

Neonatal Abstinence Syndrome: 18 months – 2 years

Introduction of the Co-Presenters

- Jennifer McAllister, MD, IBCLC
 - Medical Director, West Chester Hospital Special Care Nursery, University of Cincinnati Newborn Nursery, NOWS/NAS Follow-up Clinic
 - Pediatrician with experience in newborn medicine for 10 years
- Kate Meister, PhD
 - Assistant Professor, Behavioral Medicine and Clinical Psychology at Cincinnati Children's Hospital and Medical Center
 - Psychologist in NICU Follow-Up and NAS clinic.
 - Clinical specialty training in integrative behavioral health, early childhood psychology and developmental assessment, behavioral sleep medicine
- Liz Rick, MOT, OTR/L
 - Registered Occupational Therapist with 10 years of experience
 - Employed at CCHMC for 7 years
 - A part of the NOWS/NAS Clinic since its start 5 years ago
- Melanie Romaine-Jongewaard, M.S. CCC-SLP, CLC
 - 27 years' experience as a Speech Language Pathologist
 - Speech Language Pathologist in the inpatient setting and In NICU follow up Clinic
 - Specializing in infant feeding, development and Video Swallow Studies

Presentation Objectives

- Review relevant sensory information.
- Provide a brief overview of the Bayley Scales of Infant Development (BSID-III) and discuss neurodevelopmental outcomes of children with in-utero exposure.
- Discuss normal developmental milestones in this age range and interventions to support development.
- Discuss behavioral and emotional development of children with in-utero exposure.
- Provide an overview of Autism diagnostic criteria and early warning signs.

Review of Sensory Subtypes



Sensory Over-Responsive

- More sensitive to sensory stimulation than most people. Their bodies feel sensation too easily or too intensely.
- Often have a “fight or flight or freeze” response to sensation
- Becomes extremely upset during grooming tasks (wiping nose, teeth brushing, nail trimming, etc.) or dressing/bathing activities
- May demonstrate tantrums of long duration or extreme intensity (more than peers)

Sensory Under-Responsive

- Less sensitive to input than others, may not notice things that others do
- May appear withdrawn, difficult to engage and or self-absorbed
- May lead to poor body awareness, clumsiness or movements that are not graded appropriately
- Loose or ‘floppy’ muscles -- motor delays
- Ignores you when their name is called

Sensory Craving

- Constantly moving, crashing, bumping, and/or jumping.
- Often thought to have Attention Deficit Hyperactivity Disorder (ADHD) or Attention Deficit Disorder (ADD).
- Constantly throwing toys
- “On the go” or “driven by a motor”
- Decreased attention span – cannot attend to a seated activity for age-appropriate amount of time

Treatment Principles

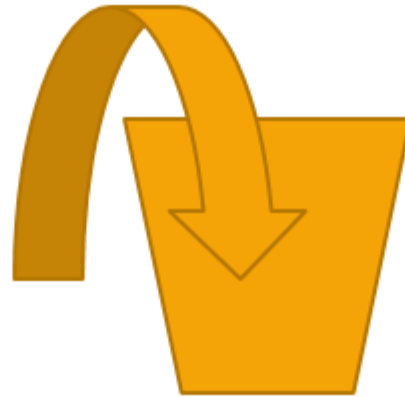
Sensory Over-Responsive

Empty the cup



Sensory Under-Responsive

Fill the cup



Sensory Craver

Cup has a hole in it!



Sensory Resources

- <https://thespiralfoundation.org/parent-toolkit/>
- <https://www.spdstar.org/>
- <https://www.spdstar.org/basic/home-activities>
 - Any activity list available on the Internet cannot possibly be individualized for a child and therefore some activities may not be appropriate for *your* child.
 - Some children may be over sensitive to sensations and will be fearful or withdraw from certain activities or sensations. Other children may be sensory seeking and find many of these activities enjoyable. You must carefully observe your child's reactions and respect them.

Ways to Incorporate Sensory Input into Routines

Bath time

Scrub with washcloth or bath brush.

Rub body with lotion after bath time.

Grocery Shopping

Have your child push the heavy cart.

Let your child help carry heavy groceries and help put them away.

Meal Prep/Baking

Let your child mix ingredients, especially the thick ones that will really work those muscles.

Allow child to help you carry pots and pans, bowls of water or ingredients (with supervision, of course).

Play Time

You can also go for a neighborhood walk with a wagon and have your child pull it (make it semi-heavy by loading it with something the child would like to pull around).

You can help your child make up obstacle courses in the house or yard using crawling, jumping, hopping, skipping, rolling, etc.

Bayley Scales of Infant Development (Third Ed.)

- Used as part of the NOWS/NAS clinic at 22-26 months
- Identify infant and toddler strengths and competencies, as well as their weaknesses (developmental delay)
- 3 domains: cognitive, language, and motor
- Playful, engaging toys and activities
- Excellent validity and reliability
- Provide information for interventional planning



http://images.pearsonclinical.com/images/pdf/bayley-iii_webinar.pdf

Cognitive Scale

Items measure age-appropriate skills including:

- Counting
- Visual and tactile exploration
- Object assembly
- Puzzle board completion
- Matching colors
- Comparing masses
- Representational and pretend play
- Discriminating patterns



Language Scale

- Receptive communication
 - Preverbal behaviors and vocabulary development such as:
 - The ability to identify objects and pictures that are referenced
 - Vocabulary development such as pronouns and prepositions
 - Understanding of markers such as plurals and tense markings
- Expressive communication
 - Pre-verbal communication (babbling, gesturing, joint referencing, turn taking)
 - Vocabulary development (naming objects, pictures, attributes)
 - Two-word utterances (plurals, verb tense)

*While the Language Scale is sufficient for determining if a language problem exists, additional assessment by a Speech Language Pathologist will be necessary to pinpoint the problem to determine appropriate intervention.

Motor Scale

Fine motor

- Items measure age-appropriate skills including:
 - Visual tracking
 - Reaching
 - Object manipulation
 - Grasping
 - Quality of movement
 - Functional hand skills
 - Responses to tactile information (sensory integration)

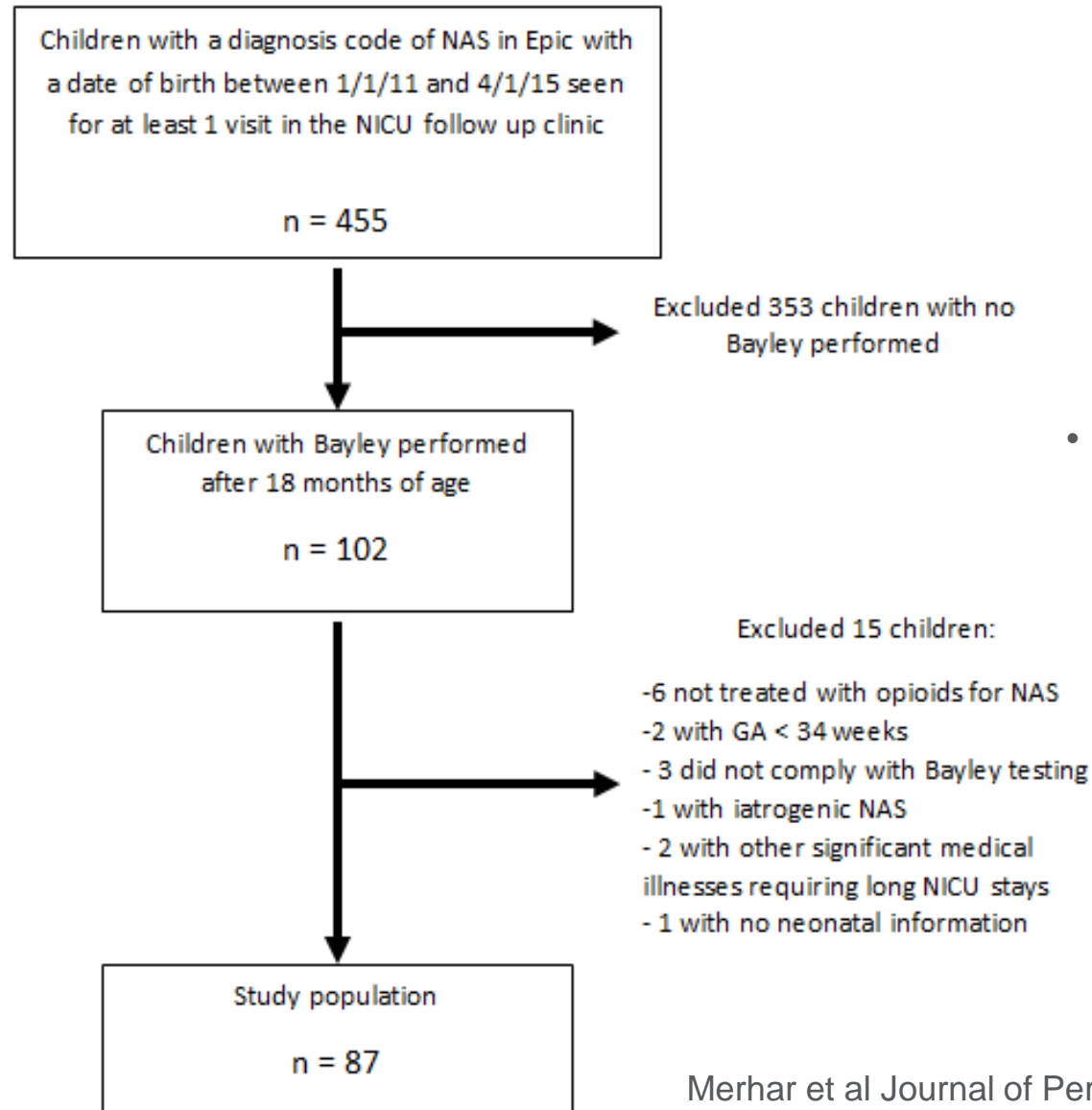
Gross motor

- Static positioning (e.g. head control, sitting, standing)
- Dynamic movement including locomotion (crawling, walking, running, jumping, walking up and down stairs)
- Quality of movement (coordination when standing up, walking, kicking)
- Balance
- Motor planning
- Perceptual-motor integration (e.g. imitating postures)

Composites Score and Classification

Composite or Composite Score Equivalent	Classification
130 and above	Very Superior
120-129	Superior
110-119	High Average
90-109	Average
80-89	Low Average
70-79	Borderline
69 and below	Extremely Low

Neurodevelopmental Outcomes of Infants with NAS



- Retrospective cohort study of infants treated for NAS and evaluated with Bayley at 2 years of age

Maternal Characteristics

Characteristic	n	percent
Caucasian	87	100%
Maternal polysubstance use	50	57%
Maternal known Hepatitis C	46	53%
In utero heroin	58	67%
In utero cocaine	19	22%
In utero benzodiazepines	20	23%
In utero marijuana	25	29%
In utero methadone	33	38%
In utero buprenorphine	21	24%
In utero amphetamines	9	10%
In utero other opioid (oxycodone etc)	30	36%
Any breastfeeding	8	9%

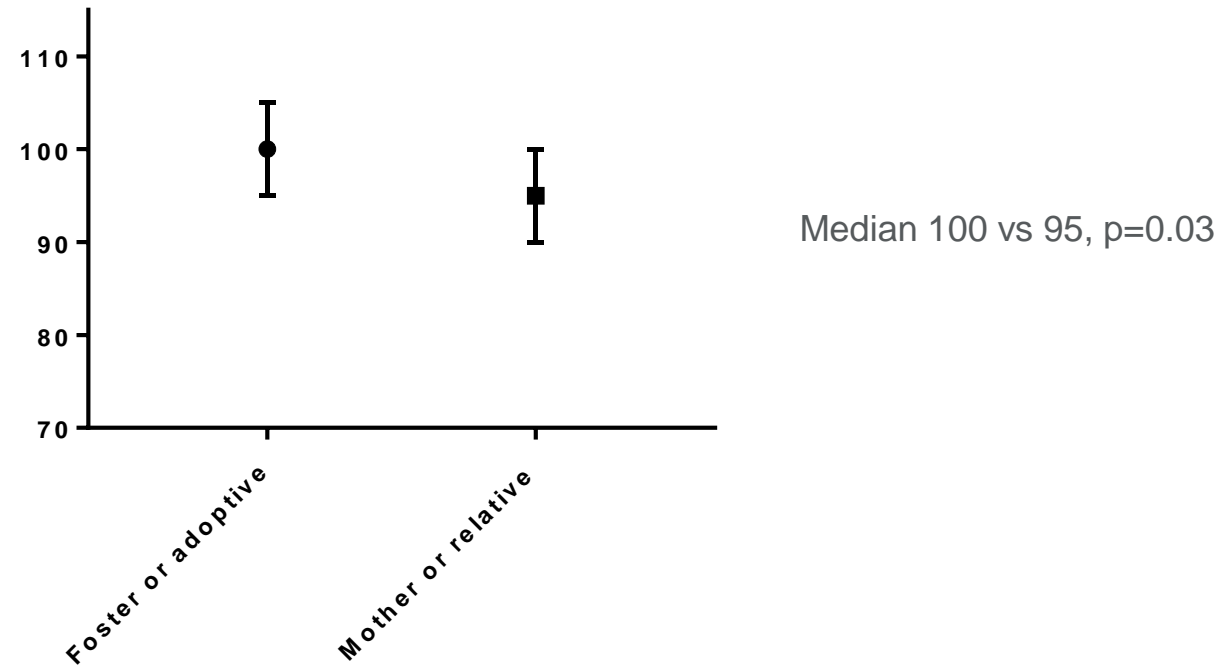
Bayley Results

	Median (range)	Mean (SD)	Score < 85	Score < 70
Cognitive	95 (65-115)	96.5 (10.6)	9	3
Language	94 (62-132)	93.8 (13.3)	17	5
Motor	94 (70-112)	94.0 (9.4)	11	0

- Most children had Bayley scores within the normal range for all 3 subscales
- Compared to normative Bayley data (mean of 100, SD of 15), **NAS children score significantly lower on all 3 subscales, $p < 0.03$**

Bayley Results- Follow-up disposition

Median Bayley cognitive score in infants with NAS living with foster or adoptive families versus biological relatives



- Children living with biological relatives also more likely to have motor scores <85 (p=0.02)

Neurodevelopmental Outcomes

- **Girls scored higher than boys on cognitive** ($p=0.002$) and **language** ($p=0.04$) subscales
- No difference in children receiving adjuvant therapy
- Primary treatment medication did not affect scores (small numbers for morphine $n=14$, buprenorphine $n=11$)
- **No difference in polysubstance exposure**

Neurodevelopmental Outcomes

- Other results:
 - 40% of all children had received Early Intervention services
 - 22% received speech therapy, 16% PT, 7% OT
 - 26% families reported significant behavioral issues including tantrums, hyperactivity, sensory issues, sleep problems, difficulty falling/staying asleep

Limitations:

- Lack of control groups (normal and exposed but not treated)
- Retrospective, observational
- Many lost to follow-up, Bayley not performed
- Our early follow-up population quite different than we see now

Cognitive and Motor Outcomes of Children with Prenatal Opioid Exposure

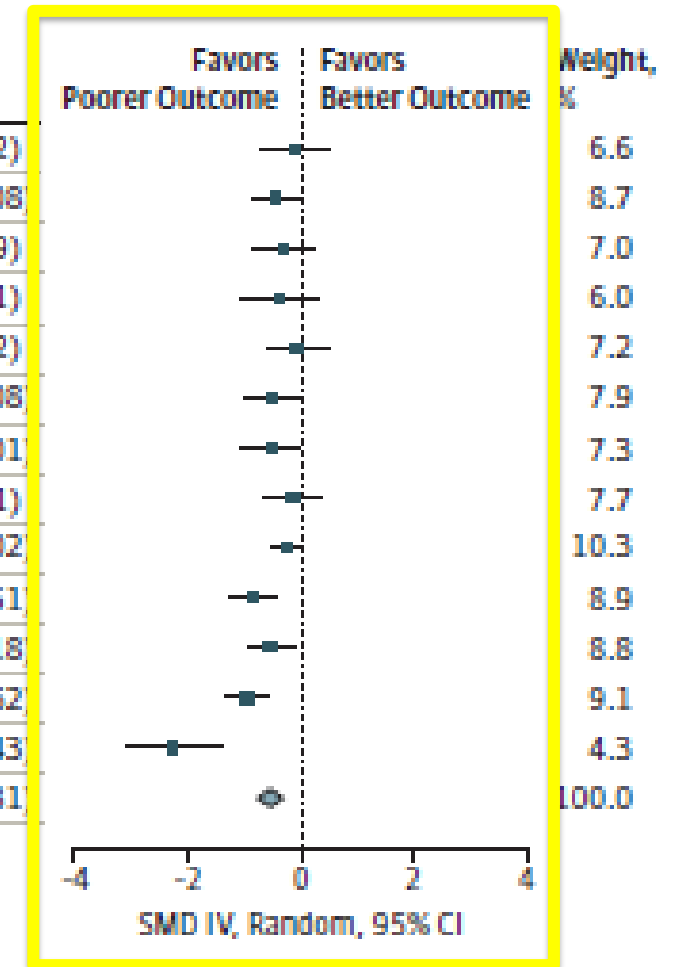
- Yeoh published a systematic review and meta-analysis of 26 studies
- Conclusion:
 - Prenatal opioid exposure appeared to be negatively associated with neurocognitive and physical development from age 6 months, and this association persisted until adolescence.

Cognitive Outcomes

Source	Age, mo	POE			Control			SMD IV, Random, 95% CI	Weight, %
		Mean	SD	Total	Mean	SD	Total		
Strauss et al, ³⁹ 1976	12	113.4	10.2	25	114.8	11.3	26	-0.13 (-0.68 to 0.42)	6.6
Wilson et al, ⁴¹ 1981	9	98.3	16.4	64	105.5	15.6	55	-0.45 (-0.81 to -0.08)	8.7
Rosen and Johnson, ³⁷ 1982	6	95.0	16.1	41	100.7	20.1	23	-0.32 (-0.83 to 0.19)	7.0
Kaltenbach and Finnegan, ³² 1989	12	102.5	11.4	27	106.5	6.4	17	-0.40 (-1.01 to 0.21)	6.0
Van Baar et al, ⁴⁰ 1990	6	106.0	13.0	27	107.0	13.0	37	-0.08 (-0.57 to 0.42)	7.2
Ornoy et al, ³⁶ 1996	24	104.0	15.8	37	112.0	14.9	47	-0.52 (-0.96 to -0.08)	7.9
Bunilkowski et al, ²⁹ 1998	12	100.5	9.3	27	107.9	17.2	42	-0.50 (-0.99 to -0.01)	7.3
Hans and Jeremy, ³⁰ 2001	12	107.0	14.3	33	109.0	13.7	45	-0.14 (-0.59 to 0.31)	7.7
Messinger et al, ³⁴ 2004	12	88.5	10.7	79	91.6	12.4	960	-0.25 (-0.48 to -0.02)	10.3
Hunt et al, ³¹ 2008	18	88.2	16.4	79	105.0	23.0	61	-0.85 (-1.20 to -0.51)	8.9
Nygaard et al, ³⁵ 2015	12	92.2	14.3	66	98.7	8.9	58	-0.53 (-0.89 to -0.18)	8.8
Levine and Woodward et al, ³³ 2018	24	76.1	17.6	68	92.4	16.4	88	-0.96 (-1.29 to -0.62)	9.1
Serino et al, ³⁸ 2018	12	95.4	3.9	11	102.6	2.9	37	-2.25 (-3.07 to -1.43)	4.3
Total (95% CI)				584			1496	-0.52 (-0.74 to -0.31)	100.0

Heterogeneity: $\tau^2 = 0.10$; $\chi^2 = 40.81_{12}$; $P < .001$; $I^2 = 71\%$,

Test for overall effect: $z = 4.73$, $P < .001$

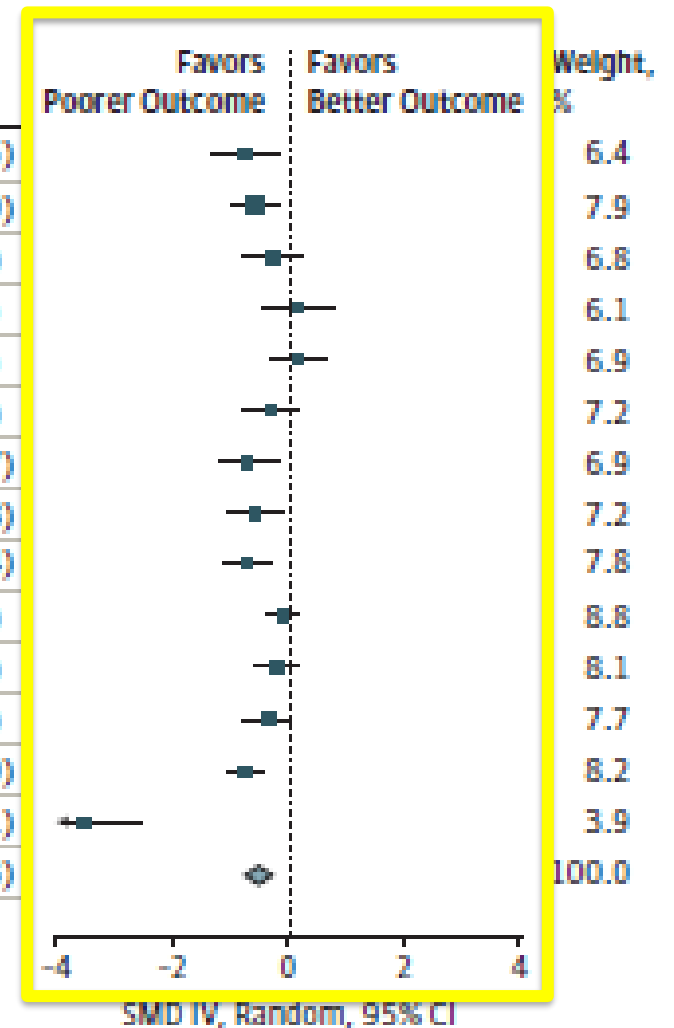


Motor Outcomes

Source	Age	PUE		Total	Control		SMD IV, Random, 95% CI	Weight, %	
		Mean	SD		Mean	SD			
Strauss et al, ³⁹ 1976	12.0 mo	102.80	11.00	25	110.40	9.80	26	-0.72 (-1.29 to -0.15)	6.4
Wilson et al, ⁴¹ 1981	9.0 mo	90.40	15.90	64	99.00	14.50	55	-0.56 (-0.93 to -0.19)	7.9
Rosen and Johnson, ³⁷ 1982	6.0 mo	101.03	18.20	41	105.13	14.20	23	-0.24 (-0.75 to 0.27)	6.8
Kaltenbach and Finnegan, ³² 1989	3.5 y	52.29	8.10	27	50.44	12.00	17	0.19 (-0.42 to 0.79)	6.1
van Baar, ⁴⁰ 1990	6.0 mo	118.00	18.00	27	114.00	21.00	37	0.20 (-0.30 to 0.70)	6.9
Ornoy et al, ³⁶ 1996	24.0 mo	96.60	13.30	30	100.90	14.50	47	-0.30 (-0.76 to 0.16)	7.2
Bunilkowski et al, ²⁹ 1998	12.0 mo	100.80	13.60	27	111.40	16.90	42	-0.67 (-1.16 to -0.17)	6.9
Hans and Jeremy, ³⁰ 2001	24.0 mo	100.00	14.20	33	108.00	14.90	45	-0.54 (-1.00 to -0.08)	7.2
Moe, ⁵⁴ 2002	4.5 y	48.90	9.00	64	55.80	10.20	52	-0.72 (-1.10 to -0.34)	7.8
Messinger et al, ³⁴ 2004	12.0 mo	88.90	14.20	79	90.00	12.30	939	-0.09 (-0.32 to 0.14)	8.8
Hunt et al, ³¹ 2008	18.0 mo	107.50	16.80	79	110.13	14.70	61	-0.16 (-0.50 to 0.17)	8.1
Nair et al, ⁴⁴ 2008	6.0 y	3.80	1.90	113	4.50	2.60	31	-0.34 (-0.74 to 0.06)	7.7
Levine and Woodward, ³³ 2018	24.0 mo	82.94	20.54	68	96.10	16.38	88	-0.72 (-1.04 to -0.39)	8.2
Serino et al, ³⁸ 2008	12.0 mo	95.00	2.10	11	101.40	1.70	37	-3.51 (-4.50 to -2.51)	3.9
Total (95% CI)				688			1500	-0.49 (-0.74 to -0.23)	100.0

Heterogeneity: $\tau^2 = 0.18$; $\chi^2 = 65.92_{13}$; $P < .001$; $I^2 = 80\%$,

Test for overall effect: $z = 3.74$, $P < .001$



Normal Cognitive Development- 2 years

- Finds things even when hidden under 2 or 3 covers
- Begins to sort shapes and colors
- Completes sentences and rhymes in familiar books
- Plays simple make-believe games
- Builds towers of 4 or more blocks
- Might use one hand more than the other
- Follows 2-step instructions
- Names items in a picture book

Red Flags:



- Doesn't know what to do with common things like a brush, phone, fork, spoon
- Doesn't copy actions or words
- Doesn't follow simple instructions
- Loses skills they once had

Normal Motor Development- 2 years

- Can stand on tiptoe
- Kicks a ball
- Begins to run
- Climbs onto and down from furniture without help
- Walks up and down stairs holding on
- Throws ball overhand
- Makes or copies straight lines and circles

Red Flags:



- Doesn't walk steadily
- Frequently tripping or in-toeing

Typical Speech and Language Development from 18-24 months



Speech

- Physically producing sounds to form spoken words



Language

- The message that is sent back and forth during talking.
- Receptive-Understanding the message from others
- Expressive-expressing messages through words and sentences
- Pragmatics-use of language for social reasons



Receptive Language

- Likes being read to –listens to the stories
- Understands almost all names of everyday objects-will look at things that are named in conversation
- Understands many describing words (“big” “little”) action words (“eat” “run”) and pronouns (“I” “him” “her”)
- Begins to understand words in the same group (dog is an animal)
- Follows 2 step commands(“Go in to your room and get a book”) and harder commands (“Give me the big ball”)
- Is interested in “why” and “how” things work

Expressive Language and Speech

- Uses less jargon and more real words
- Uses different tones of voice for statements and questions
- Uses more speech sounds, such as /f/ , /s/, and /sh/
- Has at least a 50 word vocabulary
- Begins to use pronouns (“me” “I” “mine”)
- Uses some descriptive words (“hot” “big” “good”)
- Repeats two and three word phrases

Speech and Language continued

- Begins to put two and three words together (“Mommy go” “nice doggie” “more juice” “no bed”)
- Tries to tell you about something that has happened
- Uses his or her own name
- Asks questions (“What’s that?” “Who’s that” “Where’s kitty”)



Pragmatics-Social Language

- Starts to take turns in conversations
- Uses words to ask for things, ask for help, answer questions and make comments



Red Flags

- Does not use 25 words.
- Not producing 'mama' 'dada' and other reduplicated patterns.
- Less than 50% of speech understood/intelligible by unfamiliar communication partner.
- No 2-word noun-verb phrases or adjective-noun combinations.
- Any regression of skills in language/babbling/social skills.

ASHA Development Chart

Speech development milestones	
birth to 1 month	crying and vegetative sounds
1 to 6 months	cooing, laughter, squealing, growling
4 to 6 months	marginal babbling
6 to 8 months	reduplicated babbling
8 to 10 months	variegated babbling
8 to 12 months	echolalia
9 to 12 months	phonetically consistent forms and jargon

Speech intelligibility milestones (for parents' understanding)	
18 months	up to 25 percent intelligible
2 years	50 to 75 percent intelligible
3 years	75 to 100 percent intelligible

Speech intelligibility milestones (for unfamiliar listeners)	
18 months	up to 25 percent intelligible
2 years	up to 50 percent intelligible
3 years	up to 75 percent intelligible
4 years	100 percent intelligible

If school-age children don't reach the following milestones for language, SLPs should consider evaluation.	
Birth to 1 month	crying and vegetative sounds
2 to 3 months	eye gaze
6 to 9 months	joint attention
9 to 12 months	using gestures
12 to 15 months	following simple commands
18 months	symbolic play, pretend play
24 months	sequencing of activities
36 months	episodic play

Typical vocabulary development	
12 months	first words, usually labeling familiar objects and actions in child's environment
15 months	four- to six-word vocabulary
18 months	20- to 50-word vocabulary
24 months	200- to 300-word vocabulary

Rossetti Infant-Toddler Language Scale

- Assessment designed to determine the communication skills of a child between the ages of birth to three.
- Criterion-references assessment to evaluate behaviors including:
 - Interaction Attachment: caregiver-infant interaction and relationship
 - Pragmatics: use of language in social scenarios
 - Gesture: use of gestures to communicate wants/needs
 - Play: use of representational thought/symbolism
 - Language Comprehension (receptive): understanding language
 - Language Expression (expressive): production of language

Dynamic Assessment of Development

- Parent report
- Observation of interactions with familiar and unfamiliar communication partners.
- Interaction with toys
- Responses to familiar and unfamiliar stimuli

Goldman-Fristoe Test of Articulation 3

- Standardized assessment for individuals between the ages of 2;0 years and 21;11.
- Measures the speech sound ability for articulation in both words, and sounds in sentences.
- Identifies phonological processes and other atypical sound production and patterns.

Interventions and Techniques

- **Directive Interventions:** SLP provides interventions directly to the child using modeling and prompting to elicit targets.
 - Vocabulary-
 - Phonology-
 - Morphology-
 - Pragmatics-
 - Narrative-



What families can do at home

- **Incidental Learning** happens when a child learns through seeing and hearing things around them, without being directly taught. 80% of a child's vocabulary and subsequent language has been learned through incidental learning.
 - Have your child's hearing tested to ensure normal hearing in both ears.
 - Confirm your child is hearing and understanding speech in all settings including noisy environments and from a distance.
 - Monitor your environment for distractions like the TV, radio, or computer.
 - Play games with your child that focus on listening like Simon Says, rhyming games and answering questions after reading a book.
 - Cincinnati Children's Hospital Medical Center (2017)

What families can do at home

- **Expansion:** Help your child talk in longer sentences. Add new words to a sentence that they can already say, take what your child says and add one or two words to it. This helps your child to make longer sentences.
- **Extension:** Help your child learn new information about a familiar topic and encourage the child to use new words and talk about their experiences.
- **PRAISE!** Praise your child's communication attempts! Smile at them, show excitement, and respond.
 - Cincinnati Children's Hospital Medical Center (2018)

What families can do at home

- **Reduce your input:**
 - Questions: try asking fewer questions and turn them into statements.
 - Speed: Speak slower but in a natural rate.

Cincinnati Children's Hospital Medical Center (2018)

What families can do at home

- **Model, model, MODEL!**

- Self Talk: Describes what you are doing.

- “Mommy is getting a snack”

- “My cup is empty, I need to ask for more!”

- Parallel Talk: Describes what your child is doing.

- “Melanie is building a tower, up-up-UP!”

- “ You are eating cookies, eat, eat, eat! You ate ALL your cookies!”

- Cincinnati Children’s Hospital Medical Center (2018)

Toys/Stimuli

- Action toys: cars, airplanes, buses, garbage trucks.
- Balls
- Books
- Larger building blocks
- Pretend play items: dolls, kitchen, grocery
- Musical instruments
- Ride on toys



Favorite Activities

- Explore outside
- Sensory exploration through textures
- Reading books together
- Singing
- Pretend play



For Further Information

- <http://centerlink.cchmc.org/echirp/patient-family-ed/knowing-notes/speech>
 - View early intervention information and techniques.

Behavior and Social Emotional Development (18-24 months)



NAS and Effects on Behavior and Emotional Development

- Long-term outcomes associated with NAS are not as clearly understood as short-term outcomes (Behnke & Smith 2013; Logan, Brown, and Hayes, 2013)
 - Poly-substance exposure, medical co-morbidities, SES, prenatal care, and caregiver mental health are variables that may affect outcomes
- Research findings support that children with a history of NAS are at higher risk for emotional and behavioral dysregulation

Social Emotional Milestones (CDC)

18 months

- Likes to hand things to others as play
- May have temper tantrums
- May be afraid of strangers
- Shows affection to familiar people
- Plays simple pretend
- Points to show others something interest

24 months

- Copies others, especially adults and older children
- Gets excited when with other children
- Shows more and more independence
- Shows defiant behavior (doing what he has been told not to)
- Plays mainly beside other children, but is beginning to include other children, such as in chase games



Red Flags: Does not copy others' actions or words, loses skills child once had, does not show interest in other children

Behavior Concerns

- Tantrums
- Aggression (hitting, biting, hair pulling)
- Not listening
- Head banging

*Help caregivers understand these behaviors in the context of development

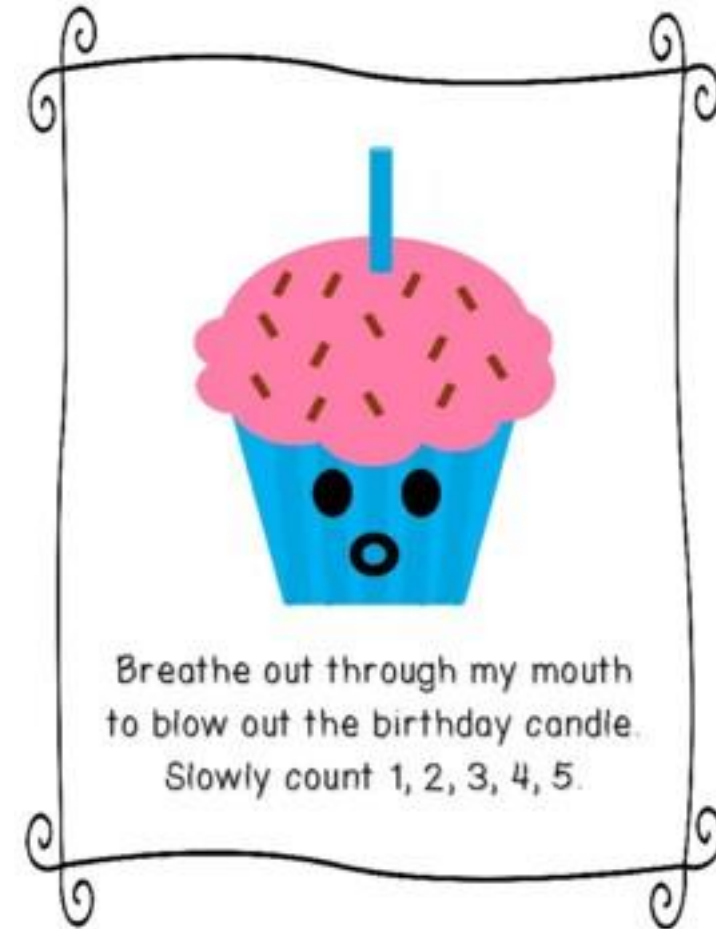


Avoiding Behavior Concerns

- High level of structure with consistent and predictable daily routines and expectations
- Frequent verbal and nonverbal praise for positive behaviors
 - Give attention/praise proactively
 - Be specific! “I love when you use gentle hands.” “Thank you for having a calm body.”
 - 5 to 1 ratio
- Be aware and responsive to sensory needs

Avoiding Behavior Concerns

- Toddler Soothing: Strategies to help regulate emotions (e.g., when angry/overwhelmed).
 - Distraction/redirection
 - Hugging/co-regulating with a caregiver
 - Use a transitional object
 - *These strategies are most effective prior to a tantrum or after (not in the middle of a tantrum)*



Getting Young Children to Follow Directions

- Get close
- Get their attention
- Call their name
- Tell your child exactly what to do (be specific)
- Give one command at a time
- Give directions based on language development (may need to include physical prompts and gestures)
- Allow child time to cooperate (~10 seconds)
- Always praise for compliance



Managing Behaviors


- Need both rewards and consequences for both positive and negative behaviors
- Rewards and Consequences should be...
 - Consistent
 - Occur close to the behavior
 - Developmentally appropriate

Managing Behaviors

- Differential Attention – “pay attention to what you pay attention to”
 - Positive behaviors (e.g., calm body, gentle hands, giving hugs and kissing, sharing) - provide lots of attention and labeled praise.
 - Negative behaviors (e.g., whining, crying, throwing things) - remove your attention from the child. Return your attention as soon as they engage in a positive behavior or start to calm.
- Timeout/Calm Down
 - Most children are not developmentally ready for timeout until age 2
 - Must teach children time out process
 - Should be brief (1-2 minutes)
 - Save for more aggressive and destructive behaviors

When do behaviors become a problem?

- Developmentally typical behaviors can be difficult to distinguish from “problematic” or “abnormal” behaviors

 Assess based on frequency, intensity, and impact of the behavior on the child’s functioning at home and school

- Higher level of behavioral support and interventions may be needed
 - Recommend caregivers contact child’s pediatrician or child psychologist

Ohio Preschool Expulsion Prevention Partnership

A free resource for licensed child care programs or family care providers to get help with challenging behaviors at their early childhood program.

We will:

- Come to your program site to provide support within 48 hours of your request
- Provide tools and resources for providers on ways to manage challenging behaviors through observation, modeling specific strategies and information on specific topics
- Link you to helpful, free Ohio Approved Trainings

Call 1-844-678-ABCS (2227), or complete an online request form at NationwideChildrens.org/Preschool-Expulsion-Prevention.



ADHD and Autism

- Children with a history of NAS have been found to be at higher risk for a ADHD and Autism in school age children (Sandtorv, Fevang, Nilsen, Bøe, Gjestad, Haugland, and Elgen, 2018).
- ADHD is typically not diagnosed until ~5 years
 - Diagnostic criteria require that symptoms occur across two or more settings (i.e., home, school, sports/activities, with peers)
 - Children with more severe presentations may be diagnosed prior to age 5
 - **Difficult to distinguish from typical development prior to age 5**
- Autism can be diagnosed early as 18 months (with diagnoses becoming more reliable at age 2)

Autism – Diagnostic Criteria (DSM-V)

- A. Social Communication** - Persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following:
1. Deficits in social-emotional reciprocity, ranging, for example, from abnormal social approach and failure of normal back-and-forth conversation; to reduced sharing of interests, emotions, or affect; to failure to initiate or respond to social interactions.
 2. Deficits in nonverbal communicative behaviors used for social interaction, ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body language or deficits in understanding and use of gestures: to a total lack of facial expressions and nonverbal communication.
 3. Deficits in developing, maintaining, and understanding relationships, ranging, for example, from difficulties adjusting behavior to suit various social contexts; to difficulties in sharing imaginative play or in making friends; to absence of interest in peers.

Autism – Diagnostic Criteria (DSM-V)

- B. Restricted, repetitive patterns of behavior, interests, or activities**, as manifested by at least two of the following:
1. Stereotyped or repetitive motor movements, use of objects, or speech (e.g., simple motor stereotypies, lining up toys or flipping objects, echolalia, idiosyncratic phrases).
 2. Insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior (e.g., extreme distress at small changes, difficulties with transitions, rigid thinking patterns, greeting rituals, need to take same route or eat same food every day).
 3. Highly restricted, fixated interests that are abnormal in intensity or focus (e.g., strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interests).
 4. Hyper- or hyporeactivity to sensory input or unusual interest in sensory aspects of the environment (e.g., apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive

Autism

- Autism Spectrum Disorder – includes a broad range of behaviors and characteristics
- Symptom presentation may look very different across children
- Some children have co-occurring intellectual impairment (some do not)
- ASD includes previous diagnoses
 - Autistic disorder
 - Asperger's syndrome
 - Pervasive development disorder-not otherwise specified (PDD-NOS)
 - Childhood disintegrative disorder

Early Signs of Autism (CDC)



Social Concerns

- Does not respond to name by 12 months of age
- Avoids eye-contact
- Prefers to play alone
- Does not share interests with others
- Only interacts to achieve a desired goal
- Has flat or inappropriate facial expressions
- Avoids or resists physical contact
- Is not comforted by others during distress

Communication Concerns

- Delayed speech and language skills
- Repeats words or phrases
- Does not point or respond to pointing
- Uses few or no gestures (e.g., does not wave goodbye)
- Does not pretend in play (e.g., does not pretend to “feed” a doll)

Unusual Interests and Behaviors

- Lines up toys or other objects
- Plays with toys the same way every time
- Likes parts of objects (e.g., wheels)
- Gets upset by minor changes
- Has obsessive interests
- Has to follow certain routines
- Flaps hands, rocks body, or spins self in circles

<https://www.cdc.gov/ncbddd/autism/signs.html>

Autism Evaluation

Developmental Monitoring

Ages and Stages Questionnaire (ASQ)

Screening

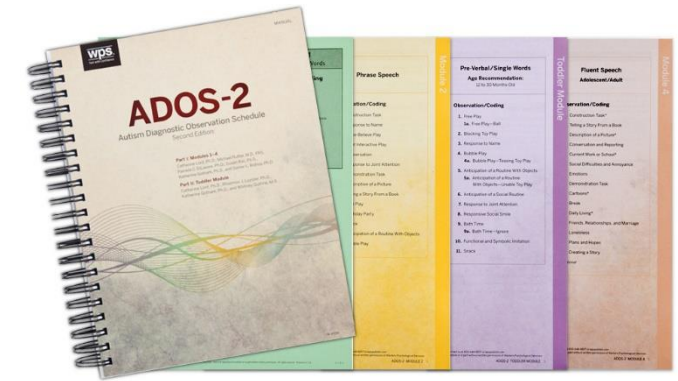
MCHAT - autism screening tool to identify children (16-30 months) who should receive a more thorough assessment for possible signs of autism spectrum disorder (ASD) or developmental delay (AAP recommends screening at 18 and 24 months)

Comprehensive Assessment

Standardized assessment by a multidisciplinary team (pediatrician, psychologist, speech language pathologist, occupational therapist)

Multidisciplinary Assessment Process

- Standardized Autism Assessment by a trained examiner
 - Autism Diagnostic Observation Schedule, 2nd Edition (ADOS-2) Gold standard assessment (semi-structured assessment tool based on observations and activities)
- Review of medical history and physical exam
- Questionnaires completed by caregivers and possibly teachers and/or daycare providers
- Other standardized assessments (e.g., cognitive (aka IQ) measures)
- DNA or genetic testing may be completed after diagnosis



In Summary

- Children with a history of prenatal opioid exposure may be at risk for cognitive, motor, and language delays
- There is an elevated risk for ADHD and autism in this population and while opioid exposure is not necessarily causative, early signs can be detected during this age window of 18-24 months.
- Consider ongoing monitoring in this age group, before language acquisition has truly developed or been able to be assessed.
- Refer for additional evaluation if there are any red flags in these areas.

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