Feeding

Infants & Toddlers

Strategies for Safe, Stress-free Mealtimes

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Developmental Milestones and Feeding

Age	Developmental Milestone	Language Development	Feeding/Swallowing Development
Birth-2 months		Cries	Nipple feeding by breast or bottle Hand to mouth movements begin Semi-reclined posture during feeding
2-3 months		Demonstrates different cries Coos in response to caregiver	Interacts with caregiver during feeding through gaze
3-4 months	Midline orientation of head, eyes, and hands begins	Babbles randomly	Begins to put hands on bottle during feeding
5-6 months	Increased head and neck control Visual tracking Sits with support Rolls over Brings hands to mouth	Babbles rhythmically	Spoon feeding introduced (4-6 months) Cup drinking introduced Holds bottle with both hands
6-9 months	Begins to sit independently Explores mouth with hands and toys Crawls Begins to use pincer grasp Visual interest and acuity increases Stranger anxiety begins Develops concept of object permanence Reaches for desired objects Ability to move tongue laterally increases Cheek, lip, and tongue strength improve Increased head, neck, and trunk control	Babbles in imitation of real speech (jargon)	More upright posture during feeding Increases lip closure around spoon Accepts spoon feeding of pureed food Begins to finger feed solids Vertical chewing pattern (munching) begins Able to suck liquids from cup Helps caregiver with spoon
9-12 months	Pulls up to stand Cruises along furniture First steps may be seen by 12 months Attempts to spoon feed Pincer grasp becomes more refined Increased mobility in shoulders and arms	Says 1 - 2 words Recognizes name Imitates familiar sounds Understands simple instructions	Drinks from cup held by caregiver Progresses to thicker, more textured food Increased finger feeding of easily dissolvable foods Chewing matures to more rotary jaw action Deliberately reaches for spoon
12-18 months	All gross and fine motor skills maturing Walks independently Climbs stairs Runs Grasps and releases well	Uses 5 - 20 words, including names	Grasps spoon with both hands for self-feeding Holds cup with both hands Able to hold and tip bottle independently
18-24 months	Attention and play skills increase	Says 2-word sentences Vocabulary continues to grow Waves goodbye Makes some animal sounds Uses words to express wants Understands “no”	Primarily self-feeding Able to chew a wide range of textures Oral movements are more precise
24-36 months	Uses scissors Jumps in place Pedals tricycle	Identifies body parts Calls self “me” instead of name Has a 450 word vocabulary Uses short sentences Matches 3 - 4 colors Knows big and little Likes to hear same story over and over again Forms some plurals	Holds cup with one hand Drinks from open cup without spilling Uses fingers to put food on spoon Uses fork Almost completely self-feeds Eats a wide range of solid foods

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Including Baby in Mealtime before Starting Solids

- Let baby sit with family at mealtimes
- Give baby a cup of water for play and practice
- Offer baby sips of water from your own cup or straw
- Offer spoons, cups, bowls and other baby-safe eating utensils to play with
- Give baby an ice cube or ice chips to play with
- Offer baby a momsicle (popsicle made from breast milk) or slushy frozen breast milk to eat with a spoon

4 Phases of Swallowing

Anticipatory Phase:	This is the “getting ready” phase
Oral Phase:	Oral Preparatory and Oral Voluntary This is where the food or liquid is manipulated in the mouth into a *bolus* and propelled backwards to exit the oral cavity
Pharyngeal Phase:	This phase begins with the initiation of the swallow reflex.
Esophageal Phase:	This is a wave that moves the bolus through the esophagus into the stomach.

The Pharyngeal and Esophageal Phases are completely involuntary.

Infant Swallowing Reflexes

Infants have many reflexes and responses designed to protect the airway.

Rooting reflex:	This is a reflex that helps infants prepare for sucking. It can be elicited with pressure on check, upper or lower lip and continues until he latches on to the nipple.
Swallowing:	This is a reflex in response to the bolus entering the pharynx. Once the bolus leaves the oral cavity there is no voluntary movement.
Tongue Thrust:	Also called Tongue Protrusion. This reflex is elicited by touching the front of the tongue. It may be a protective mechanism to keep out foreign objects. When this reflex begins to disappear, between 4-6 months, spoon feeding of solids can be introduced. If you still see consistent tongue protrusion, wait to attempt spoon feeding.
Phasic Bite:	This is elicited with pressure to the gums and is responsible for early munching (vertical chewing) patterns.
Gag Reflex:	This reflex has no relationship to swallowing in adults, but in infants it begins to diminish @ 6 months when solid feeding is usually started. Like tongue protrusion, it may be a protective measure.

Possible Signs of a Feeding/Swallowing Disorder

- Refusing to eat
- Eating very little for a prolonged period of time
- Spitting out food
- Frequent coughing or throat clearing during or soon after eating
- Excessive drooling
- Food leaking from mouth
- Refusing to eat certain textures or temperatures of food
- A “wet” or “gurgly” sounding voice or cry after eating
- Excessive spitting up or vomiting after eating

Premature Infants

- Gestational period less than 36 weeks
- Often unable to coordinate sucking, swallowing and breathing until 34 weeks
- Premature infants do not have sucking pads
- Some premature infants and those born with very low birth weight (VLBW) experience a number respiratory issues that negatively effect their ability to eat

Reflux

- Occurs when the contents of the stomach, including the stomach acid, return to the esophagus.
- Can occur when eating or drinking but also when there is any kind of change in intra-abdominal pressure
- Some symptoms of children with GERD may include:
    - Vomiting
    - Coughing, gagging, or choking
    - Exhibit abnormal postures
    - Unexplained irritability

Failure to Thrive

- Weight below the 3rd percentile for age
- Organic, non-organic or mixed etiology
- Organic causes include endocrine deficiencies, chronic disease, enzyme defects or congenital/genetic anomalies or oral-motor dysfunction
- Non-organic causes include poor caregiver-child interaction, psycho-social issues, environmental deprivation, child abuse and poor feeding practices
- Factors related to caregiver-centered FTT include lack of nutritional information, improper feeding techniques, unrealistic expectations about feeding, inability to accurately assess the child's needs, neglect and isolation

Aspiration

- Occurs when food travels into the airway instead of into the stomach
- Often suspected by observation of coughing, wet voice, throat clearing, or diagnosis of pneumonia
- Aspiration may be seen on different textures so a child could be perfectly safe eating purees and solids but aspirate on thin liquids
- If you suspect aspiration, contact your pediatrician to discuss the possibility of a swallowing evaluation

Sensory Issues

- **Reactive Sensory Defensiveness** can occur when an infant has not received positive sensory input to the mouth
- When sensory input is provided, it may be experienced as very strong and uncomfortable
- **Primary Sensory Defensiveness** to facial and oral stimulation occur as a primary difficulty in some children
- Child's basic perception is one of danger, and the sensory stimulus is often perceived as an attack
- Not based on some past, negative experience
- May occur as a response to touch, movement, smell, taste, and texture in food
- **Eating Aversion** is the result of a complex interplay of sensorimotor, gastrointestinal, and environmental responses
- Typically perceived as a behavioral issue
- Many of these children have subtle sensorimotor and gastrointestinal issues that make eating uncomfortable
- These children may choose a non-eating behavior to reduce or prevent discomfort

Non-Oral Feeding

A variety of feeding tubes are given to support life, and to make it easier for the child to grow without the risk of malnutrition, excessive fatigue, or aspiration.

- Premature infants under the gestational age of 33 weeks or 3 pounds have not yet developed strong sucking and swallowing patterns that can support oral feedings

- Children with severe respiratory or cardiac problems may not have the energy to suck and swallow

- Children who lack the neurological coordination needed to have an efficient oral phase. Sucking and swallowing may be very slow or uncoordinated, and the child might be unable to take in enough calories before becoming exhausted

- Children with severe gastrointestinal difficulties like reflux and vomiting. Surgical procedures to prevent reflux may increase the discomfort of swallowing and result in a reduced desire to eat

- Types of feeding tubes include:

    - Those inserted through the oral-pharyngeal area

        - nasogastric or orogastric tubes

    - Those inserted more directly into the digestive system

        - gastronomy or jeujenostomy tubes

- Tube feeding is often considered a failure and something to be gotten rid of as quickly as possible

- The process to wean from tube feedings to more oral feedings must be focused on developing the underlying skills to support feeding rather than on the feeding process itself

Feeding Tips for All Children

- Offer small portions (a tablespoon) to start
- Don’t ask a child what he wants and don’t be a short-order cook
- Don’t fight about food or set up power struggles
- Offer foods that are nutritious and developmentally appropriate
- Lightly cook or steam raw fruits and vegetables to aid digestion
- Encourage oatmeal or oat bran cereals in children with digestive problems or constipation
- Avoid warming food or putting hot food in plastic containers
- Do not have the TV on during snack or mealtimes
- Encourage children to help prepare or serve food
- Serve appropriate portions to toddlers and young children

Some Activities to Increase Oral Stimulation

Young children with feeding and swallowing issues related to a sensory disorder may benefit from stimulation activities that can be done at home by a caregiver at home or in a child care setting. Always consult with a speech-language pathologist or occupational therapist before embarking on a program to affect oral defensiveness.

- Gentle massage with a NUK brush
- Gentle massage with a small finger toothbrush brush
- Offer a strong piece of sterile rubber tubing to practice biting and increase jaw strength
- Offer foods of different textures: pretzels, crackers, puddings, jell-o, ice cream, mashed potatoes, etc.
- Offer drinks of different temperatures and composition
- Offer gentle vibrating toys for facial massage or oral exploration
- Gentle facial massage with different textures of cloth

Ways to Support a Child's Future Oral Feeding

Children who receive tube-feedings should be given the opportunity to develop comfortable and safe oral-motor skills. Under the direction of a speech-language pathologist, there are many activities that parents can participate in to support the child's ability to return to, at least some, oral feeding in the future.

- Keep mealtimes relaxed, comfortable, and interactive to enhance the child's association between eating and pleasure.

- An infant can be cradled in the parent's arms during the tube-feeding and receive the same interactive benefits with a caring feeder as a bottle-fed infant. Older infants and toddlers can be tube-fed during a family meal or fed in a special chair or location associated with eating.

- Provide affectionate, interactive sensory input to the child's face and mouth during play and daily care activities. Comforting touch, patting or stroking while singing or story-telling can build positive associations with oral-facial input which can prevent hypersensitivity and negative associations from developing.

- If no reflux or other gastrointestinal discomfort is noted during meals, engage in oral stimulation during tube feedings like sucking on a pacifier, stroking the lips, playing with mouth toys or other pleasurable input.

Strategies to Expand Children's Diets

- Participate in activities to normalize sensory processing before or during experiences with food
  - Jumping, bouncing, climbing stairs or marching for vestibular input
  - Firm hugs for deep touch pressure input
  - Consult with a skilled OT to develop appropriate sensory activities

- Begin where you are
  - Make a list of the foods and drinks the child will accept and organize by sensory properties
  - Make a list of other foods in the same categories

- Make small, gradual changes as new food are introduced
  - Introduce a different brand of a food
  - Introduce a different type of food
  - Make bridges toward totally new foods

- Increase comfort with new textures and foods through play
  - Keep food play separate from meal time

- Build acceptance through gradual, repeated exposure
  - Expose children to a variety of foods without an expectation of eating

- Build interest and involvement with food and mealtime
  - Encourage children to help prepare meals with no expectation of eating

- Offer foods high in nutrition
  - Children need dietary variety to get the calories and nutrients required for growth

Choosing Appropriate Feeding Equipment

Below is a list of the general characteristics of nipples, cups, and spoons that may be helpful.

Nipple

- No artificially enlarged hole that create a rapid, uncontrolled flow of liquid
- Proper fit for the size and shape of the child's mouth
- Adequate stiffness appropriate for the child's sucking pattern. A softer nipple may be better for the infant or child with a weak suck or who tends to tire easily. It should not collapse with the child's sucking

Cup

- Can be tipped up to get liquid at the bottom without tipping the child's head back
- Will not shatter or break if the child bites the edge
- Allows the caregiver a clear view of the child's mouth
- Has a thick or rolled edge for extra stability if the child needs to hold the edge of the cup with the teeth
- Has a mechanism for careful, slow control of the liquid flow for the child whose ability to handle a larger volume of liquid is poor
- Appropriate size and shape for a child to hold independently

Spoon

- Bowl of the spoon is relatively flat so that food can be removed easily by the upper lip
- Will not shatter or break if the child bites down on it
- Bowl fits the size of the child's mouth
- Coated or has a sturdy plastic bowl if the child is hypersensitive to temperature or taste, or bites down on the spoon
- Length of handle is appropriate to the size of the feeder's hand
- Handle of the spoon is wide, thick, and short for the child who is just learning to self-feed

Resources

American Speech-Language Hearing Association (ASHA)
www.asha.org
ASHA is the professional organization for Speech-Language Pathologists and Audiologists. They offer wonderful resources for families and caregivers.

Children's Hospital of Milwaukee
www.chw.org
This is one of the premier feeding and swallowing clinics in the country. They offer lots of articles and information.

Mailing Lists for Feeding Issues of Children
http://www.comeunity.com/disability/speclists.html#feeding
Recommended parent discussion lists about feeding difficulties in young children.

Small Wonders ~ A Preemie Place
http://hometown.aol.com/Lmwill262/index.html
Laura Williams' website has important feeding tips and stories for parents of children born premature. Be sure to read: Weight & Feeding: A Preemie Parent's Struggle, Feeding Tips for Preemies, and Treatment for Behavioral Aspects of Feeding Disorders. Includes the excellent Feeding Forum.

Comeunity : Sensory Integration
http://www.comeunity.com/disability/sensory_integration/
Sensory integration articles and resources here on the Comeunity website.

Dysphagia Resource Center
http://www.dysphagia.com/
Resources for swallowing and swallowing disorders. Includes the excellent **Dysphagia**

NICDC - Dysphagia Factsheet
http://www.nidcd.nih.gov/health/pubs_vsl/dysph.htm
Overview of dysphagia - defination, causes, and research.

Marcus Institute, Emory University
http://www.marcus.org/feedfocus.htm
Information on feeding disorder programs for young children, and several articles.

Feeding guidelines for you and your young child

Providing safe, nutritious food is one of the most important ways that you care for your young child. It can be tremendous fun or a tremendous stress; usually some of each. Below are some guidelines that may help you relax and enjoy the process.

How many calories does my child need to grow?

Each child's nutritional needs vary as a result of metabolism, activity level, height, weight and medical status. Children's appetites vary from meal to meal, day to day and week to week. One day you might think that your child is eating really well (a lot) and the next day he or she won't eat more than a couple of bites. When children are teething they may be less inclined to eat because their mouths might be sore or they may feel a little under the weather. When they are busy learning to run and jump and play it may be difficult to get them to sit still long enough for a nutritious meal or even snack. It's OK. Most children have an innate ability to regulate their eating. It is important not to judge your child's nutritional intake from a single meal or day. A healthy diet balances itself out over several days so your child's intake over the course of a week is more important than the intake during a particular meal or day.

Below is a guide to calorie needs for children based on age and weight. Remember that these are just guidelines and should be judged over the course of a week or so.

Age	**Calories per lb.**
birth – 6 months	49.0
6 months – 1 year	44.5
1 – 3 years	46.0
4 – 6 years	41.0
7 – 10 years	32.0
11 – 14 years	
male	25.0
female	21.5
15 – 18 years	
male	20.5
female	18.0

Adapted from the Manual of Pediatric Nutrition, Twin Cities Dietetic

Children's Serving Sizes

Since children are most often eating fresh, unprocessed foods it is often difficult to determine how much we should be serving them. There is no handy chart on the side of an apple telling parents how much a typical 18 month old should eat and labels on most packaged foods offer serving size information for adults. How then, do we know if our children are eating the appropriate amounts and types of foods?

The old food pyramid is still a good guide to which foods to serve more often than others but the portions are for adults. Below is a helpful guide for children from one to ten years old. This guide can be helpful in planning your child's meals to ensure that he or she is getting not only enough, but the right kinds of food.

Food Group	**1 – 3 years**	**4 – 6 years**	**7 – 10 years**
Grains 6-8 servings/day	½ slice bread ¼ C cooked cereal, rice, pasta 1/3 C dry cereal 2 to 3 crackers	½ slice bread 1/3 C cooked cereal, rice, pasta ½ C dry cereal 3 to 4 crackers	1 slice bread ½ C cooked cereal, rice, pasta ¾ to 1 C dry cereal 4 to 5 crackers
Vegetables 2-3 servings/day	¼ C cooked vegetables	¼ C cooked vegetables ½ C salad	¼ C cooked vegetables ½ C salad
Fruits 2-3 servings/day	¼ C cooked or canned fruit ½ piece fresh fruit ¼ C juice	¼ C cooked or canned fruit ½ piece fresh fruit 1/3 C juice	1/3 C cooked or canned fruit 1 piece fresh fruit 1/2 C juice
Dairy 2-3 servings/day	½ C milk ½ oz cheese 1/3 C yogurt	½ C milk 1 oz cheese 1/2 C yogurt	1 C milk 1 oz cheese ¾ to 1 C yogurt
Protein 2 servings/day	1 oz meat, fish, poultry, tofu 1 egg	2-3 oz meat, fish, poultry, tofu 1 egg 2 tb peanut butter ¼ C nuts ½ C cooked, dried beans or peas	2-3 oz meat, fish, poultry, tofu 1 egg 2 tb peanut butter ¼ C nuts ½ C cooked, dried beans/peas

Did you know that for children under age 2:

- 2 ounces of vitamin-C enriched orange juice gives a child all the vitamin-C he or she needs in a day
- 1 ounce of cheese has the same amount of calcium as 8 ounces of whole milk
- Just 1/8 cup of cooked carrots provides all the vitamin-A needed in a day

Some Feeding Tips

- Offer small portions (a tablespoon) to start because too much food at one time can overwhelm a baby and actually depress the appetite
- Offer foods that are vitamin-enriched and iron-fortified whenever possible
- Lightly cook or steam raw fruits and vegetables to aid digestion
- Encourage oatmeal or oat bran cereals in children with digestive problems or constipation
- Avoid warming food or putting hot food in plastic containers because compounds in the plastic are now known to seep into the food. While this should be avoided for adults it can be particularly harmful in children. Always warm food in non-plastic bowls or plates and wait to store in plastic until room temperature.

- **Foods to avoid in the first year**

- white sugar
- artificial sweeteners
- corn syrup
- shell fish
- egg whites or uncooked egg yolks
- fried foods
- unripened fruits
- chocolate or candy
- honey
- uncooked onions
- snack foods like potato chips or pretzels
- tomatoes
- corn
- processed meats like bacon, hot dogs, salami, bologna, etc.

Foods that may cause choking in young children

- hot dogs (should be cut up into bite sized pieces when served)
- peanuts
- popcorn
- snack chips
- seeds
- whole grapes or olives (should be cut in half when served)
- cherries
- corn kernels
- raw carrots and other hard to chew vegetables
- peanut butter (especially when served on soft bread)
- baby food that is too pasty
- hard candy (including the pretty wrappers)
- jelly beans

Some Good Finger Foods

- steamed apple and pear wedges
- steamed carrot, zucchini or summer squash circles or asparagus spears
- ripe banana and avocado spears
- egg-free pasta
- cottage cheese
- cheese cubes
- cut up chicken
- steamed broccoli and cauliflower
- cut up jelly sandwich or toasted waffle with peanut butter

Suggested Food Introduction Timeline

Age	Diet
Birth-6 months	Breast milk or formula
4-6 months	Cereal and Grains: rice cereal, oatmeal
	Fruit and Vegetables: very ripe, mashed banana, apple sauce, pureed pear, acorn or butternut squash, sweet potato
5-7 months	Cereal and Grains: barley, wheat
	Fruit and Vegetables: peaches, plums, carrots, peas, green beans
6-8 months	Cereal and Grains: kasha, brown rice, whole wheat bread
	Fruit and Vegetables: apricots, zucchini, summer squash
	Meats: chicken, turkey
	Milks: plain yogurt
7-9 months:	Cereal and Grains: oat cereal circles (like Cheerios), teething biscuits
	Fruit and Vegetables: papaya, avocado, asparagus
	Meats: lean beef
	Milks: cream cheese, cottage cheese, ricotta cheese
8-10 months	Cereal and Grains: egg-free noodles
	Fruit and Vegetables: citrus fruits, nectarines, prunes, beets, broccoli
	Meats: lamb, liver
	Milks: mild cheeses
9-11 months	Fruit and Vegetables: kiwi, spinach, baked white potato, parsnips
	Meats: egg yolks
	Pureed Combination Foods: chicken with vegetables, beef with noodles or rice
10-12 months	Fruit and Vegetables: cantaloupe, watermelon, blueberries, cauliflower, cucumber, eggplant
	Meats: tofu, lentils, lima beans, dried beans and peas, white fish, pork