

Research and analysis of Neonatal Abstinence Syndrome

Engrossed Substitute Senate Bill 5187; Section 215(117), Chapter 475, Laws of 2023

December 1, 2024



WASHINGTON STATE UNIVERSITY
SPOKANE

Research and analysis of Neonatal Abstinence Syndrome

Acknowledgements

Washington State University (WSU) acknowledges the Washington State Health Care Authority as the funding party of WSU's evaluation as directed by the Washington State Legislature named in ESSB 5187 (2023); Section 215(117).

The Washington State Health Care Authority credits the Washington State Department of Health (DOH) with analysis of Neonatal Abstinence Syndrome (NAS) prevalence rates for Spokane County, Washington state, and the United States and acknowledge our collaboration in supporting all pregnant-capable persons in receiving equitable and person-centered care.

Table of Contents

- Executive summary.....4
- Aim 1: limitations and challenges.....4
- Aim 2: health outcomes.....5
- Aim 3: parental experiences5
- Recommendations6
- Prevalence of Neonatal Abstinence Syndrome (NAS).....7
- Aim 1: Barriers to consistent and valid reporting of NAS8
 - Methods.....8
 - Participants.....8
 - Results.....8
 - Common themes identified through the interviews9
- Aim 2: Health outcomes of maternal-infant dyads using Maddie’s Place services in the last two years 11
 - Methods..... 11
 - Infants 14
 - Birthing parents.....20
 - Non-birthing Parents.....22
 - Impact of Maddie’s Place to avoid more costly interventions.....25
 - Allowable Medicaid-covered services at Maddie’s Place26
- Aim 3: Qualitative analysis of parent experiences at Maddie’s Place30
 - Methods.....30
 - Pregnancy Experiences.....32
 - Birth experiences34
 - Parenting/postpartum experiences.....35
 - Helpful/beneficial Maddie’s Place experiences36
 - ‘What if Maddie’s Place wasn’t here?’38
 - Areas for Improvement.....39
- Summary41
- Recommendations.....42
- Appendix A: Technical notes on prevalence of NAS.....43
- Appendix B: Interview guide.....45

Executive summary

The Health Care Authority (HCA) contracted with Washington State University (WSU) to analyze the prevalence of neonatal abstinence syndrome (NAS) and infant and maternal health outcomes associated with pediatric transitional care facilities in Washington State. WSU is the primary author for much of this report; portions where HCA is the primary author are denoted at the beginnings of those sections. Maddie's Place—currently one of only two pediatric transitional care facilities for NAS in the state—was selected as the facility to assess, focusing on their infant and maternal health outcomes.

This report describes the evaluation of Maddie's Place from July 2023 through August 2024, as detailed in ESSB 5187 (2023). The evaluation specifically aimed to:

1. Report the existing limitations and challenges with accurately measuring neonatal abstinence syndrome (NAS¹) in Spokane County, and potential recommendations for improving measurement and monitoring.
2. Describe the health outcomes of maternal-infant dyads utilizing Maddie's Place services across the previous two years.
3. Qualitatively analyze parental experiences at Maddie's Place, exploring experiences with pregnancy, birth, and postpartum periods and describe perceived benefits of services provided by Maddie's Place.

Aim 1: limitations and challenges

Aim 1 examined existing limitations and challenges with accurately measuring NAS, and potential recommendations for improving measurement and monitoring through interviews with health care providers in Spokane County.

Interviews with providers in Spokane County suggest that NAS-reporting related issues in Spokane County are larger than capturing accurate prevalence, with increased incidence of synthetic opioids (e.g.,

¹ Neonatal Abstinence Syndrome (NAS) refers to withdrawal symptoms experienced by newborns exposed to substances in utero, which include opioids. Neonatal Opioid Withdrawal Syndrome (NOWS) refers to withdrawal symptoms experienced by newborns exposed to opioids only in utero. Best practices for NAS/NOWS include observation of newborns for approximately up to 96 hours (3-5 days for most substance exposures) post birth (Patrick SW, Barfield WD, Poindexter BB, et al. Neonatal opioid withdrawal syndrome. *Pediatrics*. 2020;146(5).), but this standard may differ for different substance exposure types. In this report, we use the term NAS due to recent data and evidence suggesting newborns are most commonly exposed to multiple substances in utero, including opioids. Therefore, NAS is the most accurate description of the type of exposure and withdrawal symptoms experienced by the 71 infants included in this report.

fentanyl) and polysubstance use. Providers noted that neonatal treatment has been complicated by fentanyl and polysubstance use given that some of the protocols for managing infant withdrawal are not as effective for infants exposed to fentanyl and other substances simultaneously and that neonates are requiring additional interventions and longer courses of treatment for withdrawal symptoms. Polysubstance use is on the rise and counterfeit opioid pills with high amounts of fentanyl have an unknown composition, leading to increased difficulty in treatment of both mother and baby. Providers did not note any discrepancies in assessing, coding, or reporting NAS in their health care systems.

Providers noted that changes in substance use trends in Spokane have had a negative impact on both maternal and neonatal care efficacy. They noted that parents seem to be less stable in recovery and less able to engage in care of their infants at the hospital. They also noted that the rise in fentanyl and polysubstance use may have contributed to an increase in NAS symptomatology in infants. This, combined with a lack of parental engagement in treatment, has made it challenging for parents to effectively care for their infants using standard post-birth care methods, such as the Eat, Sleep, Console (ESC) approach.

Aim 2: health outcomes

Aim 2 examined the health outcomes of maternal-infant dyads utilizing Maddie's Place services across the previous two years. Maddie's Place provided descriptive data for 71 infants and birthing parents. On average, infants were exposed to approximately four substances at the time of birth. The most common substance exposure was to methamphetamines (n=57; 81.4%) followed by fentanyl (n=52; 74.3%) and tobacco (n=38; 53.5%). Sixty infants discharged back into the community had data on their length of stay at Maddie's Place. The average length of stay of infants discharged was 56 days (standard deviation [SD: 31.9]).

Information on discharge guardian was provided for 63 infants. The largest group, 34 infants (54%), were discharged from Maddie's Place into the community with a parent, and an additional 9 (14%) were discharged with a relative. There were 17 infants (23.9%) discharged with a foster caregiver and two (2.8%) with foster relatives. One (1.6%) infant reportedly was discharged with a "suitable other."

Infants' functioning throughout their stay at Maddie's Place was evaluated via the Hopkin's Tool, a recently developed, multidimensional, individualized assessment tool for non-pharmacologic NAS and neonatal opioid withdrawal syndrome (NOWS) care. Infant functioning scores were assessed via the Hopkins Tool in four domains:

- Autonomic nervous system
- Motor/muscle tone
- State control/attention
- Sensory reactivity

Aim 3: parental experiences

Aim 3 qualitatively analyzed parental experiences at Maddie's Place, exploring experiences with pregnancy, birth, and postpartum periods and describing benefits of using Maddie's Place. Interviews with 15 perinatal (93% postpartum; 7% pregnant) women who used services at Maddie's Place highlight several themes which map onto the interview guide in six categories:

- Pregnancy experiences (including expectations for having a baby with NAS)
- Birth experiences
- Postpartum/parenting experiences
- Helpful/beneficial Maddie's Place experiences
- "What if Maddie's Place wasn't here?"
- Areas for improvement

Overall, mothers reported positive experiences with utilizing Maddie's Place services.

Recommendations

Recommendations to meet the complex and evolving needs of families affected by the ever-changing landscape of substance use include:

- Continued surveillance and monitoring of NAS rates as well as NAS symptomology and treatment efficacy in the era of increasing fentanyl and polysubstance use.
- Continued and longitudinal monitoring of the developmental and health outcomes of infants served at pediatric transitional care facilities (PTCF) such as Maddie's Place.
- Continued assessments of quality of care and services rendered at pediatric transitional care facilities from the caregivers' perspectives.
- A robust financial evaluation to estimate any savings achieved by potentially avoiding more costly medical interventions.

Prevalence of Neonatal Abstinence Syndrome (NAS)

Note: HCA authored this section of the report with support from the Washington State Department of Health (DOH).

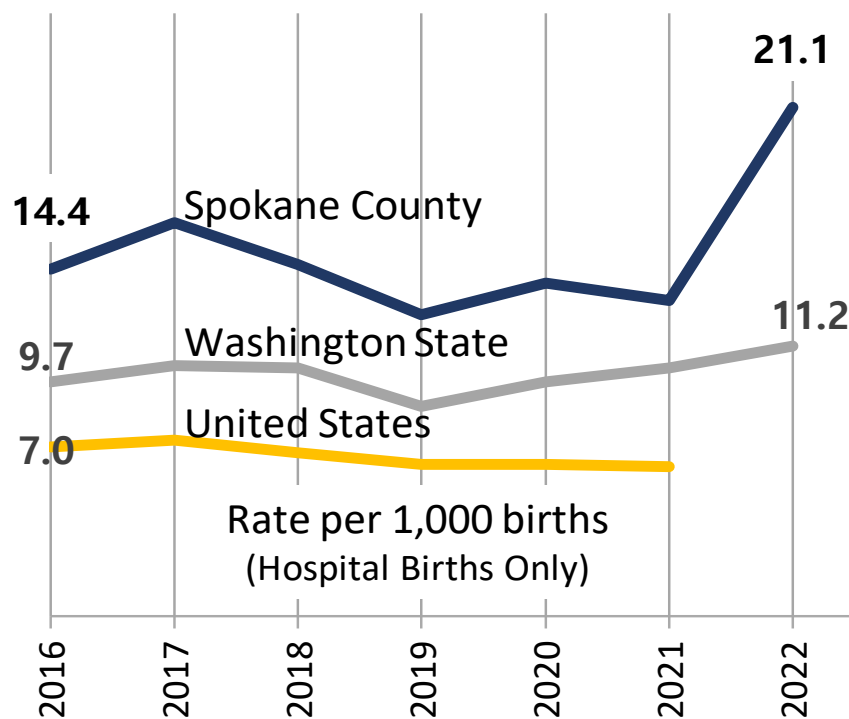
ESSB 5187 (2023) requires analysis on the prevalence of NAS. While the WSU evaluation team focused on barriers to consistent and valid reporting of NAS in the Spokane community, DOH was able to provide support and technical expertise, sharing data to include in this legislative report.

Figure 1 includes the prevalence rate of NAS (rate per 1,000 live births) for the United States, Washington State, and Spokane County, each year from 2016 to 2022. This figure highlights the rate of NAS in Washington State has been consistently higher than the national rate across this period; The most recently available data from 2021 included a national rate of 6.2/1,000 live births, while the Washington State rate was 10.3/1000 live births. Of note, the Washington rate has also increased year-over-year from 2019 to 2022 while the national rate of NAS has remained stable during this period (with national data not available for 2022). See Appendix Table 12 for technical notes.

While the data shows a Washington increase in NAS prevalence among hospitalized infants between the most recently available data of 2021 to 2022, the Spokane County results are almost twice as high than the state NAS prevalence rate, suggesting there does appear to be regional or geographic differences, and that Spokane County is an area of heightened concern (See Appendix Table 13 for technical notes).

Figure 1: Prevalence of NAS per 1,000 births, 2016–2022

Comparison of NAS rates for hospitalized infants in the United States, Washington State, and Spokane County. The rate counts hospital births only.



Research and analysis of Neonatal Abstinence Syndrome

December 1, 2024

Page | 7

Aim 1: Barriers to consistent and valid reporting of NAS

The original contract language for Aim 1 focused on examining and reporting the prevalence of NAS in Spokane County. However, the activities were revised to focus solely on identifying barriers to NAS assessment, reporting, and care through interviews with health care providers. This change was made because:

1. The contract's timeline would not allow for a thorough examination of NAS prevalence across multiple health records databases (e.g., Comprehensive Hospital Abstract Reporting System), which would be needed in order to advance our understanding of the prevalence of NAS.
2. Communication with the Health Care Authority (HCA) verified the state-of-the science already has elucidated issues with reporting up-to-date prevalence.

Additionally, HCA would be able to partner with DOH colleagues to include data in the report on NAS prevalence at the national, Washington State, and Spokane County levels. Therefore, the decision was made by HCA and WSU researchers to concentrate on the local level, with the barriers to NAS assessment, reporting, and care in Spokane County.

Methods

Informal interviews were conducted with a small sample of diverse health care professionals directly involved in maternal newborn care in Spokane County. All interviews were conducted with individuals connected with two major hospital systems (MultiCare and Providence). Current practices with the diagnosis, treatment, and medical coding of NAS (NAS) were explored to assess the current practices related to care of opioid and other substance-exposed infants in the hospital setting.

Participants

- Two neonatologists
- Neonatal Clinical Nurse Specialist and Consultant
- Two Nursing professional development specialist-Obstetrics
- Registered nurse liaison for Opioid Use Disorder (OUD) program
- Nurse manager Mother Baby Unit
- Pediatric hospitalist

Results

Providers reported current practices for caring for opioid and other substance-exposed infants in the hospital setting:

- Infants with exposure to substances are monitored for signs and symptoms of NAS up to 96 hours (ICD-10 Code P96.1 and/or P104.49 are consistently utilized in coding).
- At both MultiCare Deaconess and Sacred Heart, infants are cared for using the Eat, Sleep, and Console (ESC) method, primarily on the mother-baby unit. At MultiCare Deaconess, this care is overseen by a neonatologist, with admission to the Neonatal Intensive Care Unit (NICU) required only if there are additional complications, such as prematurity, severe symptoms, a need for high

doses of pharmacological treatment, or if the mother is unable to participate in care. Similarly, at Sacred Heart, infants are cared for on the mother-baby or pediatric inpatient unit by a pediatric nurse practitioner or pediatrician, with care transferred to a neonatologist and admission to the NICU if complications arise. It is more common for infants at Sacred Heart to require NICU care.

- Care practices are consistent across facilities with slight variations based on resources of the facility (i.e. Providence Sacred Heart has a pediatric unit while the other facilities do not and therefore infants there may be directly admitted to NICU if there are complicating symptoms or risk factors that do not allow infants to room in with their birth parents in the postpartum units).

ICD-10 coding practices

- Coding is initiated by a physician or other advanced practice providers in the progress note and then entered into the electronic health record system by the coding department of the hospital.
- ICD-10 code P96.1 is the code consistently used for a diagnosis of NAS.
- To meet the definition of the diagnosis code and national coding standards, infants must have physiological withdrawal symptoms and a history of substance exposure (through maternal record, maternal toxicology screen, maternal account, or infant cord blood sample). Umbilical cord sampling or umbilical cord tissue testing occurs in all suspected or confirmed cases of intrauterine exposure, and when infants are demonstrating symptoms of withdrawal and there is not a documented history of exposure.
- Observation code ICD-10 P104.49 is used for infants under observation “Newborn (suspected to be) affected by maternal use of other drugs of addiction,” indicated by maternal medical records documentation of Medications for Opioid Use Disorder (MOUD) treatment, self-reported use, or documented substance use.
- It is unlikely ICD-10 codes are not being entered into health records or missed. Providers noted that all babies with known or suspected exposure in utero are consistently coded with ICD-10 code P96.1.

Common themes identified through the interviews

The issue is much larger than NAS prevalence.

- **Safe and effective perinatal and neonatal care is a “moving target”** as polysubstance use is becoming more common, and infants seem to experience increased withdrawal symptoms and longer hospital stays.
- **Fentanyl and polysubstance-use complicate neonatal treatment**, leading to increased withdrawal symptoms, longer hospital stays, and instability in recovery for birth parents receiving MOUD treatment.
- **Substance use trends in Spokane have shifted over the past three years, resulting in more mothers and infants who do not meet the criteria for effective ESC care.** This is often due to infants experiencing medical complications that require NICU admission, making them

ineligible for ESC, or due to parents' active addiction, which prevents them from being consistently present in the hospital to engage in ESC care. Mothers on MOUD and those who qualify for ESC care are now in the minority, as addiction limits many parents' ability to consistently engage in ESC with their infants in the hospital.

- The length of stay in the hospital had decreased with the introduction of ESC, but **recently, due to an increase in polysubstance/fentanyl use, ESC is less effective** possibly due to both increased symptoms in newborns and less availability of mothers/caregivers to engage in ESC care.
- **The rise in polysubstance use, including counterfeit opioid pills containing high levels of fentanyl, complicates treatment for both mother and baby.** In utero exposure to potent fentanyl, alongside substances like methamphetamines, may lead to more complex infant withdrawal symptoms, requiring adaptation in infant care. Simultaneously, this combination of fentanyl and methamphetamine use can accelerate the development of severe substance use disorders (SUDs) with more severe physiological, mental, and behavioral consequences in parents, requiring higher doses of medication for opioid use treatment, which they may have limited access to. As a result, **parents often struggle to stabilize in recovery and engage in post-birth care, such as the ESC model, potentially leading to worsening infant symptoms and prolonging hospital stays.**
- Providers highlighted that perinatal populations often face co-occurring mental health conditions,² other medical comorbidities, and barriers to housing, addiction treatment, and mental health services, all of which hinder their engagement in prenatal and postnatal care. They emphasized the need for standardized care protocols and expanded access to comprehensive recovery and support services for parents to improve outcomes for substance-affected families, particularly those impacted by fentanyl and polysubstance use.

² Co-occurring mental health conditions, also known as co-occurring disorders, refer to the presence of both a mental health disorder and a substance use disorder in an individual at the same time. These conditions interact in ways that can complicate diagnosis, treatment, and recovery, as the symptoms of one disorder may influence or exacerbate the other. Examples of co-occurring mental health conditions include a person experiencing both depression and alcohol use disorder, or anxiety disorder along with opioid use disorder.

Aim 2: Health outcomes of maternal-infant dyads using Maddie’s Place services in the last two years

Methods

The WSU team worked with HCA to determine an original list of measures that should be included in the descriptive analysis of the services that Maddie’s Place provides to infants and their parent(s).

Based on the final list of measures, the WSU team authored the required Institutional Review Board (IRB) documentation and submitted to WSU’s IRB for review. Following review by WSU’s IRB, the project’s (IRB #20351-001) procedures were deemed appropriate and allowed to proceed.

The WSU team, following the IRB reviewed procedure, constructed four fillable spreadsheets for data entry and authored the basic analysis plan. A shared drive within WSU’s secure OneDrive system was created to share the spreadsheets with the team at Maddie’s Place for data entry:

1. Infant demographic and non-Hopkin’s Tool data.
2. Infant Hopkin’s Tool descriptive data: summary of weekly Hopkin’s Tool assessments over the course of the infant’s stay at Maddie’s Place.
3. Parent 1 (birthing parent) data.
4. Parent 2 (non-birthing parent) data.

The Hopkin’s Tool (Velez, Jordan, Jansson, 2021)³ is a recently developed, multidimensional, individualized assessment and intervention tool published in peer-reviewed literature that is based on scientific and developmental principles and allows for a deeper review of the infant and dyadic state. The Hopkin’s Tool was created specifically for monitoring infants with NAS and/or NOWS receiving individually tailored, non-pharmacologic care, and was used to assess infant functioning throughout their stay at Maddie’s Place. This assessment monitors four systems (Autonomic Nervous System, Motor/Muscle Tone, State Control/Attention, Sensory Reactivity) via a three-category scale:

1. Impaired
2. Mild Dysfunction
3. Optimal

The four domains in the Hopkin’s tool are viewed as dimensional, not categorical, and are interconnected. Dysfunction in each domain exists on a continuum, and the infant’s status in each domain is evaluated considering factors like gestational and postnatal age. This understanding helps tailor individualized non-pharmacologic interventions and guide medication use when necessary.³ The goal of the Hopkin’s tool is

³ Velez ML, Jordan C, Jansson LM. Reconceptualizing non-pharmacologic approaches to Neonatal Abstinence Syndrome (NAS) and Neonatal Opioid Withdrawal Syndrome (NOWS): A theoretical and evidence-based approach. Part II: The clinical application of nonpharmacologic care for NAS/NOWS. *Neurotoxicology and teratology*. 2021; 88:107032.

to tailor infant care based on each infant's dysregulation in four domains, emphasizing the importance of caregiver self-regulation to support infant co-regulation and healthy development. By assessing the infant across four neurobehavioral domains—autonomic, motor/muscle tone, state control/attention, and sensory modulation—the tool helps caregivers and clinicians understand not only the infant's individual responses but also how the caregiver's regulatory state influences the infant. This deeper review allows for targeted interventions that support both the infant's development and the caregiver's role in promoting a stable, co-regulated environment.

Table 1 is from the original publication of the tool (Velez, Jordan, Jansson, 2021) that outlines in detail the Hopkin's tool assessment domains.

Table 1: Hopkin’s assessment/intervention tool

Table 1
The Hopkins assessment/intervention tool.

	Autonomic	Motor/Muscle Tone	State Control/Attention	Sensory Reactivity
Evaluation	<p>Observe signs of stress that indicate hyper- or hypoarousal of the Autonomic Nervous System (ANS):</p> <ul style="list-style-type: none"> - Color of the skin - Respiratory rate - Heart rate - Presence of hiccups, yawning, sneezing, - Bowel sounds and movements - Spitting up, vomiting - Fever 	<p>Observe and describe:</p> <ul style="list-style-type: none"> - Quality of movements - Activity level - Quality of tone - If hypertonicity is present, is it omnipresent or fluctuant? Is it symmetrical? Is it impeding any infant function? 	<p>Observe and describe:</p> <ul style="list-style-type: none"> - Clarity of sleep/wake states - Predominant state - Frequency of transition of states - Ability to achieve expected state - Difficulty to calm 	<p>Observe how the infant responds to different types of sounds, animated and unanimated visual stimuli, movement, positioning, touch and describe:</p> <ul style="list-style-type: none"> - Hypersensitivity - Hyposensitivity - Sensory craving
Optimal	<ul style="list-style-type: none"> <input type="checkbox"/> Occasional yawning or sneezing <input type="checkbox"/> Brief changes in skin color, not sustained <input type="checkbox"/> Brief periods of tachypnea, with quick recovery, not sustained 	<ul style="list-style-type: none"> <input type="checkbox"/> Tone appropriate for state <input type="checkbox"/> Mostly smooth movements <input type="checkbox"/> Symmetrical movement and tone <input type="checkbox"/> Occasional tremors 	<ul style="list-style-type: none"> <input type="checkbox"/> Restful sleep for gestational age <input type="checkbox"/> Able to achieve different states (calm, alert, crying) <input type="checkbox"/> Usually easy to calm <input type="checkbox"/> Able to look at objects or faces without stress signs <input type="checkbox"/> Follows visual stimuli and/or turns toward auditory stimuli without stress signs when quiet alert 	<ul style="list-style-type: none"> <input type="checkbox"/> Appropriate responses to properly timed and adequate stimuli <input type="checkbox"/> Aversion to improperly timed or inappropriate stimuli <input type="checkbox"/> Fast recovery after sensory stimulus causing a defensive reaction is stopped
Mild dysfunction	<ul style="list-style-type: none"> <input type="checkbox"/> Frequent yawning, sneezing, hiccups <input type="checkbox"/> Occasional vomiting <input type="checkbox"/> Loose stools but no significant (i.e., >10%) weight loss <input type="checkbox"/> Periods of tachypnea with or without intervention <input type="checkbox"/> Color changes may be sustained, but infant displays moderate recovery <p><i>Try: Small frequent feeds, eliminate stimuli that cause dysregulation above</i></p> <p><i>Outcome: Signs of autonomic dysregulation minimize; infant is able to interact and feed without significant distress. Respiratory rate normalizes</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> (check if yes) 	<ul style="list-style-type: none"> <input type="checkbox"/> Moderate hypertonicity <input type="checkbox"/> Uncontrolled and/or excessive movements <input type="checkbox"/> Frequent tremors <input type="checkbox"/> Fluctuating or asymmetric tone <p><i>Try: Swaddling, containment holding, “C” positioning, rocking and/or pacifier. Avoid sudden, loud noises. Move infant in slow, predictable fashion.</i></p> <p><i>Outcome: Baby calmed and tone decreases with intervention, movements become minimal</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> (check if yes) 	<ul style="list-style-type: none"> <input type="checkbox"/> Easily upset <input type="checkbox"/> Difficult to rouse <input type="checkbox"/> Frequent crying <p><i>Try: Find the source of dysregulation, and apply gentle handling with minimal stimuli that is deemed upsetting. Comforting techniques specific to the infant and event triggering dysregulation: soft talking, containing, swaddling, pacifier, gentle vertical rocking.</i></p> <p><i>Outcome: Baby can be calmed and is appropriately responsive to stimulation</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> (check if yes) 	<ul style="list-style-type: none"> <input type="checkbox"/> Changes in muscle tone with stimulation <input type="checkbox"/> Pull down or moves to fussy, crying state after stimulation <input type="checkbox"/> Increased disorganized movements after stimulation <input type="checkbox"/> Increased signs of stress after stimulation <p><i>Try: Removing stimuli which infant reacts to, comforting techniques</i></p> <p><i>Outcome:</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Infant becomes calm and defensive response stops <input type="checkbox"/> Infant is able to tolerate modified stimuli without signs of stress after moderate recovery <input type="checkbox"/> (check if yes)
Impaired functioning despite individual non-pharm intervention	<ul style="list-style-type: none"> <input type="checkbox"/> Frequent vomiting that can lead to weight loss >10% <input type="checkbox"/> Loose stools that can lead to weight loss >10% <input type="checkbox"/> Persistent tachypnea <input type="checkbox"/> Unable to take oral feeds <input type="checkbox"/> Excessive sweating in all states <input type="checkbox"/> Major changes in color with stimulation that persist after the stimuli is removed, slow or minimal recovery, despite non-pharmacologic intervention 	<ul style="list-style-type: none"> <input type="checkbox"/> Significant hypertonicity with back arching, fisting <input type="checkbox"/> Head thrashing, self-clinging, jaw clenching <input type="checkbox"/> Excessive, disorganized movements <input type="checkbox"/> Excessive tremors and/or jitteriness <input type="checkbox"/> Feeding difficulties due to problems with tone or movement that lead to weight loss <input type="checkbox"/> Excessive movement/tone problems persist despite non-pharmacologic intervention 	<ul style="list-style-type: none"> <input type="checkbox"/> Very high arousal <input type="checkbox"/> “All or none” behavior (unable to achieve alert state) <input type="checkbox"/> Easily irritable and difficult to console <input type="checkbox"/> Hyper-responsive to stimulation <input type="checkbox"/> Fragmented sleep (frequent arousals to wakefulness) <input type="checkbox"/> Hypoalert, lethargic, difficult to arouse <input type="checkbox"/> Pull-down frequently 	<ul style="list-style-type: none"> <input type="checkbox"/> Aversive or minimal/no responses to ordinary stimuli after removal of triggers <input type="checkbox"/> Persistent signs of stress that continue after the stimuli is removed, minimal or prolonged recovery, despite non-pharmacologic intervention <input type="checkbox"/> Poor physiologic stability disallows attention to any stimuli, even after comforting techniques are applied

Describe domain(s) of functioning that are affected by NAS/NOWS and the types of non-pharmacologic behavioral and environmental measures that decrease or ameliorate the physiological symptoms or dysregulated behaviors. If impaired functioning despite individual nonpharmacologic intervention in any domain(s) requires medication, describe the physiologic and behavioral manifestations of NAS that justify the need for medication:

Maddie's Place provided descriptive data for 71 infants (enrolled from October 2022 to June 2024), and birthing parents by the time WSU completed analysis and reporting (June 2024)

Infants

General description

Of the 71 infants, at birth 37 were assigned male (52.1%) and 34 were assigned female (47.9%). The average gestational period was 37.88 weeks (SD: 2.38), with a median of 38.29 weeks (Range: 12.14 weeks; Minimum: 29 weeks; Maximum: 41.14 weeks). There were 18 infants born under 259 days (25.4%) with 13 (18.3%) being "late" preterm (between 238 to 258 days) and five (7%) being "moderate" preterm (203 to 237 days). For those infants that were born preterm, the average gestational period was 242.2 days (SD: 14.5), 34.6 weeks (SD: 2.1) with a median of 246.5 days, 35.2 weeks.

Nearly all infants were born in a regional hospital (n=69; 97.2%) although two infants (2.8%) had confirmed non-hospital births and were both cared for in the NICU after arrival. During the infants' stay at the hospital following birth, 53 (74.6%) were cared for within the neonatal intensive care unit (NICU), 11 (15.5%) were on the pediatric unit, and three (2.8%) were in the mother-baby unit with five infants' (7%) care-level being unknown.

The length of stay at the hospital was available for 49 (69%) of the infants, including 13 considered preterm. The average length of hospital stay for the 36 term infants only was 14.2 days (SD: 11.3) with a median of 10.5 days (range: 46 days; minimum: 2 days; maximum: 48 days). The average length of hospital stay for the overall sample of 49 infants was 18.7 days (SD: 19.6) with a median of 14 days (range: 107 days; minimum: 2 days; maximum: 109 days); while, for those 13 infants considered preterm, the average was 31.2 days (SD: 30.7) with a median of 21 days (range: 103 days; minimum: 6 days; maximum: 108 days).

Four infants (5.6%) had confirmed non-birth-related hospital visits prior to arriving at Maddie's Place including seven collective visits to an emergency room (ER) and two to an urgent care facility. A reason was unavailable for two infants' (2.8%) ER visits as well as both (single infant) to the urgent care. One infant (1.4%) had two ER visits for issues related to their feeding tube while the other infant had three visits including one each for a fall, fever and cough, and being "fussy." Three infants (4.2%) had a total of five hospitalizations, although reasons were unavailable for one infant with two stays. One infant had two hospitalizations including one for failure to thrive and one for a suspected and confirmed non-accidental trauma. The other infant had one hospitalization for a suspected non-accidental trauma. While impossible to rule out any impact related to in-utero exposure, the ED visit and admission causes listed above, except for fussiness, are not normally associated with opioid withdrawal effects.

Seventy of the 71 infants were covered by Washington State Apple Health (Medicaid) during their stay. One infant was from Idaho.

Arrival to Maddie’s Place

Referral information to Maddie’s Place was available for 70 of the 71 infants. The most common referral was from a local hospital (n=49; 69%). There were four different regional health institutes that referred infants to Maddie’s Place for care:

- Sacred Heart (n=29; 40.8%)
- Deaconess (n=15; 21.1%)
- Holy Family (n=4; 5.6%)
- Kootenai Health in Idaho (n=1; 1.4%)

Eleven infants (15.5%) were referred from the Washington State Department of Children, Youth, and Families (DCYF) Child Welfare Services (CWS). Five infants (7%) were referred from local non-profit organizations with three (4.3%) from Isabella House and one (1.4%) each from Rising Strong and Swedish. Two (2.8%) each were from community members and the Washington State Early Support for Infants and Toddlers (ESIT). Finally, a good Samaritan and the birthing parent each referred one infant (1.4%).

A total of 31 infants (43.6%) were voluntarily placed in the care of Maddie’s Place while 36 (50.7%) were placed at the recommendation of CWS. Most of the infants with post-birth hospital length of stay available arrived at Maddie’s Place directly following their initial discharge (n=35; 71.4%). The average age of arrival was 27.2 days post-birth (SD: 29.7) with a median of 18 days post-birth (Range: 170 days; Minimum: 2 days; Maximum 172 days).

On arrival at Maddie’s Place, CWS were already directly involved with an open case in 36 infants’ care (50.7%). During their stay at Maddie’s Place only three infants (4.2%) had newly active CWS cases opened while 23 had their cases closed prior to discharge (32.4%).

Prenatal substance exposures

All infants that received care at Maddie’s Place, except one, had confirmed prenatal exposures verified via umbilical cord sample. On average, infants were exposed to approximately 4 different substances (mean= 3.7 substances, SD= 1.6 substances; range of substances=7; Minimum=1; Maximum=8).

The most common substance exposure was to methamphetamines, followed by fentanyl, tobacco, methadone, marijuana, and other unspecified opioids. A full summary of prenatal substance exposure can be found in Table 2.

Table 2: Infant prenatal substance exposures measured following birth (n=70)

Substance	Count (%)
Methamphetamine	57 (81.4%)
Fentanyl	52 (74.3%)
Tobacco	38 (53.5%)
Methadone	30 (42.3%)
Marijuana	22 (31.4%)

Opioids (not otherwise specified)	17 (24.3%)
Alcohol	8 (11.4%)
Heroin	7 (10%)
Morphine	7 (11.4%)
Buprenorphine	6 (8.6%)
Codeine	4 (5.7%)
Cocaine	4 (5.7%)

Medical conditions

Nearly all infants enrolled in Maddie’s Place (n=70; 98.6%) had a NAS (P96.1) diagnosis. All infants (100%) had at least one prenatal exposure diagnosis from the hospital and/or birth record with amphetamines (n=28; 39.4%) and opiates (n=23; 32.4%) being the most common followed by tobacco (n=15; 21.1%) and alcohol (n=5; 9.9%). The single infant without a P96.1 (neonatal withdrawal symptoms) diagnosis, had an O99.31 (alcohol use complications) diagnosis.

Infants at Maddie’s Place had an average of 6.2 (SD: 5) diagnosed medical conditions from the hospital and/or birth record with a median of 5 (Range: 32; Minimum: 1; Maximum: 33). In general, the most common diagnoses (occurred in at least 10 of the infants) included:

- Feeding problems (n=37; 52.1%)
- Respiratory distress (n=24; 33.8%)
- Tongue tie (n=18; 25.4%)
- Insufficient prenatal care (n=14; 19.7%)
- Preterm birth (n=14; 19.7%)
- Hypoglycemia (n=12; 16.9%)
- Small for gestational age (n=12; 16.9%)
- Hyperbilirubinemia (n=10; 14.1%)
- Meconium present in the amniotic fluid (n=10; 14.1%)

While in-utero exposure to opioids and other substances increases the risk of conditions like low birth weight, preterm birth, respiratory issues, feeding difficulties, gastrointestinal issues, pulmonary issues, hearing loss, and seizures, not all medical conditions listed above are necessarily linked to opioid or substance withdrawal. We lack information on which, if any, of the listed medical conditions are directly associated with substance exposure. These data are presented to describe the sample of infants in this report.

Infants’ stay at Maddie’s Place

Most of the infants at Maddie’s Place had supervised intermittent visitation (according to Maddie’s Place internal policy, visitation means a monitored visit by trained staff in the visitation center during visitation hours, Monday–Friday, 11 a.m. to 7 p.m. and Saturday, 4–8 p.m.) from family (n=67; 94.4%). Forty-one (57.7%) infants had a family member rooming in with them during their stay and caring for them continuously. The most common family member rooming in with infants was their birthing parent only

(n=34; 47.9%) followed by both parents (n=3; 4.2%), their non-birthing parent (n=3; 4.2%), and, finally, another relative (n=1; 1.4%).

The team at Maddie’s Place does not provide or monitor infants’ well child visits or recommended vaccines for infants.

Pharmacologic care at Maddie’s Place

Hospital-prescribed and administered NAS-specific medication data updates were provided for 70 infants.

A total of 43 of the 70 infants (61.4%) were provided morphine at the hospital with two (4.7%) completing their morphine tapers at Maddie’s Place. One infant completed their morphine taper on their first day at Maddie’s Place and later required two "rescue doses" of morphine, while the other completed their morphine taper on their second day at Maddie’s Place.

A total of seven infants (10%) were given clonidine at the hospital with three (42.9%) completing their clonidine tapers at Maddie’s Place. All infants that received clonidine at the hospital were also co-prescribed morphine at the hospital although none required morphine tapers at Maddie’s Place. Two infants required at least one "rescue dose" of morphine.

Hopkin’s Tool assessment

The Hopkin’s Tool (Velez, Jordan, Jansson, 2021)² is a recently developed assessment and intervention tool published in peer-reviewed literature. It is based on scientific and developmental principles and allows for a deeper review of the infant and dyadic state. The tool created specifically for monitoring infants with NAS and/or NOWS receiving individually tailored, non-pharmacologic care, was used to assess infants’ functioning throughout their stay at Maddie’s Place. This assessment monitors four systems (autonomic nervous system, motor/muscle tone, state control/attention, sensory reactivity) via a three-category scale:

1. Impaired
2. Mild Dysfunction
3. Optimal.

Hopkin’s Tool scores at three timepoints (admit, midpoint, and most recent/discharge) were measured by the same team of nurses and provided for 70 infants (98.6%). One infant was a new arrival to Maddie’s Place and only had Hopkin’s Tool assessment points for the admit timepoint (deemed "Optimal" for all four systems).

While infant functioning clearly improved during their time at Maddie’s Place, it is unclear how this improvement compares to the expected progress in the absence of the services provided there, especially in the absence of further research validating the Hopkins tool as well as additional, longitudinal, cohort-matched research.

A descriptive summary of the full Hopkin’s Tool assessment data is provided in Table 3 below.

Table 3: Hopkin’s Tool scores for infants at Maddie’s Place (n=70)

Assessment Category	Admit	Midpoint	Most Recent/ Discharge
---------------------	-------	----------	------------------------

Autonomic; mean (SD)	2.2 (0.58)	2.47 (0.5)	2.74 (0.44)
Impaired; count (%)	6 (8.6%)	0 (--)	0 (--)
Mild; count (%)	44 (62.9%)	37 (52.9%)	18 (25.7%)
Optimal; count (%)	20 (28.6%)	33 (47.1%)	52 (74.3%)
Motor/Muscle; mean (SD)	2.06 (0.63)	2.19 (0.52)	2.69 (0.47)
Impaired; count (%)	12 (17.1%)	4 (5.7%)	0 (--)
Mild; count (%)	42 (60%)	49 (70%)	22 (31.4%)
Optimal; count (%)	16 (22.9%)	17 (24.3%)	48 (68.6%)
State Control/Attention; mean (SD)	2.04 (0.69)	2.31 (0.6)	2.8 (0.44)
Impaired; count (%)	15 (21.4%)	5 (7.1%)	1 (1.4%)
Mild; count (%)	37 (52.9%)	38 (54.3%)	12 (17.1%)
Optimal; count (%)	18 (25.7%)	27 (38.6%)	57 (81.4%)
Sensory Reactivity; mean (SD)	2.17 (0.56)	2.3 (0.49)	2.63 (0.49)
Impaired; count (%)	6 (8.6%)	1 (1.4%)	0 (--)
Mild; count (%)	46 (65.7%)	47 (67.1%)	26 (37.1%)
Optimal; count (%)	18 (25.7%)	22 (31.4%)	44 (62.9%)

Infant feeding

A total of 52 infants (73.2%) were reported as having gavage feeding (Gavage feeding is a way to provide breastmilk or formula directly to a baby's stomach) while at the hospital before their stay at Maddie's Place. Fifty-one infants (71.8%) had a confirmed nasogastric tube (NG-tube) and one (1.4%) had a gastrostomy tube (G-tube). A total of 18 infants (25.4%) were admitted to Maddie's Place with an NG-tube and all except two (2.8%) were able to have the device removed before discharge. The average number of days before the infants with an NG-tube at Maddie's Place were able to have all feeding delivered orally was 8.8 days (SD: 14.4) with a median of 2.5 days (Range: 56 days; Minimum: 1 day; Maximum: 57 days). One infant (1.4%) that did not arrive at Maddie's Place with an NG-tube had one placed while hospitalized for an RSV infection (see [Medical needs outside of Maddie's Place](#) for additional information on hospitalizations).

Nearly all infants (n=70; 98.6%) received some level of supplemental formula. A total of 14 infants (19.7%) were at least partially breastfed during their time at Maddie's Place. Of these 14, one of the infants (1.4%) was exclusively breastfed while three infants (4.2%) combined direct breastfeeding and bottled breast milk.

Of note, some services being captured at Maddie's Place are related to "skilled nursing services as a result of drug exposure" or other services for "drug exposed infants that primarily require withdrawal management." These include gavage feeds, feeding therapy, growth monitoring, developmental monitoring, and opioids or agonist wean. Other, non-pharmacological interventions, that have been shown to be beneficial when used in the hospital setting, such as environmental modification, physical comfort, and parent/caregiver supports are not recognized as care for payment purposes, however, they are considered best practice under new standards of care in hospital settings. Standard care practices at Maddie's Place emphasize keeping babies in a flexed, mid-line, contained position with slow, intentional movement, quiet voices, two-person or swaddled diaper changes, and minimal clothing disruptions. Specific interventions and infant care provided at Maddie's Place include maintaining a 1:2 staff ratio to provide individualized care, ensuring infants receive soothing and calming measures as needed, including

1:1 attention whenever required. Maddie’s Place provides a sensory-protective environment that controls sound, light, and visual stimulation, complemented by techniques like vertical rocking, swaddling, c-curl positioning, pacifiers, sound machines, yoga balls, large joint pressure, and deep-water baths. For noise-sensitive infants, the facility uses medical-grade hush hats, and beanie hats for those sensitive to light.

Additional programs

All eligible infants participated in the Early Support for Infants and Toddlers (ESIT) program during their stay with Maddie’s Place (n=63; 88.7%). ESIT services were provided by five distinct regional ESIT providers. Two infants (2.8%) are currently in the process of being set up in the program and six (8.5%) were ineligible to participate due to residing outside of the county in the neighboring state of Idaho.

Medical needs outside of Maddie’s Place

During their stay at Maddie’s Place, no infants required an urgent care appointment.

A total of five infants (7%) required a visit to the ER during their time at Maddie’s Place with all being seen a single time. One infant was seen for a coronavirus disease (COVID-19) infection which did not require a hospital admission. Two visits were for respiratory syncytial virus (RSV) infections, and both were admitted to the hospital for additional treatment; one infant was treated for three days and one for five days. One infant was seen and admitted for seven days with a rhinovirus infection. Finally, one infant was brought to the ER for a urinary tract infection and was admitted for developing late onset sepsis before being released after 10 days of care.

None of the infants were re-admitted for additional care needs following the initial event.

A total of 31 infants (43.7%) required specialist care at some point during their stay at Maddie’s Place with 30 (42.3%) having already occurred and one (1.4%) scheduled for a future date. Most of those infants requiring specialist care only needed a single visit (24; 77.4%) with smaller numbers required two (n=5; 16.1%) while one infant required three (n=1; 3.2%) and another (3.2%) required eight which resulted in a total of 45 total visits. The most common specialty care need was a frenectomy (n=16; 35.6% of all specialist appointments) with a pediatric dentist.

Of note, while in-utero exposure to opioids and other substances increases risks for certain conditions such as low birth weight, respiratory problems, feeding difficulties, seizures, gastrointestinal problems, pulmonary issues, and hearing loss, etc., not all specialist visits listed below are necessarily associated with opioid or substance withdrawal effects. We do not have information on which, if any, of the below listed medical conditions of the infants are associated with their in-utero substance exposures. These data are presented to describe the sample of infants included in this report.

A summary of the completed infants’ specialist needs and reasons is included in Table 4.

Table 4: Infants specialist care needs (n=45 visits)

Specialist	Appointments (%)	Reason Provided (n)
Dental	16 (35.6%)	<ul style="list-style-type: none"> Frenectomy (n=16)
Pulmonology	7 (15.6%)	<ul style="list-style-type: none"> Maintenance oxygen (n=3) Bronchopulmonary dysplasia (n=3)

Audiology	6 (13.3%)	<ul style="list-style-type: none"> • Suspected cystic fibrosis (n=1) • Failed hearing screen (n=4) • Prolonged NICU (n=2)
Radiology	5 (11.1%)	<ul style="list-style-type: none"> • Breech presentation hip ultrasound (n=3) • Cranial ultrasound (n=1) • Swallow study (n=1)
Cardiology	4 (8.9%)	<ul style="list-style-type: none"> • Exam and echo (n=2) • Ventral septal defect (n=1) • Atrial septal defect/murmur (n=1)
Laboratory	2 (4.3%)	<ul style="list-style-type: none"> • Cystic fibrosis sweat test (n=1) • Rapid plasma reagin/syphilis (n=1)
Gastrointestinal	1 (2.2%)	<ul style="list-style-type: none"> • Elevated liver function tests (n=1)
Genetics	1 (2.2%)	<ul style="list-style-type: none"> • Trisomy 21 (n=1)
Neurology	1 (2.2%)	<ul style="list-style-type: none"> • Hypoxic ischemic encephalopathy (n=1)
Surgical	1 (2.2%)	<ul style="list-style-type: none"> • G-tube surgery follow-up (n=1)
Urology	1 (2.2%)	<ul style="list-style-type: none"> • Hypospadias (n=1)

Discharge from Maddie’s Place

Sixty infants discharged back into the community had data on their length of stay at Maddie’s Place. The average length of stay of discharged infants was 56 days (SD: 31.9) with a median of 48 days (range: 126 days; minimum: 7 days; maximum: 126 days).

At discharge from Maddie’s Place, information on guardian was provided for 63 infants. The largest group, 27 infants (42.9%), went into the community with their birthing parent while three (4.8%) went with their non-birthing parent and four (6.3%) went with both. Four (6.3%) went with at least one of their grandparents, three (4.8%) went with an aunt and/or uncle, and two (3.2%) went with another unspecified relative. There were 17 infants (23.9%) released with a foster caregiver and two (2.8%) with foster-relatives. One (1.6%) infant reportedly left with a “suitable other” (this refers to someone who the family knows or has met and is comfortable with taking placement of the child, who also is approved by DCYF).

Birthing parents

Limited data on the birthing parent was available. The team at Maddie’s Place reported data such as birthing parents’ current medication, diagnoses, treatment plans, and engagement. Health outcomes measures such as well-being assessments have not been collected.

Birthing parent demographics

Age was available for 68 (95.8%) of the birthing parents with an average of 30.6 years (SD: 5.2) and a median of 31 years (range: 21 years; minimum: 20 years; maximum: 41 years). Race was available for all birthing parents with the majority being white (n=53; 74.6%) and smaller numbers of individuals being

Black/African American (n=12; 16.9%) and American Indian/Alaska Native (n=6; 8.5%). Ethnicity was not reported for most of the birthing parents, but one (1.4%) was noted as Hispanic/Latina/X.

The majority (n=63; 88.7%) were listed as single while eight (11.3%) were noted as married. All birthing parents except for eight (11.3%) had insurance information with the largest group being covered by Molina (n=35; 49.3%) followed by the Community Health Plan of Washington (n=14; 19.7%), Coordinated Care (n=6; 8.5%), and Amerigroup (n=5; 7%) with two (2.8%) being double-covered (both Molina and Community Health Plan of Washington) and one (1.4%) being covered by Kaiser Permanente. A total of 55 birthing parents (77.5%) were considered unhoused at the time of birth.

During their stay at Maddie's Place 69 birthing parents (97.2%) were able to get enrolled in the Women, Infants, and Children (WIC) nutrition program which assisted Maddie's Place with the cost of care by providing funding for formula. A total of 23 birthing parents (32.4%) were able to enroll in the [Parent-Child Assistance Program \(PCAP\)](#).

SUD and SUD treatment for birthing parents

Information on the specific treatment(s) for SUD was unavailable for 27 of the birthing parents (38%). For the other 44 birthing parents, the most common treatment was an intensive outpatient program (n=22; 50%), followed by inpatient (n=17; 38.6%), and standard outpatient treatment programs (n=5; 11.4%). A total of 34 birthing parents (47.9%) were documented by the Maddie's Place team as receiving medications for opioid use disorder (MOUD) during their stay. The most common MOUD was methadone with 24 birthing parents (70.6%) receiving medication while 10 received a buprenorphine product such as *Suboxone* or *Subutex* (29.4%). Of those with data available (n=33), most of the birthing parents had begun MOUD-based treatment before arriving at Maddie's Place (n=28; 84.8%).

The Maddie's Place team does not monitor parental medication(s) outside of MOUD. As parents are not considered patients, the Maddie's Place team does not record or administer their medication(s). Parents are allowed to store their medication(s) in a locked room and self-administer when necessary.

Maddie's Place does not routinely conduct drug screenings outside of confirmation at the time of arrival at the facility or during emergencies; the team relies upon the assigned DCYF social worker to provide results. Parents sign a consent or release of information between Maddie's Place and DCYF for this purpose. Over the course of their stay at Maddie's Place, only nine birthing parents (12.3%) had a confirmed return to use. Most of the confirmed return to use cases occurred with opioids (n=7; 77.8%; fentanyl=6; oxycodone=1) while the other two (22.2%) were with alcohol. Five of the return to use cases were identified via testing order by DCYF (55.6%), two were from self-report by the birthing parent (22.2%), and one by a test at Maddie's Place (11.1%). Also, one birthing parent's (11.1%) family members reported finding the individual suffering from suspected fentanyl overdose symptoms.

Homelessness

The biggest barrier that parents of infants at Maddie's Place face is homelessness, and Maddie's Place works to identify supports that help families maintain recovery and safely parent. Given the high demand for safe, affordable housing in Spokane, parents are placed on housing lists through Catholic Charities as early as possible. Maddie's Place also supports parents being discharged into stable environments, whether long-term treatment, sober housing options, or with supportive family members. For those with immediate shelter needs, temporary options are arranged. To further support families, Maddie's Place

often provides essential household items, including beds, cribs, houseware, and baby supplies, as parents work to build stability from a starting point that often includes homelessness.

Finally, the Maddie’s Place team assists parents in locating and applying for childcare upon the infants’ discharge from the facility. Most commonly, the assigned DCYF social worker is responsible for tasks related to direct childcare needs as they are responsible for the cost.

Non-birthing Parents

Like birthing parents, due to the focus of Maddie’s Place and the limited number of non-birthing parents present, no descriptive information was provided for the report.

While in-utero exposure to opioids and other substances increases the risk of conditions like low birth weight, preterm birth, feeding problems, respiratory issues, gastrointestinal issues, pulmonary issues, hearing loss, and seizures, not all medical conditions listed in the table are necessarily linked to opioid or substance withdrawal. We lack information on which, if any, of the listed medical conditions are directly associated with substance exposure. These data in Table 5 are presented to describe the sample of infants in this report.

Table 5: Diagnosed medical conditions from birth record for infants at Maddie’s Place

Body system and diagnosis	Count (%)
Infant specific	
Feeding problems	37 (52.1%)
Insufficient prenatal care	14 (19.7%)
Preterm	14 (19.7%)
Hypoglycemia	12 (16.9%)
Small of gestational age	12 (16.9%)
Meconium in amniotic fluid	10 (14.1%)
Intrauterine growth restriction	6 (8.5%)
Large for gestational age	6 (8.5%)
Weight loss greater than 10%	4 (5.6%)
Failure to thrive	2 (2.8%)
Microcephaly	2 (2.8%)
Premature Weight	2 (2.8%)
Abnormal neonatal screen	1 (1.4%)
Breech delivery	1 (1.4%)
Formula intolerance	1 (1.4%)
Hyperglycemia	1 (1.4%)
Hypothermia	1 (1.4%)
Other problems	1 (1.4%)
Trisomy 21	1 (1.4%)
Gastrointestinal	
Hyperbilirubinemia	10 (14.1%)
Neonatal jaundice	8 (11.3%)
Rectal Fissure	3 (4.2%)
Cholestasis	2 (2.8%)

Diarrhea	1 (1.4%)
Dysphagia	1 (1.4%)
Gastroesophageal reflux disease	1 (1.4%)
Hepatomegaly	1 (1.4%)
Melena Other biliary tract disease	1 (1.4%)
	1 (1.4%)

Respiratory	
Respiratory distress	24 (33.8%)
Transient tachypnea	10 (14.1%)
Desaturations	6 (8.5%)
Apnea	5 (7%)
Meconium aspiration syndrome	5 (7%)
Respiratory failure	4 (5.6%)
Pulmonary hypertension	4 (5.6%)
Pneumothorax	3 (4.2%)
Tachypnea	3 (4.2%)
Abnormal cystic fibrosis	2 (2.8%)
Hypoperfusion	2 (2.8%)
Lung disease	2 (2.8%)
Respiratory depression	2 (2.8%)
Pneumomediastinum	1 (1.4%)
Pulmonary insufficiency	1 (1.4%)
Upper respiratory infection	1 (1.4%)

Cardiovascular	
Heart murmur	6 (8.5%)
Patent foramen ovale	4 (5.6%)
Atrial septal defect	2 (2.8%)
Patent ductus arteriosus	2 (2.8%)
Intraventricular hemorrhage	1 (1.4%)
Periventricular Leukomalacia	1 (1.4%)
Pulmonary artery stenosis	1 (1.4%)
Ventral septal defect	1 (1.4%)

Genitourinary	
Cystitis	1 (1.4%)
Hypospadias	1 (1.4%)
Urinary tract infection	1 (1.4%)

Musculoskeletal	
Shoulder dystocia	2 (2.8%)
Abnormal magnetic resonance imaging	1 (1.4%)
Clavicle fracture at birth	1 (1.4%)
Congenital malformations	1 (1.4%)
Parietal bone fracture	1 (1.4%)

Integumentary	
Diaper rash	7 (9.9%)
Caput succedaneum	1 (1.4%)
Inguinal hernia	1 (1.4%)
Intravenous infiltration	1 (1.4%)

Umbilical granuloma	1 (1.4%)
Neurological	
Hypoxic ischemic encephalopathy	5 (7%)
Abnormal electroencephalogram	2 (2.8%)
Seizure	2 (2.8%)
Encephalopathy	1 (1.4%)
Eyes	
Congenital cataracts	1 (1.4%)
Ears, nose, mouth, throat	
Tongue tie	18 (25.4%)
Abnormal hearing	4 (5.6%)
Endocrine	
Hypocalcemia	4 (5.6%)
Metabolic acidosis	2 (2.8%)
Hyperchloremia	1 (1.4%)
Hypernatremia	1 (1.4%)
Hypokalemia	1 (1.4%)
Hematologic/lymphatic	
Coagulopathy	3 (4.2%)
Thrombocytopenia	3 (4.2%)
Anemia of Prematurity	1 (1.4%)
Congenital anemia	1 (1.4%)
Polycythemia	1 (1.4%)
Other infections	
Methicillin-resistance staphylococcus aureus	2 (2.8%)
Sepsis	2 (2.8%)
Syphilis	2 (2.8%)
Thrush	2 (2.8%)

Impact of Maddie’s Place to avoid more costly interventions

Note: HCA authored this section of the report.

ESSB 5187 (2023) requires an evaluation of the “impact of providing these services to avoid more costly medical interventions.” The WSU evaluation team was unable to draw definitive conclusions in this regard. Their evaluation, which included both quantitative and qualitative data analysis, was descriptive in nature and not an experimental or cost-benefit design. There was no comparison group and therefore no methodological ability to reasonably conclude if the services provided to infants at Maddie’s Place avoided more costly medical interventions.

In the absence of a true outcomes-based study using a comparison group or a formal cost-effective analysis, the mechanisms by which services at Maddie’s Place could prevent more costly medical interventions can be described in three scenarios. The scenarios described below are provided in order of assumed fiscal impact based on reasonable assumptions and general cost estimates.

1. **More costly medical interventions are avoided if infants are transferred to Maddie’s Place from inpatient hospital settings and the days at Maddie’s Place take the place of what would have been additional days in a hospital setting.** Replacing days in a NICU would yield greater savings than replacing days in a mother/baby or pediatric unit. This would maximize Medicaid cost savings as the daily costs of Maddie’s Place are likely less than those paid to a NICU. Because Maddie’s Place has 24/7 nursing, they can provide the skilled nursing services needed to evaluate, monitor, and adjust the treatment needs of infants requiring medications to manage withdrawal symptoms. The current lengths of stay at Maddie’s Place would need to be adjusted for any modeling, because the average length of stay for infants included in the WSU analysis was 56 days, much longer than most NICU stays for NAS as a primary diagnosis.
2. **For infants who would otherwise have been discharged from the hospital to a community/home setting and are instead admitted to Maddie’s Place, there would not be any savings from avoided hospital days.** This would, instead, be an admission for a new or different problem. It is possible that in this scenario admission at Maddie’s Place avoids additional outpatient Medicaid-covered services, including visits to the emergency room or to urgent care that would have otherwise been necessary. Once the acute symptoms of substance withdrawal resolve, after tapering off medication used to treat opioid withdrawal, for example, it is rare for symptoms to return to a level that requires skilled nurse managed observation and medication administration of the infants admitted to Maddie’s Place, only two required medication and both came from the hospital. None of the infants admitted after hospital discharge required initiation of medication.
3. **If the infants who received services at Maddie’s Place were followed longitudinally to school age and into adulthood, it is possible that additional cost savings could be identified.** But designing a clinical trial and following two sets of equally paired infants, one set that received care at Maddie’s Place and another set that did not, would be expensive, time consuming, logistically challenging, and unethical.

This report is not able to definitively determine if Maddie’s Place services avoided more costly medical interventions. The WSU analysis did reveal, however, that while the majority of the 71 infants included in

the analysis were referred from a local Spokane hospital (n=49; 69%), 36 (50.7%) were placed at the recommendation of CWS. This suggests that these placements were not primarily performed out of medical necessity and the need for 24-hour continuous residential care and skilled nursing services because of drug exposure but were rather primarily related to social needs. Supporting this, the WSU analysis revealed that over three-quarters of the birthing parents were considered unhoused at the time of birth.

It is unknown how many of the 49 infants who were referred from hospitals would have required additional days in the hospital setting if not for Maddie's Place. It is safe to assume that two of the infants would have required additional hospital days if not for Maddie's Place, because they were on opioid weans when arriving. One infant received one dose of morphine sulfate at Maddie's Place and the second infant received two doses. Maddie's Place provided feeding support, including gavage feeding. The WSU analysis indicates that 18 infants (25.4%) were admitted to Maddie's Place with a nasogastric tube. It is unknown if any of these infants on gavage feeding would have been appropriate to discharge back to a community/home setting rather than being admitted to Maddie's Place. Nasogastric feeding is often continued from the hospital to the home, with appropriate supports, outpatient services, and follow up.

Aside from cost considerations, there is data from the WSU evaluation team that indicates families experienced other benefits and positive impacts from Maddie's Place. These are described in the qualitative work done and in Aim 3 of the evaluation. There may also be benefits to the child welfare system related to family preservation, supporting dyads, and parent recovery that are not currently fiscally quantifiable.

Allowable Medicaid-covered services at Maddie's Place

Note: HCA authored this section of the report.

ESSB 5187 (2023) requires this report to identify to "what extent the federal Medicaid program allows for reimbursement of these services and identify the barriers in leveraging federal Medicaid funding for the services in Washington's state Medicaid plan." The WSU evaluation team was unable to address this requirement as they are not subject matter experts on Medicaid, Medicaid-covered services, or our Medicaid State Plan.

HCA staff compared services provided at Maddie's Place to approved services under our Medicaid State Plan. Approved services are those that are Medicaid allowable and for which we can draw down federal match. The results of this review are outlined in tables 6 and 7. Table 6 identifies services that are believed to be covered, and Table 7 identifies services that are not covered.

The barriers to receiving federal Medicaid funding for the services in the second, not covered, table vary based on the service. Possible reasons these services are not covered include:

- The service is not covered or allowable under Medicaid.
- The service may be allowable if medically necessary but is not currently in our State Plan.
- A large overarching barrier is that for any service at Maddie's Place (or any Pediatric Transitional Care Facility PTCF) to be Medicaid allowable, the statutory rules and requirements must be met. [RCW 71.12.680](#) and [WAC 246-337-081](#) require that infants at a PTCF "require twenty-four-hour continuous residential care and skilled nursing services as a result of prenatal drug exposure." It is

unclear which services at Maddie’s Place are provided to infants that meet these requirements and what skilled nursing services they are receiving that are directly related to the infant’s prenatal drug exposure.

The services provided by Maddie’s Place are organized in tables 6 and 7. Table 6 lists services that are reimbursable by Medicaid as outlined in our State Plan. Table 7 lists services that are not reimbursable by Medicaid.

Table 6: Services provided by Maddie’s Place reimbursable by Medicaid

Service	Coverage
Continuous cardiorespiratory monitoring during stabilization and treatment that includes medication.	Covered if medically necessary
24/7/365 Pediatric MD, ARNP or Neonatologist available at the bedside as needed and by phone. Full medical exam within 24-72 hours of admission, depending on status at time of admission (Neonatologist, Pediatrician or Pediatric ARNP) Two-week well newborn exam provided on-site.	Covered if medically necessary (as well as additional well exams post 2 weeks)
Phototherapy as needed	Covered if medically necessary
Labs as needed	Covered if medically necessary
Occupational Therapy to address a variety of issues related to NAS. Some of those concerns are failure to thrive, enteral feedings, suck/swallow evaluation, ability of the infant to protect their airway related to reflux. Occupational therapy will advise medical staff on management techniques.	Covered if medically necessary
Physical Therapy to address hypertonia and Hypotonia related to NAS. Additionally, Physical Therapy has been shown to help address pain management for infants in withdrawal.	Covered if medically necessary
Referrals to specialists related to common long term sequelae from drug exposure. Specialists may include Gastroenterology, Neurology, follow up STD screening based on risk, and the fetal alcohol clinic	Specialty care is covered if medically necessary
Feeding therapies include G-tube feeds as needed, gastric volume management, infant driven feeding for infants with reflux, formula intolerances (addressed with smaller volumes, frequent feeds, higher calories). Daily weight until birth weight is regained and feeding is stable.	Covered if medically necessary
Pharmacological Management of NAS as indicated by infant assessment	Covered if medically necessary

Transportation assistance to and from local appointments for parents engaged in the care of their infant at Maddie’s Place	Covered if medically necessary (appointments must be Medicaid-covered services)
Home visit two weeks after discharge from Maddie’s Place Medical and Social Services Staff	Could be covered if medically necessary and provided by a qualified health professional (not clear who/what role and licensure is providing home visit)
Mental Health Providers on-site and available for parents during daytime hours	Covered if medically necessary (Believe MP staff is not directly providing MH services but could provide by having independently licensed mental health professionals on site or by contracting out with a Behavioral Health Agency)
Developmental screening within two weeks of admission, provided by community Early Services for Infants and Toddlers (ESIT) providers	Covered if medically necessary Developmental screenings are covered under EPSDT services, most often during well child checks but can be administered more often as indicated and medically necessary. ESIT services would also be paid for by Medicaid, in utero exposure is an automatic qualifier for ESIT services in WA State)

Table 7: Services provided by Maddie’s Place not reimbursable by Medicaid

Service	Coverage
Registered Nurse Care Coordinator for patients with complex non-life-threatening medical needs, related to withdrawal. Care will be coordinated between specialists, primary care providers, OT/PT/Feeding therapies, and other vital community resources. Nurses will specialize in organizing patient care and treatments by incorporating all members in the care team. Care coordination of patients has been shown to improve patient outcomes, improve access to care, decrease healthcare costs, prevent hospital readmissions, and promote continuity of care.	Not a covered service
24 Hour Nursing Care including Head-to-toe Nursing assessment immediately upon admission and every shift during acute	Not a covered service

withdrawal period, then every day. Vital signs on admission and at least every 8 hours during acute withdrawal, then every day

NAS Nurse Educator for inpatient training of family and primary caregivers; Training provided to family members prior to discharge: Reading your infant’s signs and signals of distress, managing feeding difficulties and weight loss concerns, Managing stimulus in a family environment, Impact of prenatal drug exposure on long-term development and behavior, postpartum depression, therapeutic handling, Period of Purple Crying, and Safe Sleep. With an individualized plan of care to promote the growth, development, and health of each infant.

Not a covered service

Lactation Consultation for feeding on demand, breastfeeding encouraged and supported by AAP guidelines

Not a covered service

Wound care management (severe diaper rashes) related to NAS withdrawal

Not a covered service

But it would be covered under an appropriate E/M code aligning with national coding guidelines

Non-Pharmacological Management and family education. Environment will be controlled to accommodate low stimulation needs of infants.

Not a covered service

Staffed adequately to provide ESC successfully in absence of a parent

Not a covered service

Eat, Sleep, Console is not relevant in absence of a parent as primary caretaker

Parent peer **mentorship**

Not a covered service

Peer support is covered through BHAs (Behavioral health agencies)

24/7 text line with Maddie’s Place staff available for one year from discharge for each mom, dad, foster parent or kinship care provider

Not a covered service

Aim 3: Qualitative analysis of parent experiences at Maddie’s Place

Methods

Participants

This study was deemed exempt from Institutional Review Board review by Washington State University’s Human Research Protection Program Institutional Review Board. All participants were recruited through private Maddie’s Place groups on social media and through the distribution of informational fliers by Maddie’s Place personnel. Interested individuals submitted their demographic, contact, and scheduling information to a Qualtrics survey created by the WSU research team. At the time of the interview, participants were provided with a written copy of the informed consent as well as verbal review of the consent prior to conducting the interview.

The purpose of this study was to investigate parents’ lived experiences regarding pregnancy, postpartum, and parenting a baby with NAS, as well as their experiences with a pediatric transitional care facility for NAS, Maddie’s Place, a 501(c)3 non-profit, free-standing recovery nursery in Washington State for babies experiencing withdrawal symptoms due to prenatal substance exposure (maddiesplace.org) via qualitative interviews. To participate, individuals were required to complete a screening survey to verify they met eligibility criteria: 18 years or older; and perinatal parent of an infant with NAS who has utilized a pediatric transitional care facility for NAS (Maddie’s Place).

Procedures

One-on-one qualitative interviews were conducted in May and June of 2024 by WSU researchers Brooks and Brumley at Maddie’s Place, in private offices to preserve participant confidentiality. Interviews were recorded on non-internet-based digital recording devices for transcription purposes. Any identifying information introduced during the interview was redacted during transcription (e.g., geographic references or names). Audio recordings and transcripts were stored in a restricted access folder within the university’s two-factor authenticated, encrypted file storage system and labeled only with participant identification numbers. Participants received a \$50 Walmart gift card for their time.

Instrumentation

Interviews consisted of 10 open-ended questions about the participants’ experiences with pregnancy, postpartum, and parenting a baby with NAS, as well as their experiences with Maddie’s Place (see [Appendix B](#)). The interview guide was used to direct questioning, and follow-up questions or additional comments by participants and the interviewer were permitted. Demographic information was collected including age, gender, ethnicity, and race (see tables 8 and 9). Maternal and infant characteristics (e.g., length of stay at Maddie’s Place) were also collected (see tables 10 and 11).

Table 8: Participant Demographics, ages

	Range	Mean	Standard Deviation
Age	23-38	30.93	4.334

Table 9: Participant demographics, race and ethnicity

	Frequency (n)	Percent (%)
Gender		
Female	15	100
Ethnicity		
Not Hispanic or Latino	14	93.3
Hispanic or Latino	1	6.7
Race		
American Indian/Alaskan Native	1	6.7
White	13	86.6
More than one Race	1	6.7

Table 10: Maternal and Infant Characteristics, length of stay

	Range	Mean
Length of Stay	1 month – 4 months	2.30 Months

Table 11: Maternal and infant characteristics, continued

	Frequency (n)	Percent (%)
Status		
Currently Using Maddie's Place	5	38.46
Graduate of Maddie's Place	8	61.54
Housing Services		
Stayed in-residence	9	69.23
Daily Visits	4	30.77
Other Children		
Yes	11	84.62
No	2	15.38
Pregnancy		
Postpartum	12	92.31
Pregnant	1	7.69
Neonatal Abstinence Evaluation Method in Hospital*		
ESC	8	61.54
Unknown	5	38.46
Neonatal Abstinence Pharmacological Treatment		
None	4	30.77
Morphine	5	36.46
Morphine and Clonidine	4	30.77
Referral to Maddie's Place		
NICU Nurse	1	7.69

NICU Staff	2	15.38
Neonatologist	2	15.38
Social Worker	3	23.08
Family or Friend	2	15.38
PCAP Worker	1	7.69
Request for placement	1	7.69
CWS	1	7.69

* No mention of FNAST or Finnegans

Preliminary data analysis

Researchers followed a qualitative descriptive approach and qualitative content analysis methods to analyze participant interview transcripts and generate themes. Researchers independently reviewed the transcripts, and marginal notes were shared and discussed among the group to aid in theme development, using the interview guide as a framework.

Results

Fifteen perinatal (93% postpartum; 7% pregnant) women, aged 23–38 (M = 30.93; SD = 4.33) who have used services at Maddie’s Place participated in the study (out of the 71 total). Participants reported their race(s) as American Indian or Alaska Native (7%), More than one race (7%), and white (86%). Seven percent of participants were Hispanic or Latino. Three individuals eligible on the screening survey did not participate due to nonresponse or scheduling issues. One person partially completed the screening survey and were therefore not eligible to participate.

Preliminary analysis of the transcripts suggests several themes which map onto the interview guide in 6 categories: 1) Pregnancy Experiences (including expectations for having a baby with NAS); 2) Birth Experiences; 3) Postpartum/Parenting Experiences; 4) Helpful/Beneficial Maddie’s Place Experiences; 5) “What if Maddie’s Place wasn’t here?”; and 6) Areas for Improvement.

Pregnancy Experiences

Variations existed in participant substance use during pregnancy. All participants reported either **treatment for opioid use, active use, or some combination of both**. Among those who continued substance use during pregnancy some reported **trying to cut back**.

“Once I found out I was pregnant, I decided to go to treatment. And then once I went to treatment, after then it was very smooth.”

“In my mind, I knew I needed to do something about my addiction. And so I cut back.”

Pregnancy appeared to be a turning point that influenced behavior changes for many participants, but many challenges were reported such as **lack of connection to resources, limited social support, stress, and trauma.**

"they [prenatal care clinic] didn't ever offer any kind of assistance with like substance abuse or anything. They were offering assistance with getting me connected with an adoption agency, but they wouldn't – they never offered any kind – there's no assistance out there for moms that are pregnant and my age"

"I was using Fentanyl and the blue pills that are out nowadays. And meth. It was kinda rough for me. Like coming down all the time and not being well. [...] I didn't have no prenatal care."

"Well, I never used Fentanyl. I just – I thought it was coke. That's how I found out I was pregnant is when I died in the hospital."

"I got released from the hospital and I went back to my mom's, and then like shortly after that, my boyfriend ended up going to jail. And then after he got out of jail, he went to treatment. So I was kind of like feeling alone when I was pregnant..."

"it was kind of stressful. I was in recovery, and, I wasn't using, but I had used in the past, so I was on methadone."

Within **Pregnancy Experiences**, participants also touched on **expectations for having a baby with NAS** and interviews showed a recurrence of **not fully understanding nor receiving information** about what their babies would experience and **guilt** for continued use.

"But I do believe that doctors and medical staff, they don't really prepare you and they don't – I don't feel like they really fully disclose what your baby can potentially go through. And I feel like they kinda – with the idea in mind of harm reduction, they don't – they think that your success is more likely if you're able to stay on the medically-assisted treatment. And so in lieu of that, I believe that they'll kind of – I don't know – they don't disclose fully the withdrawal symptoms that your baby most likely will encounter."

"You know, I was so just caught up in my own addiction that I didn't really think about it."

"And then, um, this is kind of like been a problem, I guess, with like a lot of girls that are pregnant with methadone. They tell you like if you stop methadone, you're gonna have like a miscarriage and all this stuff. And actually, in your pregnancy, you need to go up because the baby is like taking some, so like you're not getting all of it. So like, yeah, 'cause I wanted to get off of it, but – so that wasn't really a choice. I had to actually stay on it and then I had to keep going up. So that was really stressful. [...] I asked them. 'Cause that was my biggest thing -- I'm still very mad about it. I was like, "Well, is my baby gonna have like withdraw symptoms?" It's the same thing as using

basically. And, they said no – they were telling me no and saying like even if he does -- on the rare chance that he has withdraw symptoms, they're not gonna be that noticeable. I also went to an OB/GYN who like supports methadone. So I literally didn't like worry about it at all during my pregnancy. And then an hour before I gave birth to (name reference), like a pediatrician came in and like told me basically what to expect with him. Like the withdraw symptoms, how long, and all this stuff. And then like all this like guilt and shame came over. And, yeah, it was really bad. It just sucks that I'm like clean technically like – but now my baby is still going to have all these withdraw symptoms from drugs. You know? I was completely like blindsided."

"And it's just so weird how like really on the hamster wheel you are with the Fentanyl. And so I was just so in that and so just like mortified about what was going on and like my guilt and stuff that I did not step up and do what I needed to do and be like I need to go to the doctor and I need to take care of this."

Birth experiences

Birth experiences varied across the 15 participants, some noted **stigma or judgmental treatment from the medical staff** while others reported feelings of **support and compassion from medical staff**.

"I mean, they didn't really treat me the best, but honestly, like if I was a normal person and like I see that coming into my hospital, I would be kind of like ick, too. But, I mean, they weren't like mean or anything, but, yeah"

"I went to the hospital one time because I actually had a UTI, and I thought I was having contractions because my bladder was like spasming. And they tried to do the C-section then. And I found out that it was my bladder 'cause I looked at the monitor. And I was like, "You guys are messed up, man. You're sitting here and you have me believing that I'm having contractions, and you're over here laughing about it." And I said, "Why? Because I'm on drugs?" I said, "Look past that. I'm a human being and this baby is a human being." I deserve some kind of dignity. Like just because I'm a drug addict like doesn't mean that I don't deserve some kind of respect."

"[Hospital Name] was so great in the NICU. And they weren't judgmental at all, and they were just like sympathetic with us, even though – based on all that was going on. They gave us – like they talked us up and said you can do it. Like we've seen this so many times. Like you can do it. And they were just awesome in the NICU. And it was so nice. That was like the first like sign of compassion that we had seen since she was born, and it was just so amazing and really helped kickstart our journey into furthering like wanting a better life."

"I felt the most supported. The NICU staff there, they were super welcoming, and I was with them 24/7."

"It was actually – it was pretty good. Well, considering I went in there and they knew nothing about me at all or my pregnancy. They were really nice and they were super

helpful. [...] There was one nurse lady there – she was like the most helpful. She was like calming me and like helping me through. She was really nice. Um, but they were – ah, they were explaining to me like – you know, like ‘cause of substance use and stuff that the baby could have problems and like they have to prepare for all that. So they kind of walked me through that, too. So it was – it was really nice.”

Participants noted that **the hospitals expectations and procedures for infant care differed from their own** and expressed **feelings of not being heard or misunderstood**.

“A new nurse would come in, and she would have her own way of doing things. Or like he would be crying, and I know if he’s crying, like you have to hold him. If you put him down, he’s not going to stop crying. It’s just gonna make him worse. And like when I had to leave one time, I handed him off to one of the nurses, and she instantly just went to go put him down while he was crying. Like they just did things that I just didn’t like agree with, I guess. Like how to like handle him. I guess like obviously they have their own things and I have mine. So that kind of was frustrating. [...] –I wanted to go home and just be in the comfort of my own home and make my own bottle if I wanted to. You know?”

Parenting/postpartum experiences

Mothers described **the joy of parenting and happiness in getting the opportunity to parent**.

“I just love being a mom. ‘Cause I never thought I’d be a mom before, you know, and I just love it. I get so excited when I go pick him up from daycare. You know? It’s just amazing.”

“Actually, it’s been pretty great. It’s different how – like with my parenting this time just because I was kind of winging it before. Like, you know, I didn’t really have much guidance with parenting. And I’m more on like a schedule now, I guess. Like so I just – kind of being here, they’ve taught me a lot, um, just like with feeding routines, changing routines and I’ve had more of a bond with my baby this time than I did with my prior. It’s just – it’s nice.”

Challenges in parenting emerged to include **postpartum depression, needing resources for basic needs such as housing, and difficulty with time management** and mothers described **feelings of being stressed and overwhelmed**.

“Like I know I’m a good mom, and my baby knows I’m a good mom. And for people to just treat me like something else because I was addicted to drugs is really hard. ‘Cause like I’m sober now, and it’s really hard to get to the point where I’m at now. Like it was hard. It still is hard. Like I go to treatment three times a week. I’m on methadone. I have all these appointments I have to get to. The baby – she has a dietician, a feeding therapist, um, an O.T., a P.T. She has the – she goes to her doctor appointments like – her next appointment is in a couple weeks. She has a swallow study she has to do.”

"It's so stressful. Um, so, yeah, between that and (name reference), like I'm not showering or like brushing my teeth, eating. Like nothing. I have like just no time for myself, so it's just like really, really hard. And then I was still sleep deprived. Even if like I could sleep, I'd still have to wake up every two hours to pump. So, yeah, it just started to like really wear on me. So, that's basically how it's looked like. And I just feel so bad because I wasn't able to enjoy having a baby and a newborn. And just – it is just so stressful. Like I'm not really enjoying it. I'm just trying to like survive it almost."

Helpful/beneficial Maddie's Place experiences

All mothers described positive benefits in using Maddie's Place. Participants described **care and compassion from staff for themselves and for their baby.**

"I was in tears this morning. I walked in the kitchen and I was just thinking to myself – because I had just handed my baby off to one of the cuddlers, and one of the ICS was holding one of the other ones. And I was just thinking like, wow, what a blessing to be able to know like I handed my baby off and to know like he's being so loved right now by somebody that wants to care for him, that wants to hold him, that wants to be there."

"They always made us feel comfortable. That was like my favorite thing about it. They never treated them like they were below you. They always treated you as an equal. And it's just – it was just like always going – kind of like going home whenever we would come to our visits and stuff because it's just so comfortable and you just get to know everybody. And everybody is rooting for you, and they'll help you with any parenting stuff, tell you about parenting classes. Like – and they have the nurses and everything. And so just the whole experience at Maddie's Place is exactly what new – or not even new moms exactly, but moms who have addiction problems and babies that are born exposed to all of the things that you could be exposed to that Maddie's Place covers – it's exactly that bridge. You know, that's the best way I can describe it is like a bridge after the hospital and then to the next big part of life with you and the baby"

"It took me, like I said, over like a month, um, to get clean after she was born. So I visited her here, but only, you know, for like an hour or so at a time. Where they were with her twenty-four hours and like held her through all of her tremors or any of her, you know, symptoms that she had. Which was like so comforting as a parent to know that she still got that care and wasn't being left alone."

"it's just nice. Like the staff, they're – the workers are all there to help you. And it was nice at night, too, 'cause they'd – they want you to like rest and take care of yourself also, so they would help sometimes with like the cares if you needed help. And when I say cares, I mean like, um, the baby wakes up, you change them, you feed them, prep their bottles. They would help with like making bottles – like pre-making them and putting them in the fridge for you. Um, they'd warm them up while you're changing

the baby. Like they're super helpful. Or like if you're just tired and you needed sleep, they would take the baby for you a little bit. Like they were – they were really helpful with that, too."

Mothers reported the benefits of social services at Maddie's Place to include **assistance in making connections with community resources outside of Maddie's Place** and the fostering of **social connections and peer support**.

"When I was here at Maddie's Place, they helped me get things done on my like to-do list. They helped me get my dentures. 'Cause before, they helped me get my teeth pulled out and get my dentures. Just – there's a bunch of different stuff that they helped me get squared away, you know, so I could have a better life. [...] There's been lots of benefits. 'Cause they have helped me come off of methadone so I can be alive and take care of my son on my own. They've helped me like be a better mom. 'Cause before I could leave here, I had to be giving all of his cares – taking care of him. So they helped me be determined to do all of his cares so I could leave here and go on with my life and start a new life over here. [...] I've made a lot of new friends here – all the people that work here. Now that I left Maddie's Place, they're in my life and I go and see them. I go out to lunch with them."

"...housing, rides, childcare. Pretty much anything you need they'll help you with."

"They have a lot more services than I thought. Like literally anything you need. [...] They're very accommodating. Like every time I've like brought up something, they think of something to fix it or – you know? And they want to know, too, so that they can fix things and make it better here. It's just a bunch of trial and error."

"Maddie's Place has been really awesome with like helping us like in any direction we needed. [...] And I just think that's such a cool thing to offer and like help. Especially when you're like getting out of addiction and you don't really know how to go into parenting, and you have that support like 24/7 for questions. Or if you're struggling with baby, they're there to help you. [...] even before like we got our car, like they helped me get to doctor visits or like any appointments we needed. Um, really just like anything we've needed and asked for, they've met our needs, which is amazing. It makes it that much easier to keep you in the right mind frame and doing the next right thing instead of like falling back into that cycle and giving up."

"Maddie's Place becomes your family. So, yeah, it's a really awesome, great place to be. And you want to be here. So, yeah, expect an add-on in your family. So my family is added on by a lot."

Lastly, participants described **benefits to their baby's health** because of the care at Maddie's Place, **improved parenting**, and **improved relationships with DCYF**.

"Yeah. I mean, like she's perfect. She's super healthy. She's just – she's growing great. She's doing amazing. I mean, like she's happy. She's – I don't ever see her cry. It's

crazy. I've never heard her cry yet. She is in the 99th percentile for her weight right now.- she's doing great. She's just happy, healthy. It's amazing. You can tell she's super cared for, so it's pretty nice."

"my son got the twenty-four-hour care that DCYF wanted. And I got the eyes that they wanted. And my son was able to – I don't know the word I'm looking for. My son was able to overcome his neonatal exposure. And they helped me better myself as a parent. They helped me get all my tasks and everything done. I mean, they – we tackled that right from the start. Um, when I entered, I was a return-home dependency, and by the time I left here, I'd completed everything DCYF wanted me to do."

'What if Maddie's Place wasn't here?'

When asked "What do you think things would have looked like for you and your baby if you didn't receive services at Maddie's Place?" several mothers believed they would have **continued using substances** or experienced **relapse** in their treatment.

"[Without Maddie's Place] I wouldn't be a functional human being. I would be I mean, who knows? I very likely could've relapsed under the pressure and the lack of sleep and just trying to – I mean, as addicts, especially if you're not far in your recovery, like our coping mechanisms are using. So if I'm tired and I'm like I need to find a way to be able to stay up and care for my children, that very easily for me could be like I need to go use a stimulant to be able to stay awake. Or the stress. I need to smoke a pill or an opiate in order to take care of my stress because I – like, yeah, my mental health really is – it's the number one thing that they've helped with. And it's the number one thing that I struggle with"

"I honestly would still be contemplating on getting high probably. Yeah, probably still be stuck in my old ways. And I don't know. They [Maddie's Place] loved me enough to want me and saw that I loved myself and worked on myself. "

"I would probably still be using and I probably wouldn't have my kid."

Many mothers reported the belief that their baby would be in **foster care** or they would have lost custody if not for Maddie's Place.

"I think [my baby] would've went straight to foster care. And I don't even know how that would work – if we would've been able to get visits with her. And I feel like with a lot of people that are using and in that situation and their child just automatically goes to foster care, that just seems like such a – a like permanent-ish kind of end to like – it just kinda like cuts off your road"

"My baby would probably have been in foster care. And honestly I probably wouldn't be in a treatment facility right now and working on myself. I probably would've relapsed and just stayed like on the path that was on."

"Honestly, I feel like she would probably be in foster care and I wouldn't have gotten clean. I think that I would've spiraled worse knowing that she was in foster care. Which doesn't make sense. You'd think that you could pull yourself out of it, but I feel like it would've put me deeper into it and made it harder for me to get her back. I think having her here gave me that – um, what's the right word? Like it took weight off my shoulders so that I could focus on what I needed to do and like break away from my addiction so that I could be a mom instead of just pushing me deeper into addiction."

"she'd probably still be in foster care and I'd probably still be gettin' high. I probably would just be...not having any of the support that I've been able to get here."

"I think I probably would've lost her. [baby]"

"I probably would've lost him. [baby]"

Participants reported the **unknown** if they were not able to receive services from Maddie's Place.

"I have no idea. I honestly don't know."

"Well, I don't know where my son would've went. You know, that's kind of scary to me. I am really thankful for the fact that Maddie's Place was here. Because I was able just to take care of things like for myself."

"I honestly don't know. I honestly do not know. Probably not good. [...] I wouldn't have gotten as far as I have without them."

"I have no idea. It would be bad. I don't know. 'Cause I do get a lot of help here. So– and the way (name reference) is right now and like my mental – like I know like how – how much I can take, you know? Like how much of the crying I can take and no sleep and without eating. And, yeah, so I would not get a break at all. I'd be going crazy probably. And I keep saying like, oh, my God, thank God I'm here. Like I don't even know what I would do without like being here. You know? 'Cause it's really difficult to do it by yourself. So, yeah, I'm not sure what it would look like, but it wouldn't be that good."

Areas for Improvement

Participants suggested potential changes and highlighted areas for improvements related to different aspects of parental control to include **staff-patient interactions**, **incorporating more staff**, and expressed **challenges related to communal living** (e.g. cleaning, additional recreational activities). Additional **classes** in areas such as breastfeeding, career development, and parenting were recommended for areas of improvement, as well as **continued support after discharge**. The **need for more facilities like Maddie's Place** was expressed.

"it is a little hard still because there's still like new staff coming in, you know, relieving other staff. [...] And, yes, like I need to communicate, but it's so hard to communicate with like five different people that come on and then tell the other five people when

they come in. And then – you know, 'cause I'm not – like I don't like explaining my feelings to people as it is. So like telling like just random people that I don't like know that well like this is how I'm feeling today. Like you know what I mean? And saying it five times every day like to different – to everyone that comes in. [...] It's definitely like a mix between how like the moms living here and the nurses taking care of the babies and working here – it's like how there needs to be a system, I guess, for like communication and, um, just learning to live together. It's weird – you know, like it's a medical facility plus the homey feeling."

"Maybe visits on Sundays would be nice."

"Another thing they could do differently is, um, like we're not allowed to let the babies wear clothes from home. Like you have to wear the facility clothes for your baby. And that's really hard to do. So they can let people use their own clothes for their babies. And, um, that's another thing. Probably help people after they leave more than they do with like funding for clothes or, um – I don't know – give 'em more support after they leave."

"They're getting a coffee truck done, so that way the moms who come through the program will be able to work in it and make some money also."

"One thing that I heard was that a lot of moms come through here and they have the goal of being able to breastfeed, but I've been told that I'm the only mom that's followed through with it. Or I've heard that there was one other mom that was, but I think she relapsed or something. But out of all the moms that have come through here and so many of them wanting to breastfeed and none of them being able to be successful and giving up so quickly, I feel like maybe – it'd be really great to be able to educate them on the benefits and then educate them on the how-to and just really support them"

"Need more of these. [facilities like Maddie's Place]"

"I just wish there was more places like this place. Because especially like the opioid crisis and everything, like there's so much more like babies being born to like being exposed and stuff like that. And especially with Maddie's Place, like they even take babies without the moms. Just like for the babies, it's really good to have a place like this where they constantly are holding babies."

View [Appendix B: Interview guide](#) to see what questions were asked to Maddie's Place participants.

Summary

Maddie's Place, a pediatric transitional care facility in Washington State, offers a low-intervention, nurturing care model that aims to improve infant outcomes and may reduce health care costs. This report describes the preliminary impact of such a pediatric transitional care facility using descriptive quantitative and qualitative methods.

In **Aim 1** we examined existing limitations and challenges with accurately measuring and treating NAS and sought potential recommendations for improving measurement and monitoring through interviews with Spokane County healthcare providers. Providers highlighted rising fentanyl and polysubstance use, which has complicated neonatal treatment, requiring longer and more complex interventions for infant withdrawal while also accelerating severe SUDs in parents, limiting their ability to engage in post-birth infant care. While no discrepancies were noted in NAS reporting, changes in substance use trends, particularly increased fentanyl use, have negatively impacted both maternal and neonatal care. Providers stressed the need for standardized care protocols and expanded access to comprehensive recovery services to address co-occurring mental health conditions, medical comorbidities, and treatment barriers in perinatal populations affected by fentanyl and polysubstance use.

In **Aim 2** we described the health outcomes of 71 maternal-infant dyads utilizing Maddie's Place services. Infants were typically exposed to an average of four substances at birth, with methamphetamines (81.4%) and fentanyl (74.3%) being the most common. The average stay for infants at Maddie's Place was 56 days, with most returning to their parents or relatives. While infant functioning clearly improved during their time at Maddie's Place, it is unclear how this improvement compares to the expected progress in the absence of the services provided there, especially in the absence of further research validating the Hopkins assessment tool as well as additional, longitudinal, cohort-matched evaluation.

In **Aim 3** we qualitatively analyzed parental experiences at Maddie's Place through interviews with 15 women, exploring pregnancy, birth, and postpartum periods. Key themes included positive experiences with Maddie's Place services and suggestions for improvement, with most mothers expressing gratitude for the support provided through Maddie's Place. The biggest barrier for parents at Maddie's Place is homelessness, and Maddie's Place works to connect families with the supports needed for recovery and safe parenting. Due to high demand for affordable housing in Spokane, parents are placed on housing lists through Catholic Charities early in their stay. Maddie's Place ensures parents are discharged to stable environments, whether in long-term treatment, sober housing, or with family support, with temporary shelter arranged as needed.

The state could request future state resources and consider additional research for continued evaluation of the impact and potential offset of longer-term costs to Medicaid-covered infants. As very few of the services currently provided at Maddie's Place are eligible for payment by Medicaid, additional information showing cost-neutrality would be needed for submission of a waiver request to CMS if additional Medicaid funding is desired. Medicaid waivers are only approved for new service types if current Medicaid costs are maintained. Because most admissions to Maddie's Place occurred after hospital discharge, costs were added to the system.

Recommendations

Potential recommendations to meet the complex and evolving needs of families affected by the ever-changing landscape of substance use include:

1. Continued surveillance and monitoring of NAS rates as well as NAS symptomology and treatment efficacy in the era of increasing fentanyl and polysubstance use.
2. Continued monitoring of the developmental and health outcomes of infants served at pediatric transitional care facilities such as Maddie's Place.
3. Continued assessments of quality of care and services rendered at pediatric transitional care facilities from the caregivers' perspectives.
4. A robust financial evaluation to estimate any savings achieved by potentially avoiding more costly medical interventions.

Appendix A: Technical notes on prevalence of NAS

Table 12. Rate of NAS at the Washington State and National levels from 2016-2022

Year	Number of live births occurring in WA to WA residents	Number of hospitalizations of infants with NAS ¹	Rate per 1,000 births in WA	Rate per 1,000 births nationally ²
2016	89,058	865	9.7	7
2017	86,161	895	10.4	7.3
2018	84,648	869	10.3	6.8
2019	83,553	730	8.7	6.3
2020	81,678	791	9.7	6.3
2021	82,304	848	10.3	6.2
2022	81,759	912	11.2	Not Available

Birth Certificate Data: Washington State Department of Health, Center for Health Statistics.

¹NAS defined as ICD9-CM code 779.5 or ICD10-CM code P96.1

²HCUP Fast Stats. Healthcare Cost and Utilization Project (HCUP). September 2024. Agency for Healthcare Research and Quality, Rockville, MD.

‡ Beginning in 2008, cases of iatrogenic withdrawal are excluded. Iatrogenic withdrawal defined as ICD9-CM codes: 765.01–765.05, 770.7, 772.1X, 779.7, 777.5X, 777.6 or ICD10-CM code P96.2

Definitions:

Council of State and Territorial Epidemiologists. (2019). [Neonatal Abstinence Syndrome Standardized Case Definition](#). (CSTE Position Statement 19-MCH-01).

Iatrogenic withdrawal occurs when an infant experiences withdrawal symptoms from medication (often opioids and benzodiazepines) prescribed after birth for the long-term treatment of critical conditions that require pain control and sedation and is not associated with the mother's use of these substances before the child was born.

Important considerations:

- NAS data doesn't indicate type of substance exposure.
- NAS data doesn't indicate recovery status of the birth parent.
- Transitions in the provision of newborn clinical care may be impacting NAS rates reported for years 2018, 2019 and 2020.

Table 13. Rate of NAS at the Spokane County level from 2016-2022

Year	No. of live births occurring in Spokane to Spokane residents	No. of Spokane hospitalizations of infants with neonatal abstinence syndrome ¹	Rate per 1,000 births	Standard Error
2016	6,096	88	14.4	1.5
2017	5,835	95	16.3	1.7
2018	5,669	83	14.6	1.6
2019	5,767	72	12.5	1.5
2020	5,657	78	13.8	1.6
2021	5,743	75	13.1	1.5
2022	5,722	121	21.1	1.9

Birth Certificate Data: Washington State Department of Health, Center for Health Statistics.

¹NAS defined as ICD9-CM code 779.5 or ICD10-CM code P96.1

‡ Beginning in 2008, cases of iatrogenic withdrawal are excluded. Iatrogenic withdrawal defined as ICD9-CM codes: 765.01–765.05, 770.7, 772.1X, 779.7, 777.5X, 777.6 or ICD10-CM code P96.2

Definitions:

Council of State and Territorial Epidemiologists. (2019). [Neonatal Abstinence Syndrome Standardized Case Definition](#). (CSTE Position Statement 19-MCH-01).

Iatrogenic withdrawal occurs when an infant experiences withdrawal symptoms from medication (often opioids and benzodiazepines) prescribed after birth for the long-term treatment of critical conditions that require pain control and sedation and is not associated with the mother's use of these substances before the child was born.

Important Considerations:

- NAS data doesn't indicate type of substance exposure.
- NAS data doesn't indicate recovery status of the birth parent.
- Transitions in the provision of newborn clinical care may be impacting NAS rates reported for the years 2018, 2019, and 2020.

Appendix B: Interview guide

To start off we would like to ask you a little background information about using Maddie's Place services.

- Are you currently using Maddie's Place services, or did you use them in the past?
- How long have you been using (/did you use) Maddie's Place services (a month, etc.)?
- What has that looked like? (daytime hours/nighttime hours/continuously)

Thank you. Now we're going to ask you about your experiences during three stages: pregnancy, birth, and parenting. First, let's talk a little bit about your pregnancy.

1. How was your experience while pregnant? Tell me about your pregnancy. [let them answer in general]
 - a. Follow-up: how was it in terms of substance use or opioid treatment? What about any expectations about having a baby with NAS or a baby that might go through withdrawal?

Next let's talk about your experiences related to giving birth.

2. Please tell us about your birth experience. (examples: hospital, support system, interactions with medical staff, personal feelings)
 - 2a. Can you tell me about your baby's treatment in the hospital? (Prompt: Do you know if your baby got medication for substance withdrawal symptoms, did your baby have to stay in the NICU, how many days)
 - 2b. How was your baby evaluated for substance withdrawal symptoms? Did they tell you if they used any scoring tool like Eat Sleep Console, FNAST or Finnegans?

And now let's talk about the parenting stage.

3. Please tell us about what your experiences have been like since giving birth and becoming a parent. (examples: postpartum success or challenges, employment, opioid treatment after birth, housing)

The rest of the questions are about your experiences with Maddie's Place.

4. How did you and your baby come to receive services at Maddie's Place?
5. Please describe your time here at Maddie's Place. (prompt- services used, are they staying, etc.) How has it been helpful or unhelpful?
6. Have there been any benefits to you or your baby by using services at Maddie's Place? This can be benefits to you, your baby, other relationships, interactions with CWS, your health, your baby's health, etc. If so, please describe the benefits.

7. What do you think things would have looked like for you and your baby if you didn't receive services at Maddie's Place?
8. Is there anything Maddie's Place could have done differently to support you and your baby?
9. What additional services do you think you or other families would like to see at Maddie's Place?
10. Do you have anything else you would like us to know about Maddie's Place or do you have any additional feedback for Maddie's Place?