

AN EVIDENCE-BASED APPROACH TO MANAGING
NEONATAL ABSTINENCE SYNDROME

by

Kimberly Larsen Kusak

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Kimberly Larsen Kusak

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Elizabeth Kinion, EdD, MSN, APN-BC, FAAN

Approved for the Department of Nursing

Elizabeth Nichols, DNS, RN, FAAN

Approved for the Division of Graduate Education

Dr. Carl A. Fox

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Kimberly Larsen Kusak

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ABSTRACT

Neonates born to mothers addicted to opiates may develop neonatal abstinence syndrome (NAS). An infant exposed to opiates in-utero causes the neonate to withdraw from the substance after birth. Neonates with NAS are at risk for adverse outcomes including seizures and death along with many adverse symptoms related to neurological excitability and gastrointestinal dysfunction as described by the American Academy of Pediatrics (1998). As mentioned by Hunt et al. (2008), neonates exposed to opiates are at higher risk for prematurity, low birth weight and adverse neurodevelopment. These risk factors are directly related to increased death and adverse outcomes for this population. Variability exists regarding the treatment of NAS. The project intention is to propose an evidence-based practice recommendation for the treatment of neonates with NAS, thus providing consistency in care. A thorough literature search was done using several search engines including Medline, Pubmed, Cochran Library, CINAHL, National Guidelines Clearinghouse, Medline via First Search, and individual journal searches. The evidence was compiled and reviewed for strong research technique including type of randomization, inclusion and exclusion criteria, population representation, bias, confounding variables, and loss to follow-up. Protocol recommendations include evidence based recommendations for the care of NAS including medication treatment protocols. The protocol's focus is on increased positive patient outcomes and safety. Specifically, the goal is to avoid adverse outcomes such as seizures and death along with decreased duration of treatment, hospital stay, and nursing care. Overall, the practice recommendations raise multidisciplinary team awareness, increases care consistency, and provides a method for early intervention.

CHAPTER ONE

INTRODUCTION

Substance abuse is a known problem in society. At least 8.2 percent of all Americans abuse illicit drugs (Belik & Hawes, 2006). The incidence of drug abuse among pregnant women is unknown. The rate of abuse may range from 3% to 50% and varies according to socioeconomic, educational, and population factors (Neonatal Drug Withdrawal, 1998). Fifty-five to ninety-four percent of neonates born addicted to opiates experience symptoms of withdrawal (Neonatal Drug Withdrawal, 1998). All neonates exposed to opiates in-utero are at risk for developing neonatal abstinence syndrome (NAS).

Neonatal Abstinence Syndrome

Neonatal abstinence syndrome describes neonates exposed to opiates in-utero that are exhibiting some or all symptoms of neurological excitability and gastrointestinal dysfunction. Neurological excitability in NAS includes marked irritability, high pitched crying, seizures, increased muscle tone, poor feeding, increased wakefulness, and frequent yawning/sneezing. Gastrointestinal dysfunction in NAS includes diarrhea, dehydration, fever, sweating, poor weight gain, excessive sucking, vomiting, and temperature instability. With or without the neurological excitability and gastrointestinal dysfunction, all neonates with NAS are at risk for negative patient outcomes such as seizures and death (Neonatal Drug Withdrawal, 1998; Osborn, Jeffery, & Cole, 2005). In

addition, neonates exposed to opiates in-utero are at higher risk to be born prematurely and at a low birth weight. Hunt, Tzioumi, Collins, and Jeffery (2008) looked at long-term effects of opiate exposure to neonates. Neonates with NAS were found to have growth and developmental delays such as growth, social, neurological and cognitive delays (Hunt et al., 2008).

Statement of the Problem

The project intention is to influence the care of neonates with NAS at the local level. The only in-patient hospital in Gallatin County is an eighty six bed community hospital. The healthcare service provided reaches Gallatin County and areas of Park County. The population of Gallatin County was estimated at 78,210 as of 2006. Comparison of the 2006 census estimate to the 2000 census shows a population increase of 11.5%. Gallatin County is a youthful community with the average age being around 33 years. A little more than 19.5% of the total population is 18 years old and younger. Gallatin County is the fast growing county in the state. The total population for Park County as of the 2000 census was 15,968 with 19% being 18 and younger (Department of Public Health and Human Services, 2006).

Table 1. Gallatin County Population Change

Year	Total Population	Population 18 and younger
2000	67,831	12,292
2006	78,210	15,382

Gallatin County is the fast growing county in the state. Last year, the community hospital in Bozeman had over 1200 births and is experiencing a steady birth rate increase.

According to the Montana State and National Child Abuse and Neglect Data Comparisons (Fox, 2006), 67% of reported child abuse is for neglect. While the neglect reason is not clearly tracked, it is hypothesized that a substantial amount of the reported cases are due to prenatal substance abuse (Fox, 2006). The majority of neglect reports are from healthcare personnel and the children are frequently less than one week old. Nationally, 79% of all neglect reports are done by medical personnel (Center for Disease Control, 2008). Basically, medical personnel are the first line of defense for neonates at risk. This information provides strong support for development of an evidence-based protocol for the recognition and treatment of NAS.

Currently, a policy exists for testing and assessing neonates at risk for NAS. The current community hospital nursery policy/procedure contains eight items for care. The first is to ensure communication of suspected or confirmed substance abuse between care areas. Next, the policy states that these infants should be assessed for withdrawal and describes possible signs and symptoms of the addicted neonate. However, the list of signs and symptoms are not inclusive. Care of the neonate per policy includes hypoglycemia monitoring, environmental controls, nutritional support, skin integrity assessment, parental education, when to notify the physician, and actions to take in case of a seizure. Steps of how and when to notify Child Protective Services are also included in the policy. The policy/procedure dictates when and how to start a neonatal drug withdrawal score sheet. The policy does not suggest what neonatal drug withdrawal score requires physician notification or medical interventions.

In the past six months, twenty seven neonates were tested for illicit drug toxicology at the 86-bed hospital. Of those, one was positive for narcotics. While the occurrence of NAS is low, the risk to patient safety is high. Considering the adverse outcomes of seizure and death to neonates with NAS along with the increased burden to the healthcare system, two cases per year is certainly justification for development of a treatment protocol.

Treatment and tracking of NAS varies between practitioners at the local, state and national level (Center for Disease Control, 2008). A study conducted in Maryland looked specifically at variability in the treatment of NAS at twenty seven hospitals. Only one half of the hospitals surveyed reported standardized protocols in the assessment and treatment of NAS (Crocetti, Amin, & Jansson, 2007). The variability exists in all areas including assessment tools, assessment of risk factors, guidelines for toxicology screening of newborns and mothers, pharmacological treatment of NAS, and discharge criteria (Crocetti et al., 2007).

Purpose

The project intention is to propose an evidence-based practice guideline for the treatment of neonates with neonatal abstinence syndrome. The best practice protocol will work to promote early assessment, intervention, and consistent treatment of NAS as well as reduce the risk of adverse patient outcomes.

CHAPTER TWO

LITERATURE SEARCH

A thorough literature search was done using several search engines including Medline, Pubmed, Cochrane Library, CINAHL, National Guidelines Clearinghouse, Medline via First Search, and individual journal searches. The researcher compiled the evidence and reviewed it for strong research technique including type of randomization, inclusion and exclusion criteria, population representation, bias, confounding variables, and loss to follow-up. Evidence meeting exclusion and inclusion criteria of sound research technique were included in the protocol development. In addition, the researcher reviewed protocols for the treatment of NAS.

Substance Abuse and Stigma

According to Belik & Hawes (2006), 8.2 percent of all Americans abuse illicit drugs. The extent of drug abuse among pregnant woman is unclear because of a reluctance to report substance abuse (Oei & Lui, 2007). A main potential challenge to a NAS treatment policy involves the stigma that surrounds substance abuse. A study done by Luoma, Twohig, Waltz, Hayes, Roget, Padilla, and Fisher (2007) looked at stigma experiences by substance abusers. The design involved a phenomenological qualitative approach to gain a deeper understanding of how stigma affects patients in substance abuse treatment. The researchers interviewed 197 participants from 15 different treatment facilities. The questions considered ranged from stigma experienced in general, stigma

within the treatment process itself to a potential increase in stigma to those in the legal system. A general summary found that 60% of the participants felt an attitude of stigma towards substance abusers (Luoma et al., 2007). In addition, the study investigators concluded that stigma is multidimensional. The study subjects had a tendency to internalize shame and have a heightened level of perceived stigma.

The evidence presented by Luoma et al. (2007) presents a double edged sword. Substance abusers are less likely to admit to drug use and seek treatment. In addition, those interacting with substance abusers may be reluctant to consider addressing the topic. The problem exists in both the agency and the community. Pregnant women are less likely to report substance abuse due to the potential harm to the infant and the risk of losing parental rights. Therefore, it is important to educate those in direct contact with substance abusers to be aware of stigma.

Toxicology Screening

The extent of drug abuse among pregnant woman is unclear because of a reluctance to report substance abuse (Oei & Lui, 2007). Because mothers are reluctant to report substance abuse, all mothers and infants should be screened for risk of substance abuse (Oei & Lui, 2007). Risk factors for the mother include no prenatal care, history of previous drug use, previous unexplained fetal demise, precipitous labor, abruption placenta, hypertensive episodes, severe mood swings, cerebrovascular accidents, myocardial infarctions, repeated spontaneous abortions, erratic behavior, repeated requests for unwarranted medications, track marks visualized, attempts to leave against

medical advice, paranoia, nicotine use and gut instinct of the nurse (Neonatal Drug Withdrawal, 1998; Burns, Mattick, & Cooke, 2006; Osborn et al, 2005; Strano-Rossi, S., 1999; Zellman, Fair, Hoube, & Wong, 2002). Commonly abused opiates include morphine, codeine, hydromorphone, methadone, heroin, oxycodone, and fentanyl. Mothers with one or more risk factor should be considered for urine toxicology screening according to hospital policy (Strano-Rossi, S., 1999; Zellman et al, 2002).

Regardless of known maternal risk factors, all neonates must be screened for specific risk factors. These include positive maternal toxicology screen, jittery with normal glucose level, marked irritability, preterm birth, unexplained seizures or apneic spells, unexplained intrauterine growth restriction, neurobehavioral abnormalities, congenital abnormalities, atypical vascular accidents, necrotizing enterocolitis in an otherwise healthy term infant, and signs of neonatal abstinence syndrome: marked irritability, high pitched cry, feeding disorders, excessive sucking, vomiting, diarrhea, rhinorrhea, and diaphoresis (Burns et al, 2006; Neonatal Drug Withdrawal, 1998; Osborn et al, 2005; Zellman et al, 2002).

Infants determined to be at risk should be screened for illicit drug exposure with both a urine and meconium screen (Oei & Lui, 2007). The urine screen needs to be immediate with the knowledge that urine toxicology has a high false negative. Neonatal kidneys work to excrete substances and the mother would have had to abuse the substance shortly before birth for the urine to test positive. Meconium screening has a much higher level of accuracy at 77% for opiates. In addition, meconium screening provides a look at substance abuse from the time of the gut development at about 12

weeks gestation (Oei & Lui, 2007). It is also important to test the first meconium available as transitional stool will not provide a reliable sample (Oei & Lui, 2007).

Early Assessment and Intervention

When risk factors of NAS are identified in the mother or the infants, ongoing assessment of side effects to the neonate must be done. To do this, a standardized assessment tool should be utilized by nursing staff. Immediate and ongoing assessment is important due to the variance in timing of withdrawal symptoms. As stated by Oei and Lui (2007), the timing of withdrawal is determined by the type of substance abused. For instance, benzodiazepine withdrawal may take up to two weeks and occur after discharge from the hospital. However, heroin has a much shorter half-life and withdrawal can occur in the first twenty-four hours of life (Oei & Lui, 2007). According to Osborn et al. (2005), up to 48-94% of neonates exposed to substances in-utero will exhibit signs of withdrawal.

In 2004, Kuschel et al. studied the relationship between neonatal methadone blood levels and severity of NAS symptoms. All the infants enrolled were born at 35 weeks gestation or greater. A blood sample was taken at birth from the umbilical cord and then a serum sample was drawn from the neonate at 48 hours of life. A total of 25 infants met exclusion criteria and were enrolled in the study. Of those, 17 infants had appropriate blood samples for analysis. The end result showed that infants with higher methadone levels at delivery and at 48 hours required less treatment than those with lower methadone serum levels. This study provides important information; more research

is needed in this area because drug levels at the time of delivery may help to predict the severity of withdrawal in neonates (Kuschel, Austerberry, Cornwell, Couch, & Rowley, 2004).

Regardless of type of substance abused, early intervention is linked to early assessment. Early intervention may help prevent adverse outcomes in the neonate such as seizures which occur in 2-11% of neonates with NAS (Osborn et al., 2005). Kuschel (2007) recommends the use of the Finnegan Neonatal Abstinence Severity scoring system. Assessment includes items based on neurological, gastrointestinal, metabolic, and respiratory disturbances (Kuschel, 2007). Many assessments are rated such as tremors, stool characteristics, reflexes, irritability, and fever. The tool is to be used during wakeful periods in the neonate. However, the tool is open to bias if the assessor is unfamiliar or inexperienced in use of the tool. Thorough training of those using the Finnegan scoring tool is necessary to reduce bias (Oei & Lui, 2007). Use of this tool requires education for the staff caring for the neonates on how and when to use the scoring system. Although this tool is helpful and commonly used, other similar tools may exist. What remains important is that one tool is chosen and used correctly and consistently among all staff.

Protocol Development Literature

Knowledge of the need to screen all mothers and neonates for substance abuse is just the beginning. A protocol must be in place to dictate how and when screening should occur and what type of intervention is necessary. In the first twenty-four hours of life, the

neonate with risk factors of NAS should be scored frequently with the Finnegan scoring tool. Literature varies on the frequency of assessment, however it is suggested that the tool be used during wakeful periods. For consistency, an assessment with the Finnegan scoring tool every four hours is reasonable (Ebner, Rohrmeister, Winklbaaur, Baewet, Jagsch, Peternell, Thau, & Fischer, 2007).

Initially, the literature search for the project included comparison between opiates versus supportive treatment to neonates with NAS. In 2005, Osborn, Jeffery, and Cole published in *The Cochrane Collaboration* their work, Sedatives for opiate withdrawal in newborn infants. The review compared the safety of opiate versus non-opiate treatment for NAS in six different studies with a combined total of 305 participants. Osborn et al. (2005) specifically looked at what evidence supports the use of opiate treatment for opiate withdrawal instead of or in addition to placebo, usual newborn care, or non-pharmacological interventions. In addition, the authors addressed what type of sedative provides the safest and most effective treatment of NAS.

The review considered studies that utilized random or quasi-random patient assignment. All participants exhibited signs of NAS and were born to mothers with opiate addiction. Within the literature, Osborn et al (2005) defined primary and secondary outcomes. Primary outcomes included significant adverse outcomes such as treatment failure, seizures, and death. Secondary outcomes included duration of treatment or hospital stay, amount of time to reduce symptoms of NAS, weight gain, and side effects of treatment. Additionally, the authors intended to group the studies examined into subcategories according to the type of treatment studied (Osborn et al, 2005).

Osborn et al (2005) used the Cochrane Neonatal Review Group as a standard search strategy for the literature review. In addition, other search engines were utilized to ensure an exhaustive search. Search terms utilized included withdrawal, neonatal, neonatal abstinence syndrome, various sedative terminology, pregnancy, and infant/newborn. Three different authors examined the six studies used for quality. This was done independently. Criteria for quality included blindness, allocation concealment, and loss to follow-up were used by the investigators. The standard methods for Cochrane Neonatal Review Group were used throughout the review.

Two of the six studies reviewed reported randomized allocation. Three of the six studies reported quasi-randomization. The last study reported randomization but did not describe the method utilized. Four of the six studies reviewed reported blinding. All six studies reported a low loss to follow-up. However, it must be noted that two of the studies may have had a certain amount of identical participants (Osborn et al, 2005).

The review concluded that neonates with NAS from opiate addiction had better symptom control when treated with an opiate versus phenobarbitone or diazepam. If a sedative is considered over opiate therapy, then phenobarbitone was shown to have reduced treatment failure over diazepam. One small study in the review found that treatment with opiate for opiate withdrawal resulted in shorter hospital stay. However, these findings may not be applicable to all settings (Osborn et al, 2005).

A second notable study by Ebner et al (2007) specifically compared opiate versus Phenobarbital treatment in neonates with NAS. The study took a prospective cohort view. The infants enrolled were born to mothers with opiate addiction. Those with polyabuse

(more than one substance being abused) were excluded from the study. After delivery, neonates were screened every four hours with the Finnegan scoring tool. Phenobarbital was used for treatment in the first 13 months while morphine hydrochloride was used in the last 17 months of the study. A total of 53 neonates were included in the study. All neonates were of 34 weeks or greater gestational age. Thirty two of the neonates exhibited signs of NAS that required treatment. Fifteen received Phenobarbital therapy while the remaining 17 received morphine hydrochloride (Ebner et al, 2007).

The researchers found the morphine treated group required reduced duration of treatment. The average hospital stay for the morphine treatment group was 9.9 days as compared to 17.7 in the Phenobarbital group. The findings of the study are significant enough to warrant further research in this area. In addition, the participants had very similar risks in-utero thus reducing confounding variables. The discussion of this study includes the importance of standardized care for NAS. Standardized care may work towards reducing hospital stay, healthcare costs, and enhancing mother/infant bond (Ebner et al, 2007).

Adverse Outcomes

In addition to acute adverse outcomes, neonates with NAS may experience long term neurodevelopment outcomes. Hunt et al (2008) reviewed published literature on neurodevelopmental outcomes in infants with NAS combined with a case-controlled study of infants born to opiate addiction. The literature review and the case-controlled study looked at follow-up assessments of the participants at 18 months and three years of

life. A meta-analysis was not possible due to the varying study designs and heterogeneity. In addition to growth measurement, the study used standardized screening tools to compare psychomotor, intelligence, motor, maturity, language and verbal skills. The narcotic exposed infants were compared to non-opiate exposed infants. Findings show that infants exposed to opiates in-utero are at greater risk for developmental concerns in early childhood (Hunt et al., 2008).

Collective review of the literature produced common themes. The extent of drug abuse among pregnant woman is unclear because of a reluctance to report substance abuse (Oei & Lui, 2007) Because mothers are reluctant to report substance abuse, all mothers and infants should be screened for risk of substance abuse at birth (Oei & Lui, 2007). Regardless of known maternal risk factors, all neonates must be screened for specific risk factors. Infants determined to be at risk should be screened for illicit drug exposure with both a urine and meconium screen (Oei & Lui, 2007). When risk factors are identified in the mother or the infant, ongoing assessment of side effects to the neonate must be done. To do this, a standardized assessment tool such as the Finnegan Neonatal Abstinence Severity score should be utilized.

The object is to target and treat 100% of patients with potential NAS effects. The researched guideline is evidence-based and will treat a population at risk for potential negative outcomes. Environmental controls such swaddling, dim lights, and a quiet environment should be utilize for all neonates at risk for NAS. The neonate should be scored with the Finnegan scoring tool every four hours. For three consecutive scores of eight or greater, pharmacological treatment should be initiated (Oei & Lui, 2007). A

component of the evidence-based research on treatment for NAS suggests initial treatment of opiate withdrawal with opiate medication (Johnson et al, 2003; Osborn et al, 2005).

CHAPTER THREE

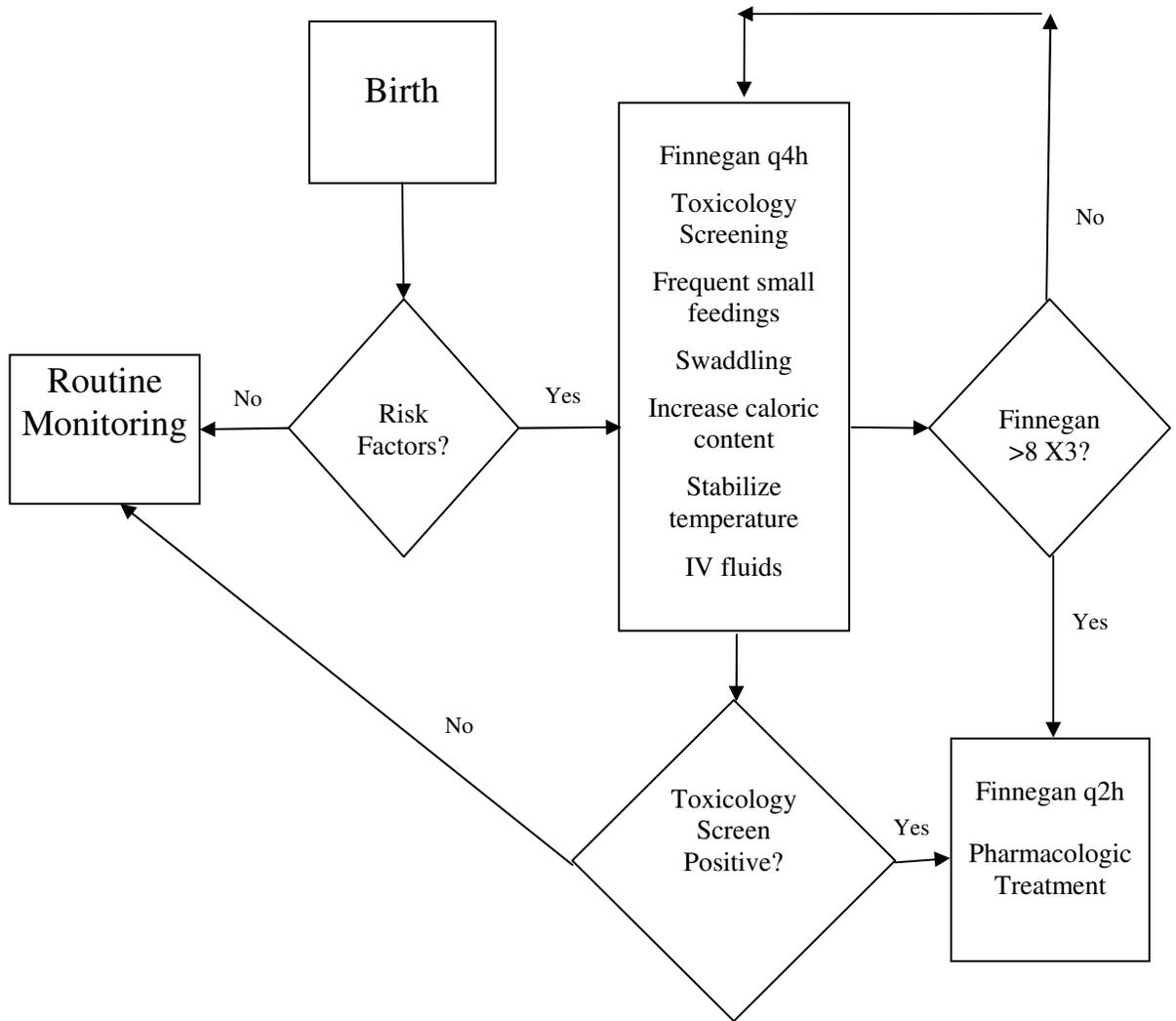
PROTOCOL PROPOSAL

As defined in Chapter two, all infants should be screened for risk of substance abuse exposure in-utero. The findings of Osborn et al (2005) and Ebner et al (2007) are in line with recommendations from the American Academy of Pediatricians (Neonatal Drug Withdrawal, 1998). An important factor of a treatment protocol for NAS dictates when medication intervention should occur and what medication should be used for treatment. In the first twenty-four hours of life, the neonate should be scored with the Finnegan scoring tool every four hours. For three consecutive scores of eight or greater, pharmacological treatment should be initiated (Oei & Lui, 2007).

A component of the evidence-based research on treatment for NAS suggests initial treatment of opiate withdrawal with opiate medication (Johnson, Gerada, & Greenough, 2003; Osborn et al, 2005). The Academy of Pediatricians (Neonatal Drug Withdrawal, 1998) recommends tincture of opium at a strength of 10 mg/ml. The starting dose should be 0.1 mg/kg given every four hours. If symptoms persist or worsen, an increase of 0.1 mg/kg may be used. Tapering of treatment should be considered after 3-5 days of treatment (Neonatal Drug Withdrawal, 1998). A suggested treatment protocol for the process is shown in Appendix A.

Before and during pharmacological intervention, non-pharmacological controls should be utilized. These include environmental controls such as low lighting and quiet rooms, swaddling, frequent feedings, and high calorie formulas (Langenfeld, Birkenfeld, Herkenrath, Muller, Hellmich, & Theisohn, 2005). However, pharmacological treatment should not be delayed if non-pharmacological treatment fails (Oei & Lui, 2007). A flowchart of this process follows (Figure 1):

Figure 1. Process Flow Chart



Needs Assessment

Introduction of a new protocol or concept requires identification of the problem and background history to be presented to staff. The national drug abuse rate as discussed previously is 8.2 percent (Belik & Hawes, 2006). This information combined with the inconsistency of the treatment and assessment of NAS provides substantial groundwork for protocol development. On the most basic level, risk factors for mothers and infants will be identified and put into action. By doing this, a population of patients at risk for NAS will be recognized. Once the specific population has been targeted, implementation of consistent, evidence-based care can occur. First, all patients will be screened on admission for risk factors. When a risk factor is identified, toxicology screening will occur. From here, an evidence-based screening tool, such as the Finnegan Neonatal Abstinence Severity score will be used on all at risk neonates. The protocol is evidence-based and will treat a population at risk for potential negative outcomes.

Interdisciplinary Adaptation

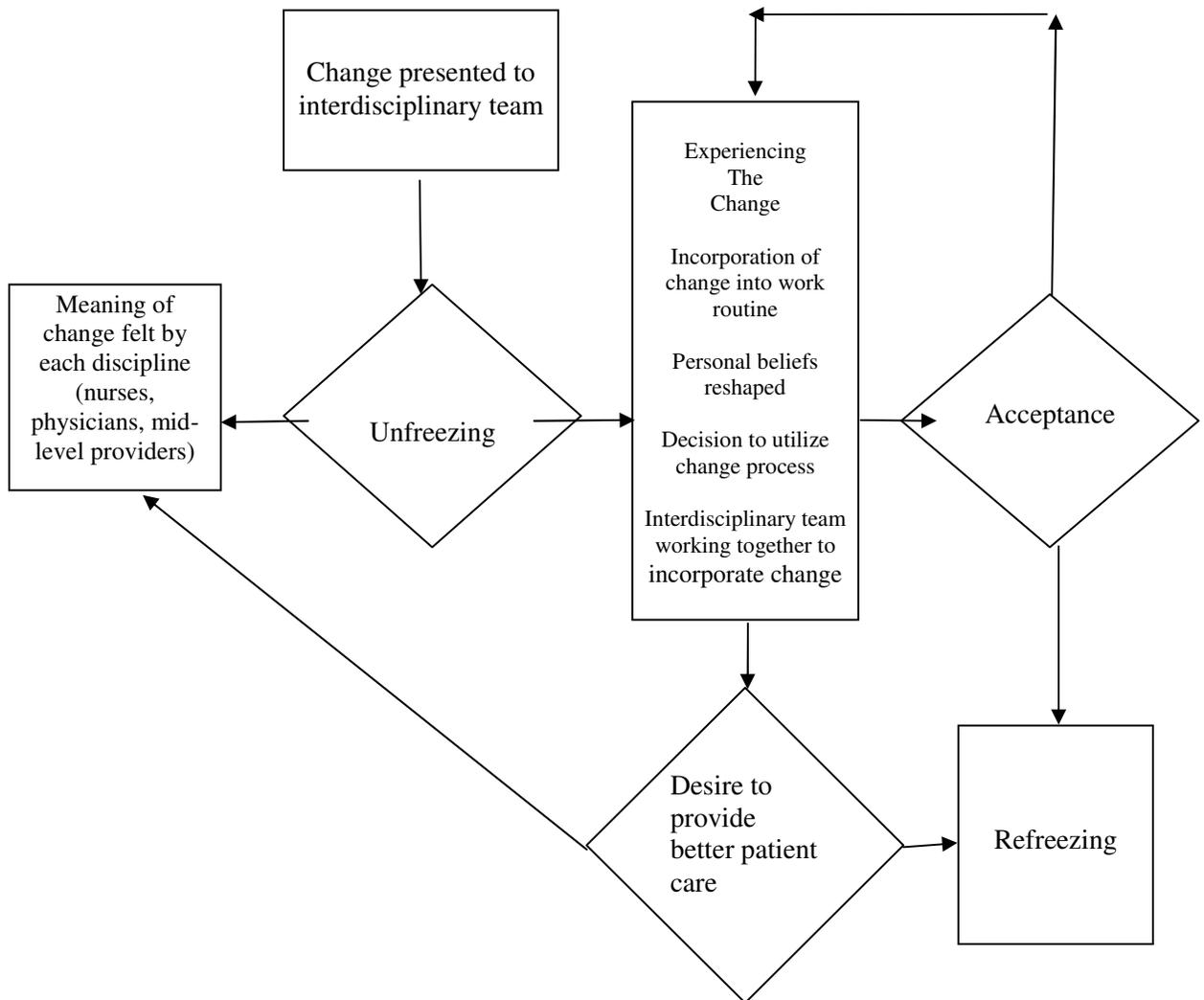
Implementation of a protocol to any facility requires participation with the interdisciplinary team and major stakeholders. The NAS protocol is evidence-based and will treat a population at risk for potential negative outcomes. Once the protocol has been adopted, then staff must be educated in the use of the guideline. The protocol will be implemented on a “pilot” trial. Staff members tend to be more open to changes if they are presented as a trial rather than permanent.

As mentioned by Kristi D. Menix (2003), the first reaction to change from staff may be hesitance or resistance. Implementation of change requires recognition that each individual may have a different response to change. An effective change agent has the ability to recognize these differences and provide support to the individual or group (Menix, 2003). According to the change model described by Lewin (1947/2003), there are three stages to change. The first is “unfreezing” to the idea that a problem exists and the change is necessary. The experience of this process will be different according to each discipline. According to Kotter (1996) it takes at least 25% of the team to produce a significant change. Therefore, the change agent needs to look for leaders in each discipline to foster others through the change. In addition, barriers to change should be researched for each discipline. According to Kresse, Kuklinski, and Cacchione (2007), each member of the team should be viewed as a customer having their needs recognized and attended to. A good method for assuring interdisciplinary support is to focus on evidence-based information while providing relevant and recent case studies.

The next step is incorporation of the change which Lewin (1947/2003) calls “experiencing the change.” Through this process, each discipline will feel the effects of the change differently. This is where support from active key holders is essential. The change agent must actively participate in each discipline’s experience with the change. This is the time to make adjustments to enhance the ease of the change integration (Kresse et al., 2007). Lastly, those affected by the change will have a period of “refreezing.” This period happens after the change has been integrated and accepted into the work environment (Lewin, 1947/2003). Ongoing evaluation must occur to validate

that the change is effective and applicable to the clinical setting (Kresse et al., 2007). Implementing new practices requires recognition that response to change fluctuates between individuals. Recognizing the need to accommodate different disciplines and provide support during periods of confusion is necessary to effectively apply change (Menix, 2003). A flow chart of this process follows (Figure 2):

Figure 2. Flow Chart of Interdisciplinary Change Process



The implementation will include interdisciplinary education on the topic at hand and the use of the protocol. After implementation, the protocol will have ongoing assessment for use by staff. This will be done six months after execution of the protocol. During this phase, feedback for those using the protocol will be requested. In addition, data will be collected to compare the number of toxicology screenings completed. After evaluation, any necessary adjustments to the protocol will be made. The process

described above is an adapted version of the outcomes management process as described by Melnyk & Fineout-Overholt (2005).

Part of convincing an administration and major stakeholders to implement a protocol is to include a timeline and cost analysis. The timeline for implementation of the protocol is two to three months. The protocol must be converted into facility specific language that meets national and Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) standards. This is important to maintain facility accreditations. Next, staff must be educated on the policy. This can be done in a short amount of time during best practice committees and staff meetings. The cost of implementation involves some basic administrative costs for printing. In addition, help of the facility's nurse educator and legal counsel will be utilized. However, both of these positions are currently filled and should not cost anything extra. In addition, staff members will be paid one hour of time to come to a staff meeting for education on the protocol. Again, the staff meeting is a monthly requirement and would not accrue any new costs.

Community Implications

The main potential challenge to the NAS policy involves the stigma that surrounds substance abuse. A study done by Luoma et al (2007) looked at stigma experiences by substance abusers. Over 60% of the participants that an attitude stigma exists towards substance abusers (Luoma et al, 2007). Substance abusers are less likely to admit to drug use and seek treatment. In addition, those interacting with substance abusers may be reluctant to consider addressing the topic. Pregnant women are less likely

to report substance abuse due to the potential harm to the infant and the risk of losing parental rights. A partnership between the local hospital and community players such as the local Health Departments and the Department of Family Services must be formed. Family wellness should be stressed and communicated between the different agencies. By doing so, a culture of cooperation and family health can be created. Effective treatment of NAS requires a full assessment of the family situation and utilization of community resources. In addition, education to the staff must stress the importance of substance abuse and its potential adverse effects on neonates.

CHAPTER FOUR

PROJECT OUTCOMES

The contribution of a protocol for NAS to health care providers includes consistency in care, improved communication between all levels (physicians, nursing, administration, and community care environments) and a clear protocol to guide care. The protocol has obvious positive implications for the client by improving outcomes, decreasing delays in care, and reduced hospitalizations. In addition, adverse outcomes such as seizures, death, growth and developmental delay may be avoided or minimized.

Another consideration for the implementation of the NAS protocol is the expected outcome benefits to the hospital, the staff, and the patient. The protocol for treatment of NAS will identify patients at risk and assure speedy treatment. This means increased safety and positive patient outcomes. Other benefits to the facility include reduced nursing hours. This means decreased stress to the staff and declining staffing needs and costs. In addition, there are many potential long-term positive outcomes for the patient. These include reduced risk for developmental delays, decreased sleep deprivation, and decreased length of hospital stay. The policy will also improve community health and quality of life. When comparing the many benefits against the minor cost, the implementation of a NAS policy is obvious and necessary.

REFERENCES CITED

- Belik, J. & Hawes, J. (2007). *Neonatal Abstinence Syndrome*. Retrieved February 14, 2008 from the World Wide Web: <http://www.emedicine.com/ped/topic2760.htm>
- Burns, L, Mattick, R.P., & Cooke, M. (2006). The use of record linkage to examine illicit drug use in pregnancy. *Addiction (Abingdon, England)*. 101(6), 873-82.
- Center for Disease Control. (2008). *Morbidity and Mortality Weekly Report*. Retrieved April 14, 2008 from the World Wide Web: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5713a2.htm>
- Crocetti, MT, Amin, DD, & Jansson, LM. (2007). Variability in the evaluation and management of opiate-exposed newborns in Maryland. *Clinical Pediatrics*. 46(7), 632-5.
- Department of Public Health and Human Services. (2006). Retrieved April 15, 2008 from the World Wide Web: <http://www.dphhs.mt.gov/PHSD/health-profiles/health-profiles-2006.shtml>
- Ebner, N., Rohrmeister, K., Winklbauer, B., Baewert, A., Jagsch, R., Peternell, A., Thau, K., & Fischer, G. (2007). Management of neonatal abstinence syndrome in neonates born to opioid maintained women. *Drug and Alcohol Dependence*. 87(2-3), 131-8.
- Fox, S.B.(2006). *State and National Child Abuse and Neglect Data Comparisons, Definitions, and Burdens of Proof*. Retrieved April 14, 2008 from the World Wide Web: http://leg.mt.gov/content/committees/interim/2005_2006/child_fam/STATS.pdf
- Hunt, R.W., Tzioumi, D., Collins, E., & Jeffery, H.E. (2008). Adverse neurodevelopmental outcome of infants exposed to opiate in-utero. *Early Human Development*. 84(1), 29-35.
- Johnson, K., Gerada, C., & Greenough, A. (2003). Treatment of neonatal abstinence syndrome. *Archives of Disease in Childhood. Fetal and Neonatal Edition*. 88(1), F2-5.
- Kotter, J.P. (1996). *Leading Change*. Boston, MA: Harvard Business Press.

- Kresse, MR, Kuklinski, MA, & Cacchione, JG. (2007). An evidence-based template for implementation of multidisciplinary evidence-based practices in a tertiary hospital setting. *American Journal of Medical Quality : the Official Journal of the American College of Medical Quality*. 22(3), 148-63.
- Kuschel, C. (2007). Managing drug withdrawal in the newborn infant. *Seminars in Fetal & Neonatal Medicine*. 12(2), 127-33.
- Kuschel, C.A., Austerberry, L., Cornwell, M., Couch, R., & Rowley, R.S. (2004). Can methadone concentrations predict the severity of withdrawal in infants at risk of neonatal abstinence syndrome? *Archives of Disease in Childhood. Fetal and Neonatal Edition*. 89(5), F390-3.
- Langenfeld, S., Birkenfeld, L., Herkenrath, P., Müller, C., Hellmich, M., & Theisohn, M. (2005). Therapy of the neonatal abstinence syndrome with tincture of opium or morphine drops. *Drug and Alcohol Dependence*. 77(1), 31-6.
- Lewin, K. (1947/2003). Frontiers in group dynamics: Concept, method, and reality in social science, social equilibria and social change. In Yoder-Wise, P. S. *Leading and Managing in Nursing*. (3rd Ed.) (pp. 121-137). St. Louis, Missouri: Mosby
- Luoma, J.B., Twohig, M.P., Waltz, T., Hayes, S.C., Roget, N., Padilla, M., & Fisher, G. (2007). An investigation of stigma in individuals receiving treatment for substance abuse. *Addictive Behaviors*. 32(7), 1331-46.
- Melnyk, B. M. & Fineout-Overholt, E. (2005). *Evidence-based practice in nursing and healthcare: A guide to best practice*. Philadelphia, PA: Lippincott, Williams and Wilkins.
- Menix, K.D. (2003). Leading Change. In Yoder-Wise, P. S. *Leading and Managing in Nursing*. (3rd Ed.) (pp. 121-137). St. Louis, Missouri: Mosby
- Neonatal drug withdrawal. American Academy of Pediatrics Committee on Drugs. (1998). *Pediatrics*. 101(6), 1079-88.
- Oei J, & Lui K. (2007). Management of the newborn infant affected by maternal opiates and other drugs of dependency. *Journal of Paediatrics and Child Health*. 43(1-2), 9-18.
- Osborn, D.A., Jeffery, H.E., Cole, M.J. (2005). Sedatives for opiate withdrawal in newborn infants. *The Cochran Collaboration*, Issue 3.
- Strano-Rossi, S. (1999). Methods used to detect drug abuse in pregnancy: a brief review. *Drug and Alcohol Dependence*. 53(3), 257-7

Zellman, G.L., Fair, C., Houbé, J., & Wong, M. (2002). A search for guidance: examining prenatal substance exposure protocols. *Maternal and Child Health Journal*. 6(3), 205-12.

APPENDIX A

SUGGESTED TREATMENT PROTOCOL

Title: Drug Dependent Newborns-Care and Treatment Of

Policy: Intended to guide the care of newborns at risk for Neonatal Abstinence Syndrome

Steps:

1. All mothers and newborns will be screened for risk factors at time of admission.

Maternal Risk Factors: no prenatal care, history of previous drug use, previous unexplained fetal demise, precipitous labor, abruption placenta, hypertensive episodes, severe mood swings, cerebrovascular accidents, myocardial infarctions, repeated spontaneous abortions, erratic behavior, repeated requests for unwarranted medications, track marks visualized, suspected alcohol use, attempts to leave against medical advice, paranoia, nicotine use and gut instinct of the nurse.

Newborn Risk Factors: positive maternal toxicology screen, jittery with normal glucose level, marked irritability, preterm birth, unexplained seizures or apneic spells, unexplained intrauterine growth restriction, neurobehavioral abnormalities, congenital abnormalities, atypical vascular accidents, necrotizing enterocolitis in an otherwise healthy term infant, and signs of neonatal abstinence syndrome: marked irritability, high pitched cry, feeding disorders, excessive sucking, vomiting, diarrhea, seizures, repeated yawning, hyperthermia, hypertonia, rhinorrhea, and diaphoresis.

2. Mothers with one or more risk factor are to receive an urine toxicology screen.

3. Newborns with one or more risk factor to mother or newborn are to receive an meconium and urine toxicology screen.

4. Newborns with one or more risk factor to mother or newborns are to be assessed with the Finnegan Scoring Tool every 4 hours or during wakeful periods if this is more frequent than four hours.

5. Newborns with a Finnegan score greater than eight for three consecutive assessment require pharmacological intervention.

6. Recommended Pharmacological Treatment: Begin initial therapy with tincture of opium at a strength of 10 mg/ml. The starting dose should be 0.1 mg/kg given every four hours. If symptoms persist or worsen, an increase of 0.1 mg/kg may be used. Tapering of treatment should be considered after 3-5 days of treatment at a dose determined by the healthcare provider.