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Eastern Kentucky University

Hooked on Life: Recreational Therapy in the Lives of Drug Exposed Children

Honors Thesis

Submitted

In Partial Fulfillment

Of The

Requirements of HON 420

Spring 2019

By

Sawyer M. Davidson

Faculty Mentor

Dr. Michelle Gerken, CTRS

Recreation and Parks Administration: Therapeutic Recreation

Hooked on Life: Recreational Therapy in the Lives of Drug Exposed Children

Sawyer M. Davidson

Dr. Michelle Gerken, CTRS

Recreation and Parks Administration: Therapeutic Recreation

ABSTRACT: The drug epidemic in the United States is a growing and prevalent issue in today's society. Every day, the demographics of people influenced by drugs and alcohol increase. Unfortunately, a huge part of the problem stems from prenatal exposure to toxic chemicals that can result in health issues, developmental delays, stunted mental growth, and continued addiction habits later in life. Understanding the issue, addressing it, and creating treatment plans to end it is the main focus of this research. My plans include exploring how far this issue spreads in the United States, knowing how many people it is influencing, and analyzing the benefits of Recreational Therapy on the population.

Resources for this research extend through scholarly research. Exploring the drug epidemic in the United States is daunting, but it is taking steps toward stopping prenatal exposure to drugs and other dangerous chemicals that negatively influence babies and their development. Eradicating the issue is the ideal outcome and research will continue on how to give children effected by this issue the brightest and most successful future as possible.

KEY WORDS: abuse, substance abuse, amphetamines, opioids, benzodiazepines, marijuana, antidepressants, alcohol, therapeutic recreation, cotreatment

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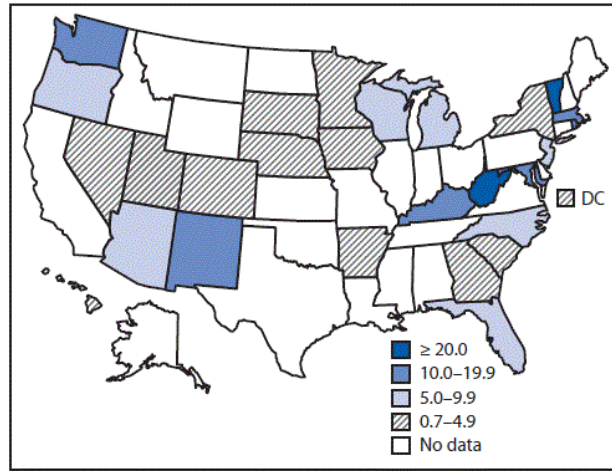
II. Acknowledgements

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List of Figures and Tables

1.

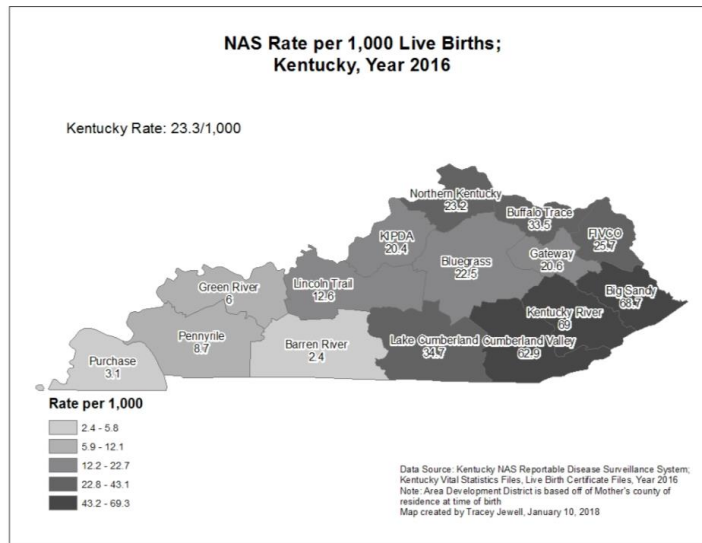


This figure was put together by the CDC to represent the percentage of NAS births in the nation from 2012-2013.

Ko JY, Patrick SW, Tong VT, Patel R, Lind JN, Barfield WD. Incidence of Neonatal Abstinence Syndrome — 28 States, 1999–2013.

DOI: <http://dx.doi.org/10.15585/mmwr.mm6531a2external icon>

2.



This figure was created by the Kentucky Cabinet of Health to represent the number per 1,000 births that were NAS cases.

Kentucky Cabinet for Health and Family Services. (2018). Neonatal Abstinence Syndrome in Kentucky: Annual Report on 2016 Births. *KY Cabinet for Health and Family Services*, Department for Public Health, Division of Maternal and Child Health.

3.

NEONATAL ABSTINENCE SCORING SYSTEM

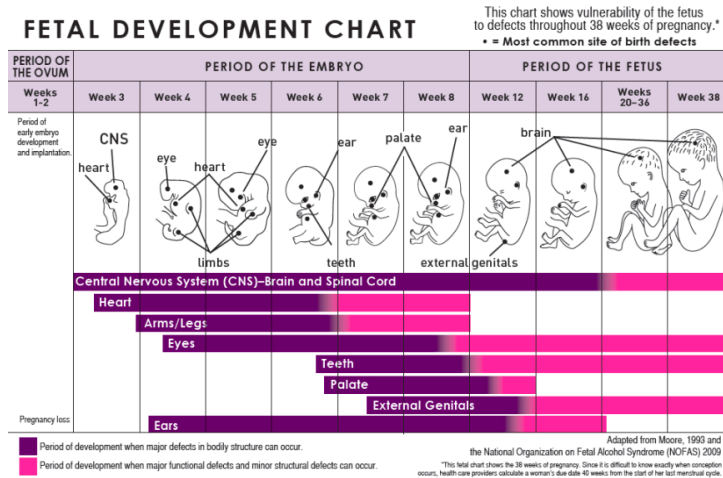
Modified Finnegan Neonatal Abstinence Score Sheet¹

System	Signs and Symptoms	Score	AM		PM		Comments
Central Nervous System Disturbances	Excessive high-pitched (or other) cry < 5 mins	2					
	Continuous high-pitched (or other) cry > 5 mins	3					
	Sleeps < 1 hour after feeding	3					
	Sleeps < 2 hours after feeding	2					
	Sleeps < 3 hours after feeding	1					
	Hyperactive Moro reflex	2					
	Markedly hyperactive Moro reflex	3					
	Mild tremors when disturbed	1					
	Moderate-severe tremors when disturbed	2					
	Mild tremors when undisturbed	3					
	Moderate-severe tremors when undisturbed	4					
	Increased muscle tone	1					
	Excoriation (chin, knees, elbow, toes, nose)	1					
	Myoclonic jerks (twitching/jerking of limbs)	3					
	Generalized convulsions	5					
Metabolic/ Vasomotor/ Respiratory Disturbances	Sweating	1					
	Hyperthermia 37.2-38.3C	1					
	Hyperthermia > 38.4C	2					
	Frequent yawning (> 3-4 times/ scoring interval)	1					
	Mottling	1					
	Nasal stuffiness	1					
	Sneezing (> 3-4 times/scoring interval)	1					
	Nasal flaring	2					
	Respiratory rate > 60/min	1					
	Respiratory rate > 60/min with retractions	2					
Gastrointestinal Disturbances	Excessive sucking	1					
	Poor feeding (infrequent/uncoordinated suck)	2					
	Regurgitation (> 2 times during/ post feeding)	2					
	Projectile vomiting	3					
	Loose stools (curds/steely appearance)	2					
	Watery stools (water ring on nappy around stool)	3					
Total Score							
Date/Time							
Initials of Scorer							

This scoring sheet is a copy of the Finnegan NAS scoring sheet used by nurses in the NICU to gauge care of babies born with NAS after being exposed to prenatal substance abuse.

Finnegan LP. Neonatal abstinence syndrome: assessment and pharmacotherapy. In: Nelson N, editor. *Current therapy in neonatal-perinatal medicine*. 2 ed. Ontario: BC Decker; 1990.

4.



This fetal development chart shows how babies grow in utero and serves as a visual representation of how substance abuse can affect growth during specific parts of

pregnancy.

Center for Disease Control. (2009). Alcohol Use in Pregnancy. *Center for Disease Control*. 1-2.

Acknowledgements

I would like to take a moment to acknowledge the individuals who have encouraged me in my journey through life at ECU. I fully believe in the power of a strong support system and I think I have the best one.

Thank you to my mom and daddy for pushing me to pursue a college career, encouraging me in the toughest moments, and giving me the resources to graduate with no debt and an unlimited list of possibilities.

To my sister: thank you for always being a friend and for proof reading this paper over and over again.

To my friends, I could not have done this without you. We truly are all in this together.

To Dr. J and the rest of the Recreation Department: thank you for investing in me and everyone else in the department. I see the work you put in for me and for us and I appreciate everything you do.

Dr. Gerken, thank you for reminding me that I am smarter than the average bear and for always staying patient. You are truly one of the reasons I have succeeded in this department and I am blessed by you.

To ECU: I am so thankful for every opportunity you have given to me. I am thriving because of my education here and I am sad to leave the campus beautiful.

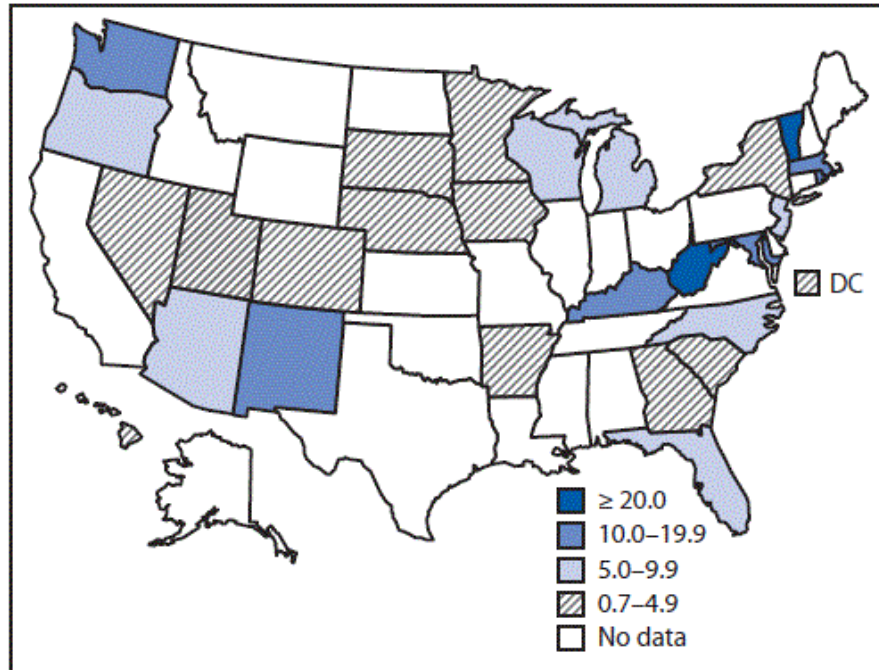
In the United States, approximately 5% of expecting mothers are addicted to illicit drugs. Addiction is defined as a chronic, relapsing disorder characterized by compulsive drug seeking, continued use despite harmful consequences, and long-lasting changes in the brain (NIDA, 2018). Maternal addiction results in over 150,000 babies born with Neonatal Abstinence Syndrome (NAS) annually (Kentucky Cabinet of Health, 2016). NAS is the collection of signs babies experience in withdrawing from drugs that they were chronically exposed to in utero. Withdrawal treatment is dependent on NAS scores and can range from comforting the infant to pharmaceutical intervention (Finnegan, 1990). As NAS infants age, disorders affecting developmental, mental, and physical health become visible. As diagnoses emerge, Therapeutic Recreation (TR) is an imperative addition to treatment plans for children affected by addiction.

Any drug use during pregnancy, prescribed or recreational, can cause harm to an unborn fetus. Drug abuse during pregnancy can cause long-term, irreversible effects on a child. This study is designed to explain how opioids, benzodiazepines, amphetamines, antidepressants, marijuana, and alcohol can negatively affect the development of a child prenatally, postnatally, throughout childhood, adolescence, and into adulthood.

Opioids

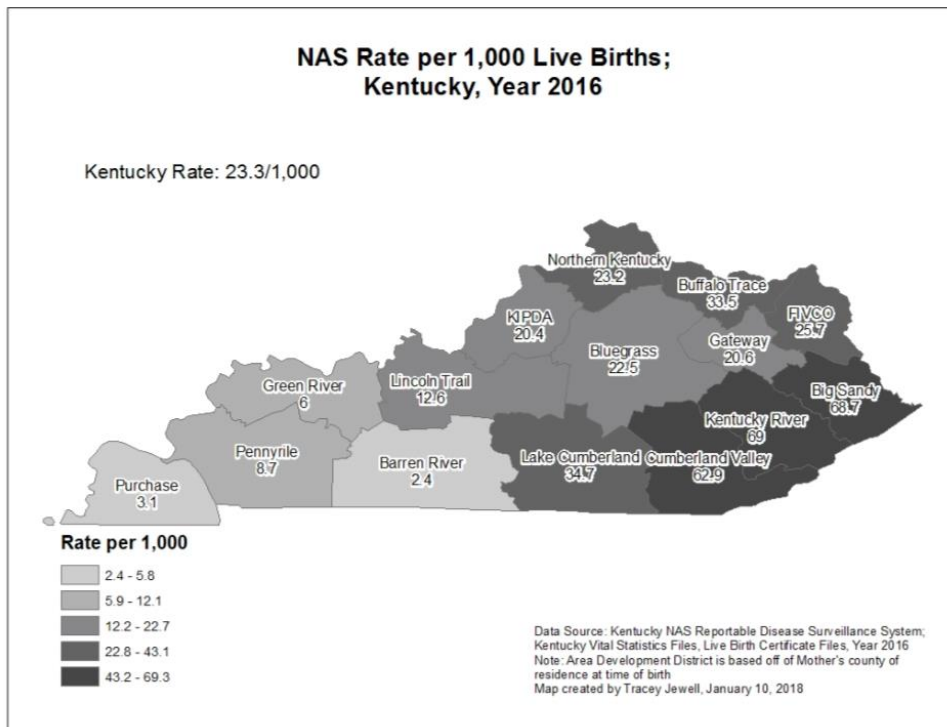
Opioids are a class of drugs found in the opium poppy plant and are highly addictive. Prescription opioids such as hydrocodone, codeine, and oxycodone are used to treat moderate to severe pain and are commonly abused as they trigger the release of endorphins. As opioid use continues, tolerance is built. This tolerance requires a higher dose to achieve the same result. When individuals can no longer acquire prescriptions for their opioid addiction, they may turn to more dangerous street drugs or man-made substances such as heroin. Heroin is the most dangerous variety of opioid as it is not safely manufactured or used as a medicine and can be made using impure or dangerous materials (NIDA, 2018).

“Opioid use in pregnancy has escalated dramatically in recent years, paralleling the epidemic observed in the general population” (ACOG, 2018). In 2013, 6 cases per 1,000 hospital births in the nation were identified as NAS cases increasing from 1.5 cases per 1,000 in 1999. This statistic means the national rate of opioid affected births has quadrupled in 14 years. Kentucky is 6th in the nation for NAS births. In 2016, 23.3 cases per 1,000 hospital births were NAS cases. This translates to 2.33% of Kentucky’s population born addicted to drugs in 2016. An avoidable and growing problem has hindered the development of neonates, children, and adults. This hindrance will cause a rise in therapeutic needs and treatment of children and adults that were exposed to opioids while in utero.



Ko JY, Patrick SW, Tong VT, Patel R, Lind JN, Barfield WD. Incidence of Neonatal Abstinence Syndrome — 28 States, 1999–2013.

DOI: [http://dx.doi.org/10.15585/mmwr.mm6531a2external icon](http://dx.doi.org/10.15585/mmwr.mm6531a2external%20icon)



Kentucky Cabinet for Health and Family Services. (2018). Neonatal Abstinence Syndrome in Kentucky: Annual Report on 2016 Births. *KY Cabinet for Health and Family Services*, Department for Public Health, Division of Maternal and Child Health.

Pregnancies affected by opioid usage may ensue short or long-term struggles for the infant. After delivery, babies begin showing signs of withdrawal based on when their mother last used. Signs may begin immediately after birth but have potential to not be visible for up to five days. The Finnegan Scoring System is used by hospital staff to determine the severity of withdrawal and to guide treatment while in the Neonatal Intensive Care Unit (NICU). The scoring system measures Central Nervous System, Respiratory, and Gastrointestinal Disturbances and a score is determined after every feed (Finnegan,1990).

Protocols vary by hospital, but Finnegan scores regulate the treatment of NAS babies. If an infant score is an 8 or higher for three evaluations, pharmaceutical intervention is suggested to help withdrawal the infant (Finnegan, 1990). The most common medications used to withdrawal infants from opioids are methadone and morphine. As the child becomes less dependent on opioids, the dosage is weened. The average hospital stay for an infant weening from opioids is 22.5 days. The best care plan for NAS babies is to treat opioid addiction with opioids. This exposure to toxic chemicals both prenatally and postnatally is shown to have a drastic long-term effect on growing babies.



NEONATAL ABSTINENCE SCORING SYSTEM



Modified Finnegan Neonatal Abstinence Score Sheet ¹							
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	Increased muscle tone	1					
	Excoriation (chin, knees, elbow, toes, nose)	1					
	Myoclonic jerks (twitching/jerking of limbs)	3					
Generalised convulsions	5						
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	Loose stools (curds/seedy appearance)	2					
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	Total Score						
	Date/Time						
Initials of Scorer							

Finnegan LP. Neonatal abstinence syndrome: assessment and pharmacotherapy. In: Nelson N, editor. Current therapy in neonatal-perinatal medicine. 2 ed. Ontario: BC Decker; 1990.

NAS is an example of short-term effects of opioid abuse during pregnancy. Long-term effects of opioids include delays in growth, behavior, and cognition. The severity of these delays and disabilities varies by case, as each mother and child are different.

Benzodiazepines

Benzodiazepines are a class of drugs that influence Central Nervous System (CNS) depression and are most commonly used to treat mental illness, insomnia, and depression (NIDA, 2018). When being abused, benzodiazepines are often used with opioids, which is dangerous because both drugs sedate and suppress breathing. Some examples of benzodiazepines are: Xanax, Ativan, and Valium. Continuous use of benzodiazepines can result in overdose or abuse of other drugs.

The dangers of benzodiazepines during pregnancy are hard to pinpoint. Depending on the drug, duration of use, and dosage, any medication classified as a benzodiazepine can have a negative effect on a developing child. A study done by professionals in the American Psychiatric Association suggests that benzodiazepines can cause sedation, weight loss, and congenital defects if not appropriately prescribed during pregnancy and lactation (Iqbal, M. M., Sobhan, T., Ryals, T. 2002). The research on benzodiazepine usage while carrying a child is limited but growing due to the rising usage of the drugs that regulate mood and mental illness. Limited research requires inferences when discussing long-term effects of benzodiazepines: if the drug has a chance of influencing the growth and development of a child, usage while pregnant should be highly regulated or halted if possible. If usage continues, the fetus has a chance of defects, growth delays, and weight loss.

Amphetamines

Amphetamines are “synthetic, addictive, mood-altering drugs, used illegally as a stimulant and legally as a prescription drug to treat children with ADD and adults with narcolepsy” (NIDA, 2018). Inappropriate use of amphetamines such as cocaine, Adderall, and Ritalin provides a stimulant for users that allows them to stay energized for a long period of time. Though these drugs can provide a burst of energy, using them without professional direction can lead to addiction, overdose, or harm to a baby.

Effects amphetamines can have on a baby after birth are: physical development delays, behavioral health impairments, cognitive delays, and learning differences (Behnke, M., Smith, V., 2013). Timing, duration, and dosage of amphetamine drugs determine effects on a developing baby, if at all. Each scenario is unique and each child’s side effects are individual and may not surface until later in life (Plessinger, M. A., 1998). Treatment for any impairments from amphetamine usage during pregnancy must be determined for each individual as they grow and develop.

Antidepressants

Antidepressants are drugs used to treat depression and other mood disorders. They work by balancing the naturally produced hormones in the brain (NIDA, 2018). Neurotransmitters such as serotonin and noradrenaline are link to emotion and mood, so drugs like Prozac, Zoloft, and Celexa help maintain a healthy chemical balance. Doses can be adjusted as needed but should always be done with consultation from a doctor or mental health specialist. When taken with alcohol or illegal drugs, antidepressants can make symptoms of depression and other medical conditions worse. The usage of antidepressants during pregnancy can also be a risk for a developing baby.

Prenatal use of antidepressants is a conflict in the medical profession. Though antidepressants can be safely used during pregnancy, they can also cause Persistent Pulmonary Hypertension (PPHN) and withdrawal symptoms in a newborn (Payne, J.L., Meltzer-Brody, S., 2009). PPHN can cause breathing difficulties, which may result in loss of oxygen to the brain, leading to development delays cognitively and physically. PPHN is rare, but is a risk associated with antidepressant use during pregnancy. The other risk is withdrawal following birth. This effect is short term and can be regulated by either tapering doses before labor or in hospital care following birth. Abuse of antidepressants may lead to a more dangerous version either of these two symptoms, which may result in pulmonary distress, developmental delays, or death of a child (Payne, J.L., Meltzer-Brody, S., 2009).

Marijuana

Marijuana is a drug extracted from *Cannabis Sativa* and can be used recreationally or medicinally. The National Institute on Drug Abuse describes it as:

Marijuana—also called *weed, herb, pot, grass, bud, ganja, Mary Jane*, and a vast number of other slang terms—is a greenish-gray mixture of the dried flowers of *Cannabis sativa*. Some people smoke marijuana in hand-rolled cigarettes called *joints*; in pipes, water pipes (sometimes called *bongs*), or in *blunts* (marijuana rolled in cigar wraps).¹ Marijuana can also be used to brew tea and, particularly when it is sold or consumed for medicinal purposes, is frequently mixed into foods (*edibles*) such as brownies, cookies, or candies. Vaporizers are also increasingly used to consume marijuana. Stronger forms of marijuana include sinsemilla (from specially tended female plants) and concentrated resins containing high doses of marijuana's active ingredients, including honeylike *hash oil*, waxy *budder*, and hard amberlike *shatter*. These resins are increasingly popular among those who use them both recreationally and medically (NIDA, 2018).

Though beliefs regarding usage of marijuana vary, usage, whether medical or recreational, can have adverse effects on a developing fetus.

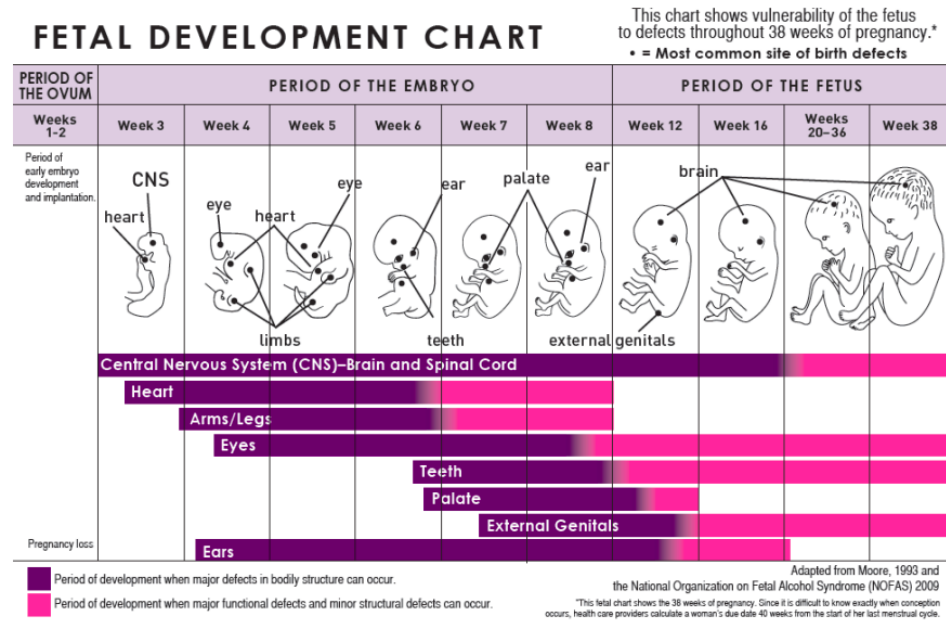
Though the effects of marijuana on a developing baby are widely variant and require more research, the National Institute on Drug Abuse and the American College of Obstetricians and Gynecologists recommend refraining from use while pregnant. Research suggests that pregnant women who partake in marijuana usage have a higher chance of delivering a stillborn or a child with behavioral and learning differences (ACOG, 2018). Marijuana affects a developing fetus because the chemicals can cross the placenta. To avoid prenatal effects of marijuana, pregnant mothers should consult their doctors and eliminate the usage of the drug while the baby is developing and breastfeeding.

Alcohol

Alcohol is defined as a “liquid that is produced by the natural fermentation of sugars and is the intoxicating constituent of wine, beer, spirits, and other drinks” (Merriam-Webster). Ingesting alcohol causes an individual to become intoxicated, affecting their motor skills, speech, and decision-making abilities. Consuming copious amounts of alcohol can lead to alcohol poisoning, liver disease, and death. When alcohol is ingested during pregnancy, risks arise for the mother and the unborn child.

Use of alcohol while pregnant causes Fetal Alcohol Spectrum Disorder (FASD). This is the umbrella term for any birth defect cause by alcohol ingestion during pregnancy (CDC, 2018). The Center for Disease Control explains that alcohol can pass from the blood stream to the developing baby and cause harm to their development. A few birth defects that can be cause by alcohol during pregnancy are: small head size, physical development delays, intellectual disabilities, and hyperactive behavior disorders

(CDC, 2018). Alcohol is a danger to a developing baby. Pregnant mothers should eliminate all alcohol during pregnancy to avoid birth defects and life altering side effects.



Center for Disease Control. (2009). Alcohol Use in Pregnancy. *Center for Disease Control*. 1-2. Side effects can be specific to when the substance was used because of how the fetus develops.

In review, medications, illegal drugs, and alcohol can take a life altering toll on a developing baby. The side effects differ, depending on the substance ingested or used during pregnancy and the point at which the substance was used. Prenatal substance abuse can cause delayed physical growth, behavioral health impairments, learning disabilities, stillbirth, cognitive delays, NAS, and more. As children exposed to toxicity in utero grow and develop, treatment plans are formulated to individual needs. These plans may include Occupational (OT) and Physical (PT) Therapy to aid in intentional development. An additional therapy that may be beneficial in treatment is Recreational Therapy (RT).

Recreational Therapy is systematic process that utilizes recreation and other activity-based interventions to address the assessed needs of individuals with illnesses and/or disabling conditions, as a means to psychological and physical health, recovery and well-being (NCTRC, 2019). This translates to using leisure and recreation to treat life challenges and disabilities. Recreational Therapists utilize client's interests and abilities to specifically target goals and objectives. RT can be preferable for clients because it is more fun and less overwhelming than other disciplines.

Occupational Therapy focuses on the development of daily activities. OTs practice with clients by cultivating their abilities to live independently (AOTA, 2019). Physical therapy instead focuses on the physical rehabilitation of clients or help in management of physical abilities due to a condition or accident (APTA, 2019). PTs work with OTs in cultivating and adapting daily activities so their clients can function as independently as possible.

Three common long-term side effects seen with children who were prenatally exposed to drugs and/or alcohol are: behavioral health impairments, physical and developmental delays, and cognitive disabilities. These three disabilities are examples of opportunities to treat with Recreational Therapy. RT can help identify leisure activities that can cultivate skills to improve behavior, progress physical abilities, and develop cognitive abilities and independence.

Behavioral health is an issue many children with prenatal exposure to drugs struggle with. Symptoms include impulsiveness, lack of attention span, and poor listening skills. Children with these symptoms do not do well with multistep instructions and may need many verbal reminders to complete tasks given to them. A recreational therapist

would build goals specific to these symptoms to improve overall behavior functioning. To complete these goals, the recreational therapist would build programs and activities based on their interests that focused on skills required to improve behavioral health. An example of a session planned for a child with behavioral health impairments would include an activity one-on-one with the recreational therapist that required following multiple instructions depending on the age of the client. The therapist would go through the activity with the client, promoting listening skills and fun throughout the session. Implementing listening skills, incorporating interests, and communicating with the client will promote improvement in behavioral health with a positive attitude from the client.

Depending on development at the time of substance abuse, physical characteristics of clients may be affected in utero. Though physical therapists will assist in adapting daily activities, recreational therapists are responsible for adapting leisure activities for clients. In these cases, an interdisciplinary session could also be beneficial for a client. Providing opportunities for recreation for clients with physical disabilities can improve quality of life and motivate clients to continue to recreate freely and effectively.

Individuals with cognitive disabilities often are not given a chance for recreation because they require extra attention and care while being involved. When recreational therapists design programming for these individuals, they keep ability level and interests in mind. If a child has a cognitive delay due to a cause out of their control, a recreational therapist can give them opportunities they never would have expected. Recreation may look different for clients with cognitive delays, but recreational therapy can be an

effective avenue to encourage these individuals to improve their physical health and cultivate social skills.

Implementing recreational therapy in treatment plans for children affected by prenatal substance abuse can cultivate positive behavioral changes, improved physical health, and more confident social skills. Recreation can be a part of OT and PT to encourage these skills through fun and leisure for clients who may not enjoy therapy but enjoy being outdoors, playing games, or being a part of a social club or group. Children growing and developing with delays and disabilities due to prenatal substance abuse can be given a therapy based on their own interests. That therapy can change their lives through fun and recreation without them even noticing, which is the power of Recreational Therapy.

Continuing Research

Linking disabilities caused by prenatal substance abuse and recreational therapy is not a heavily researched topic. Inferences and intuition are vital in understanding that substance abuse can cause any type of disability and that recreational therapy can be applied to a wide variety of lifestyles and abilities. Continuing research in this topic would ideally include: understanding where substance abuse is most prevalent (statewide, nationwide, and worldwide), implementing leisure education to attempt a decrease in substance abuse numbers, and performing case studies in various areas to see how recreational therapy changes and influences lives touched by substance abuse.

Recreational therapy can be molded to fit any ability, need, or interest. Understanding a child with a disability caused by prenatal substance abuse is the first step. The second is

implementing programming based on their interests and abilities. The last is changing lives through fun.

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