



Department of
Children's Services



Neonatal Abstinence Syndrome (NAS) & Safe Sleep

Participant Guide

Presented by the Tennessee Department of Children's Services

Outreach & Development Unit

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Ground Rules

- Be on time
- Please turn off cellphones
- Please hold calls until break
- Actively participate
- Return from breaks on time
- Avoid disturbing others
- Avoid performing activities not related to training
- Have fun! 😊



Expectations

- Be **R**esponsible for your own learning
- Have **E**njoyment of opportunity
- Be **S**ensitive to each other's needs and diversity
- Know **P**rofessionals are professional in their conduct
- Embrace **E**ducation as a continuous process that requires effort
- Cherish **C**ommitment to personal growth and development
- Acknowledge **T**ime management is personal management



Agenda

- Welcome & Introductions
- What is NAS?
- Symptoms & Soothing Techniques
- Preparing to go Home
- Transitioning Home
- ABC's of Safe Sleep
- Working with Birth Parents of an Infant with NAS
- Therapy and NAS
- Closure

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NOTES:

Objectives

- Participants will have an understanding of the term Neonatal Abstinence Syndrome (NAS).
- Participants will be able to describe the differences between an infant with NAS and an Intrauterine Drug Exposure (IDE) infant.
- Participants will become familiar with the drug classification associated with NAS and the risk factors to the newborn infant.
- Participants will become familiar with the group of symptoms associated with NAS and techniques used to soothe these symptoms.

Objectives continued...

- Participants will learn what to expect in the NICU.
- Participants will be provided with information on how to care for the infant when transitioned to the home.
- Participants will gain information on Safe Sleep for all infants.
- Participants will become familiar with different forms of therapy and therapeutic techniques that may be prescribed for an infant with NAS.

What is NAS?

- *Neonatal Abstinence Syndrome (NAS) is a group of symptoms that occur in a newborn baby who has been exposed to **Opioid** drugs while in the mother's womb.*
- An infant may be exposed to many drugs that are taken by the mother. As the definition states, **NAS** is only associated with exposure to **OPIOIDS** while in the mother's womb.
- The term NAS is a medical diagnosis and can only be given by an authorized health care professional. The Department of Children's Services (DCS) does not make the NAS diagnosis.

Drugs Classified as Opioids

- **CODEINE**
- **FENTANYL**
- **HYDROCODONE** (Lorcet, Lortab, Vicodin)
- **HYDROMORPHONE** (Dilaudid)
- **OXYCODONE** (OxyContin, Roxicodone, Percocet)
- **MORPHINE**
- **Medication-Assisted Treatment programs such as METHADONE, SUBOXONE, and SUBUTEX**



NAS DATA

According to this data, almost 1,000 NAS cases were reported in 2015 and over 50% of them were in the East Grand Region. The Middle Grand Region has a growing number of NAS cases and accounted for more than 25% of the reported cases.

NAS SURVEILLANCE SUMMARY

Drug Dependent Newborns (Neonatal Abstinence Syndrome)
Surveillance Summary For the Week of December 27, 2015 - January 3, 2016*



NOTES:

CNN NEWS VIDEO

Hospital's seeing more Babies Exposed to Prescription Drugs video- click here (5:56)



Symptoms and Soothing

- NAS symptoms may begin from birth but could take longer to appear.
- During the NICU stay, a baby experiencing NAS is scored according to their observable symptoms using an approved scoring tool.
- The care and treatment that an infant receives in the Neonatal Intensive Care Unit (NICU) is **symptom based**, meaning the type of care that a baby with NAS receives is based on the symptoms they are currently exhibiting. Not all infants with NAS are treated exactly the same.

Parent/Caregiver Education of NAS Symptoms

Signs & Symptoms	What Is This?	What Parents & Caregivers Can Do
<p>Excessive High Pitched Cry</p> <p>Continuous High Pitched Cry</p>	<p>Drug withdrawal can be very uncomfortable, sometimes painful, and make your baby irritable.</p>	<p>Help soothe baby by swaddling, holding baby close, or offering a pacifier.</p>
<p>Sleeping Less Than 1 to 3 Hours</p>	<p>Withdrawal symptoms can make your baby uncomfortable - making it difficult for baby to sleep.</p>	<p>If baby wakes up, offer a pacifier to help baby go back to sleep. If your baby is asleep when you get to the bedside, let baby sleep until baby wakes up to eat. During a feeding is the best time to hold your baby.</p>
<p>Moro Reflex</p>	<p>Moro reflex is a normal reflex for newborn babies. Babies experiencing withdrawal have sensitive central nervous systems that can cause extra abnormal movements (jitters and/or jerks) after the Moro reflex.</p>	<p>Approach your baby quietly. Don't speak loudly and use gentle, firm pressure when touching your baby. Do not stroke your baby.</p>
<p>Tremors</p>	<p>A few tremors are normal for a baby to have. Babies experiencing withdrawal may have more tremors due to their sensitive central nervous systems.</p>	<p>Keep your baby swaddled. If your baby is having tremors, gently but firmly hold their arms and legs close to their bodies. Sometimes this will help stop the tremors. Always use a gentle but firm pressure when touching your baby.</p>

Signs & Symptoms	What Is This?	What Parents & Caregivers Can Do
Increased Muscle Tone	Withdrawal can make a baby stiff and hard to bend the arms and legs.	This will eventually go away after baby goes home. Be gentle when changing diapers. A physical therapist may work with you and your baby to help baby
Excoriation	Withdrawing babies are irritable and will rub their chins, knees, elbows, nose, and toes against blankets, sheets, or clothing.	Keep your baby swaddled. Sometimes nurses will place clear dressing on the knees to protect them. You can place mittens on your baby's hands to prevent scratching face.
Myoclonic Jerks (twitching or jerking of arms and/or legs)	Babies experiencing withdrawals can have very sensitive central nervous systems which can be easily stimulated by sound and/or touch.	Approach your baby quietly. Do not wake baby up unless it is time to eat. Speak softly to your baby and use a firm touch. Do not stroke or pat your baby.
Generalized Convulsions/Seizures	This is a rare but very serious symptom of drug withdrawal.	If you think your baby is having a seizure, call 911 immediately.
Sweating	Babies usually do not sweat. Babies who are withdrawing have an increased metabolism which will sometimes cause them to sweat.	Do not overheat your baby. Keep baby in light clothing or just a diaper while baby is swaddled.

Signs & Symptoms	What Is This?	What Parents & Caregivers Can Do
Increased Temperature (Hyperthermia)	Just like with sweating, your baby's increased metabolism may cause your baby to run a fever.	Do not overheat your baby. Keep baby swaddled in a light blanket. Do not give any medications to your baby without asking your doctor first.
Frequent Yawning	Babies normally do not yawn very much but may yawn often if your baby is in withdrawal.	This will improve as the withdrawal symptoms subside.
Mottling	Mottling is a marbled, discoloration of the skin, especially on baby's chest, trunk, arms, and legs.	This can be normal for babies in withdrawal and will go away. It is not harmful.
Nasal stuffiness	Babies are nose breathers. It can be frustrating for babies experiencing withdrawal to get stuffed up. This does not mean they are sick; it is a symptom of withdrawal.	Frequent suctioning of the nose can make the stuffiness worse. Do not suction baby's nose unless there is drainage.
Sneezing	Babies do not normally sneeze. Sneezing is a symptom of withdrawal.	Sneezing eventually goes away as symptoms of withdrawal subside. Let your nurse know if your baby sneezes.
Nasal Flaring	It may be harder for your baby to breathe normally while they are withdrawing. One of the signs of this is flaring their nostrils when they breathe.	Holding baby upright may help baby breathe easier.

Signs & Symptoms	What Is This?	What Parents & Caregivers Can Do
Increased Respiratory Rate	Breathing fast is another symptom of drug withdrawal. Sometimes you can see your baby's ribs when they breathe; these are called retractions.	Keep your baby calm and hold your baby upright, especially after they have eaten.
Excessive Sucking	Sometimes babies will act frantic when they are experiencing withdrawal. They will suck excessively on their pacifier, their hands, or anything else that comes near their mouth.	Try and keep your baby calm, especially before a feeding. Swaddle in a blanket and offer a pacifier.
Poor Feeding	<p>Even when your baby sucks well on a pacifier, it may be difficult to coordinate sucking on a bottle.</p> <p>Babies experiencing withdrawal are easily over stimulated which interferes with coordination while bottle feeding.</p>	Do not rock or stimulate your baby while bottle feeding. Keep swaddled during the feeding. Help pace your baby while you feed. Your nurse and the speech therapist can give you suggestions on how to help baby eat.

Signs & Symptoms	What Is This?	What Parents & Caregivers Can Do
<p>Regurgitation & Projectile Vomiting</p>	<p>It is normal for a baby to have a wet burp or spit up a little during or after a feeding. Babies who are experiencing withdrawal often spit up more than is normal. It is not normal for a baby to vomit excessively during or after a feeding. This is called feeding intolerance.</p>	<p>Your baby will be on a special formula while in the nursery which should help with feeding intolerance.</p> <p>Pacing your baby while bottle feeding may also help. Your baby may also be on other medications to help relieve symptoms. You can learn how to give these medications while you are with your baby. Your doctor will tell you if your baby is getting enough to eat in order to gain weight.</p>
<p>Loose or Watery Stools</p>	<p>Babies experiencing withdrawal will sometimes get upset stomachs and stomach cramps. This can cause loose, diarrhea like stools. These loose stools can cause a red, irritated bottom.</p>	<p>Be very gentle when changing your baby's diaper. Use sterile water wipes and put skin barrier on the bottom for protection even if his bottom is not red yet.</p>

This chart was provided by Cook, Kyle E. (2016). Neonatal Nurse Practitioner, East Tennessee Children's Hospital.

NAS Soothing Technique Activity

Activity (15 Minutes)

- **Brainstorm** techniques YOU would use to soothe a baby with NAS symptoms.
- **Record** the NAS Symptom and their Soothing techniques on the blank flipchart page provided to your group.



NOTES:

Preparing to go Home

[Cuddler Volunteer Video- click here \(2:29\)](#)



Preparing to go Home continued...

- Rooming in with the infant prior to discharge is ***required*** by some hospitals. Doing so can help foster parents to become familiar with the infant's cues and the symptoms the infant may be exhibiting.
- **Foster parents will need to provide a car seat and view a video on car seat safety prior to the infant being released from the hospital.**
- All medications prescribed for the infant will be reviewed with you by hospital staff prior to discharge along with information that you should provide to the infant's pediatrician.

Preparing to go Home continued...

- The nurse and hospital staff will review a list of discharge instructions with the foster parents. This will include information on all follow-up appointments with doctors and clinics that will need to take place after the infant goes home with you.
- Ask any and all questions you may have before leaving the hospital with the infant. The nursing staff wants to ensure you are comfortable taking the infant home.



Transitioning Home

Tennessee Early Intervention System

- **A TEIS referral is required by DCS for any infant that the caregiver has been substantiated for drug exposure.**

<http://tennessee.gov/education/teis/index.shtml>

Tennessee's Early Intervention System is an educational program for families with children birth through age two with disabilities or developmental delays.

Principles of Early Intervention

- 1) Support families in promoting their child's optimal development.
- 2) Facilitate the child's participation in family and community activities.
- 3) Encourage the active participation of families in the intervention by imbedding strategies into family routines.



Principles of Early Intervention cont...

It is the parents who provide the real early intervention by creatively adapting their child care methods to facilitate the development of their child, while balancing the needs of the rest of the family.



The goal of Early Intervention

- The **primary** goal of **EI (Early Intervention)** is to support families in promoting their child's optimal development and to facilitate the child's participation in family and community activities.
- **EI requires** a collaborative relationship between families and providers, with participation by all involved in the process. An on-going parent-professional dialogue is needed to develop, implement, monitor, and modify intervention activities.
- **Intervention** should be monitored periodically to assure that the strategies implemented are successful in achieving outcomes.

The goal of Early Intervention ...

Children and their families in Tennessee's Early Intervention System deserve to have services of the highest quality possible. High standards will be set for the training and credentialing of administrative and intervention staff. Training, supervision, and technology will be focused on achieving excellence.



Help Us Grow Successfully (HUGS)

Help Us Grow Successfully (HUGS) is a home-based prevention and intervention program that provides services to prenatal/postpartum women, children from birth through age 5, and parents/guardians of these families.

The HUGS program is designed to:

- Improve pregnancy outcomes
- Improve maternal and child health and wellness
- Improve child development
- Maintain or improve family strengths



Who is eligible for HUGS?

- Pregnant teens and women
- Postpartum teens and women
- Children birth through 5 years of age
- Parent/Guardian of children under age 6
- Women who have experienced death of a child less than 2 years of age



Who is eligible for HUGS?

How to make a referral:

There are no financial guidelines. Referrals can be made by calling your local Public Health Department. Referrals are made by physicians, hospitals, social agencies, clinics, family members, and individuals.

Brainstorming...

Brainstorm ways that caregivers can take care of themselves and relieve stress from the constant care of an infant with NAS.



Ways to Take Care of Yourself

- Date Nights with spouse or significant other
- Plan regular times each week for a babysitter to stay for a few hours so you can run errands, take time for yourself, etc.
- Nap when the infant is napping
- Have good nutrition and eat regularly
- Recognize the signs of fatigue and address the need for rest
- Use Respite for weekends when needed



NOTES:

Safe Sleep

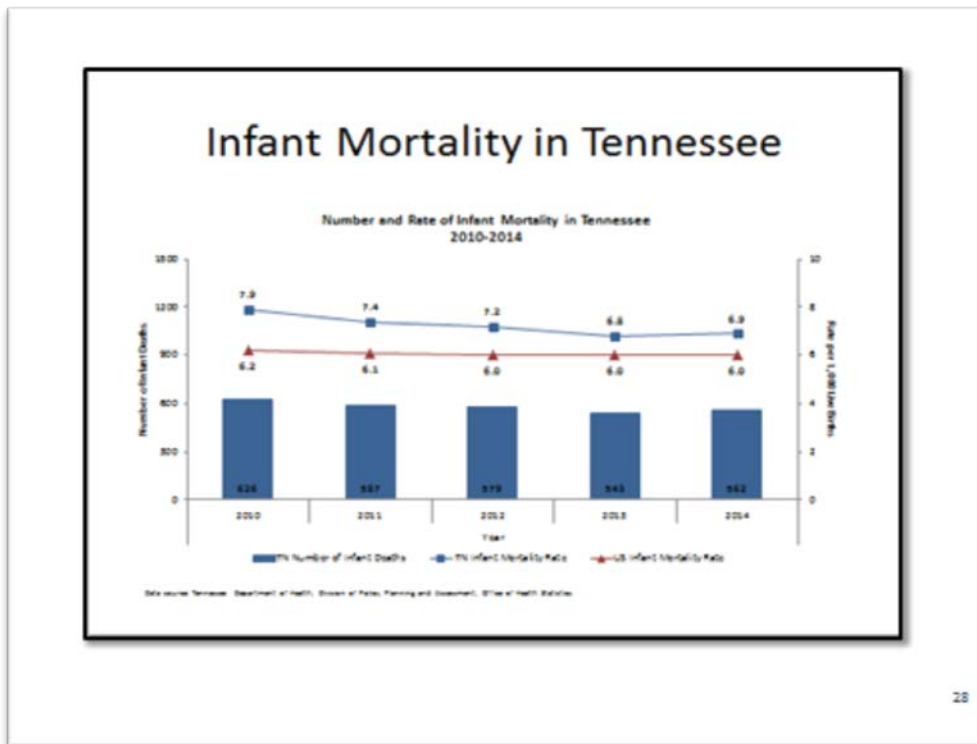
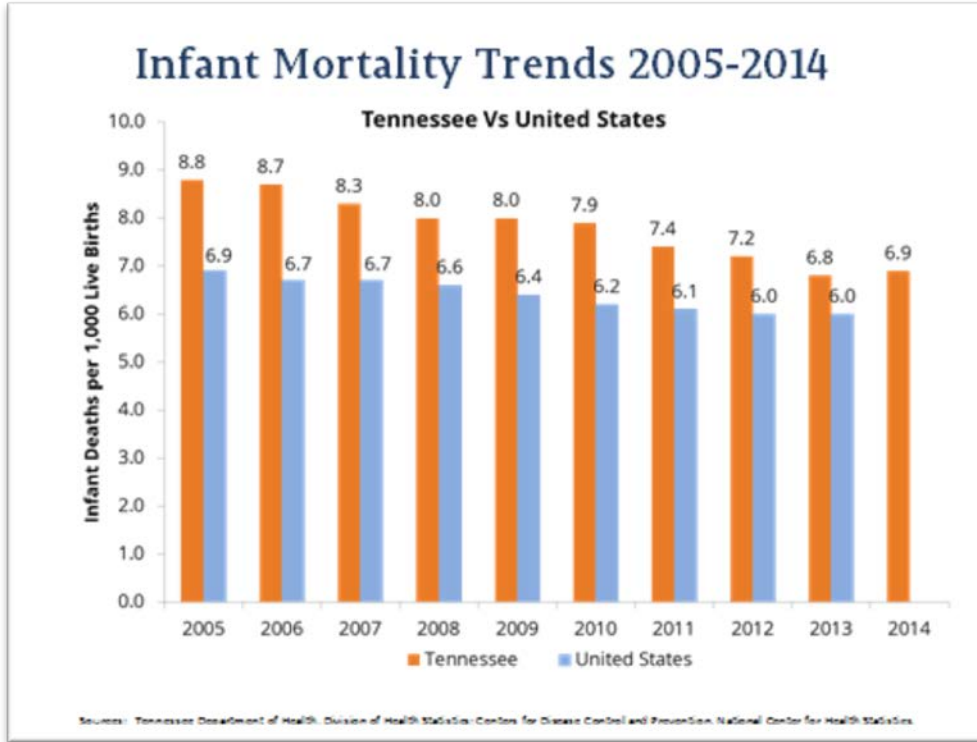
What do you know about Safe Sleep?



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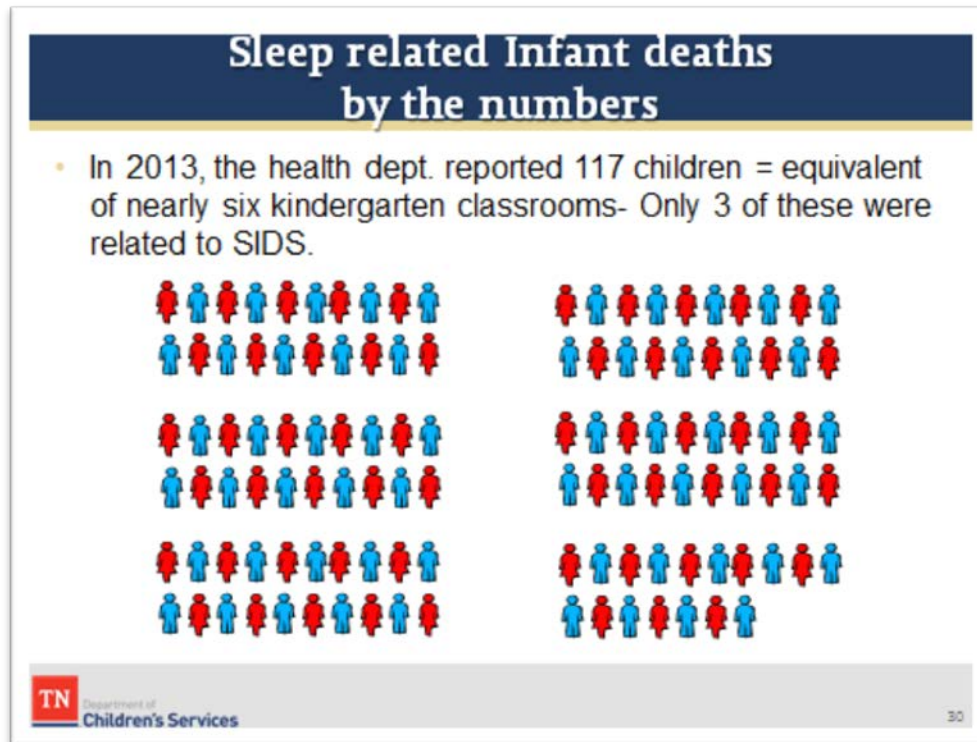
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- The American Academy of Pediatrics (AAP) first released its recommendations in 1992 that infants should be placed for sleep in a non-prone position (not on stomach or side) in order to prevent the increase of infant death by SIDS.
- Studies show that 90 percent of SIDS deaths occur before the infant reaches the age of 6 months.
- Unfortunately, even after the AAP recommendations were made, infant sleep-related death numbers continued to rise. Therefore, the American
- Academy of Pediatrics has since expanded its recommendations from being only SIDS-focused to focusing on a Safe Sleep environment that can reduce the risk of ALL infant sleep-related deaths.
- Since the AAP's last publication in 2005, sleep-related infant deaths including suffocation, asphyxia, and entrapment; along with ill-defined or unspecified causes of death have slowly continued to decline.





NOTES:



Safe Sleep Data:

- In 2013, the TN Department of Health reported 117 **sleep-related** infant deaths; three of these were identified as SIDS.
- Sleep-related deaths accounted for 21.5% of all infant deaths.
- These infants died from suffocation, strangulation, or other causes in the sleep environment.
- There was a 10% decrease from the 130 infants who died in 2012.
- A statewide public awareness campaign began in late 2012 and may have contributed to the decrease.

Four main contributing factors are consistently present in sleep-related infant deaths:

- Infant not sleeping in a crib or bassinette = 75% of cases
- Unsafe bedding or toys in sleeping area = 62% of cases
- Infant not sleeping on their back = 61% of cases
- Infant not sleeping alone 57% of cases

ABC's of Safe Sleep

Babies should sleep...

Alone

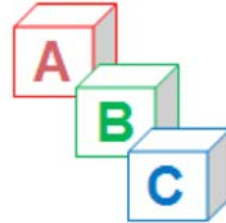
- Not with an adult, another child, or pets
- Not with pillows or stuffed toys
- Not with crib bumpers

On their Back

- Not on their side
- Not on their stomach

In a Crib

- Not in an adult bed
- Not on a couch or sofa
- Not in a chair



Safe Sleep Quiz



Bouncy chair or swing



Baby Crib/ Bassinet



Car seat or carrier



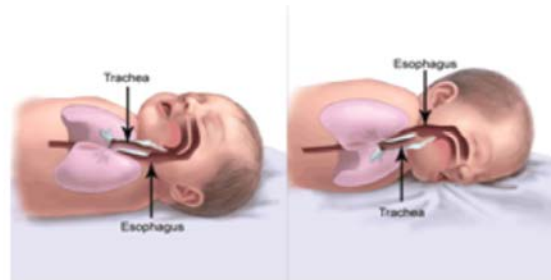
Baby Pack n Play



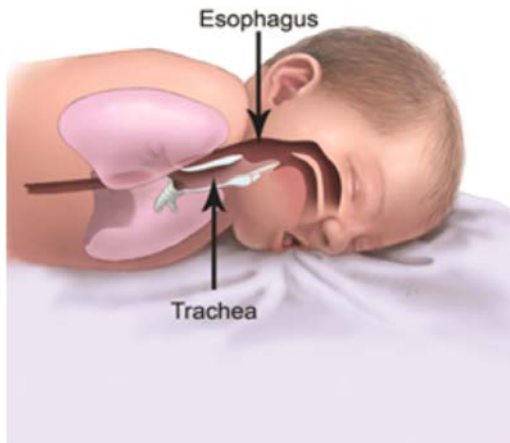
Sofa or couch



Which position shows safe sleep?



INCORRECT POSITION for a baby to sleep



If a baby is lying on its stomach when the baby vomits or spits up, gravity might pull food down into the windpipe (trachea), causing the baby to aspirate or choke.

CORRECT POSITION for a baby to sleep

Notice the position of the Esophagus and Trachea. Placing a baby on its back decrease the risk of choking. If the baby vomits or spits up while on its back, gravity might keep food from going into the windpipe (trachea), making it less likely for the baby to aspirate or choke.



DCS POLICY 16.3; Section 3

It is the Department's recommendation that foster parents not smoke in a home where children are placed.

- **There is evidence to support that children who reside with smokers have more upper respiratory infections than children who do not. Smoking and the use of tobacco products is prohibited in any vehicle in which children receiving care in the home are transported.**
- **Children who are medically fragile, or who experience asthma or other breathing-related medical conditions, are not placed into homes with foster parents who smoke.**

Public Chapter 820

- This act makes it a misdemeanor if a pregnant woman **illegally** uses a narcotic drug while pregnant, if her child is born dependent on or harmed by the narcotic drug, and the addiction or harm is a result of her **illegal** use of a narcotic drug taken while pregnant.
- The law specifically states that “prosecution of a woman for assault” may only occur “for the **illegal** use of a narcotic drug.”

Public Chapter 820 cont...

- Under Public Chapter 820, if the mother actively enrolled in an addiction recovery program before the child is born, remained in the program after delivery, and successfully completed the program, regardless of whether the child was born dependent on or harmed by the narcotic drug, she protects herself from criminal charges and preserves her family.

This law became ineffective July 1, 2016. There was a spike in mothers with little to no prenatal care observed after this law was put into place.

Video “Brittney Hudson’s”

Brittney Hudson's Story- [click here \(4:11\)](#)



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NOTES:

Questions to ponder ??

- What is your reaction to the mother taking pills that caused her baby to be born drug-dependent?
- How do you feel about the way the mother referred to her addiction as a disease?
- Did this video change your opinion on mothers whose babies are diagnosed with NAS? How?

Working with the birth parents of an infant with NAS

Regardless of why the child was placed into care, it is the responsibility of **EVERYONE** in the child welfare system to actively involve birth parents in the assessment and decision-making for their child. This begins with the birth parents' first interactions with case managers and foster parents.



Key Themes of the Practice Model

- **Family-Centered Approach:** Involves seeing the family as a system and viewing the situation (problem, needs risks) in the context of the family system rather than solely as it relates to the child or youth.
- **Strengths-Based Model:** Believes that all people, regardless of difficulties, can change and grow; that family members can be their own agents of change; and, with guidance, they can find their own solutions.

Key themes continued...

- **Cultural Responsiveness:** Means respecting the unique culture of a family, not only in terms of cultural or ethnic heritage, but also their unique values, attitudes, beliefs, habits, priorities, customs, ways of making decisions, and how they relate to one another.
- **Family/Team-Driven Casework:** Means helping family members build and gather a team around them for supports - others who care about them and their well-being. It also involves strengthening the team and facilitating family and team members working with one another to help the family move through the process of change.

Attachment

Newborn infants have an attachment to their birth mother from the time they are born as they have heard the mother's voice and heartbeat the entire time they were developing in the mother's womb



Building a Helping Relationship Activity



Roles for Building a Helping Relationship

- **Mentor**
- **Teacher**
- **Advocate**
- **Support System**

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- **Mentor:** *Webster's Dictionary* defines a mentor as a wise and trusted guide. Birth parents become stronger and more confident parents when you include them in as many activities as possible with their child such as doctor's appointments, haircuts, shopping for clothes, birthdays, etc. Foster parents could also help birth parents role-play meetings with doctors or other professionals, coaching them in how to communicate. Children then see both families working together for their best interests and the birth family sees the foster family as a resource rather than a threat.
- **Teacher:** A foster parent can help the birth parent remain involved with their child in foster care through co-parenting. This means providing support and assistance to the birth parents while they continue to parent their child. Foster parents have taught birth parents how to fix formula, how to give medicine to their child, how to get the most for their money in a grocery store, how to fix nutritious meals, and how to follow a budget. Remember to focus on the birth parents' strengths.
- **Advocate:** *Webster's Dictionary* defines an advocate as "one who pleads the cause for another." An advocate might go with the birth parent to the utility company and help resolve payment problems in order to keep their utilities on or be an advocate for reunification during court hearings.
- **Support System:** Many birth families are isolated and have few people on whom they can call when they have questions about child care. As the goal of reunification gets closer, you can support the birth parent(s) in the eventual return home. The child will begin to spend increasing amounts of time at home with the birth parent(s), starting with occasional visits and working up to overnight and weekend visits. Foster parents can help the birth parent(s) adjust to having the child at home more during this time through phone calls and open communication. Foster parents can let the birth parent(s) know that they are "on call" for assistance if the birth parent(s) need them.

Therapy and NAS

- Children diagnosed with NAS will likely need therapy upon discharge from the NICU **and** as they age. The type of therapy the child may need will depend on the child's symptoms, as all NAS children differ. The child may need to meet with one or more of the following types of physicians/therapists:

- **Physiatrist**
- **Physical Therapist**
- **Occupational Therapist**
- **Speech Therapist**



Physiatrist

- A **Physiatrist** is a Physical Medicine and Rehabilitation physician. Most infants with NAS will be referred to meet with a Physiatrist. This is one of the most important doctor appointments your infant will have.
- A **Physiatrist** treats patients of all ages and their focus is on how the child functions. A Physiatrist treats a wide variety of medical conditions affecting the brain, spinal cord, nerves, bones, joints, ligaments, muscles, and tendons.

Physiatrist cont...

- **Physiatrists** will design a treatment plan for the NAS child and may collaborate with neurologists, orthopedists, neurosurgeons, physical therapists, occupational therapists, speech therapists, and primary care physicians to look at the “big picture” of improving function.



Physical Therapist

- **Physical Therapy** works to improve a child's gross motor function in order to promote independence and safety for the child in all environments.
- **Physical Therapists** work on improving the child's strength, balance, coordination, and transitional movements in order to improve their gross motor development.



Occupational Therapist

- **Occupational Therapy** helps improve fine and visual motor skills needed in all aspects of life; such as, playing with and manipulating toys, dressing, eating, writing, and other academic work.
- **Occupational Therapists** work to improve sensory processing (integration) skills. This will help the child to process all types of sensory information so that the child can successfully participate in life.
 - **Sensory Integration** is the process of taking sensory information from the environment (sight, sound, movement, taste, touch) into the body and then processing it appropriately in the brain in order to have the correct motor output/response.
 - **Sensory Integration** deficits/disorder is commonly seen in babies who have been exposed to drugs in utero.

Occupational Therapist continued...

- **Occupational therapists** address the three main foundational systems in order to produce a change in how the brain processes this information. These are the proprioceptive, vestibular, and tactile systems.
- **Proprioceptive System** provides body awareness feedback to the brain (where you are in space and how far you are from objects). These receptors are located in the muscles and joints of the body.

Occupational Therapist continued...

- **Vestibular System** provides feedback to the brain regarding movement. This is the system that tells your body where your head is in relation to your body and how your body is moving. The receptors are located in the inner ear.
- **Tactile System** provides information to the brain regarding touch. It provides feedback about the objects that you touch and when you are touched by objects and other people.

Speech Therapist

- **Speech Therapy** is the evaluation, diagnosis, and treatment of speech, language, communication, and swallowing disorders.
- **Speech-language pathologists** (sometimes called **speech therapists**) assess, diagnose, treat, and help to prevent communication and swallowing disorders in patients.

NAS Symptoms- Early Phase of Infancy

Before trying any of these techniques at home, ask the physician/therapist to instruct you how to use these for your particular child with NAS.

Early Phase of Infancy. This phase can last up to six months. During this phase, the infant may experience an increase in the following behaviors:

- Crying/Irritability (especially due to hypersensitivity to touch)
- Hyperactivity
- Poor sleeping patterns such as difficulty going to sleep and/or staying asleep

NAS Symptoms- Early Phase of Infancy cont.

They may be calmed using the following methods:

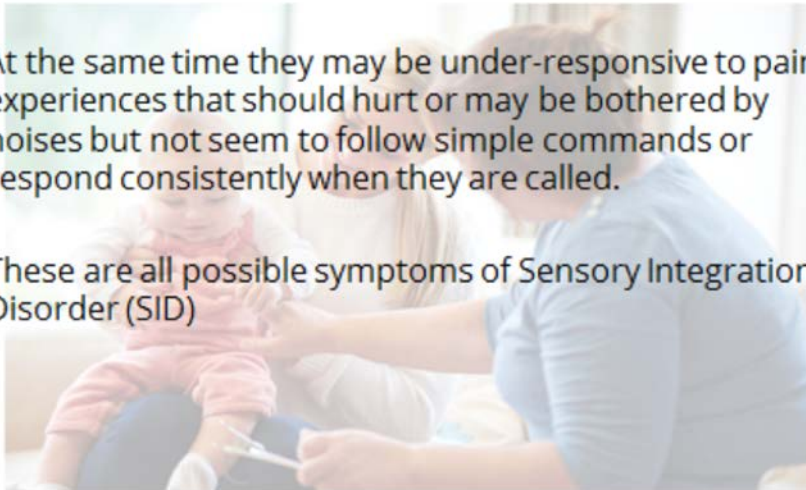
- Wrapping the baby firmly in a terry cloth towel
- Towel baths
- Dressing the infant in clothes that have texture because softer or silkier textures are often uncomfortable for children with sensory processing problems. The rough textures are sending signals to the brain without feeling uncomfortable.

NAS Symptoms- Later Phase of Infancy

- The **Later Phase of Infancy** may last long term. The infant may experience one or more of the following:
- Sensory Problems (these tend to be the greatest)
- Poor tolerance for handling and touch, sleeping and feeding problems, and poor tolerance for noise (may scream if taken to the mall or grocery store)

NAS Symptoms- Later Phase of Infancy

- At the same time they may be under-responsive to painful experiences that should hurt or may be bothered by noises but not seem to follow simple commands or respond consistently when they are called.
- These are all possible symptoms of Sensory Integration Disorder (SID)



NAS Symptoms- the *Later Phase of Infancy*

- Because the drugs affected the developing signal system between the sensory input from the skin, ears, joints, eyes, and the areas in the brain that “read” the input
- These problems can be decreased or resolved with appropriate therapy and simple interventions like the towel wrap
- An example of SID is food on their tongue doesn't feel right
- They may feel numb as well as hypersensitive - **think of when your foot 'falls asleep' and is numb and yet prickly**

Additional NAS Symptoms in the Later Phase of Infancy

- **Motor Problems**
- **Developmental Delays**
- **Delays in Developmental Skills**
- **Delay in Speech and Language**
- **Delay in Coordination**
- **Delays in Fine Motor Skills**
- **Behavioral Problems**



It is important to understand that not every therapist or physician is aware of these problems or how to work with them.

NAS Symptoms of a Toddler

- Unable or difficult to self-calm
- Irritable
- Does not like to be touched
- Inability to sleep through the night
- Increased amount of time to calm in order to go to bed
- Prefers to be sedentary instead of active



NAS Symptoms of a Toddler cont.

- Delayed grasping and visual motor skills
- Delayed gross motor skills (such as stair climbing and jumping)
- Abnormal muscle tone
- Poor movement patterns (decreased use of trunk rotation, stiff movements)
- Poor core strength (relies on surfaces to pull to stand or comes to stand using a wide base of support)



NAS Symptoms- Preschool Age



- Constantly moving (unable to sit still at any time)
- Difficulty calming to go to sleep
- Unable to sleep for more than 4 hours at a time
- Always moving fast, no slow gear
- Picky eater
- Does not like to be touched and refuses to touch different textures (such as bare feet on the grass)
- Abnormal muscle tone

NAS Symptoms- Preschool Age cont...

- Delayed gross motor skills (stair climb, jumping)
- Delayed fine motor skills (unable to draw single lines)
- Delayed ability to coordinate the use of both hands (lacing beads, snipping with scissors)
- Too still - would rather sit and watch others play
- Clumsy/Poor body coordination
- Poor balance - moves quickly through their environment

NAS Symptoms- 5 -6 year olds

- You may begin to see learning and behavior problems start to emerge at this stage. The child may have reading, math, and memory problems along with poor auditory processing and difficulty staying organized.
- Hyperactive (cannot sit still in class)
- Difficulty calming to go to sleep
- Difficulty sleeping through the night without waking more than 1 time
- Inability to make decisions without assistance (unable to decide on a game to play without assistance)

NAS Symptoms- 5 -6 year olds cont.

- Poor auditory processing
- Unable to tolerate being touched by others or touching different textures
- Mixed hand dominance (does not have a dominant hand when writing and throwing a ball)
- Delayed visual motor skills and grasping skills (should have a mature writing grasp by 6 years old)



NAS Symptoms- 5 -6 year olds cont.

- Delayed gross motor skills (skipping, jumping, ball play)
- Clumsy/Poor body coordination
- Sedentary – prefers to watch others play and interact instead of join in with peers
- Poor balance

NAS Symptoms- Middle and High School Age

Children may display more cognitive problems such as:

- **Memory problems:** Their reading content may become more of an issue as well as higher level cognitive skill problems.
- If they experience psychiatric problems, it will likely show up in Middle School and Adolescence. These psychiatric problems may present as Attention Deficit Hyperactivity Disorder (ADHD), Anxiety, Bipolar Disorder, and Oppositional Defiant Disorder (ODD).

NAS Symptoms- Middle and High School Age

Children may display more cognitive problems cont...

Making Inferences: For example, the teenager may remember the contents of a paragraph well, not have memory problems, but completely miss the inferences. This sort of problem will lead to poor scores on standardized tests and/or an inability to write an essay. There may be social communication problems because of not understanding figures of speech such as similes and metaphors (they don't get the joke or even realize that it was a joke).

NAS Symptoms- Middle and High School Age

- **Executive Skills:** These higher order cognitive skills for organization, setting priorities, and keeping track of time do not develop until this age and may be impaired. This often leads to not keeping track of when homework is due, not turning it in, or losing it.
- **Flexibility of Thoughts:** Typically someone has alternatives if the first idea does not work. The reverse of this is a tendency to stay stuck in one way of solving a problem, becoming repetitive, and/or having difficulty to "change set".
- **Anti-Social Behaviors:** Often do not show up until the child is reaching puberty or adolescence.

Therapeutic Techniques

- **Difficulty sleeping**

- Use a therapeutic weighted blanket or a heavy quilt
- Swaddle the baby or if they are older tuck the sheet tight around them
- Before bed, use the “Carrying Heavy Load” or the “Pushing and Pulling” activity
- Hermit Crab

Therapeutic Techniques

- **Unable to tolerate movement (cries when being moved from one position to the next)**

- Introduce vertical movement first; this is the movement that is the easiest for the neurological system to process
- Swaddling
- Holding them tightly/firmly when moving (like moving down for diaper changes)
- Joint compressions
- Thera-pressure Brushing (Wilbarger Brushing Protocol)

More Therapeutic Techniques

Unable to tolerate being placed on his/her back or difficulty transitioning from one surface to the next

- These children have gravitational insecurity which is a vestibular processing problem
- Provide lots of motor planning opportunities (e.g. climbing/crawling over, under, and through objects)
- Instead of lying the baby down on his/her back, lie them down on their side
- Roll them to their side before picking them up
- Never pick them up from behind (anything behind them is fearful and anything that requires their head to be moving backward in space is also very fearful to their nervous system)

Therapeutic Techniques cont...

Unable to tolerate being touched

- Therapressure Brushing (Wilbarger's Therapressure Protocol)



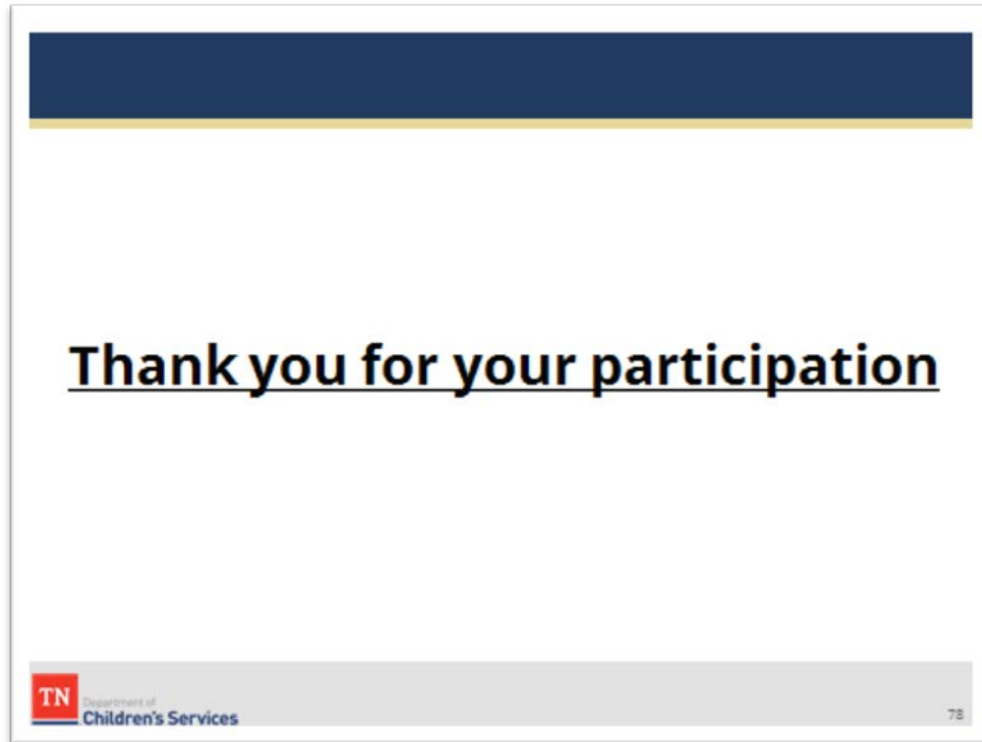
When would you refer your child for therapy?

Forms of Therapy- Occupational/physical/speech

- Delayed grasping and/or delayed visual motor skills
- Poor sensory processing skills such as difficulty staying calm
- Unable to perform daily activities such as dressing, eating, and/or sleeping
- No internal motivation to play
- Poor self-confidence
- Unable to tolerate touch

Forms of Therapy-Conti...

- Increased muscle tone or arching of their back
- Increased resistance to movement in their extremities
- Prefer to sit/lie and play instead of attempting movement
- Increased falling during play or walking
- Difficulty playing on playground equipment



Supplemental Forms

- Therapy and NAS
- Fine/Visual Motor Developmental Milestones: 0-14 months
- Gross Motor Developmental Milestones : 0-12 months
- Core Strengthening Activities
- Coordination Activities

Supplemental Forms

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Therapy and NAS

Physical Therapy

- Physical Therapy works to improve a child's gross motor function in order to promote independence and safety in all environments.
- Physical Therapists work on improving strength, balance, coordination, and transitional movements in order to improve a child's gross motor development.

Occupational Therapy

- Helps improve fine and visual motor skills needed in all aspects of life; such as, playing with and manipulating toys, dressing, eating, writing, and other academic work
- Improves sensory processing (integration) skills in order to process all types of sensory information appropriately to successfully participate in life

Sensory Integration

- The process of taking sensory information from the environment (sight, sound, movement, taste, touch) into the body and then processing it appropriately in the brain in order to have the correct motor output/response. Sensory integration disorder occurs when there is a roadblock anywhere in the process of bringing sensory information to the brain, the brain processing the information, and the body's response to the information. Sensory integration deficits/disorder is commonly seen in babies who have been exposed to drugs in utero.
- Occupational therapy addresses the three main foundational systems in order to produce a change in how the brain processes information: the proprioceptive, vestibular, and tactile systems.

Proprioceptive System

- Provides body awareness feedback to the brain (where you are in space and how far you are from objects)
- Receptors are located in the muscles and joints of the body

Vestibular System

- Provides feedback to the brain regarding movement. This is the system that tells your body where your head is in relation to your body and how your body is moving. The receptors are located in the inner ear (semi-circular canals and the otolith organs).

Tactile System

- Provides information to the brain regarding touch. It provides feedback about the objects that you touch and when you are touched by objects and other people.

Abnormal Muscle Tone

- Typically individuals with increased muscle tone demonstrate: an overuse of their trunk extensor muscles, stiffness in their extremities, and difficulty with transitional movements.
- Abnormal muscle tone is commonly seen in babies/children who have been exposed to drugs in utero. Most commonly they have increased muscle tone (increased stiffness in their extremities and trunk), however, they can present with low muscle tone (decreased firmness of their muscles, “squishy muscles”).
- Increased muscle tone is demonstrated through
 - Arching backward when being carried
 - Difficulty maintaining a sitting position due to frequently arching backward because of abdominal weakness and increased strength of back extensor muscles
 - Arching back to initiate rolling instead of using their abdominal muscles and leading with their legs and hips
 - Transitioning from lying on their back to sitting – when you are trying to get them to pull to sit they will arch backward and typically come all the way to standing instead of coming to a sitting position
 - Difficulty assuming hands and knees in order to progress to crawling
- Decreased muscle tone is demonstrated through
 - Demonstrates increased propping with their hands or leaning forward when attempting to sit (at or after 5 months of age) due to decreased abdominal muscle strength

- Unable to bring to feet to mouth or hands when lying on their back

Signs of Difficulty in Infancy

- Unable or difficulty self-calming
- Irritable
- Does not like to be touched
- Fearful or cries uncontrollably when moved from one surface to the other (being picked up from the floor to being upright in a caregiver's arms or being placed down on the changing table)
- Inability to sleep through the night
- Increased amount of time to calm in order to go to bed
- Prefers to be sedentary instead of an active baby
- Delayed reaching and visual motor skills
- Delayed grasping skills such as using a pincer grasp (picking up small objects with thumb and index finger, 12 months)
- Delayed gross motor skills (such as rolling, sitting and walking)
- Abnormal muscle tone
- Poor movement patterns (decreased use of trunk rotation, stiff movements)
- Poor initiation of movement/too much movement
- Prefers to use only one side of their body

How to help them improve their core strength

- **Transitional movements**
 - Encourage a chin tuck when coming to sit from lying on their back
 - Play in a side lying position in order to engage their abdominal muscles, making sure their chin is tucked down toward their chest or they are looking down toward their belly.
 - Encourage them to bring their feet to their hands/mouth when lying on their back
 - When helping to them transition from lying to sitting roll them to their

side and then help them push up into a sitting position

- **Tummy time**

- Help them reach with one arm keeping the other in contact with a surface making sure they are able to reach with their right and left arms without rolling to their side or back

Signs of Difficulty in Toddlers

- Unable or difficulty self-calming
- Irritable
- Does not like to be touched
- Inability to sleep through the night
- Increased amount of time to calm in order to go to bed
- Prefers to be sedentary instead of active
- Delayed grasping and visual motor skills
- Delayed gross motor skills (such as stair climbing and jumping)
- Abnormal muscle tone
- Poor movement patterns (decreased use of trunk rotation, stiff movements)
- Poor core strength (increased lumbar lordosis, relies on surfaces to pull to stand or comes to stand using a wide base of support)

Signs of Difficulty in the Preschool Age Child

- Constantly moving (unable to sit still at any time)
- Difficulty calming to go to sleep
- Unable to sleep for more than 4 hours at a time
- Always moving fast, no slow gear
- Picky eater
- Does not like to be touched and refuses to touch different textures (such as bare feet on the grass)
- Abnormal muscle tone

- Delayed gross motor skills (stair climb, jumping)
- Delayed fine motor skills (unable to draw single lines)
- Delayed ability to coordinate the use of both hands (lacing beads, snipping with scissors)
- Too still (would rather sit and watch others play)
- Clumsy/Poor body coordination
- Poor balance – moves quickly through their environment

Signs of Difficulty in 5-6 Year Olds

- Hyperactive (cannot sit still in class)
- Difficulty calming to go to sleep
- Difficulty sleeping through the night without waking more than 1 time
- Inability to make decisions without assistance (unable to decide on a game to play without assistance)
- Poor auditory processing
- Unable to tolerate being touched by others or touching different textures
- Mixed hand dominance (does not have a dominant hand when writing and throwing a ball)
- Delayed visual motor skills and grasping skills (should have a mature writing grasp by 6 years old)
- Prefers to be sedentary and watch others play and interact
- Delayed gross motor skills (skipping, jumping, ball play)
- Delayed visual motor skills and grasping skills (should have a mature writing grasp by 6 years old)
- Clumsy/Poor body coordination
- Sedentary – prefers to watch others play and interact instead of join in with peers
- Poor balance

Common Sensory Problems:

- **Difficulty sleeping**
 - Use a therapeutic weighted blanket or a heavy quilt
 - Swaddle the baby or if they are older tuck the sheet tight around them
 - “Heavy Work” - proprioceptive input before bed - pushing or pulling something heavy
 - Hermit Crab
- **Unable to tolerate movement** (cries when being moved from one position to the next)
 - Provide Proprioceptive and/or Tactile input
 - Swaddling
 - Holding them tightly/firmly when moving (like moving down for diaper changes)
 - Joint compressions
 - Therapressure Brushing (Wilbarger Brushing Protocol)
 - Introduce vertical movement first - this is the movement that is the easiest for the neurological system to process
- Unable to tolerate being placed on back or difficulty transitioning from one surface to the next
- These children have gravitational insecurity which is a vestibular processing problem
- Provide Proprioceptive Input
 - Provide lots of motor planning opportunities- climbing/crawling over, under, and through objects
- Instead of lying the baby down on his/her back, lie them down on their side
- Roll them to their side before picking them up
- Never pick them up from behind (anything behind them is fearful and anything that requires their head to be moving backward in space is also very

- fearful to their nervous system)
- Therapressure Brushing
 - Unable to tolerate being touched
 - Provide deep pressure/proprioception
 - Therapressure Brushing (Wilbarger's Therapressure Protocol)

When to Refer for Occupational Therapy and Physical Therapy

If a child has:

- Delayed grasping and visual motor skills
- Poor sensory processing skills
 - Difficulty staying calm
 - Unable to perform daily activities (dressing, eating, sleeping)
 - No internal motivation to play
 - Poor self-confidence
 - Unable to tolerate touch
- If you notice increased muscle tone or arching of their back
- Increased resistance to movement in their extremities
- Prefer to sit/lie and play instead of attempting movement
- Increased falling during play or walking
- Difficulty playing on playground equipment

Fine / Visual Motor Developmental Milestones: 15 – 71 months

15-17 months

- Places seven blocks in cup on command
- Builds tower of 3-4 blocks
- Scribbles on paper
- Grasps marker with thumb and first finger directed toward paper and marker held in palm

18-23 months

- Places small pellets in bottle (i.e. beans, cheerios)
- Separates pop beads
- Turns thick pages in a book one at a time
- Inserts three shapes in a shape sorter
- Builds a tower of 6-8 blocks
- Imitates a vertical stroke with a marker
- Strings three beads
- Snips paper with scissors

24-29 months

- Turns knob to open door
- Places all rings on ring stand
- Removes cap from bottle
- Imitates a horizontal stroke with marker after demonstration
- Builds a simple block design after demonstration

30-35 months

- Builds tower of 9-10 blocks
- Draws a circle after demonstration
- Washes hands with good wrist movement and one palm to back of other hand
- Unbuttons small buttons
- Cuts paper from one side to the opposite side

36-41 months

- Begins to show hand preference, i.e. picks up blocks consistently with same hand

- Unscrew cap that is placed loosely on bottle
- Strings 4-5 beads
- Turns key of wind-up toy
- Cuts paper in 2 along a one inch line
- Draws intersecting lines within 20° of perpendicular (draws a cross)

42-47 months

- Traces a line drawn on paper with marker
- Holds marker with fingers in a mature position, i.e. with thumb and first and second digits
- Draws a square after demonstration
- Cuts out a circle with $\frac{3}{4}$ of the cutting on the line
- Laces 2-3 holes on shoe (does not have to cross)



48-59 months

- Places small pellets in bottle
- Buttons and unbuttons large buttons
- Builds a complex design with blocks after demonstration
- Folds paper in half with edges close to each other
- Cuts out square

60-71 months

- Connects dots
- Builds pyramid with blocks after demonstration
- Rapidly touch each finger with thumb in sequential order
- Colors within lines.

Gross Motor Developmental Milestones: 0-12 months

1 month

- Lifts head slightly when on tummy and rotates head from side to side
- Kicking of feet when laying on their back
- Minimal weight through legs when stood

2 months

- Holds head up to 45° while on tummy
- When laying on back moves head frequently (rotating from side to side)
- Collapses when supported in standing
- Rolls to back from right and left sides

3 months

- Lifts head to 90° while on tummy
- Props on forearms when on tummy
- Able to achieve a chin tuck (bring chin to chest) when laying on their back
- Head held steady when in supported sitting
- Back rounded when in supported sitting

4 months

- Rolls accidentally from tummy to back and from tummy to side (right and left)
- No head lag with pull to sit (grasping hands and bringing baby to sit from laying on his back)
- Sits with slight support for several seconds

5 months



- Pushes up onto arms when on tummy
- Pivots when on tummy, swimming is seen when they are on their tummy
- Plays with feet when laying on back
- Sits by propping on hands (still may require assistance)
- Rolls from tummy to back (over right and left)
- Rolls from back to side (right and left)

6 months

- Reaches for toys when on tummy
- Prop sit alone
- Rolls from back to tummy
- Rolls from tummy to back (rare)

7 months

- Sits without support
- Combat crawls on stomach
- Gets on all four and rocks
- Pulls to stand using arms to achieve standing



8 months

- Leans forward to get an object in sitting then returns to sitting
- Pulls to stand at surfaces (increased use of feet to achieve standing)
- Walks along furniture
- Crawling on hands and knees (main mode of movement)

9 months

- Uses various sitting postures (ring sit, side sit, long sit)
- Transitions out of sitting to crawling, standing, etc. with ease
- Uses kneeling and half kneeling (one foot on floor with other knee on floor)

10 months

- Climbing over obstacles (small such as parents legs or small toys)
- Walks along surfaces with one hand on surface
- Walks with one hand held
- Pivots in sitting

11 months

- Uses sitting for fine motor tasks (eating, dressing, etc.)
- When crawling attempts to put themselves inside and get out of containers/boxes
- Climbs up onto surfaces (chairs, couch) must be taught to climb down backwards
- Can squat to get a toy when standing at a surface
- Stands without support
- May take a few steps without support

12 months

- Walks independently
- Enjoy climbing
- Will play in a squatted position
- Transitions easily from crawling, sitting, standing and squatting



Gross Motor Developmental Milestones: 14 months – 5 years

14 months

- Walks without help at least 5 steps
- Stands from the middle of the floor alone
- Able to start and stop walking without falling
- Squats to pick up a toy then return to stand/walking without losing balance
- Able to maintain a kneeling position
- Able to corral a medium size ball when rolled to them
- Able to roll a medium size ball using hands and arms
- Throws a small ball

18 months

- Crawls backward down stairs (3-5 steps)
- Walks up 4 steps with hand held
- Walks while carrying a large toy
- Walks backward without falling
- Lifts foot to contact a ball, when asked to kick
- When standing throws a small ball without losing balance

24 months

- Runs 10ft.
- Walks sideways
- Jumps forward 4 inches
- Jumps up with both feet



- Jumps down 1 step
- Walks up 4 steps (both feet on the same step)
- Kicks a ball
- Throws a small ball over handed and under handed

30 months

- Walks down 4 steps (both feet on the same step)
- Walks upstairs one foot on each step
- Walks backward 10ft.
- Rides a tricycle with pedals with help
- Jumps down from higher surfaces
- Attempts to catch a ball
- Kicks a ball by bending knee prior to kicking

3 years

- Jumps over a small hurdle (2 inches off ground)
- Jumps forward 24 inches
- Walks upstairs alone with one foot on each step
- Stands on one foot for several seconds
- Rides a tricycle
- Catches a ball with arms away from body

4 years

- Walks down stairs alone with one foot on each step
- Hops forward on one foot (can hop on right and left foot)
- Walks on balance beam
- Stand on one foot with little movement of body
- Throw a ball at a target

5 years

- Gallops forward
- Skips
- Runs with control and without falling
- Walks on a balance beam with good balance
- Attempts skills such as jumping rope, dribbling, skating, etc.

Core Strengthening Activities

(Only try these activities if they are age appropriate for your child)

1. Airplane

The parent holds the child's hands, places their feet on the child's tummy/hips, and lifts them up to fly. The parent can count or sing a song to see how long the child stays up.

2. Wheel barrel Walk

Hold the child's feet and have them walk on their hands.

Have a visual cue of "walk to Mommy, walk to the puzzle" to encourage the child to complete the task.

3. Sit Ups

Lay on your back with knees bent and feet on the floor. Place arms across their chest. Have them lift their head and shoulders off the surface. Breathe out as you lift and in as you lower. You can play catch while the child lifts and lowers for have them grab a puzzle piece with each lift in order to complete a puzzle.

4. Statue

The child holds different positions as a "statue" while the parent gently tries to "knock over" the child. Positions can include kneeling (both knees placed on the floor with bottom lifted off their feet, half-kneel (start in kneeling, lift one leg up and put one foot on the floor like you are standing up), standing, standing with eyes closed, standing on a pillow or cushion with eyes open or closed. Again, the parent can count or sing a song to see how long the child stays up.

5. Surf Board

Have the child stand on a pillow or sofa cushion and play catch, hit a balloon, or pop bubbles. Counting to 10 repetitions of an activity will help to keep some children engaged.

6. Obstacle Course

Create an obstacle course that includes climbing over, under, and through things. A way to make the course more fun is to use visual cues such as getting a piece of

the puzzle, go through the course, and then place it in the puzzle.

7. Scooter games

Square gym scooters can be used in a variety of ways. The child can lie on their belly and use their hands to move, they can sit on the scooter and ride with feet, or they can keep their knees on the scooter and propel with their hands on the floor.

8. Rock and Rolls

Have the child sit with knees curled up and arms wrapped around legs. Have them rock back and then sit right back up. The child can also do “egg rolls” in this position rocking side to side.

9. Animal Walks

Some examples are crab walk, worm wiggle, bear walk on hands and feet, stand on one foot like a flamingo and move like a turtle with a pillow as a shell. Take turns choosing the animal and then do the walk together. You can also print out animal pictures or use animal toys to choose an animal if the child would benefit from visual choices.

10. Build a Bridge

Have the child lie on their back with their knees bent and feet on the floor. The child will then lift their bottom up off the floor. Roll a toy car under the bridge. Remind the child to keep the bridge open!

11. Superman

Lay on stomach with arms overhead. Lift arms and legs so upper chest and upper thighs lift off the surface.

Arms and legs should be straight. You can have them reach for soft objects with their hands which they can “hide” under their body, have them pretend to fly to a special destination or for an increased challenge have them play catch from this position.

12. Planks

Have your child lay on his stomach on the floor with his hands flat on the floor at shoulder level and toes on the

floor. On the count of 3, have him push up on his hands to straighten his arms and lift his whole body all the way to his toes off of the floor. Have them see if they can stay longer than you or a friend. Or see if they can stay long enough for 2-3 small balls to roll under them.

Coordination Activities

Compiled by: Jennifer Walkup, PT, DPT, PCS

Side stepping: “step together”, feet point straight out, leading leg steps out and then the trailing leg comes together. Repeat to the right and left.

Galloping: “like a horse”, Place leading leg forward and back leg perpendicular to the lead leg (feet are in an L shape). Tummy and hips are facing forward. Smoothly and evenly step forward with the lead leg and then bring the back leg up to the lead leg without it touching or crossing. Hands are kept at your side and swing freely.

Marching: “opposite arm and leg”, March forward while lifting opposite arm and leg together. Make sure your arms and legs are moving at the same time and make sure you have controlled movements with all extremities. Also, make sure your arms do not cross your body.

Braiding: “cross in front, cross behind”, standing sideways down a hallway. Step out with your right foot and cross your left foot in front of your right foot. Then step out with your right foot. Then cross your left foot behind your right foot. Repeat to the opposite side with your right foot crossing in front then behind of your left foot.

Skipping: “step hop”, lift right foot off the ground, hop on your left foot, then return your right foot to the ground and repeat the pattern with your left foot off the ground. Keep switching between right and left legs without pausing or taking any extra steps in between.

Bird dog: Start on your hands and knees. Then slowly extend your right arm in front of you up by your ear and extend your left leg straight out. Hold 3-5

seconds then repeat with your left arm and right leg.

Doodle bugs: Start lying on your back with arms at your side and your legs extended. Lift your left arm and right leg into the air simultaneously, and then slowly lower to the start position. Then lift your right arm and left leg into the air simultaneously, then slowly lower to the start position. Then repeat alternating sides.

Doodle bugs on your belly (dolphins): Start lying on your belly with your legs straight and your arms in front of you. Slowly lift your left arm and right leg simultaneously. Then slowly lower. Then lift your right arm and left leg simultaneously. Then slowly lower. Then repeat alternating sides.

Jumping jacks: Start with your feet together and your arms down by your side (pencil). Then jump and bring your feet apart and your hands together over your head (rocket ship).

Scissor jumps: Place a target on the floor. Place your right foot on the target and your right arm extended forward in front of your body and your left foot off the target with our left arm extended behind you. Jump and switch your arms and legs. When you land, the left foot will be on the target and your left arm will be extended forward in front of the body and your right foot will be off the target and your right arm will be extended behind you. Make sure your tummy and hips remain facing forward.

Scissor jumps (opposite sides): Place a target on the floor. Place your right foot on the target and your left arm extended forward in front of your body and your left foot off the target with your right arm extended behind you.

Jump and switch your arms and legs. When you land, the left foot will be on the target and your right arm will be extended forward in front of the body and your right foot will be off the target and your left arm will be extended behind you. Make sure your tummy and hips remain facing forward.

CONTRIBUTOR BIOGRAPHIES

East Tennessee Children's Hospital

Children's Hospital has been recognized nationwide as both a leader and an innovator in the treatment and education of Neonatal Abstinence Syndrome. NAS is a group of problems that occur in a baby who has been exposed to certain drugs while in the mother's womb. Taking these drugs while pregnant puts a baby at risk for NAS. Once born, they no longer get these drugs and may start having symptoms of withdrawal. These babies are not born addicted to certain drugs. They are born drug dependent. In 2011, Children's Hospital staff created a new way to treat NAS babies. The NICU now uses small doses of morphine to help these babies through their withdrawal. Children's Hospital has a very experienced Cuddler Program in the NICU. These volunteers hold babies, rock them to sleep, and give them a human connection when parents are not present. In 2012, Children's Hospital built a brand new NICU with 16 private rooms just for NAS babies. In 2014, a \$75 million dollar expansion began, which includes the addition of 44 private NICU rooms to improve the environment for both babies and their families. The NICU's location in Children's Hospital means that that all staff members are highly trained to work with and understand the special needs of children and their families. The staff is dedicated to providing the best care for these babies. Their goal is to get these babies home as safely and as quickly as possible. After discharge, Children's Hospital offers these babies at risk for developmental delays a continuance of care while monitoring their growth.

The DCS Foster Parent contact at ETCH is Janet Noble, RN. She may be contacted at the following:

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Miriam Weinstein, MD

Miriam L. Weinstein, M.D. is a Clinical Associate Professor of Pediatric Rehabilitation at the University of Tennessee Graduate School of Medicine. She did her residency in Physical Medicine and Rehabilitation at Tufts New England Medical Center and Louisiana State School of Medicine, New Orleans/Charity Hospital. She did her fellowship in Pediatric rehabilitation with cross training in Developmental Pediatrics at The Rose. F. Kennedy Center, Albert Einstein School of Medicine, Bronx, New York. She has over twenty years of experience working with children who have a history of drug exposure during pregnancy and Neonatal Abstinence Syndrome. She has given many different forums about the special needs of these children. Currently, she has a private practice in Knoxville, TN.

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Michael D. Warren, MD MPH FAAP

Dr. Michael Warren is the Assistant Commissioner for Family Health and Wellness at the Tennessee Department of Health.

Dr. Warren is a board-certified pediatrician. He received his undergraduate degree from Wake Forest University and his medical degree from the Brody School of Medicine at East Carolina University. He completed his pediatrics residency, Chief Residency, and fellowship in Academic General Pediatrics at Vanderbilt, where he also obtained a Master's in Public Health. He is a fellow of the American Academy of Pediatrics.

Dr. Warren serves as Tennessee's Title V/Maternal and Child Health Director and oversees numerous child- and family-serving programs in all 95 counties, including programs related to Maternal and Child Health, Chronic Disease Prevention and Health Promotion, and Supplemental Nutrition.

Prior to joining the Department of Health, Dr. Warren served as an Assistant Professor in the Department of Pediatrics at Vanderbilt and as Medical Director in the Governor's Office of Children's Care Coordination. He currently serves as President-Elect for the Association of Maternal and Child Health Programs, the national professional organization for maternal and child health professionals.

He is actively involved in the community and in 2010 was recognized as the Nashville Emerging Leader in the area of Health and Medical Services and in 2013 with a Special Achievement Award from the Tennessee Chapter of the American Academy of Pediatrics.

Rachel Heitmann, MS

Rachel Heitmann, MS, is the Section Chief for Injury Prevention and Detection at the Tennessee Department of Health. She has over ten years in the injury prevention field and five years specifically working with infant safe sleep. Rachel has been responsible for the implementation of the statewide safe sleep campaign resulting in a 25% decrease in sleep-related deaths in two years. Rachel has a Bachelor's degree in Psychology and a Master's degree in Mental Health Counseling.

Jennifer Walkup, PT, DPT, PCS

Jennifer Walkup, PT, DPT, PCS graduated from East Tennessee State University as magna cum laude with a Bachelor's of Science degree in Biology. She then attended Belmont University and received her Doctorate degree in Physical Therapy. She has been practicing as a Physical Therapist for 10 years. She has experience treating outpatient pediatric patients and outpatient adult neurological and orthopedic patients. Jennifer received her Pediatric Clinical Specialist Certification through the American Board of Physical Therapy Specialists in 2012. She has received further education in the areas of torticollis treatment, neurodevelopmental technique (NDT) for infants and children, and orthotic management. She is also certified in the Interactive Metronome.

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Crystal Henley, OTR/L, USC/WPS Sensory Integration Certification #3066, is the sole proprietor of Sensory Puzzles, Inc. She graduated from the University of Tennessee-Chattanooga as magna cum laude with a BS in Occupational Therapy in 2003. She has been practicing as an occupational therapist for 11 years. She has had experience with treating outpatient pediatric patients, inpatient and outpatient adult neurological and orthopedic patients, and wound care. Crystal received her comprehensive certification in Sensory Integration through USC/WPS in 2006. She has received further education in the areas of brain gym techniques, handwriting, NDT use with babies, and Torticollis treatment. She is also certified in the interactive metronome and the Wilbarger Therapressure Technique.

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