Pregnancy Considered | | When Drug Use Diagnosed or Suspected, State Requires | | | Drug Treatment for Pregnant Women | |
| | Child Abuse | Grounds for Civil Commitment | Reporting | Testing | Targeted Program Created | Pregnant Women Given Priority Access in General Programs | Pregnant Women Protected from Discrimination in Publicly Funded Programs |
|---|---|---|---|---|---|---|---|
| GA | | | | | | X | |
| IL | X | | X | | X | X | X |
| IN | X | | | X | X | | |
| IA | X | | X | X | | X | X |
| KS | | | | | | X | X |
| KY | X | | X | X | X | X | X |
| LA | X | | X | X | | | |
| ME | | | X | | | X | |
| MD | | | | | X | | |
| MA | | | X | | | | |
| MI | | | X | | | | |
| MN | X | X | X | X | X | | |
| MO | X | | | | | X | X |

| State | Substance Use During Pregnancy Considered | | When Drug Use Diagnosed or Suspected, State Requires | | Drug Treatment for Pregnant Women | | |
| | Child Abuse | Grounds for Civil Commitment | Reporting | Testing | Targeted Program Created | Pregnant Women Given Priority Access in General Programs | Pregnant Women Protected from Discrimination in Publicly Funded Programs |
|---|---|---|---|---|---|---|---|
| MT | | | X | | | | |
| NE | | | | | | | |
| NV | X | | X | | | | |
| NY | | | | | X | | |
| NC | | | | | X | | |
| ND | X | | X | X | | | |
| OH | X | | X | | X | X | X |
| OK | | | X | | | X | X |
| OR | | | | | | | |
| PA | | | X | | X | | |
| RI | X | | X | X | | | |
| SC | X | | | | X | | |
| SD | X | X | X | X | | | |

| State | Substance Use During Pregnancy Considered | | When Drug Use Diagnosed or Suspected, State Requires | | Drug Treatment for Pregnant Women | | |
| | Child Abuse | Grounds for Civil Commitment | Reporting | Testing | Targeted Program Created | Pregnant Women Given Priority Access in General Programs | Pregnant Women Protected from Discrimination in Publicly Funded Programs |
|---|---|---|---|---|---|---|---|
| TN | | | | | X | X | X |
| TX | X | | | | | | |
| UT | X | | X | | | X | |
| VA | X | | X | | X | | |
| WA | X | | | | X | | |
| WV | | | | | | X | |
| WI | X | X | X | | X | X | |
| Total | 23 | 3 | 24+DC | 8 | 19 | 17+DC | 10 |

*Note.* Source: Guttmacher Institute. (2018). Substance use during pregnancy. Retrieved from https://www.guttmacher.org/state-policy/explore/substance-use-during-pregnancy

QUANTITATIVE STUDIES REGARDING PERINATAL SUBSTANCE USE SCREENING POLICIES

| Reference | Year Published | Type of Study/Study Design | Setting | Key Findings |
|---|---|---|---|---|
| Wood, K., Smith, P., Krasowski, M. (2017). Newborn drug testing practices in Iowa birthing hospitals. *Journal of Neonatal-Perinatal Medicine, 10,* 445–450. | 2017 | Cross-sectional survey<br><br>14 question electronic survey with 90.8% response rate (69 of 76 hospitals completed the survey) | Iowa birthing hospitals | Recently passed federal legislation requires states to establish policies identifying substance exposed newborns, but lack of standard guidelines or practice recommendations present gaps in translation from policy to practice<br><br>None of the hospitals surveyed employed universal screening; instead, a risk assessment tool or provider discretion triggered screening<br><br>Hospitals with higher Medicaid populations tended to screen more newborns<br><br>Of the respondent hospitals, 37.3% used a risk assessment tool, 10.4% relied upon provider discretion, and 52.2% utilized both mechanisms to initiate newborn toxicology screening |
| Wexelblatt et al. (2015). Identifying opioid-exposed infants: Universal drug testing in moms. *Journal of Pediatrics, 166*(3), 582–586. | 2015 | Retrospective cohort study involving chart review of a convenience sample of 2,956 mother-infant dyads | Cincinnati Children's Hospital | 5.4% of women tested had positive toxicology screens<br><br>Maternal risk factors on the hospital's previous selective screening protocol were absent in 20% of the women who tested positive for opioids, indicating that these women would have been missed/lost on previous testing protocols. |
| Miller, K., Lanham, A., Welsh, C., Ramanadhan, S., & Terplan, M. (2014). | 2014 | 25-item telephone survey of nurse managers and perinatal social workers | Maryland birthing hospitals | Drug screening and testing was categorized as universal, risk factor based, or random |

| Reference | Year Published | Type of Study/Study Design | Setting | Key Findings |
|---|---|---|---|---|
| Screening, testing, and reporting for drug and alcohol use on labor and delivery: A survey of Maryland birthing hospitals. *Social Work in Health Care, 53,* 659–669. | | 91% (*n*=31) response rate | | While all hospitals reported screening for illicit substance use, few used a validated screening instrument<br><br>45% (*n*=14) of hospitals reported universal maternal testing for illicit substance use, but only 7% universally tested newborns<br><br>61% of hospitals surveyed reported that mothers were informed of illicit drug testing, but only 32% obtained maternal consent before testing<br><br>Risk factor-based drug testing is discretionary and fails to detect many patients with substance use disorders while reinforcing stigma, bias, and shame |
| Oral, R., Koc, F., Bayman, E. O., Assad, A., Austin, A., Strang, T., & Bayman, L. (2012). Perinatal illicit drug screening practices in mother-newborn dyads at a university hospital serving rural/semi-urban communities: Translation of research to quality improvement. *The Journal of Maternal-Fetal & Neonatal Medicine, 25*(11), 2441–2446. | 2012 | Retrospective chart review of mother-newborn dyads<br><br>Sample divided into 2 groups: Group 1 consisted of 121 dyads with every newborn receiving testing. Group 2 was comprised of 107 dyads that did not receive testing enrolled by random selection from every 25th delivery that did not qualify for Group 1 | University of Iowa Hospitals & Clinics | There were no dedicated electronic health record fields for hospital personnel to enter certain risk factors associated with maternal substance use: history of maternal sex work, discovery of drug paraphernalia, initial pregnancy denial, repeated parental placement in foster care as a child, parental incarceration, and prior fetal demise.<br><br>Between group comparisons revealed that Group 1 consisted of more women with Medicaid or lack of insurance, lower maternal age and less education, unmarried status, and unplanned pregnancy<br><br>In Group 2, 46.7% of newborns of women with documented risk factors were not tested for illicit substances, while 35.5% of newborns were not tested despite presence of qualifying risk factors that should have triggered testing in the hospital's selective screening protocol |

| Reference | Year Published | Type of Study/Study Design | Setting | Key Findings |
|---|---|---|---|---|
| Azadi, A., & Dildy, G. A. (2008). Universal screening for substance abuse at the time of parturition. *American Journal of Obstetrics & Gynecology, 198*(5), e30–32. | 2008 | Retrospective analysis of universal urine toxicology screening<br><br>Sample size comprised of 462 women admitted for delivery | LSU obstetric service at University Hospital in New Orleans, LA | Of women admitted in labor, 90% had urine drug testing obtained. Of those women, 19% screened positive for one or more illicit substances<br><br>THC was the most common substance detected by screens with 17.2% of patients testing positive for use. Benzodiazepines were detected in 5.7% of patients, and 3.1% of tests indicated cocaine use. Opiates rates were 2.6%.<br><br>Women using illicit substances were older and of higher parity |
| Oral, R., & Strang, T. (2006). Neonatal illicit drug screening practices in Iowa: The impact of utilization of a structured screening protocol. *Journal of Perinatology, 26,* 660–666. | 2006 | Cross-sectional survey design consisting of initial phone interview and subsequent mailed survey<br><br>53 of 81 Iowa birthing hospitals participated in the survey, yielding a 65% response rate | Iowa birthing hospitals | Both screening rates and numbers of positive toxicology reports were higher in institutions that implemented a structured screening protocol (10.9% of the population screened and 0.9% tested positive) than those that did not (2.1% screened and 0.2% tested positive).<br><br>25% of respondent hospitals had structured substance screening protocols, 60% of hospitals tested newborns randomly based on provider discretion, and 15% of survey respondents did not test infants at all<br><br>Regional standardization of screening protocols may improve recognition of substance exposed newborns and more optimal coordination of treatment. |
| Zellman, G., Fair, C. C., Houbé, J., & Wong, M. (2002). A search for guidance: Examining prenatal substance | 2002 | Cross-sectional survey<br><br>Convenience sample of 510 of 806 hospitals returned | Birthing hospitals across the United States | Key components of sound protocols include identification of originating agency, department, or committee creating policies, draft date and timetable for revision/review, and outline reporting and communication guidelines between |

| Reference | Year Published | Type of Study/Study Design | Setting | Key Findings |
|---|---|---|---|---|
| exposure protocols. *Maternal and Child Health Journal, 6*(3), 205–212. | | completed survey, yielding a 63% response rate<br><br>Only 166 of the 510 respondent hospitals reported prenatal substance screening protocols in place. | | departments. Effective prenatal substance exposure protocols should include maternal and newborn factors that trigger testing, guidelines for consent, identify whether provider order is necessary to initiate testing, screening method or biologic source, and appropriate intervals at which to screen.<br><br>Of respondent hospitals, only 15.5% required discussion with mothers before testing, and 59.2% of protocols did not address the issue of consent. Only 11.3% of protocols addressed discussion of newborn testing with mothers while 71.8% of protocols did not address the issue of consent for newborn testing<br><br>85% of hospital protocols did not delineate rules for notification of key healthcare personnel regarding positive toxicology results, and only 1% of policies mandated that the obstetric provider be informed of positive tests<br><br>Protocols addressed newborn screening more often than maternal testing<br><br>Researchers were surprised by the small number of protocols in place, and many of the policies reviewed were poorly drafted |
| Birchfield, M., Scully, J., & Handler, A. (1995). Perinatal screening for illicit drugs: Policies in hospitals in a large metropolitan area. | 1995 | Cross-sectional survey<br><br>49 of 50 eligible hospitals participated in the survey, garnering a 97% response rate | 49 Chicago-area hospitals | 8 hospitals reported universal drug testing policies in either the prenatal or labor & delivery unit<br><br>One hospital incorporated policy never to test |

| Reference | Year Published | Type of Study/Study Design | Setting | Key Findings |
|---|---|---|---|---|
| *Journal of Perinatology, 15*(3), 208–214. | | Respondents were interviewed via initial phone interview and follow-up mail survey. | | For other hospitals with either selective screening policies or testing based on provider suspicion, respondents reported the most frequent criteria for testing on L&D included maternal admission of illicit drug use (98%) and mother testing positive for HIV or other sexually transmitted infections (75%), and provider suspicion (70%). |

# APPENDIX C

## LABOR AND DELIVERY DRUG SCREENING PRACTICES SURVEY

### Labor & Delivery Drug Screening Practices

Q1   Click the link below to enter the survey.

Survey link (1)

Q2   Does your hospital have a Labor & Delivery unit?

○ Yes (1)

○ No (2)

Q3   If No selected→Thank you for your consideration. You are not eligible to complete this survey.

Q4   Name of survey respondent and contact information (optional)

---

Q5   What are your credentials?

○ RN (1)

○ CNM (2)

○ MD (3)

○ LCSW (4)

○ Other—please provide (5)

Q6   Name of affiliated hospital (optional)

---

Q7 State in which your hospital is located:

○ Alabama (1)

○ Florida (2)

○ Georgia (3)

○ Mississippi (4)

○ North Carolina (5)

○ South Carolina (6)

○ Tennessee (7)

○ Other (8)

Q8 What type of facility is your institution? Please check all that apply.

☐ Tertiary care center (1)

☐ Community hospital (2)

☐ Academic center/residency education (3)

☐ Private hospital (4)

☐ Military hospital (5)

☐ Not-for-profit facility (6)

☐ State hospital (7)

☐ Federal facility (8)

☐ Birth center (9)

☐ Other—please provide (10) _____

Q9    How many patient beds does your facility have? If unsure, please give best approximate guess.

_____

Q10  How many beds does the L&D unit have? If unsure, please give best approximate guess.

_____

Q11  How many births did your hospital have last year? If unsure, please give best approximate guess.

   ○ Less than 100 births/yr (1)

   ○ 101-500 births/yr (2)

   ○ 501-1,000 births/yr (3)

   ○ 1,001-1,500 births/yr (4)

   ○ 1,501-2,000 births/yr (5)

   ○ 2,001- 2,500 births/yr (6)

   ○ Greater than 2,500 births/yr (7)

Q12  Does your facility have a Level 3 or 4 NICU?

   ○ Yes (1)

   ○ No (2)

Q13  Please report approximate race/ethnicity demographic statistics of patient population served on the unit by selecting the closest match:

|  | 0-20% (1) | 21-40% (2) | 41-60% (3) | 61-80% (4) | 81-100% (5) |
|---|---|---|---|---|---|
| White (1) | ○ | ○ | ○ | ○ | ○ |
| Black or African American (2) | ○ | ○ | ○ | ○ | ○ |
| American Indian or Alaska Native (3) | ○ | ○ | ○ | ○ | ○ |

|  | 0-20% (1) | 21-40% (2) | 41-60% (3) | 61-80% (4) | 81-100% (5) |
|---|---|---|---|---|---|
| Hispanic or Latinx (4) | O | O | O | O | O |
| Asian (5) | O | O | O | O | O |
| Native Hawaiian or Pacific Islander (6) | O | O | O | O | O |
| Other (7) | O | O | O | O | O |

Q14 What is the predominant payer source for patients on your Labor & Delivery unit?

O Medicaid (1)

O Private insurance (2)

O Cash pay (3)

O Charity care (4)

O Other (5) _____

Q15 Please report approximate payer source statistics of patient population on the Labor & Delivery unit by selecting the closest match. If unsure of exact percentages, please give best approximate guess.

|  | 0-20% (1) | 21-40% (2) | 41-60% (3) | 61-80% (4) | 81-100% (5) |
|---|---|---|---|---|---|
| Medicaid (1) | O | O | O | O | O |
| Private insurance (2) | O | O | O | O | O |
| Cash/self-pay (3) | O | O | O | O | O |
| Charity care (4) | O | O | O | O | O |
| Other (5) | O | O | O | O | O |

Q16 Does your Labor & Delivery unit have a policy regarding urine drug screens for women presenting in labor?

O Yes (1)

O No (2)

Q17 Is this a formal written policy/protocol or is it a verbal communication?

    ○ Formal, written policy/protocol exists and may be referenced if needed (1)

    ○ Verbal communication. There is no written protocol, but drug testing may be performed if needed (2)

    ○ Neither of these apply (3)

    ○ Other—please provide explanation (4)

Q18 If maternal urine drug tests are performed, is patient consent obtained prior to the analysis?

    ○ Always (1)

    ○ Most of the time (2)

    ○ About half the time (3)

    ○ Sometimes (4)

    ○ Never (5)

Q19 If maternal consent is obtained prior to collection and/or processing of drug tests, is consent verbal or written?

    ○ Consent is implied when patients sign general consent for treatment upon hospital admission (1)

    ○ Separate verbal consent/agreement for drug testing is obtained (2)

    ○ Separate signed maternal consent form for drug testing is obtained (3)

    ○ Consent is not obtained prior to collection or processing of maternal urine drug screens (4)

    ○ Other--please provide explanation (5) _____

Q20  If a woman has a positive urine drug test, is she notified of the positive result?

   ○  Always (1)

   ○  Most of the time (2)

   ○  About half the time (3)

   ○  Sometimes (4)

   ○  Never (5)

Q21  If a woman has a positive urine drug test, is confirmatory testing performed?

   ○  Always (1)

   ○  Most of the time (2)

   ○  About half the time (3)

   ○  Sometimes (4)

   ○  Never (5)

Q22  Are mothers with positive drug tests upon delivery admission offered referral for drug treatment or other assistance?

   ○  Always (1)

   ○  Most of the time (2)

   ○  About half the time (3)

   ○  Sometimes (4)

   ○  Never (5)

Q23  Is a physician, certified nurse-midwife, or other healthcare provider order required before maternal drug testing is performed?

   ○  Yes, provider order is required to initiate maternal drug testing (1)

   ○  No, RN may initiate maternal drug testing without an order (2)

○ Other—please provide explanation (3): _____

_____

Q24  Are drug tests ordered at nurse or provider discretion based on clinical suspicion?

○  Yes (1)

○  No (2)

Q25  Does your unit utilize universal urine drug testing for all patients presenting in labor, selective testing (only if patients meet certain criteria), or random testing based on provider discretion?

○  Universal drug screening—every mother has urine drug screen obtained upon presentation of labor. (1)

○  Selective/targeted criteria used—only mothers who meet certain criteria determined by the hospital have urine drug screening performed. (2)

○  Random—drug screen is obtained only per discretion of the RN or healthcare provider based on clinical suspicion. (3)

○  No formal drug screening policy exists. (4)

○  Other—please provide explanation (5): _____

_____

Q26  If selective/targeted criteria (if mothers meet certain criteria determined by the hospital, then urine drug screening is performed) is used, what criteria prompt testing? Please check all that apply.

☐  Any past history of substance use prior to pregnancy (1)

☐  Any substance use during current pregnancy (2)

☐  Methadone, Suboxone, or Subutex medication-assisted therapy (3)

☐  Mother appears chemically altered--either drunk or high upon arrival to hospital (4)

☐  No prenatal care (5)

☐ Late entry, insufficient, or lapse in prenatal care (6)

☐ History of domestic or intimate partner violence (7)

☐ Mental illness or other behavioral health diagnosis (8)

☐ Homelessness or unstable housing (9)

☐ Placental abruption (10)

☐ Fetal growth restriction (11)

☐ Preterm labor (12)

☐ Infant admission to NICU (13)

☐ Other--please provide explanation (14)

Q27 Does your hospital provide any sort of training or in-service regarding your maternal drug screening/testing protocol? Please select all that apply.

☐ The nursing staff receives formal training regarding maternal drug testing policies (1)

☐ The medical staff (MDs, CNMs, or other healthcare providers with ordering privileges) receives formal training regarding maternal drug testing policies (2)

☐ Written communication notifies nursing or medical staff of these policies with instruction for use (e.g., email, notification board, or other modes of communication) (3)

☐ No formal in-service/training or written communication is given (4)

☐ My hospital does not have a formal/written maternal drug screening protocol (5)

Q28 Does NICU admission prompt toxicology testing?

○ Yes (1)

○ No (2)

Q29 If NICU admission does prompt toxicology screening, which patient is tested?

○ Mother (1)

○ Infant (2)

○ Both (3)

Q30 If mothers are tested for drug use, what type of screening is performed? Please check all that apply.

☐ Blood (1)

☐ Urine (2)

☐ Hair (3)

☐ Mother is not tested (4)

☐ Other--please provide explanation (5): _____

_____

Q31 If infant is tested, what type of screening is performed? Please check all that apply.

☐ Urine (1)

☐ Meconium (2)

☐ Cord toxicology (3)

☐ Infant is not tested (4)

☐ Other—please provide explanation (5): _____

_____

Q32 If your institution has a formal maternal drug screening/testing policy, what were factors motivating development of this policy? Please check all that apply.

☐ Evidence of effects of neonatal abstinence syndrome (NAS) or other poor neonatal outcomes (1)

☐ Perceived mandate by local, state, or national legislation (2)

☐ Desire to develop community practice standard (3)

☐ Other--please provide explanation (4)

☐  I don't know (5)

Q33  What were obstacles that hindered drug screening/testing policy development?

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Q34  Are there any other factors/considerations that would be helpful to me as I gather this descriptive data? Please type your comments below. Thank you for your time and thoughtful consideration.

_____

_____

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Q35  If written documentation of Labor & Delivery unit drug screening policy could be provided to this investigator, please email copy to dlpressl@uncg.edu. These policies would be collected by the researcher solely for descriptive data purposes, and would be held in confidence without institutional identification.

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