

Feeding the Whole Child

“A Nourishing Mealtime Experience”

Nancy Sinden, M.S., CCC-SLP

Child Development and Rehabilitation Center

Oregon Health and Sciences University

sindenn@ohsu.edu

503-494-8689

When you leave here today...

I hope you take with you:

- **An holistic understanding of eating and drinking within a “Mealtime Experience”**
- **Lots and lots of “tips” for improving mealtimes**

Eating and Drinking!

More than just food and drink!

- **Satisfies hunger and thirst**
 - **Essential to our health and well being**
- **Structures our day**
- **Source of memories, love, and pleasure**
- **Highly individualized (PB&J)**
- **Eating at the table with family and friends helps define who we are and what we are all about through opportunities for social interaction**

“Nourishment”

“Understanding the Whole Child”

- **Eating and drinking are just a small part of nourishment**
- **The essence of the child needs to be acknowledged**
- **Nourishment means more than feeding the body. It means feeding the heart, the mind, and the spirit as well**
- **The challenge of improving mealtimes is to provide a nourishing mealtime environment from which change can occur**

Suzanne Evans Morris 1981

What is eating and drinking?

- Eating and drinking or feeding is a **mealtime experience** that is accomplished within a nurturing environment of communicative and social-emotional interaction
- Feeding uses every muscle, every sense, and every organ of the body
- A successful mealtime experience serves to deliver nourishment from the “**table to the pot**”

What is a disorder of feeding?

- **Any problem** in eating and drinking that occurs anywhere from the **“table to the pot”** that interferes with the ability of the child to leave the table feeling nourished.

What is a disorder of feeding?

“Feeding problems in childhood typically have a neurodevelopmental origin and reflect a spectrum of delays and disabilities”

Rogers, B. , Neurodevelopmental Aspects of Feeding Disorders, Seminar for Feeding Teams, 2002

The Mealtime Experience

- **What do we bring to the table?**
 - Birth and medical histories, health, ethnic background, cultural heritage, experiences, beliefs, appetite, emotions, motivations, behavior, personalities, developmental abilities
- **How do we set the table?**
 - Environment, guests, food and drink, utensils, seating, family dynamics and social relationships, communication, routines, rules and responsibilities

The Mealtime Experience

- **How do we eat and drink?**
 - Oral sensorimotor functioning
 - oral preparatory phase of the swallow
 - developmental feeding skills
 - saliva control
- **How do we swallow what we eat and drink?**
 - Oral preparatory, oral initiation, pharyngeal, cervical esophageal, and esophageal phases
 - Oral protective mechanisms

The Mechanics of Eating and Drinking!

The Mealtime Experience

- **How do we breathe, digest and eliminate?**
 - **Gastrointestinal functioning: GER, constipation, diarrhea, hydration**
 - **Respiratory status**
- **How do we grow?**
 - **Nutritional intake and variety**
 - **Absorption and Metabolism**
- **How do we leave the table?**
 - **What kind of experience do we leave with?**
 - **Were they nourished in all ways?**

How we eat and drink!

Oral Sensorimotor Functioning

“The integration of an individual’s oral anatomy with their sensory and motor systems for the support of eating, drinking, swallowing, speaking, and performance of non-speech oral movements including maintaining appropriate oral resting postures all within a foundation of positive learning experiences”

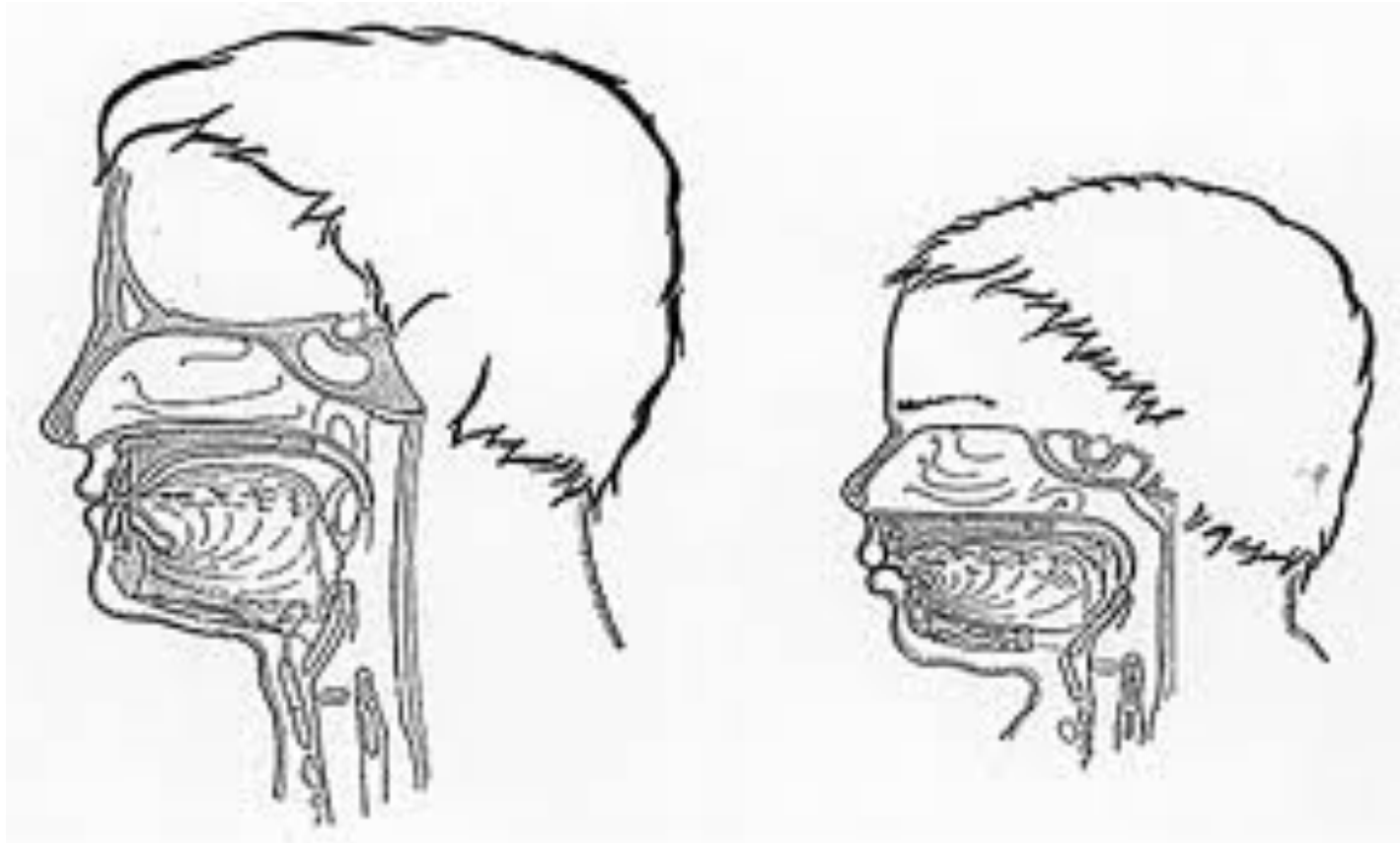
Nancy Sinden, 2010
How the mouth works!

How we eat and drink!

Oral Sensorimotor Functioning

- **Oral Structure:** The size, shape, and position of the jaw, lips, cheeks, tongue, teeth, palate, pharynx, hyoid, and vocal tract that is unique to the individual
- **Sensory Processing:** The ability of the oral mechanism to perceive, interpret, organize, and act on information coming through our senses
- **Motor Performance:** The ability of the muscles and joints to maintain a dynamic balance between stability and mobility
- **Circular Process**
 - Sensory input is needed for motor output
 - Movement is needed to integrate the sensory system
 - Movement disorders lead to disorders in sensory integration

A child is not a miniature adult!



Growth and Development

- “The infant, child, and adolescent are different from each other, and all are very different entities from the adult”
- “Growth and development is an underlying process, which affects all aspects of feeding and swallowing”
 - Enlarges and remodels anatomy
 - Expands internal spaces
 - Modifies origins and insertions of muscles
 - Increases nutrition and hydration needs
 - Requires greater muscle complexity and strength
- “Growth and development occur in a sequence”
 - Each child progresses through the continuum at their own rate, and at times, vary the sequence

(Beecher & Alexander, 2004)

Oral Sensitivity

“The ability of the oral mechanism to perceive, interpret, and act on information coming through our senses”

Sensory input is critical for motor learning to occur!

- **Vestibular**
- **Tactile**
- **Proprioceptive**
- **Auditory**
- **Visual**
- **Olfactory**
- **Gustatory**
- **Temperature**
- **Smell**
- **Taste**
- **Sound**
- **Movement**
- **Volume**
- **Size**
- **Weight**
- **Consistency/Texture**
- **Pressure**
- **Shape**
- **Acidity**

Oral Sensorimotor Functioning

Sensory Integration

- **Optimum Arousal:** Needed to attend, concentrate, process, and perform. Can fluctuate between activity and fatigue. Can be impulsive, distractible, fearful, angry, or removed
- **Sensory Registration:** Arousal, orientation to sensory stimuli, determining the significance of the stimuli and preparing the body for action (Koomar and Bundy, 1991)
- **Sensory Integration:** A neurological process involving the analysis, synthesis and organization of sensory stimuli (Burpee, 1999)
- **Self-regulation:** Ability to achieve, monitor and change behavioral state to match the demands of the situation (Oetter, et al, 1995)

Oral Sensorimotor Functioning

Sensory Modulation Disorders

- **Hypersensitivity:** Sensory input floods the CNS and results in a disorganized response. Extreme reaction to sensory input. Lack of experiences and poor vision. Gagging, vomiting, turning away, pushing into extension, tightening of facial muscles can occur
- **Hyposensitivity:** Excessive inhibition of incoming sensory input and a lack of sensory arousal resulting in immature, imprecise or disorganized responses. Less reaction to input. May not be aware of food in mouth or saliva on chin. Diminished or absent cough, gag, and swallow. Fearful of eating. Inability to react. Craves intense sensory experiences

Oral Sensorimotor Functioning

Sensory Modulation Disorders

- **Sensory Defensiveness:** A tendency to act negatively or with alarm to sensory input that is generally considered harmless. An emotional or behavioral response due to lack of experience or to negative experiences
- **Sensory Thresholds:** Overloaded or under loaded within each sensory modality
- **Sensory Overload:** Difficulty in sifting out and integrating unimportant sensory information. React by falling asleep, crying uncontrollably, and difficulty calming

Oral Sensorimotor Functioning

Principles of Motor Development

- **Development is a continuous process from conception to maturity**
- **Sequence of development is the same for all children, but the rate may vary**
- **Movements develop cephalocaudally**
- **Movements develop proximal to distal**
- **Gross motor control emerges earlier than fine motor control**
- **Straight planes of movement to rotation**
- **Midline development**
- **Reversion to earlier patterns of movement**
- **Sensory information determines the direction and selection of movement**
- **Economy and efficiency of movement**
- **Rhythmicity**

Posture, Tone and Movement

Stability and Mobility

- **Oral movements are dependent upon dynamic stability where one part of the body remains stable, but active, while allowing another to move**
 - **Pelvis: trunk and shoulder girdle**
 - **Trunk and shoulder girdle: Head and neck**
 - **Head and neck: Jaw**
 - **Jaw: Tongue, cheek, and lips**
 - **Tongue: Lateral margins and tongue tip**
 - **Hyoid bone: Tongue and larynx**

Muscle Tone

“The degree of stiffness in the muscles to stabilize or move the skeleton in the presence of gravity”

Hypotonicity: decreased muscle tone that reduces the stability around the joints

- Limited oral play experiences
- Decreased oral responses
- The lower the tone the more delayed motor skills
- May have inefficient respirations for speech and swallowing
- Gross motor activities increase tone
- Hyperextension or fixing

Muscle Tone

“The degree of stiffness in the muscles to stabilize or move the skeleton in the presence of gravity”

Hypertonicity: elevated muscle tone with movement against tension and resistance

- Abnormal patterns of muscular coordination
- Movements limited to small ranges of weight shifting and restrict movement around joints
- Shallow and rapid breathing
- Tonic reflexes prevalent
- Develop contractures and deformities
- Fine motor activities reduce tone

Movement

Occurs with weight shift in the body

Separation of movement

- **Speech and feeding require refined fine motor control and rapid succession of dissociated lip, tongue, and jaw movements**
- **Rapid and precise sequential movements are dependent upon the ability to perform discrete movements**
- **Tongue from jaw separation of movement critical for speech production and chewing**
- **Can't dissociate movements until midline control is complete and has some ability to rotate**

Motor Considerations and Challenges

Limiting oral patterns

- Exaggerated jaw and tongue movements
- Jaw or tongue thrusting
- Jaw clenching
- Tonic bite
- Tongue retraction and protrusion
- Lip retraction and pursing
- Low or high oral tone
- Sensory modulation difficulties

Oral Sensory and Motor Disorders

Arvedson and Brodsky, 2002

Sensory

- Nipple confusion
- Inability to differentiate taste
- Liquids managed better than solids
- Sort out mixed textures
- Oral holding patterns
- Gags with solids at lips
- Vomits certain textures
- Tolerates own, but no one else's fingers
- Does not mouth
- Refuses tooth brushing

Motor

- Inefficient suck
- Differentiates tastes
- Inefficient/discoordinated motor movements with all food types
- Swallows food whole
- Problems holding or containing food in mouth
- Gags in oropharynx or after swallow
- Vomiting not texture specific
- Tolerates other's fingers
- Accepts mouthing toys and toothbrush, but can't hold onto them

Developmental Feeding Skills

The functional outcome of how we eat and drink!

- **Suck-Swallow-Breathe Triad**
 - Suckle swallow: 0 to 3 months
 - Suck Swallow: After 3 months
 - Non-nutritive versus nutritive sucking
 - Bottle, breast, spouted cup and straw
- **Spoon feeding:** Introduced between 4 to 6 months
- **Open Cup drinking:** 1 month after spoon
- **Chewing:** 6 to 7 months, adult like by 3 years, mastered by 16 years
- **Straw drinking:** variable, but typically between 2-3 years

Secretion Control

- **Highly complex skill requiring good posture, tone, oral sensorimotor functioning, and cognitive abilities**
- **Neuromuscular involvement**
 - **Oral sensorimotor deficits**
 - **Pharyngeal hyposensitivity**
 - **Impaired oral praxis**
- **Saliva is produced involuntarily to:**
 - **Protect the teeth and gums and cleans the mouth**
 - **Prepare food for chewing and swallowing**
 - **Initiate digestion of carbohydrates: enzymes**
 - **Lubricate the tongue and lips during speech**
 - **Regulate acidity in the mouth and gut**
 - **Facilitate tasting**

Saliva Control

Saliva production affected by:

- Age and Gender
- Hydration
- Chewing frequency and strength
- Vomiting/GER
- Illness with congestion
- Medications
- Sugar, citric acid
- Light
- Fatigue
- Obstructive tonsils
- Day and seasonal cycles
- Emotion
- Acquisition of new motor tasks
- Dental caries
- Gum disease
- Teething
- Attention and concentration
- Positioning
- Oral stimulation

Oral Reflexes

How do we eat and drink?

Protective Mechanisms

- Gag
- Cough
- Sneeze

- Throat clearing

Infant Reflexes

- Rooting
- Lip
- Mouth Opening
- Phasic Bite
- Lateral/Transverse Tongue
- Tongue Protrusion
- Suck-Swallow
- Santmeyer Swallow
- Babkin

How do we swallow what we eat and drink?

What is Swallowing?

“Deglutition”

- A complex series of events that function to deliver food and saliva from the mouth to the stomach
- It is a highly integrated act under neurological control that involves the central and peripheral nervous system and requires coordination of over 27 muscles acting in concert over a period of 2 seconds
- Children swallow about 600-1000 times/day and adults about 2,400 times/day with more swallowing occurring during food intake and less while asleep
- **Synergistic Theory**: A dynamic integrated system of tubes, valves, and pumps!

What is Dysphagia?

- **An impairment in the ability to receive, prepare, and swallow food.**
- **It is not a disease, but a symptom of an underlying pathology.**
- **It may be transient, episodic or pervasive.**
- **It may manifest itself as FTT, distress during eating including coughing and choking, refusal to eat, drooling, respiratory disease, or as difficulty with developmental skill progression.**

How do we swallow what we eat and drink?

- **Phases of the swallow:** “Dynamic interactive process!”
 - Oral preparatory phase
 - Oral sensorimotor functioning
 - Developmental feeding skills
 - Swallow tasks: receive, contain, form, transfer
 - Saliva management
 - Oral initiation phase
 - Pharyngeal phase
 - Cervical esophageal phase
 - Esophageal phase
- **Aspiration and Airway Protection**

The Mealtime Experience

How do we breathe while we eat and drink?

- **“The quintessential issue determining whether a child should orally feed relates to his or her ability to protect the airway during eating” (Beecher & Alexander, 2004)**
- **Breathe first...eat last!**
- **The throat is the crossroads of swallowing and breathing**
- **Lung volumes reduced to support endurance**
- **Timing and coordination critical for safe swallowing**
- **Learn chest PT: Pulmonary Toileting**

What is Aspiration?

- **Aspiration** occurs when material including food matter, secretions, and/or gastric contents incorrectly enter the larynx below the vocal cords into the tracheobronchial tree
- **Microaspiration**: Penetration to vocal cords with suspected coating and aspiration
- **Penetration** occurs with passage of material into the laryngeal vestibule followed by rapid expulsion back into the pharynx during swallowing.

Aspiration

- **When does it happen?**
 - **Before the swallow:** Material enters the still-open airway
 - **During the swallow:** Material enters during the swallow response
 - **After the swallow:** Material enters due to residue remaining in pharynx after the swallow or from backflow

Aspiration of liquids before and during the swallow most common finding

Aspiration

Where does it happen?

- **Aspiration from above**
 - Oropharyngeal, nasal and sinus secretions
 - Food and liquid
- **Aspiration from below**
 - Gastric contents

Oral Protective Responses

- Oral preparation of a swallow-safe bolus
- Timing of the Swallow
- Gag reflex
- Mechanical closures
- Cough
- Pulmonary Toileting
- Sneeze

Aspiration is usually silent in children with neurological deficits

Predictors of Aspiration Pneumonia

- **Dependent feeders**
- **Dependent oral care**
 - **Pathogens in gingival crevices and in dental plaque present potential risk for aspiration pneumonia (Terpenning et al, 2002)**
 - **Aggressive oral care has potential to decrease aspiration pneumonia (Yoneyama, et al,2002)**
- **Tube feeding**
- **Multiple medical diagnoses**
- **Number of medications**
- **Need for suctioning**

The presence of dysphagia is not a predictor of pneumonia. Aspiration is necessary, but not a sufficient condition (Langmore et al, 1998)

Symptoms of Aspiration

- **Gagging, choking, coughing, wheezing**
- **Recurring pneumonia and upper respiratory disease: Recurrent asthma, bronchitis, bronchiolitis**
- **Behavioral avoidance reactions, irritability, arching and stiffening of the body, lack of alertness**
- **Cyanosis, apnea, tachypnea, strider**
- **Wet, gurgling breath and vocal congestion**
- **Vocal hoarseness**
- **Persistent low grade unexplained fevers**
- **Multiple swallows needed to clear the spoonful**

The Mealtime Experience

How do we digest and eliminate what we eat and drink?

- **Gastrointestinal functioning:**
 - Processing, immunizing, digesting, absorbing, and eliminating
 - Highly complex system regulated by sensory feedback
 - Determine what children eat, drink and how much they are willing to eat

Gastroesophageal Reflux

“Backflow of stomach contents”

“A symptom of an underlying pathology”

- Cricopharyngeal dysfunction
- Esophageal Dysmotility
- Changes in LES relaxation
- Gastric Emptying
- Pyloric Stenosis
- Thoracoabdominal pressure changes
- Constipation
- Obstruction
- Disease
- Alternative feeding methods (GT: ↑25-44%)
- Medications
- Mechanical Ventilation
- Food allergy

Gastroesophageal Reflux Symptoms

92% of CP kids have symptoms, 70% have GERD

- **Regurgitated versus non-regurgitated reflux**
- **Mouth odor**
- **Poor growth**
- **Vomiting, “spitting-up”**
- **Intake of small volumes, frequent interruptions**
- **Constant fullness**
- **Pain (heartburn)**
- **Food refusal and aversion**
- **Poor sleep patterns**
- **Drooling**
- **Nausea**
- **Gagging and retching**
- **Distress during feeding: Crying, screaming, pulling away, arching**
- **Recurrent sinusitis**
- **Laryngeal inflammation
Vocal hoarseness**
- **Coughing and wheezing**
- **Strider and hiccups**
- **Aspiration and acute and chronic pulmonary disease**
- **Family stress and emotional fatigue**

Gastroesophageal Reflux: Treatment

- **Clinical Strategies**
 - Positioning: Left side-lying, tummy to tummy time
 - Diet:
 - Thickened boluses: Decrease rate of emptying
 - Avoid fatty foods, carbonation, and acid drinks
 - Smaller, more frequent meals
 - Movement restrictions
- **Medications:**
 - Antacids
 - Prokinetics (Reglan)
 - H₂ receptors (Zantac)
 - Proton pump inhibitors (Prilosec)
- **Surgery:** Nissen Fundoplication

The Mealtime Experience

How do we digest and eliminate what we eat and drink?

- **Gastrointestinal Complications**
 - **Constipation**
 - **Diarrhea**
 - **Dehydration**
 - **Dumping Syndrome**
 - **Structural anomalies**
 - **Celiac disease**
 - **Eosinophilic Esophagitis**

The Mealtime Experience

How do we grow from what we eat and drink?

- **Nutritional intake and diversity**
- **Digestion and absorption**
- **Metabolism**
- **Hormones: Endocrine**
- **Failure to Thrive: Descriptive, multifactoral problem of growth based on established growth standards for age and gender. “Pediatric Undernutrition” (Arvedson & Brodsky, 2002)**
- **“Non Organic FTT” children are at significant risk for developmental delays and feeding problems**

Alternative Feeding Approaches

- **Why kids need tube feedings?**
 - Inadequate food and fluid to meet nutritional requirements
 - Inability to swallow or have an unsafe swallow
 - Aspiration and respiratory disease
 - Extreme oral aversive behaviors with distress at mealtimes
 - Prolonged dependence on NG tube feedings
 - Prolonged oral feeding times > 40 minutes

Alternative Feeding Approaches

- **Types:**
 - Orogastic
 - Nasogastric
 - Gastrostomy tube
 - Jejunostomy tube: G-J tube
- **Attitudes:** Challenge our beliefs!
 - Underscores the child's disability
 - Some welcome the relief of worry about nutrition
 - Guilt or failure to meet fundamental nurturing role
 - Permanent or “partnership”

“Tube feedings are mealtimes too!”

- **Continue to provide an appropriate physical, social, emotional, and communicate environment**
- **Provide pleasurable oral stimulation to the face and mouth during tube feeding**
- **Maintain good oral health**
- **Offer gravity feeding along with family mealtimes, while child experiences smells, tastes, social interactions, etc.**

Marsh Dunn-Klein, 1999

The Mealtime Experience

How do we leave the table?

- What kind of experience do we leave with?
- Were they nourished in all ways?
 - Positive social-emotional interactions and communications
 - Positive oral sensorimotor experiences
 - Safe and efficient swallowing
 - Adequate digestion and elimination
 - Satiated
 - Pleasurable experience
 - Satisfactory emotional adjustment with less stress and demand on caregivers
 - Growth

Mealtimes, for Children with Eating and Drinking difficulties, can be:

- **Messy**
- **Time consuming**
- **Require attention to nutrition, growth and health**
- **Require special shopping and food preparation**
- **Require organization and planning**
- **Highly stressful**
- **Delegating responsibilities**
- **Unpleasant**
- **Dependent**
- **Limiting in diversity of life experiences**
- **Require professional supports**
- **Can be physically challenging for the feeder**

Mealtime Goals

- **Safety**
- **Efficiency**
- **Pleasure**
- **Growth**

Nourishment of the Whole Child

What can we do to help?

- **Assure good medical health: GERD, Constipation**
- **Provide scheduled mealtime routines and expectations**
- **Provide positive, engaging, and interactive mealtimes that are fun!**
- **Provide seating that maximizes a stable base of support**
- **Provide an environment free from distractions**
- **Division of responsibility: Parent vs child**
- **Eat from your plate not your child's**
- **Allow active participation in preparation, serving and cleaning up**

What can we do to help?

- **Take baby steps toward eating**
- **Don't bribe or force feed!**
- **Reward through positive fun experience**
- **Use language that does not focus on the language of eating**
- **Provide foods that are developmentally appropriate not necessarily age-appropriate**
- **Thicken liquids as needed for control and safety**
- **Encourage head in midline**
- **Remember "mess is best"**

What can we do to help?

- **WOO them in with flavor**
- **Choose new foods with similar characteristics to their preferred foods**
- **Allow for spitting out of food or a “no thank-you” bowl**
- **Supplement as recommended by dietitian**
- **Offer liquids at the ends of meal**
- **Provide foods that are not a choking risk**
- **Chewing, biting, and cup drinking practice**
- **Encourage independence**
- **Practice good dental hygiene**
- **Aspiration precautions**

Specific Strategies to Promote Eating and Drinking

“For Your Reading Pleasure!”

Positioning

- **Good positioning is fundamental in optimizing eating, drinking, attention, communication and learning**
- **Requires careful assessment of position and posture for both the child and caregiver**
- **Common problems include increased extension or flexion, asymmetry, poor head and trunk control, deformities and contractures**

Positioning

- **Oral movements are dependent upon dynamic stability, where one part of the body remains stable, but active, while allowing another to move**
- **The greater the postural limitations the greater the chances for swallowing problems**
- **When gravity is used to aid feeding there is an increased risk for aspiration**

An Ideal Position

Upright Sitting

- **Good support of pelvis and hips for base of support**
- **Balance of trunk over base of support**
- **Feet planted firmly on footrest**
- **Good midline alignment of head and trunk: Head should always be higher than the chest**
- **Decreased elevation of shoulders**
- **Neck elongation and slight chin tuck: Protects the airway**
- **Face positioned vertically**
- **Weight bearing of elbows and upper extremity. Hands toward midline. A tray should be available.**
- **Consider width, height, and depth of seat, height of chair and table, and distance between chair and table**

Positioning Tips

- **Safety is critical. Stable and secure, but child accessible**
- **Encourage a symmetrical posture of flexion**
- **Distribute weight evenly**
- **Provide comfort and eliminate if possible forces at pressure points to reduce pain**
- **Decrease abdominal cavity pressure to minimize GER**
- **Promote positioning of child and caregiver for eye regard, communication, and ability to read readiness cues**
- **Equipment or supports should be comfortable, easy to use, and accessible**
- **Positioning alternatives: Side-lying, prone, reclined, standing**

Communication

- **Dependent on the skill of the communicative partner to interpret non-verbal behavior of a child who is unable to speak or speak well**
- **Makes mealtimes more successful, enjoyable, quicker and more efficient**
- **Develops personal choice with control over their world and self-esteem**
- **Behavior is communication! It's a response to the environment and the environment's response to the child.**
- **Emotion affects appetite and desire to talk!**
- **Is that a communication signal or is that a reflex?**

Communication Tips

- **Observe vocalizations, eye movements, body movements and gestures, and mouth and facial movements to help understand what is communicated about feeding**
- **Offer a favorite food, one not liked, and a new food. Observe reactions. Repeat to see if responses change**
- **Videotape a mealtime and analyze the communication between caregiver and child**
- **Symbol systems, mealtime picture charts, and voice output devices**
- **Let the child give permission to eat**
- **Offer food choices, but be willing to give the choice**

Mealtime Routines

- **Important for establishing hunger and satiety patterns**
- **Promote expectations of behavior**
- **Allow opportunities for observing and modeling others**
- **Prolonged feeding times burn calories**

Mealtime Routines: Tips

- **Offer 3 meals and 2 to 3 snacks a day**
- **A mealtime should last up to 30 minutes**
- **Try to watch for “grazing” patterns**
- **Practice new skills at snack times and when accomplished within an environment of distraction introduce the skill at mealtimes**
- **Eating with others helps model behavior**
- **Active participation: Prepare, serve, pass, and clean-up.**

Sensory Modulation Disorders

- **More common in kids born prematurely**
- **Problems can be generalized or specific to the mouth**
- **Motor impairments limit oral exploration which in turn limits sensory learning**
- **Kids often have a history of negative oral experiences**
- **Normalize not desensitize sensation**

Sensory Modulation Disorders

- **Tips: Hypersensitivity**
 - Slow rocking or swinging
 - Bounce on a large ball
 - Gradually bring hand and toys to the mouth
 - Offer opportunities for mouthing outside of the meal
 - Grade the introduction of touch
 - Allow child to initiate or give permission
 - Encourage touch of food and bring it to his mouth

Sensory Modulation Disorders

- **Tips: Hyposensitivity**
 - Check into side effects of medication: anti-convulsants
 - Add activities that build activation the muscles of the neck and shoulder girdle
 - Select appropriate type, frequency and intensity of input
 - Grade the input when comfortable and relaxed
 - Provide opportunities for arousal: vibratory toys or toothbrush

Sensory Modulation Disorders

Sensory Overload

- **Tips for calming**
 - **Use flexion, which is self-regulatory and organizing**
 - **Hold the child close for warmth**
 - **Add extra covers or clothing**
 - **Reduces excess light and noise**
 - **Use containment: swaddling, holding**
 - **Use firm touch**
 - **Gentle rocking or bouncing**
 - **Make transitions slowly: Take your time and be calm**
 - **Remove the child from the environment**
 - **Soft vibration may help**
 - **Quiet, rhythmical music**

Sensory Modulation Disorders

Optimum Arousal

- **Tips for alerting**
 - **Cool down the temperature**
 - **Remove extra clothing or covers**
 - **Vary the speed, intensity or rhythm of movement**
 - **Vary the pitch, tone and animation of your voice**
 - **Use faster, louder music**
 - **Light touch that tickles or fast stroking**
 - **Variable levels of vibration**
 - **Gentle airflow, such as a small fan**

Sensory Modulation Disorders

“Massage”

- **Tips for normalizing not desensitizing sensation:**
 - **Stable and comfortable positioning**
 - **Take your time and be playful and relaxed: It's not an exercise!**
 - **Start by offering touch to part of body where accepted**
 - **Use firm, rhythmical, slow, and symmetrical stroking**
 - **Use warm hands or a soft warm flannel or towel**
 - **Stop when any signs of distress are shown**
 - **End with a positive experience**
 - **Offer short sessions several times a day**

Facial and Oral Stimulation

Non-nutritive oral sensorimotor program

- Reduces sensory hypersensitivity and promotes acceptance
- Increases oral organization and control
- Offer outside of mealtimes during activities of daily living: Tooth brushing, washing
- Encourage active participation by the child
- Non-nutritive sucking experiences
- Mouthing exploration: experience and exercise
- Touch should move symmetrically toward the mouth using firm, gentle and broad strokes
- “Hug and kiss” therapy: Gum and cheek massage, facials
- Use wet fingers or fingers dipped in juice, milk, or toothpaste. Teach spitting!
- Give time for swallowing. Can increase saliva.

“Infant Oral Feeding”

Suckling

- Prominent “in-out” tongue movements
- Pronounced jaw opening and closing
- Loose approximation of the lips

True suck

- By 6 months
- “up-down” movement of the body of the tongue
- Less jaw action
- Firmer lip approximation

Sucking Behavior

- We need to appreciate that if the infant volume of each suck is 0.2 ml, it requires 300 suck/swallows to consume 60 ml over a 5 minute period of time
- Sucking is **WORK!**
- Choosing bottles and nipples depend on the size and shape of the mouth, the strength of the suck and the flow rate of the fluid
 - Flow rate affects sucking pressures, sucking rate and frequency, and work effort: Nipple holes, pliability

Tips: Sucking

- **Explore changes in body positioning that enables the baby to breathe with little stress**
- **Bottles should be comfortable, transparent, accommodate volume, easy to clean and sturdy**
- **Develop a rhythmic suckling pattern by stroking the tongue with a downward and forward to the lips with a tempo of 1 stroke/second**
- **Add tastes to the finger, a nipple dipped in formula, or a medicine pacifier (Numi-med)**
- **Cheek support helps the infant to latch onto and stabilize the nipple**
- **Jaw support helps maintain the tongue in the mouth**

Tips: Sucking

- **Slight pressure under the chin helps to reduce forward movement of the tongue base.**
- **Medicine cup or spoon**
- **Pacing the suck with swallowing and breathing. May need to rhythmically break the seal to teach self-regulation**
- **To enlarge nipple hole use a cross-cut as it closes after sucking limiting flow**
- **Solids should not be added to bottles unless directed: leads to obesity and perpetuates immature sucking patterns**
- **If sucking problems persist beyond 4 months transition to a small cup for more mature skills**

Spoon Feeding

- **Introduce solids at about 6 months**
- **Prerequisite**
 - **Maintain sitting balance with head and neck stability**
 - **Open mouth in anticipation of food**
 - **Actively engage in hand-to-mouth play**
- **Requires increased cheek and lip activity and tongue cupping**
 - **Tongue action shows up-down movements to propel and swallow strained foods (9 months)**
 - **Maintain lip closure during swallowing (12 months)**

Spoon Feeding

- **Increase food texture in small steps over time going from a thin, smooth texture to a gradual change in thickness and graininess, to lumpy purees, but not to a mixture of smooth with pieces, and then to soft spooned chewables. Keep texture consistent**
- **If suckling food off spoon, not ready for lumpiness. Pieces can be swallowed whole increasing risk for choking and poor digestion, or spit out with risk for continued sucking and tongue thrusting**

Tips: Spoon Feeding

- **Sit at eye level in a comfortable position**
- **Pureed foods can be introduced on fingers or toys**
- **Spoons: In general, use a small, shallow spoon with a rounded or shovel-shaped bowl. Needs to fit and not touch side teeth**
- **Spoon placement, volume and speed of delivery can be challenges for the CP youngster**
 - **Place spoon at mid-tongue with slight downward pressure to promote central grooving of tongue and lip closure.**
 - **Slight inward pressure reduces tongue thrusting.**
 - **Horizontal placement may stimulate varied tongue movements**

Tips: Spoon Feeding

- **Remove spoon across the tongue without scraping palate or alveolar ridge**
- **Heavier foods provide more sensory feedback. Thicken with foods that don't alter taste: rice cereal, dried potatoes**
- **Must be able to prepare single textures efficiently before mixed textures can be introduced**
- **External jaw control to assist mouth closure**

Cup Drinking

Prerequisite skills

- **Jaw stabilization in open and closed positions necessary for development of graded movements during cup-drinking**
- **Sitting unsupported**
- **Selection:**
 - **Wide lipped cup fits into corners of the mouth to reduce spillage. A flexible cup may be preferred**
 - **A narrow base to the cup promotes good head and neck posture in midline**
 - **A rolled rim allows for a stabilized bite**
 - **A transparent cup helps to see cup placed with tongue underneath**
 - **Straight and narrow cups cause neck extension**
- **Types: Solo 9 oz.plastic cup, Nosey cup, MagMag training cup system, Infatrainer**

Cup Drinking Tips

- **Consistency modification**
 - Slightly thicken liquids with rice cereal or thin pureed fruits with water
 - Gradually thin as child's skills improve
- **Present spoon first and follow with cup**
- **Colder liquids may increase awareness and trigger a faster swallow**
- **Acidic and sweet liquids increase saliva**
- **To assist jaw stabilization and postural alignment of head and neck let cup rest on the lower lip between swallows. Slight downward resistance may help stabilize jaw**
- **A cup with a recessed lip is recommended when introducing independent cup-drinking**

Chewing

“Breaking up food into small pieces!”

- **A “lateral” skill: Tongue moves from side to midline, from midline to side, and then to cross-midline transfer and finally rotational movements**
- **Jaw, tongue, teeth, cheeks, and lips all work together**
- **Development**
 - **“Munching”**: 6 -7 months: Vertical jaw with limited lateral tongue movements
 - **“Lateral Chew”**: 12 -24 months
 - **“Cross midline transfer”**: 18-24 months
 - **“Rotary Chew”**: 24-36 months: Tongue lateralization and jaw stabilization
- **Chewing practice without swallowing: “Food ball”**

Chewing Tips

- **Begin with foods that break down easily and don't flake apart or gum up, "meltables", by placing small pieces between side teeth/gums. Alternate sides of the mouth.**
- **Progress to long, thin, crispy or soft foods: graham crackers, cheese, French fries, bread sticks, and partially cooked carrots, licorice sticks, fruit leather strips**
- **Firmer foods can be introduced when tongue lateralizes across midline.**
- **Changes from pureed to ground textures require increased lateral tongue action and rotational jaw movement. Children should experience the textural variations of ground before solids are introduced into the diet (Morris and Klein, 1987)**

Biting

“Breaking small pieces of food off larger pieces”

Prerequisites:

- **Mouthing and biting activities**
- **Jaw stabilization in open, closed, and still positions**
- **The ability to grade jaw movements and sustain pressure**
- **Dental eruption (sensory receptors), alignment, occlusion, and sensitivity**
- **Tips:**
 - **Good stable positioning is critical for neck, head and jaw stability**
 - **Offer lots of opportunity for safe biting and chewing of non-food**
 - **Avoid foods that require maximum preparation (peanuts, popcorn, hotdogs, raw vegetables, and mixed textures)**
 - **Snapping off small pieces grading thickness for progression of a sustained bite**
 - **External jaw support and resistance activities**

Straw Drinking

- **Reinforces sucking and promotes tongue thrusting**
- **Introduced after open cup and chewing**
- **Good for those who need sucking action for fluid intake and independence**
- **Selection depends on strength of suck and subsequent flow rate**

Straw Drinking

Tips:

- Firmer straw resist biting and chewing
- Wider the opening the less lip closure
- The smaller the opening the less flow
- Curly straws require more work
- A small hole with thick walls and a wider outer circumference works best for kids with a poor suck
- Blocked straw technique
- Don't place straw too far back as it reduces oral control
- Thicker liquids require more effort and pressures

Self-feeding

- **Difficulty with hand to mouth control, vision, and motivation to eat**
- **Independence should not be at the expense of nutritional intake**
- **Improving oral feeding skills first and then introducing independence may lead to more successful outcomes**

Texture Definitions

- **Liquids**
 - Thin: water, juice, milk, formula
 - Nectar: Kearns juices, drinkable yogurts
 - Syrup: Thick smoothie or milkshake
 - Honey: Wendy's Frosty
 - Spoon-thick: Stage 2 puree
- **Purees**: Homogeneous, very cohesive, no chewing
 - Thin: Baby cereal plus formula
 - Slightly thick: Stage 1
 - Thick: Stage 2: Pudding-like
- **Meltable Solids**: Crispy but stay together in a mass. Cheetos, Fruity Booty, Veggie sticks, Lorna Doones, Nabisco Grahams, Teething biscuits, Meringue

Texture Definitions

- **Hard Munchables:** Marker size carrots, pepperoni sticks, licorice, lollipops, veggie sticks: **Not for biting or chewing, but for mouthing exploration!**
- **Spooned Chewables:** Moist, cohered fork mashed or blended table foods: Oatmeal, mashed potatoes, casseroles, macaroni and cheese, rice and beans
- **Crispy Solids:** Crispy but shatter in the mouth. Crackers, cheerios, chips
- **Mechanical Soft:** Moist cohered, semi-solids requiring some chewing: Soft cubes of cheese, pasta, casseroles, scrambled eggs, soft meats, French fries
- **Hard Mechanical:** Require more chewing. Meats, regular table foods, nuts, popcorn, raw vegetables

Saliva Control: Tips

Therapeutic

- Handling and Positioning
- Oral Sensorimotor facilitation
 - Slight downward pressure across upper lip closed lips
 - Mouth wiping: Dabbing with slow firm blots of a small absorbent material
 - Brushing and icing
 - Improve jaw stability
- Drop Retrieval
- Cueing
- Wet-dry discrimination
- Blotters

Surgery: Best with less affected older kids

Medications: Botox

Oral Preparatory Phase Dysphagia

Signs and Symptoms

- **Poor weight gain**
- **Abnormal oral sensitivity**
- **Abnormal muscular tone**
- **Jaw instability with lack of separation of structures**
- **Reduced lip closure and cheek retraction**
- **Abnormal tongue movements**
- **Limiting oral postures**
- **Poor oral feeding skills**
- **Delayed acquisition of oral feeding skills**
- **Anatomic variations: dental occlusion, clefting, restricted frenulum, etc.**
- **Inefficient preparation of swallow safe bolus size**
- **Excessive drooling and food spillage**

Oropharyngeal Phase Dysphagia

Signs and Symptoms

- Absent or delayed initiation of the swallow
- Nasopharyngeal reflux: food loss from the nose
- Vocal or pharyngeal congestion
- Pharyngeal residue: Multiple swallows
- Respiratory changes
- Obstructive tonsils and adenoids
- Any impact on the organization, coordination, sequence, or strength of the pharynx will impair clearance of food and liquid and jeopardize the airway

Esophageal Phase Dysphagia

Signs and Symptoms

- **Cricopharyngeal dysfunction**
- **Esophageal obstruction**
- **Anatomic malformation**
 - **Tracheo-esophageal fistula**
 - **Esophageal atresia**
 - **Achalasia**
 - **Diverticulum**
- **Gastroesophageal reflux/Reflux Esophagitis**
- **LES pressure responds to hormonal and pharmacological influences**
- **Drooling, reduced swallowing frequency, and reduced peristaltic action**

Dental Hygiene

- **Dental care is especially important for kids who have feeding problems because:**
 - **Poor tongue control to clear away food**
 - **Mouth breathers**
 - **Softer diets reduce stimulation to teeth and gums**
 - **Tooth grinding can damage teeth**
 - **Reflux can damage outer surfaces of teeth**
 - **Often there is dental malalignment or malocclusion**
 - **Drooling**

Dental Hygiene: Tips

- **Visit a pediatric dentist who works with special needs kids**
- **Seek advise on fluoride supplements**
- **Wash your hands carefully to prevent spread of infection when providing mouth care**
- **Position in the best way possible**
- **Gum massage helps pave the way**
- **Give opportunities for swallowing when brushing teeth**

Dental Hygiene: Tips

- **Teach spitting**
- **Start brushing on least sensitive side with the head of the brush rolled under the lip, one quadrant at a time, using circular movements**
- **Begin with water on brush and then add cleaners**
- **Electric toothbrushes can be helpful if tolerated**
- **Gauze can be used wrapped around finger**
- **Tube fed kids need tooth brushing too!**

Mealtimes at School

■ **Problems**

- Inadequate and varied staff
- Inadequate time allocated
- A noisy, distracting environment
- Poor management of seating, equipment, and positioning
- Lack of feeding therapist to support a protocol for feeding skills and swallowing
- Self-consciousness and social isolation
- Limited dietary support
- Mealtimes are seen as interruptions to learning

■ **Advantages**

- Create excellent opportunities for learning: communication, independence, personal hygiene, and social skills

Tips for Mealtimes at School

- **Risk assessment: Choking, staffing, training and supervision of skilled staff, appropriate textures, etc.**
- **Provide a chain of trained overlapping support staff.**
- **Positioning should be monitored closely by motor therapists**
- **Feeder must understand communication signals and supports**
- **Sufficient time (1 hr) must be provided for pleasurable mealtimes that are safe and efficient. Time for moving, handling, positioning, eating, drinking, tooth brushing and toileting is needed. This can be therapeutically adaptive and be included in an IEP.**

Tips for Mealtimes at School

- **“Lunch Clubs” help to provide a mealtime for a small number of children in a distraction free and quieter area. Peers are included**
- **Snack times may be critical for maintaining good nutrition and hydration**
- **Develop a IMP: Individual mealtime plan! Work with your school’s Feeding Team. Home visits are important. Transdisciplinary meetings at regular intervals should include the child’s feeders.**

A Few Last Tips...

- **Enlist help: It's a huge responsibility for one person**
- **Look after yourself: comfort and posture**
- **Remember your goal is safety, efficiency and nutrition**
- **It's your job to give food...it's the child's job to eat it**
- **Eliminate stressors: Make it fun!**

Resources

- **Medical Based Feeding Clinics**
- **Early Intervention and School based Feeding Teams**
- **Private OT and Speech clinics and practices**
- **Medical Intensive Feeding Programs**
 - **Inpatient**
 - **Outpatient Day Clinics**

Resources

- www.rsoi.org
 - **Regional Services**

- <http://www.fairfield.edu/fleitas/sitemap.html>
 - **Band-Aides and Blackboards: When Chronic Illness...Or Some Other Medical Problem...Goes to School.**

- <http://www.brookespublishing.com>
 - **Children and Youth Assisted by Medical Technology in Educational Settings**

Resources

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Resources

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