Diet Texture Progression for Individuals with Autism

When Just Take a Bite Doesn't Work

Presentors

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Disclosure Statement

- Michele Cole Clark has no financial disclosures to make
- Michele is employed by the Marcus Autism Center, Pediatric Feeding Program, Atlanta, Ga., which hosts the Beckman & Associates Beckman Oral Motor 2-day certification course annually

Disclosure Statement

- Debra Beckman is employed by Beckman and Associates, Inc and receives compensation for presenting conferences regarding Beckman Oral Motor Assessment and Intervention
- Debra Beckman receives royalties for 3 products she developed and patented, which are distributed by Ark Therapeutic Services
  - Tri-Chew Teether
  - E-Z Spoon
  - Beckman Professional Oral Probe

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Concerns are Multifactorial

- Medical
- Behavioral
- Sensory
- Motor
- Social

Problems Begin Early

- Niehus & Lord (2006)
  - More ear infections
  - Use significantly more antibiotics.
  - More chronic gastrointestinal problems.
- Barnevik Olsson et al (2013)
  - Regulatory problems (RP) were much more common in children from birth to age 2 who later received a diagnosis of ASD
- Keen (2008)
  - Presence of severe or atypical feeding problems and FTT in infancy should alert professionals to possible underlying ASD

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Problems with Eating Occur Often

- Sharp et al (2013)
  - Results indicated children with ASD experienced significantly more feeding problems versus peers
- Marí-Bauset et al (2014)
  - There is empirical evidence and an overall scientific consensus supporting an association between food selectivity and autism spectrum disorders.
- Hubbard et al (2014)
  - Children with ASD were significantly more likely to refuse foods based on texture/consistency (77.4% vs 36.2%), taste/smell (49.1% vs 5.2%), mixtures (45.3% vs 25.9%), brand (15.1% vs 1.7%), and shape (11.3% vs 1.7%).

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Poor Oral Intake Impacts Nutrition

- Lower intake of calcium and protein (Sharp et al, 2013)
- Increases in the degree of problematic feeding behaviors predicted decrements in nutritional adequacy (Johnson et al, 2014)
- Body mass indices were below the 5th percentile in 20 % of ASD versus 8.85 % of TD children
  - Inadequacy of intake suggests that routine monitoring of children with ASD should include assessment of dietary habits, as well as anthropometric measurements (Marí-Bauset et al, 2015)

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Poor Oral Intake Impacts Nutrition

- Higher average intake of magnesium
- Lower average intake of protein, calcium, vitamin B12, and vitamin D
- Selective eaters were significantly more likely than typical controls to be at risk for at least one serious nutrient deficiency (Zimmer et al, 2012)
- Routine screening for food refusal among children with ASD is warranted to prevent dietary inadequacies that may be associated with selective eating habits (Hubbard et al, 2014)

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Poor Oral Intake Impacts Nutrition

- Lane et al (2014)
  - Severe autism-specific disruptive behaviors at mealtimes were most at risk for suboptimal intake of select nutrients such as biotin, vitamin K, iodine, linolenic omega-3 fatty acids, and choline, which play a role in metabolism and bone and brain health.

Medical

- Gastrointestinal Issues
  - Motility
  - Structure

59 percent of autistic children who were undergoing endoscopy for GI symptoms had carbohydrate digestive abnormalities, compared with only 11 percent in unaffected children undergoing endoscopy for GI symptoms. (Kushak et.al., 2005)

GI Concerns

- Children with ASD experience significantly more general GI symptoms than comparison groups, with higher rates of diarrhea, constipation and abdominal pain (McElhanon et al, 2014)
- Feeding difficulties may be caused by exacerbated symptoms of Eosinophilic Esophagitis (EE), a chronic inflammatory disorder manifesting itself predominantly in reflux-type symptoms that do not respond to standard anti-reflux pharmacotherapy (Jarocka-Cyrta, et al 2011)

GI Concerns

- Review by Vissoker, et al (2015) suggests a strong relationship and significant correlations between eating problems and gastrointestinal dysfunction.

- Schreck, et al (2004) found that children with autism have significantly more feeding problems and eat a significantly narrower range of foods than children without autism.

GI Concerns

- Nadon, et al (2011) found that children with ASD had a mean of 13.3 eating problems, with lack of food variety predominating. Siblings had 5.0 problems.
- Important to screen for mealtime problems
-
- GERD was the most prevalent condition found and was the factor most often associated with food refusal. Neurological conditions and anatomical anomalies were highly associated with skill deficits, such as oral motor delays and dysphagia (Field et al, 2003)

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GI Concerns

- Meral & Fidan (2015) found feeding problems, mealtime problems and feeding strategies, play a significant and predictive role in health related quality of life for individuals with ASD

- Eliminating feeding and mealtime problems and ameliorating parental feeding strategies/practices may promote the health related quality of life of children with ASD.

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GI Concerns

- Problems could be
  - Functional – related to behaviors such as suboptimal eating and toileting habits, such as extreme food selectivity (often a preference for starches and snack foods and an aversion towards fruits and vegetables) or ineffective toileting routines.
  - Organic - related to biological factors, such as altered population of intestinal microbes, altered patterns of intestinal contractions, or increased risks of gluten sensitivity, lactose intolerance, food allergies, or gastroesophageal reflux disease

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Medical

- Research (Mahikoa, 2006) is needed with a focus on
  - medical issues, including GI disorders, exacerbate autistic behaviors
  - recognition and treatment of underlying medical conditions will improve functional outcomes
  - raising awareness of underlying medical issues among medical providers will improve quality of life

Behavioral

- Unrecognized gastrointestinal disorders may contribute to behavioral problems, but are often overlooked since the clinical symptoms are nonspecific. (Jarocka-Cyrta, et al 2011)
- Unusual sleeping or eating habits and oppositional behavior were significantly associated with GI problems. (Maenner et al, 2012)
- Strong associations (Johnson et al, 2014) between parent reported feeding habits and
  - Repetitive and ritualistic behaviors
  - Sensory features
  - Externalizing and internalizing behavior

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Behavioral/ Social

- Dewrang & Sandberg (2010) found that parents in many cases were well aware of anomalies in their children's behavior at an early age.
- Areas of most concern were
  - Food/feeding
  - Sleep
  - Contact
  - Social activity

Behavioral/ Social

- Provost, et al (2010)
- More children with ASD were picky eaters, mouthed nonfood items, resisted new foods, limited foods based on textures, had problems with gagging, had difficulty eating at regular restaurants or at school, resisted sitting at the table, and threw or dumped food.
- Knowledge of these early differences can help pediatric therapists to assess feeding issues and plan interventions.

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Social

- Schreck & Williams (2006) found that children with ASD preferred fewer types of food items within groups than their families; however, family food preferences appeared to influence food selection more than the diagnostic characteristics of autism.

Oral Motor Concerns

- Brisson et al (2012)
  - Autism/ASD group had an early oral motor anticipation deficit (did not open their mouths as infants when the spoon was presented)
- Manno et al (2005)
  - Oral-motor interventions have been shown to be effective in improving the oral function
  - Oral-motor problems may be under identified

Minimal competence for oral motor skills before beginning with introduction of new foods

50/50 chance of controlling the bolus

- 10 vertical jaw movements in 10 seconds
- 67% midblade tongue elevation
- 40% posterior cheek activation

(Beckman, 2013)

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Motor Control for Smooth Muscle

- Smooth muscle does not strengthen
- Changes with stretch memory
- If incoming material is perceived as stretching too much, the brain stem activates the Vagal Nerve Response (immediate gag/reflux)

Vagal Nerve Response

- Brain Stem response
- Not under cognitive control
- Abnormalities in autonomic nervous reflexes might account for the frequent occurrence of gastro-esophageal reflux and may be involved in the production of disordered gastrointestinal motility (Smart & Atkinson, 1987)

Peristaltic Practice (Beckman)

- Must make incrementally small changes in stretch
- Sensory motor response is best for this
  - Increase quantity before variety
  - Increase variety before texture
- Goal: 20 different foods that can be consumed at 4 ounces in 20 minutes at an age appropriate texture:
  - 5 Protein
  - 5 Starches
  - 5 Fruits
  - 5 Vegetables

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Beckman Sensory Motor Approach

Target Food Work Sheet		
Name	Date	Target Food
Stimulus	Number of Trials	
See it		
Touch it		
Smell it		
Kiss it		
Gum Massage		
Chew Target on Non Food Item		
1/8 tsp to Side of Mouth		
1/4 tsp to Side of Mouth		
1/2 tsp to Side of Mouth		
1/2 tsp at Midline		
Larger Amounts at Midline		
Notes		

Assessment with Beckman Oral Motor Protocol

- Video with 3.8 year old with diagnosis of Autism
- Sessions began in December of 2013
- One session a week for 30 minutes
- Parent participated in every session
- Video session # 40

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Profile of the Child with ASD: Marcus Autism Center Pediatric Feeding Program

- Highly rigid in general daily routine including mealtime
- Strong aversions to texture & appearance variations
- Oral motor baseline skill

  Mild to severe skill deficits of jaw strength, durational jaw strength, and variety of lingual movement i.e., lingual lateralization
- Sensory hypervigilance

  Behaviors that halt progress on multiple tasks
  - secondary to rigidity with food presentations
  - secondary to sensory sensitivities/intolerance

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Assessment

- Beckman Oral Motor Evaluation
  - Non-nutritive motor skill
- Oral Hypersensitivity Scale Beckman, 2004
  - Sensory tolerance
- Meal Observation
  - Nutritive skill
  - Developmental feeding skill
- Parent Interview
- Behaviors surrounding the meal/feeding, medical hx,
- Collaboration with Behavioral psychology and Nutrition services

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ORAL HYPERSENSITIVITY SCALE

Level 1	□ Tolerates minimal pressure and movement on the outside of the face □ Can chew on item that is as firm as a finger at the back of the mouth less than 5 times in 5 seconds, bilaterally. □ Gags 6 to 8 times a day or less with oral intake, touch to the face or within the mouth, often with reflux (throwing up) □ Difficulty accepting adequate amounts of food and fluid by mouth
Level 2	□ Tolerates pressure and movement for necessary activities on the face with minimal resistance (wash face, blow nose) □ Can chew on item that is as firm as a finger at the back of the mouth 5 times in 5 seconds, bilaterally □ Gags 4 to 6 times a day or less with oral intake or touch to the face, often with reflux (throwing up) □ Consistently eats 4 ounces in 20 minutes of particular foods and fluids, but significant difficulty with unfamiliar foods and fluids
Level 3	□ Tolerates pressure and movement on the face, but not within the mouth □ Can chew on item that is as firm as a finger at the back of the mouth 10 times in 10 seconds, bilaterally □ Gags 1 to 2 times a day or less, occasionally with reflux (throwing up) □ Explores novel foods and fluids at least once each day, but may spit it out
Level 4	□ Tolerates pressure and movement on the face and within the mouth, for routine activities □ Can chew on item that is as firm as a finger at the back of the mouth 15 times in 15 seconds, bilaterally □ Gagging 1 to 2 times a week or less which rarely results in reflux (throwing up) after gagging □ Swallows at least 2 ounces of novel foods and fluids of various textures and tastes 5 or more times a week
Level 5	□ Accepts pressure and movement on the face and within the mouth for novel activities □ Can chew on item that is as firm as a finger at the back of the mouth 20 times in 20 seconds, bilaterally □ Rarely exhibits gagging in response to pressure and movement on the face or within the mouth, or with foods or fluids. □ Consistent adequate oral intake of a variety of foods and fluids of various textures and tastes

Oro-sensory function and oral motor function *cannot develop independently* of one another

Morris & Klein, 2000

We cannot change the foods going into the mouth without touching the mouth

D Beckman, 2013

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The Problems

Food Refusal
Food Selectivity

primary to the disruptive
w out of initial
lter treatment outcomes
nutrition

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ASD: Generalization of Skills

The (in)ability to adapt motor responses and/or movements used for one task to complete other (similar) novel tasks.

- Issues of generalization vs Apraxia?
  - High repetition of tasks
    - Target specific foods and textures commensurate with functional skill

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ASD: Food Selectivity

- Texture
  - Prefer processed dissolvables vs firm/fibrous chewables
- Type
  - Categories of foods i.e., no fruits/veggies, color, shape, brand, presentation, place

- Difficulty generalizing skills from one food to another similar food & across categories leads to…

Experience-based motor deficits

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Experience-based Deficits

- Deficits that develop for children who avoid or have not had the opportunity to engage in consistent oral sensorimotor activities
  - Lack of experience secondary to a medical complication w/otherwise intact motor system
  - Tend to change more easily once the motor tasks have been introduced vs organic motor deficits and difficulty generalizing skills
  - ASD

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The Challenge

- Balance the child's nutrition in meal (Dietician)
  - Increase variety of foods in repertoire
- Improve functional oral sensorimotor skill to increase texture by mouth

  While simultaneously:
- Decreasing disruptive behaviors
- Timely progress in treatment
- Best practices

✔ Evidence-based treatment approaches

Therapist-lead vs Child-lead treatment

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Child-lead vs Therapist-lead

A Comparison of the Sequential-Oral-Sensory Approach to an Applied Behavior Analytic Approach in the Treatment of Food Selectivity in Children with Autism

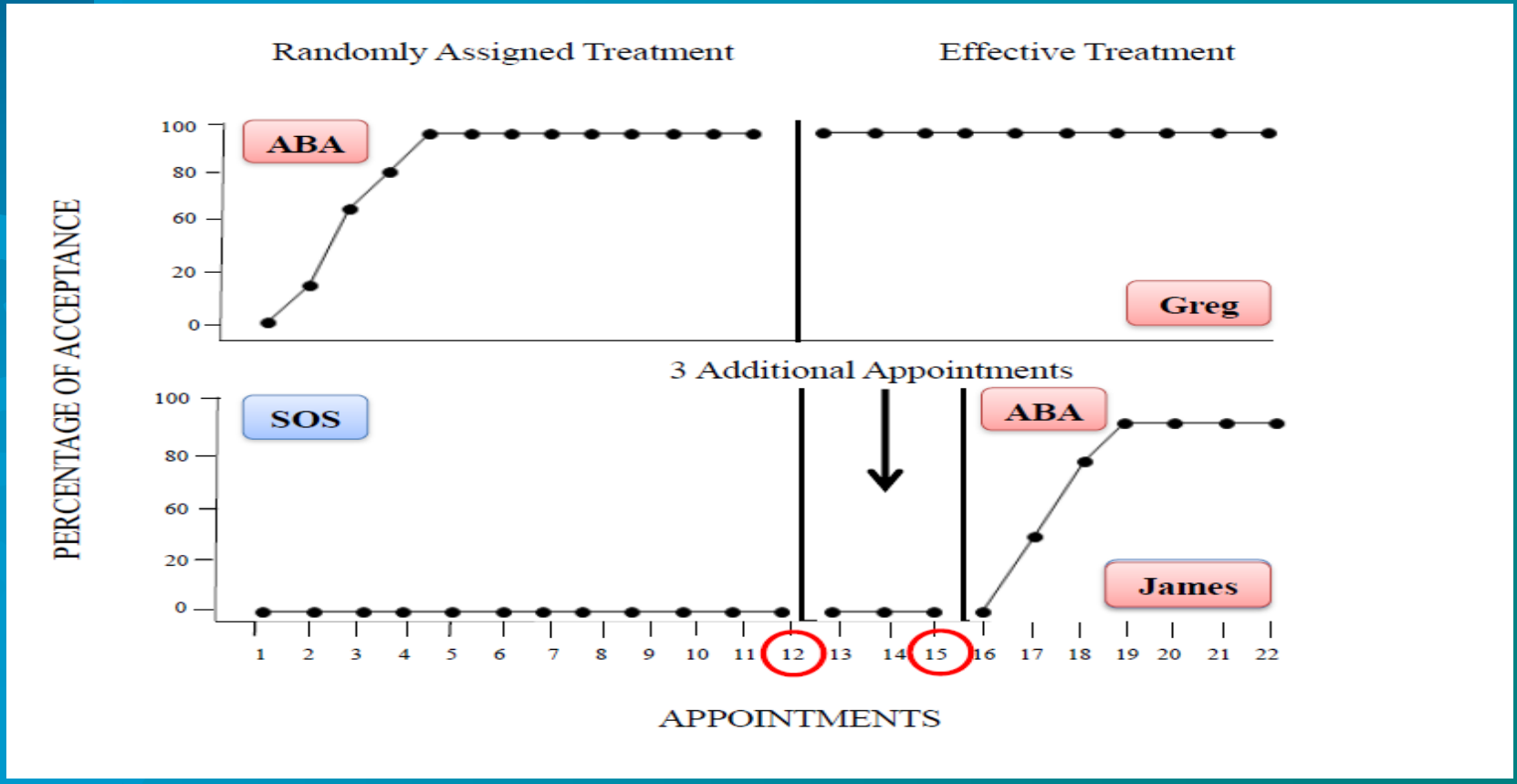
Kathryn M. Peterson, Valerie M. Volkert, Cathleen C. Piazza, Ashley M. Niebauer, & Kayla D. Broksle, 2014

University of Nebraska Medical Center's

Munroe-Meyer Institute

Petersen et al, 2014

- Six boys, b/w 4 and 6 years of age; **all diagnosed with an ASD**
- Weight for height WNL
- All displayed chewing skills and were safe oral feeders



Therapist-lead Intervention
Oral Motor Intervention Model

- Establish **baseline oral motor skill** to identify the key motor targets
- Address deficits of strength and range of movement of lips, cheeks, and jaw, and the variety of movement the of tongue
  - Based on Beckman criterion-referenced skill expectations
  - Goals specific to the functional nutritive & non-nutritive deficits /mealtime concerns

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Therapist-lead Intervention
Oral Motor Intervention Model

- Incorporates principles of Behavioral Psychology i.e., applied behavior analysis
  - Antecedent manipulation
    - Change what precedes behavior
      - Persistence
        - Remove escape from the task
      - Reasonable request or task demand
      - Fading the demand

To facilitate progression from session to session…

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Reasonable Request

- Provide consistent, *persistent reasonable requests* to complete a task or consume a food
  - Reasonable request means lowering the expectation of the task to a level that is achievable for the child
- Persistence means not removing a task request or allowing escape from the task
  - Persisting in the face of escalating behaviors
    - Crying, eloping, negative vocalizations

      Head turns, batting at your hand, hitting
      - Gagging & emesis

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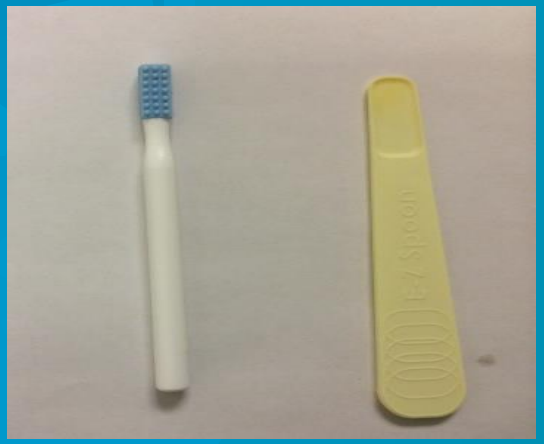
Reasonable Request:
Meet the child where he is…

Desensitize to…



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Meet the child where he is…

Dissolvable solids

Crisp/Crunchy/Chewy Chewable solids

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Meet the child where he is…..

Developmentally appropriate vs Age appropriate

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Texture Progression

Texture

- Puree
- Wet-ground
- Ground
- Chopped
- ¼” x ¼” (pea size) table texture

(texture changes when child meets decision rule criteria to ↑)

Bolus size

- Empty (maroon spoon)
- Tip dipped/rice
- ½ level
- Level
- Rounded
- Heaping
- 1 pea size
- 2 pea size

(cont. to double size)

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Bolus Progression

Rice size

1 pea size

½ level

Level

Rounded

Heaping

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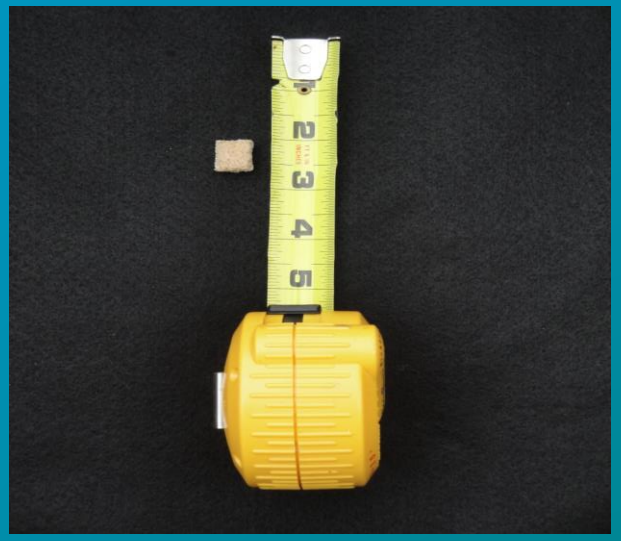
¼” pea size table texture

½” size table texture



2 pea size table texture

Level pea size table texture

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Persistence with a Reasonable Task Demand

- Not removing the demand once participation is requested
- Persisting as long as it takes
  - Not allowing escape from the task demand by removing the spoon/tool/food (non-removal of the task)
  - The tool/spoon/gloved finger should remain at the lips until accepted (not going in the mouth)

Persistence with a Reasonable Task Demand

- Not removing the demand once participation is requested
- Persisting as long as it takes
  - Not allowing escape from the request by removing the spoon/tool/food with increased behaviors.
  - The tool/spoon/gloved finger should remain at the lips until accepted
- Recognition that a demand may be too great or ***unreasonable*** for the child
  - Decrease the demand to accomplish the task and work forward again – take your time, move slowly

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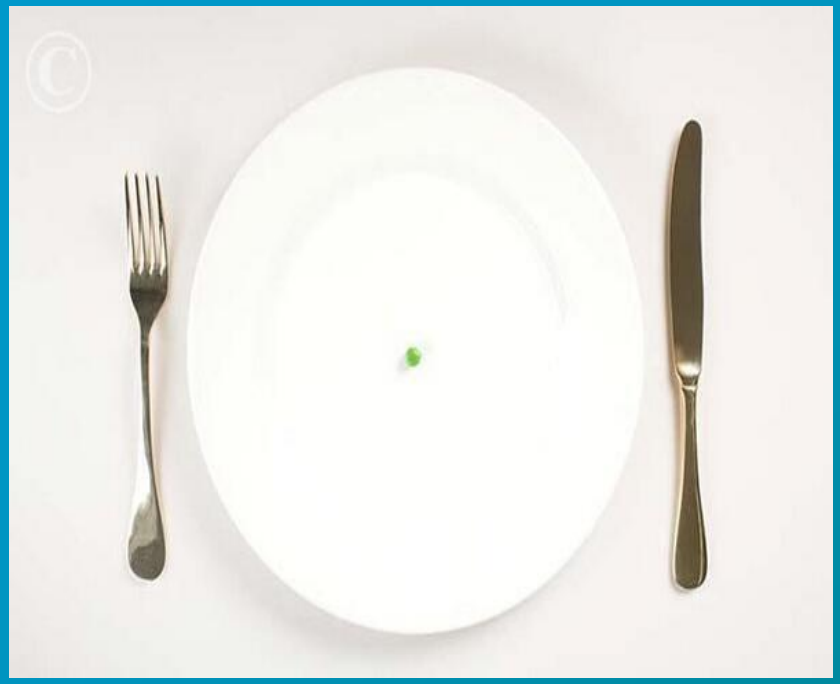

Progress in Treatment

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Definitions & Decision Rules

Assessment of oral-motor skills should include task analysis of the movement typically observed in the wide range of normal skill developments

Lori Overland CCC/SLP

Operational Definitions and Decision Rules

- Data is used to guide decisions regarding fading, shaping, or your target of intervention

Operational Definition

Must be specific to assure the definition is so narrow in scope that others would observe only what you had in mind

Allows 2 or more people to collect data for the same set of target behaviors

Observable

Measurable

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Data Collection:
Oral Motor & Sensory Targets

- Vertical Chew

  Rhythmical, resistive chew
- Lateralization of the tongue from mid-line
- Mid-blade elevation of the tongue
- Reduced occurrences of gagging
- Reduced occurrences of emesis

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Operational Definition: Motor Task

Chewing

A rhythmical (1 chew/second), resistive vertical movement of the jaw

Vertical movement of the jaw

Resistive (graded pressure)

1 chew/second

Operational Definition / Goal

Motor task- Chewing:

Pt will demonstrate lateralization of a pea size bolus to the molars for a rhythmical (1 chew/second), resistive chew 8-10 times prior to the swallow at 80% of opportunities, 20% or less gags, and no emesis.

Behavioral task- Decreased disruptive behaviors:

Pt will accept the bite within 5 seconds of presentation and swallow the bite within 30 seconds with 20% or less gags and no emesis

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Decision Rule

A set of specific measurable and observable criteria that guide specific decisions or identify readiness for progression i.e., texture progression

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Decision Rule

Beckman:

Minimal competence for oral motor skills before beginning with introduction of new foods

10 vertical jaw movements in 10 seconds
67% midblade tongue elevation
40% posterior cheek activation
(Beckman, 2013)

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Decision rules tell you when to…

- Begin puree by mouth
- Increase texture from puree to dissolvable solids in practice
- Increase texture from dissolvable solid to chewable solid in practice
- Increase texture in the meal from puree to ground
- Increase texture in the meal from ground to chewable (¼ “ x ¼”) table texture

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Data

is used to guide decisions regarding fading demands, shaping behaviors, or your intervention targets

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Rev:10/2015

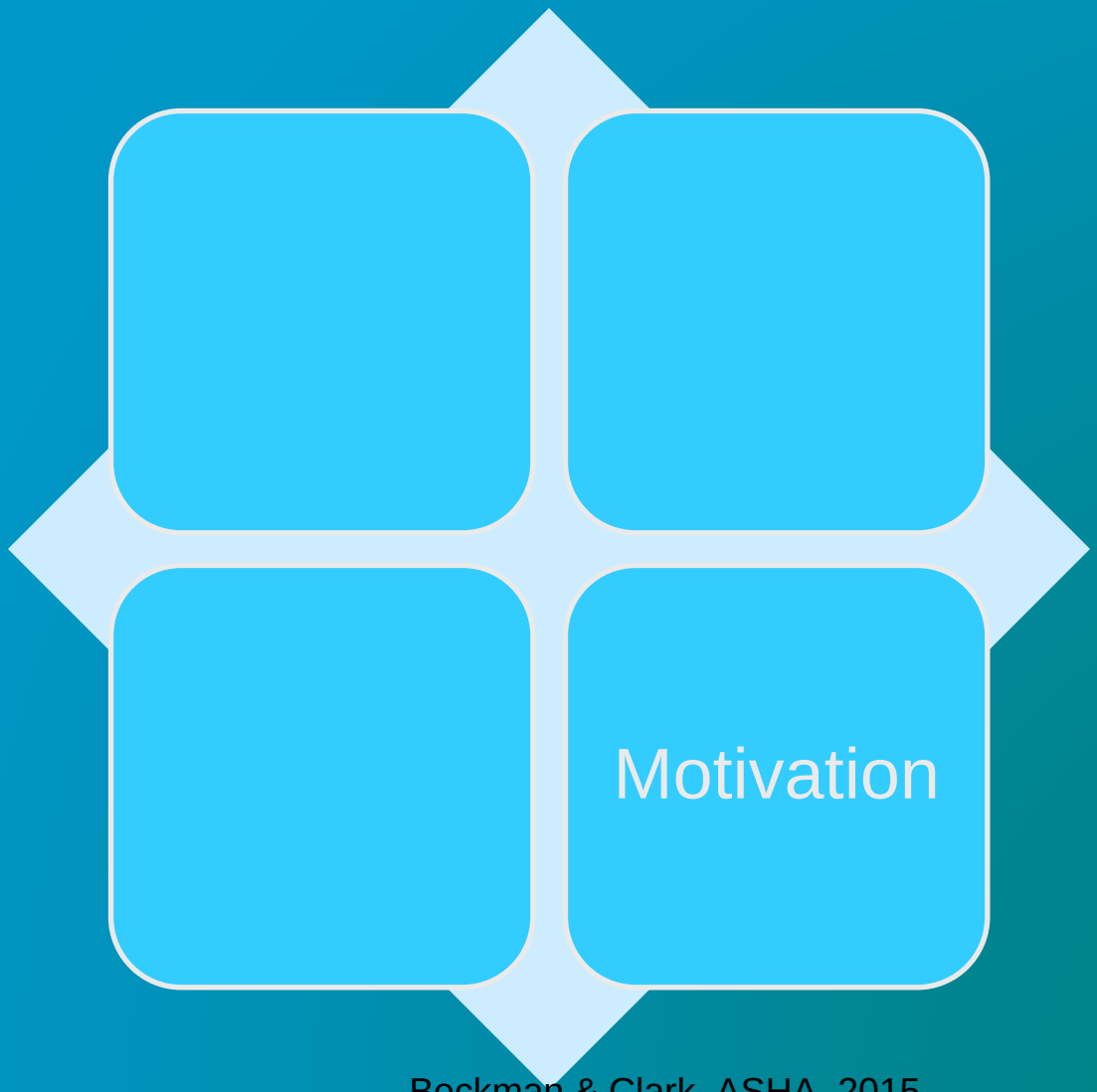
Chew Development Data Sheet

DATE: _____ CHILD: _____ CLINICIAN/FEEDER: _____ CONDITION: NCA or DRA _____

CHEW UTENSIL **(circle one): ARK grabber/ Chewy Tube-Red/ Chewy Tube-Yellow/ Y-Tube/ Soft EZ Spoon/ Organza wrapped/ Other:_____**
TEXTURE LEGEND: **P(puree), WG(wet-ground), G(ground), C(chopped), T(table), D(dissolvable), L(liquid)**

Bite Number	Food	Acc(5/>5)	Expel (#)	Pack (✓)	Mouth Clean(√)	Gag (#)	Emesis	Disruptive Behavior	Food Texture		RIGHT	LEFT	CHEWS 0-3 #	CHEWS 3-5 #	CHEWS 5-8 #	CHEWS 10	CHEWS 15	CHEWS 20	INDEP. Lateralize (1/4" bolus)	DEP. Lateralize
1.																				
2.																				
3.																				
4.																				
5.																				
1.																				
2.																				
3																				

Progress in Treatment



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Motivation

Highly motivating activity

- Singing favorite songs,
- Favorite toy,
- iPad, DVD
- Tickles & giggles
- Must be *worth* working for!

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Motivation

The child's "why" is the END of the task

Counting aloud through tasks helps identify the "end" of the task and ↓ anxiety

- Video of N

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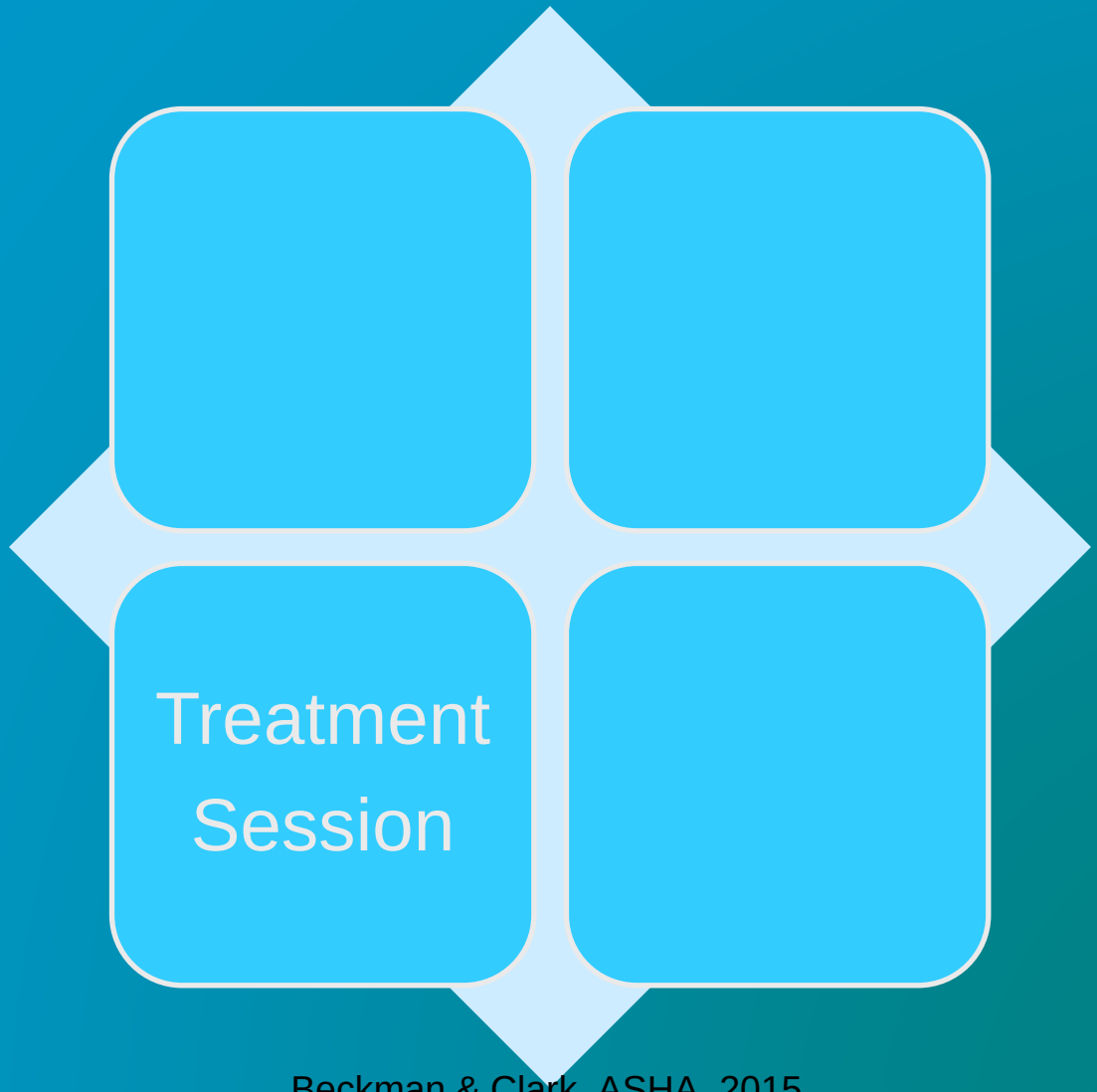
Progress in Treatment



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Structure of the Treatment Session

- Establish a routine that the child can expect each and every session
  - Do not vary the routine!
  - Fear/anxiety/ASD need the routine to remain the same to feel less anxious
- Give a 20-30 second break b/w tasks & before beginning next task

Structured Treatment Session

- Room set-up: Same chair, tools, motivating activity, etc.
- Use the same commands to signal the task – “take a bite,” “time to chew,” or “my turn/your turn”
- Use labeled praise- “Good job chewing!,” “Good job swallowing!,” “Good job taking your bite!”

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Home Program

- Frequency of practice trumps intensity of practice
- Short practice sessions (no longer than 5-10 minutes)
- Practice 3 times per day (no more than 5 times/day)
- Parent is coached in weekly sessions to accomplish the home program;
- Parents/caregivers must be aware that behavior challenges will occur at home
- Do not send home practice that is not return demonstrated in the session with you coaching the parent through persistence with a reasonable request

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Putting All the Pieces Together

- Choose 4 of the more important foods to onboard based on Dietician's assessment of nutrient needs
- Baseline motor deficits
  - Identify the motor deficits for specific target work
- Meal
  - Consider lowest texture to create ease of intake within the meal (usually puree)
  - Volume before variety
    - Easier to increase volume with an easy to swallow food, one that does not require motor coordination and durational strength
- Reduce refusal
  - Antecedent manipulation/reduce escape from the task

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Remember…

- ✓Nutrition is the reason we focus on feeding
  The child's growth and development is at risk
- ✓Address volume first & texture second
- ✓Cost of treatment over time: Evidence-based treatment strategies

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