



The  
INFORMED SLP

# Birth to Three

SAMPLE REVIEWS

Each month, we hand-search **300+ top research journals**, looking for articles relevant to speech-language pathologists. We read, then review articles that are immediately applicable to clinical practice.

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**Below are four sample reviews. Each month, members receive at least 5 reviews, and often 10 or more, depending entirely on the volume of research published that month.**

You can also search past reviews by topic in our database.

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# Making heads and tails of autism interventions: The current state of the research

*Talk about a big goal:* **Sandbank et al. (2019)** set out to collect and synthesize all available intervention studies that targeted any outcome for children with ASD under the age of eight. In this meta-analysis, they **describe the state of the evidence for seven different intervention approaches for ASD:**

- **Behavioral approaches** focus on teaching skills by setting up discrete opportunities and prompting for target responses. Examples include PECS, discrete trial training, and positive behavior supports.
- **Developmental approaches** focus on supporting social reciprocity and communication during naturalistic parent-child interactions. Examples include DIR/Floortime and Hanen.
- **NDBIs** incorporate aspects of both behavioral and developmental approaches. They use behavioral principles to teach developmentally appropriate skills that will support the child's ability to engage socially with others. You can read more about NDBIs in [this review](#). Examples include Early Start Denver Model, Enhanced Milieu Teaching, and Pivotal Response Treatment.
- **TEACCH** is a specific classroom-based approach in which the environment is arranged and structured in a way to be supportive for the specific strengths and challenges of children with ASD.
- **Sensory-based interventions** aim to help children develop sensory regulation skills that will allow them to engage with others and participate in activities of daily living. Examples include sensory integration therapy and activities such as brushing, swinging, and weighted vests.
- **Animal-assisted interventions** use interacting with animals as a highly motivating and calming stimuli in order to practice skills.
- **Technology-based interventions** use technology, such as a computer program or DVD, as the primary means of intervention, rather than another person. This category does not include AAC interventions.

“States with insurance mandates that explicitly cover traditional behavioral interventions should furthermore **revise their policies to also include NDBI and developmental approaches.**”

Sandbank et al., 2019

While no intervention approach had enough quality evidence to be considered “established,” the researchers found that the approaches could be grouped in the following way:

- **“Promising intervention approaches”**

- NDBIs
  - Developmental interventions

- **“Intervention approaches with some evidence”**

- Behavioral interventions

- **“Intervention approaches with little evidence”**

- TEACHH
  - Sensory interventions
  - Technology-based interventions
  - Animal-assisted interventions

## What does this mean for us?

Here are some of their conclusions that impact us as clinicians:

**NDBIs have by far the most support from high-quality research** and are especially useful for supporting social communication, language, and play skills.

**Developmental interventions have quality evidence** suggesting their effectiveness in improving social communication.

**Behavioral interventions have some evidence support**, but the body of research has significant methodological concerns due to a lack of RCTs and a reliance on using caregiver report to measure progress.

**None of the other approaches have high-quality evidence bases.**

States with mandated insurance coverage of traditional behavioral interventions should now **also mandate coverage for NDBIs and developmental approaches** due to the substantial evidence for their effectiveness. (This is great news, everyone!)

The evidence bases for all intervention approaches were affected by **various degrees of methodological concerns**, such as risk of bias and/or a scarcity of randomized clinical trials. We need to be careful to consider the quality standards of intervention studies when making interpretations and conclusions about them.

# (In)consistency of flow rate during bottle feeds: Any impact on oral feeding in the NICU?

If you're an SLP practicing in the NICU or a parent of a premature infant, did you ever consider that some **feeding difficulties may arise from inconsistencies in the flow rate** of nipples? Well, two different studies, independently conducted by researchers in the **US** and the **UK**, have identified **significant variations in flow rate across trials of commonly used nipples** in neonatal care units. These studies were both packed with data and clinically relevant findings.

**The studies looked at differences among various nipples from various brands, considering:**

- Disposable and commercially available nipples (and of the same advertised flow type)
- Nipples marketed similarly to one another (e.g. comparisons between common commercially available nipples all marketed as "extra slow flow" nipples)
- The impact of pressure on flow rate (i.e. the amount of gravitational pressure pushing fluid out of a nipple)
- Identification of nipples of comparable flow rates across brands (helpful for parents to more easily select nipples for their infants!)
- ... with multiple trials with the nipples, and with multiple versions of the same nipple

"There can be considerable variability between nipples of the same type. Packaging and manufacturer's labeling information does not always provide accurate information on flow rates."

Pados et al., 2019

In the **Pados et al. study**, the authors found that commercially available nipples could be grouped by flow, which often did not align with the brand's marketed flow rates. Considering data from both studies, they found the following:

Green (-) = Low Variability

Gray (○) = Moderate variability

Red (●) = High variability

### Extra slow

1–5 mL/min

- Dr. Brown’s UltraPremie
- Philips Avent Natural First Flow
- nfant Labs Extra Slow
- Philips Avent Natural 0mos +

### Slow

6–10 mL/min

- Avent Level 1
- nfant Labs Slow & Standard
- Dr. Brown’s Premie (also measured at Extra-Slow) & Level 1 (standard neck)
- Playtex Baby Naturalatch 0–3m
- MAM Level 1
- Playtex Ventaire Breastlike & Full Sized
- Similac Single-Use Slow Flow

### Medium

11–16 mL/min

- Dr. Brown’s Level 1
- NUK Orthodontic, small
- Evenflo Classic & Single-Use Slow Flow
- Tommee Tippee Closer to Nature 0m+
- Gerber First Essentials
- Tommee Tippee Anti-Colic 0m+
- MAM Anti-colic 0mos+

### Fast

17–22 mL/min

- Enfamil single-use Standard Flow
- Philips Avent Anti-colic 0mos +
- NUK disposable orthodontic, medium & large
- Similac Single-use Premature
- NUK SMA Nutrition hygienic
- Similac Single-use Standard Flow
- Medela Wide-Base Slow Flow

### Very fast

25+ mL/min

- Medela Calma
- NUK First Choice + Size 1, medium

*Please reference the original articles for flow rates and variability values! What we’ve provided here is simply an overview; there are many nipples/teats included in the studies that aren’t included here.*

## What does this mean for infant feeding success?

Both studies identified that each time an infant is fed using the same type of disposable nipple, they will likely receive milk at differing flow rates. This is an external factor that should be considered when assessing an infant's oral feeding success. **Inconsistencies and variations in flow rate can impact acquisition of feeding skills.** Compound this with the high likelihood of having different individuals facilitating feeding (in both the NICU and at home), and these babies are experiencing tons of variability!

## Can we do anything to compensate or improve the consistency of flow?

Yes! Both studies suggest that SLPs can work with caregivers and team members to **facilitate use of a bottle and nipple that can be used both in the NICU and at home post-discharge**, for a more stable path to successful feeding. Also:

**Carefully inspect the disposable nipples** prior to use. Quality inconsistencies were present due to missing holes or silicone sticking to itself, causing flow to be blocked. Pados et al. (2019) notes that if the infant appears to be sucking well but not extracting fluid, this may be the cause.

**Don't overtighten the collar** on bottles because this can interfere with venting systems and cause nipple collapse, which might be misinterpreted by the feeder as the nipple having too slow of a flow for the infant.

**Consider how hydrostatic pressure impacts flow rate.** This doesn't usually impact healthy, typically developing infants, but infants in the NICU are more susceptible to this. To combat this, the data from Pados et al. (2019) suggests that clinicians should only put the minimum amount of fluid in the bottle that is needed for the feeding session. Excess fluid and gravity increases flow rate.

Side note: This also adds support for use of a **sidelying position** for these infants as well (the horizontal bottle that results from a sidelying position can also reduce hydrostatic pressure during the feed and slow flow rate).

When recommending nipples for home use, **select brands that have a lower variability in flow rate.**

Bell, N., & Harding, C. (2019). An investigation of the flow rates of disposable bottle teats used to feed preterm and medically fragile infants in neonatal units across the UK in comparison with flow rates of commercially available bottle teats. *Speech, Language, and Hearing*. <http://doi.org/10.1080/2050571X.2019.1646463>

Pados, F., Park, J., Dodrill, P. (2019). Know the Flow: Milk Flow Rates From Bottle Nipples Used in the Hospital and After Discharge. *Advances in Neonatal Care*. <http://doi.org/10.1097/ANC.0000000000000538>

# A (free) decontextualized vocabulary test for toddlers

If only we had a crystal ball to predict late talkers' later language skills (those would be nice in so many areas of our field!). As SLPs, we are always trying to get an accurate picture of how many words a child uses and understands. But because we don't have a dedicated assessment of toddlers' early vocabulary, we often do this through parent report, either formally (like an MCDI) or informally. However, researchers have found that parents' report of their child's vocabulary doesn't do as good of a job when we try to use it to predict later language. It seems that **parent report may not be giving us all of the information that we need** about a child's vocabulary in order to predict their later language abilities.

We know that there's a **continuum of what "knowing a word" entails** for a toddler. When they first learn to say the word "milk," they may only know it within the context of breakfast. The word "dog" however, they may use all day long whenever they see a dog or a picture of one. A parent would rightly conclude that a child knows both "milk" and "dog," even though the child's "level of knowing" varies between the two words. Contrast this with a picture ID vocabulary assessment, in which all of the words are presented out of context. For a toddler to correctly identify a word during the assessment, he would have to have a strong understanding of what that word really means without all of the support that context provides.

"Decontextualized vocabulary [could be used for] overcoming the longstanding difficulty of **harnessing early vocabulary prior to 30 months of age** to predict development."

Friend et al., 2018

Because of this, **Friend et al. (2018)** set out to create a picture ID test for young children and test if it could better predict preschool language abilities than parent report. They developed the **Computerized Comprehension Test (CCT)** in which children are asked to identify decontextualized pictures from a field of two. They then tested it with 16-month, 23-month, and 36-month-old children. At 16 months, parent report continued to best predict preschool language abilities. However once the child reached 23 months, the CCT was a stronger predictor of later language abilities with great psychometric properties.

While the CCT is still in its early phases, it shows promise of becoming a useful instrument for EI SLPs to get a **more accurate picture of toddlers' vocabulary**, especially after age two. In its current state, it could serve to complement other assessments already in your toolkit, such as an MCDI. And while we'll never have a crystal ball to tell us what a child's language will be like years down the road, assessments such as this may give clues to help us make more informed decisions about assessment and treatment.

**Note: The authors have published all of their CCT materials online**, including the computerized assessment, training videos/instructions, and data sheets. I tested out the program myself, and while there was a learning curve, it didn't prove to be too challenging! Let's all take a moment and cheer for these scientists giving us access to the materials we need!

# Talking tongue tie: Do tongue ties affect speech?

You won't find many hotter topics in our little corner of the world right now than tongue-ties AKA ankyloglossia AKA tethered oral tissues AKA a very short and/or tight sublingual frenulum that restricts lingual mobility. If you're a regular reader, you'll know that we've reviewed lots of other research on tongue-ties, from the **impact of feeding assessment on revision rates**, to **complication** rates, to the **link between tongue-tie and breastfeeding problems**, to... well, there's a **lot**.

What we haven't seen much of is research on the hypothesized link between tongue-tie and speech (for your interest, there are a couple of older systematic reviews **here** and **here**). Neither has the American Academy of Otolaryngology—Head and Neck Surgery, who, this month, published **a paper** providing their consensus on a number of statements related to tongue-tie, including "A consultation with a speech pathologist is encouraged before frenotomy/frenuloplasty in an older child who is undergoing the procedure for speech concerns." Wonderful! Thanks otolaryngologists! Um... now what?

Well, **here's some new information** to ponder. The researchers in this study assessed speech sounds, intelligibility, and lingual control in three groups of children aged around three to five years with:

- "No tongue-tie"—children with no previous or current diagnosis of tongue-tie
  - "Untreated tongue-tie"—children diagnosed with tongue-tie as babies by a dentist and lactation consultant, who had not had surgery
  - "Treated tongue-tie"—children diagnosed with tongue-tie as babies by a dentist and lactation consultant, who had laser frenulotomy as infants
- Speech sound production, including production of alveolar and palato-alveolar sounds
  - Intelligibility, as rated by parents or clinicians
  - Tongue mobility
  - Tongue-tie diagnosis (measured using what the researchers reported is the only tongue tie measurement tool designed for children aged over one year)

**"No significant difference in speech outcomes** was found between children with [untreated tongue tie] and [no tongue tie]."

Salt et al., 2020

Here is what the groups did NOT differ on:

## Here is what the groups DID differ on:

- History of attending speech pathology. Four children with treated tongue-tie, five with untreated tongue-tie, and no children without tongue-tie had attended speech pathology.

### HOW INTRIGUING.

OK, so we cannot draw any 100% dead-certain conclusions from this study. The researchers used a retrospective design (i.e. they looked at children who had been treated in the past, rather than tracking them from before their treatment), recruited all their 'tongue-tie' participants from a single clinic, used a tongue-tie assessment tool whose accuracy they found to be questionable, and did not account for a whole lot of potential confounding factors. Maybe the UTT group had less severe tongue-ties than the TTT group, and that's why they were untreated; or maybe the clinicians who diagnosed the tongue-ties were prone to over-diagnosis, and so the UTT and/or TTT groups included children who never had a tongue-tie to begin with; or maybe the UTT group were using all sorts of compen-

satory speech patterns that might have some sort of negative impact on speech intelligibility or acceptability in the future.

But can we draw any clinical implications from it? We sure can. The key clinical message here is that it is **not** appropriate to recommend tongue-tie revision for the purpose of **preventing** speech problems. Without clear evidence that it does make a difference, and with some evidence that it doesn't make a difference, we simply can't justify recommending a surgical intervention prophylactically.

Another important clinical implication is that if we send children off for tongue-tie revision to address existing speech problems (after a thorough differential assessment and a period of diagnostic therapy of course), they may still require some habilitative services post-revision to acquire the sounds that were affected by their tongue-tie.

No single paper is going to give us all the answers, but this paper is another piece of the puzzle. **At TISLP, we've been keeping a close eye on this area.** Think of us as tongue-tie allies!

Messner, A. H., Walsh, J., Rosenfeld, R. M., Schwartz, S. R., Ishman, S. L., Baldassari, C., Brietzke, S. E., Darrow, D. H., Goldstein, N., Levi, J., Meyer, A. K., Parikh, S., Simons, J. P., Wohl, D. L., Lambie, E., & Satterfield, L. (2020). Clinical Consensus Statement: Ankyloglossia in Children. *Otolaryngology-Head and Neck Surgery*. <https://doi.org/10.1177/0194599820915457> [open access]

Salt, H., Claessen, M., Johnston, T., & Smart, S. (2020). Speech Production in Young Children with Tongue-Tie. *International Journal of Pediatric Otorhinolaryngology*. <https://doi.org/10.1016/j.ijporl.2020.110035>



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