

# Feeding Healthy Term Infants Resource Manual

# Section B. Introduction of Solids

# **B.1 Signs That Infants are Ready to Eat Solid Foods**

## Recommendations

- a) Infants are ready for solid foods at approximately 6 months of age.
- b) The following are signs that an infant may be ready to eat solid food:
  - holds her head up;
  - sits up (on own or with some assistance) and leans forward;
  - opens her mouth when food is offered;
  - takes food from a spoon;
  - ability to let the parent/caregiver know when she is full (e.g. turns head away to refuse food);
  - keeps food in mouth and swallows it instead of pushing it out; and
  - ability to pick up food and try to put it in her mouth (e.g. mouths toys and fingers).

## **Evidence**

- By about 6 months of age, infants are physiologically and developmentally ready for new foods and textures with the goal of eating a variety of foods, including vegetables and fruit, whole grains and protein foods at one year of age.<sup>1,2</sup>
- Early introduction of solid foods (prior to 6 months of age) decreases the duration of exclusive breastfeeding.<sup>1</sup>
- Early introduction of solid foods (including adding infant cereals or other pureed foods to bottles containing formula or milk), may pose more risks than benefits, including the potential for under-nutrition (associated with decreased milk consumption), over-nutrition (due to increased caloric density), and diarrheal diseases (due to exposure to pathogens present in foods). 1,3 Moreover, the effects of early introduction of rice protein into an infant's diet are not known. 1 Preliminary data also suggests that early introduction of complementary food during infancy increases the odds of developing picky eating behaviours and obesity in preschool-aged children (the latter observation reported in formula-fed infants only). 4,5 [Level C Evidence]
- After 6 months of age, delay in introducing solids increases the risk of iron deficiency. 1
- Late food introduction has also been associated with growth faltering, micronutrient deficiencies and diminished motor skills.<sup>2</sup>

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# **B.2 Order of Introducing Solid Foods**

## Recommendations

- a) Infants should continue to breastfeed or be fed infant formula with iron while solids are introduced. Breast milk or infant formula should be the major source of nutrition for the first 9–12 months of life. There is insufficient evidence to suggest an order for breastfeeding and feeding solids at a meal, however, an order may be suggested in individual cases if feeding problems are present.
- b) Iron-containing foods should be the first solids introduced, at 6 months of age. Sources of iron include meat, fish, poultry, eggs (especially cooked egg yolk), cooked legumes and tofu. Iron-fortified infant cereal may be added, but the iron in cereal is not absorbed as well as the iron contained in meat. Consuming a food containing a source of vitamin C helps to increase absorption of iron from plant sources.
- c) Vegetables, fruits, grain products and milk products such as cheese and yogurt can be introduced in any order. Whole cow's milk can be introduced at 9-12 months, when the infant is eating a variety of iron-rich foods (see *Whole Cow's Milk* in *Section C. Introduction of Other Fluids*).
- d) New foods should be introduced individually; parents and caregivers should be advised to wait 2–3 days before introducing another new food.
- e) Infants can eat many of the same nutritious foods enjoyed by the family. They should be prepared with little or no added salt or sugar. Dietary fat restriction is not recommended for children younger than 2 years of age.

## **Evidence**

- At around 6 months of age, breast milk or infant formula should still be the main source of nutrition. However, it is no longer sufficient to meet all of the infant's nutrient needs. As solids are introduced, the foods offered as a 'complement' to breast milk or formula should be energy-dense and rich in nutrients such as iron.<sup>1</sup>
- There is little evidence to indicate whether solid foods should be offered before or after breastfeeding. Adequate energy and nutrient intakes for this age group are the result of a balance between appropriate breastfeeding and complementary feeding.<sup>2</sup>
- The wide variability in infants' needs makes regular growth monitoring essential as an indicator of nutritional adequacy throughout the first 2 years of life.<sup>2</sup> [Level A Evidence]
- Most healthy term infants are born with sufficient stores of iron to meet their iron needs until they are about 6 months of age. At around 6 months, iron stores are depleted and breast milk alone can no longer meet all of the infant's nutrient requirements.<sup>3, 4</sup>
- Iron-containing foods are recommended as the first solid foods introduced to infants.

  Traditionally, iron-fortified infant cereal has been the first food introduced, but meat, fish, poultry, eggs and plant-based protein foods including well-cooked legumes and tofu may

- also be added at this time. Iron from meat sources is better absorbed than iron from non-meat sources.<sup>4,5</sup> [Level B Evidence]
- Other than iron-rich foods being the first foods introduced, there is no particular order for the introduction of other foods (except fluid cow's milk). There is no evidence to suggest any benefit to introducing complementary foods in a specific sequence, other than as needed to meet nutritional needs. 4,5 [Level C Evidence]
- Vegetables, fruit, and milk products such as cheese and yogurt can be introduced, between 6 to 9 months, along with a variety of iron-rich foods. <sup>1,4</sup> [Level C Evidence]
- Vegetables and fruits added to the infant's diet contribute important nutrients as well as providing colour, flavour, texture and variety. [Level C Evidence]
- Whole cow's milk can be introduced at 9-12 months, when the infant is consuming a variety of iron-rich foods (see *Whole Cow's Milk* in *Section C. Introduction of Other Fluids*).<sup>1,4</sup>
- The introduction of one food at a time makes it easier to identify the cause of an allergic reaction, were it to occur. There is no evidence to indicate the ideal interval before the introduction of the next new food; a guideline is between 2 and 3 days. 5,6 [Level C Evidence]
- In infants 6 months or older with or without a parental history of allergy, there is a lack of consistent evidence to suggest that delaying the introduction of common allergenic solid foods (eggs, fish, shellfish, peanuts, tree nuts, soy, wheat) has an impact on the development of allergy (see *Highly Allergenic Foods*, page 18).<sup>3,7,8,9</sup> [Level D Evidence]
- From 6 months of age, infants can eat many of the same nutritious foods enjoyed by the family. Children who have early experiences with eating nutritious foods are more likely to prefer and consume those foods, leading to eating patterns that promote healthy growth. These eating patterns may continue into later childhood.
- Advise parents and caregivers to limit or avoid adding salt and sugar when preparing foods for infants and young children. This allows them to experience food's natural flavours.<sup>1</sup>
- Commercial infant foods are not needed and can be high in added sugar. Health Canada's Food and Drug Regulations have strict limits on sodium, food additives, and the addition of vitamins and minerals to foods for infants less than 12 months of age. However, there are no regulations on sugar.<sup>1</sup>
- Restriction of dietary fat is not recommended for children under 2 years of age as it may compromise a child's intake of energy and essential fats, adversely affecting growth and development. There is no evidence that dietary fat restriction has any benefit during childhood. Nutritious foods that contain fat (e.g. breast milk, whole cow's milk, cheese, avocado, nut butters) provided a concentrated source of energy during a life stage when fat and energy requirements are especially high.<sup>1</sup>

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# **B.3 Order of Introducing Textures**

## Recommendations

a) Food consistency and variety should gradually increase with increasing age as shown in Table 1. It is important that parents and caregivers provide a variety of soft textures and finger foods from 6 months of age.

Table 1. Progression of foods offered by age<sup>1,2</sup>

Age	Texture of foods offered					
6 months	<ul> <li>A variety of soft textures on a spoon or as finger foods: pureed, mashed, ground, lumpy, finely minced, and grated foods</li> <li>Safe finger foods include:         <ul> <li>Pieces of soft-cooked vegetables and fruit</li> <li>Ripe fruit, e.g. banana</li> <li>Fine minced, ground or mashed cooked meat</li> <li>Deboned fish</li> <li>Grated cheese</li> <li>Bread crusts or toast</li> </ul> </li> </ul>					
6-8 months	<ul> <li>Finger foods as above</li> <li>Crunchy foods that dissolve (e.g. toast, crackers)</li> <li>Increased variety of flavours</li> </ul>					
12 months	A variety of family foods with modified textures: chopped, ground or mashed					

- b) Advise parents and caregivers to progress quickly to foods with a lumpy texture. Delaying the introduction of lumpy textures beyond 9 months of age is associated with feeding difficulties in older children and a lower intake of nutritious foods.
- c) Foods that children can easily choke on should not be given until 4 years of age, unless safely prepared (see *Choking Hazard Foods*, page 16).
- d) Children should transition to the family diet at about 12 months of age.
- e) Children should always be supervised when eating.

### **Evidence**

• An infant's ability to consume various types and textures of complementary foods depends on the maturation of her neuromuscular system. Infants have 4 age-related methods of processing food: suckling, sucking, munching and chewing. From birth to 6 months, infants have the oral skills to suckle, suck and swallow.<sup>2,3</sup>

- As infants are introduced to solid foods, they develop the ability to "munch" (up and down mandibular movements). This allows them to eat some solid foods (e.g. crackers, toast, ready-to-eat breakfast cereals) whether or not they have teeth. <sup>2,3,4</sup>
- Based on consensus, recommendations suggest that food consistency and variety offered to
  infants should gradually increase with increasing age. At 6 months of age, infants can start
  with pureed, mashed, minced or ground foods, progressing to finger foods at 6-8 months, and
  by 12 months be consuming a variety of chopped, ground and mashed family foods.<sup>5</sup> [Level
  C Evidence]
- It is important that parents and caregivers offer a variety of soft textures (e.g. lumpy, tender-cooked and finely minced, pureed, mashed or ground) and finger foods from 6 months of age.<sup>2</sup>
- Finger foods are small pieces of food that infants can pick up and eat easily. Eating finger foods helps infants learn how to bite and chew, and to use their fingers and hands to feed themselves. Eating finger foods also improves an infant's coordination and helps her get used to different food textures.<sup>6,7</sup>
- Current evidence suggests a critical window for introducing texture-modified solid foods; delaying their introduction beyond 10 months of age may lead to feeding difficulties in older children and a lower intake of nutritious foods such as vegetables and fruit.<sup>2,5,8</sup> [Level C Evidence]
- An older infant is capable of consuming more solids, but the time needed to do so is longer than consuming pureed foods. An infant's efficiency at consuming purees will peak at 10 months of age. Their ability to consumer other solid food textures will continue to improve until around 24 months of age.<sup>3</sup>
- Lateral movements of the tongue develop around 8 to 12 months. These allow infants to move food to their teeth, enabling them to bite and chew chopped foods and therefore consume a greater variety of finger foods.<sup>3</sup>
- By 12 months of age, young children should be offered a variety of family foods with modified textures (i.e. ground, mashed, chopped) with a tender consistency.<sup>2,4</sup>
- By 12 to 18 months, young children will acquire full chewing movements.<sup>3</sup>
- Safety is a primary concern in introducing solid foods. Foods that could block an infant's airway and lead to choking should be avoided until their chewing and swallowing skills are developed.<sup>5</sup> Hard, small, round, smooth and sticky solid foods should be avoided. [Level C Evidence]
- Table 2 outlines foods that are safe and unsafe for children <4 years of age.

Table 2. Foods that are safe and unsafe for children <4 years of age<sup>5,7</sup>

Safe foods (prepared as described)	Unsafe foods		
Wieners, diced or cut lengthwise	Popcorn		
Grated raw carrots	Hard candies / Cough drops		
Hard fruit pieces	• Gum		
Fruits with pits removed	Whole grapes and raisins		
Chopped grapes	Peanuts and other nuts		
Peanut butter*spread thinly on crackers	Sunflower and pumpkin seeds		
or bread	Fish with bones		
	Snacks served on toothpicks or skewers		

<sup>\*</sup>Peanut butter, served alone or on a spoon, is potentially unsafe as it can stick in the palate or posterior pharynx and lead to asphyxia.

 Choking risk can be minimized when caregivers match foods offered to infants and toddlers based on their developmental and physiological readiness, supervise infants/toddlers when eating and know how to handle choking if it occurs.<sup>5</sup>

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## **B.4 Frequency and Timing of Meals**

## Recommendations

- a) Parents and caregivers should allow the infant's appetite to be the guide for the amount of breast milk, formula and solids to provide. Respond to the infant's hunger and satiety cues to ensure the infant is getting enough but not overfed (see *Hunger and Satiety Cues* and *Division of Responsibility in Feeding* in *Section D. Feeding Relationships*).
- b) Each infant will eat different amounts of food and an infant's appetite may change every day. Age-appropriate feeding schedules are noted in Table 1.
- c) Begin to offer solid foods to infants in conjunction with regular family meal schedules to set the stage for sharing family meals together in the future.
- d) Offer solids in addition to breastfeeding or formula feeding. The number of times solid foods are offered should increase as infants gets older:
  - For infants 6–8 months old, start slowly and work towards offering solids 3-5 times a day (2-3 meals and 1-2 snacks).
  - For infants 9-11 months old, solids can be offered up to 4-5 times a day as part of a regular meal pattern (3 meals and 1-2 snacks).
  - For children ≥12 months of age, offer 3 meals and 2–3 snacks per day to meet additional energy requirements.

## Table 1. Age-appropriate feeding schedule

Note: Every child is different. This is only a guide.

Time of	Age					
day	6 months	7 months	8 months	9–11 months	≥12 months	
Early	Breast milk	Breast milk	Breast milk	Breast milk or formula	Breast milk	
morning	or formula	or formula	or formula		or formula	
Morning	Breast milk	Breast milk	Breast milk	Breast milk, formula		
	or formula	or formula	or formula	or homogenized milk	Homogenized	
	Iron-rich	Iron-rich	Iron-rich	(3.25% MF)	milk (3.25%	
	foodsa	foods <sup>a</sup>	foodsa	Iron-rich foods <sup>a</sup>	MF)	
		Vegetables	Vegetables	Fruit		
		Fruit	Fruit	Milk products <sup>b</sup>	A variety of	
			Milk	Grains <sup>c</sup>	table foods at	
			products <sup>b</sup>		meal times (3	
Noon	Breast milk	Breast milk	Breast milk	Breast milk, formula	times per	
	or formula	or formula	or formula	or homo milk (3.25%	day) and	
	Iron-rich	Iron-rich	Iron-rich	MF)	nutritious	
	foodsa	foodsa	foodsa	Iron-rich foods <sup>a</sup>	snacks	
		Vegetables	Vegetables	Vegetables	between	
		Fruit	Fruit	Fruit	meals (2-3	
			Grains <sup>c</sup>	Grains <sup>c</sup>	times per	
Afternoon	Breast milk	Breast milk	Breast milk	Breast milk, formula	day)	
	or formula	or formula	or formula	or homo milk (3.25%		
				MF)		
				Snack		
Early	Breast milk	Breast milk	Breast milk	Breast milk, formula		
evening	or formula	or formula	or formula	or homo milk (3.25%		
	Iron-rich	Iron-rich	Iron-rich	MF)		
	foodsa	foods <sup>a</sup>	foodsa	Iron-rich foods <sup>a</sup>		
		Vegetables	Vegetables	Vegetables		
		Fruit	Fruit	Fruit		
			Grains <sup>c</sup>	Grains <sup>c</sup>		
Evening	Breast milk	Breast milk	Breast milk	Breast milk or formula		
	or formula	or formula	or formula	Snack		
Night	Breast milk	Breast milk	Breast milk	Breast milk or formula		
time	or formula	or formula	or formula			

<sup>&</sup>lt;sup>a</sup>Iron-rich foods such as meat, poultry, fish, eggs, legumes, iron-fortified infant cereal

<sup>&</sup>lt;sup>b</sup>Milk products such as cheese, yogurt, cottage cheese

<sup>&</sup>lt;sup>c</sup>Grains such as barley, rice, oats, bulgur, quinoa, bread, pasta, couscous, unsalted crackers *Adapted from Feeding Your Baby Solid Foods: 6 Months to 1 Year, 2014.* 

## **Evidence**

- Infants have unique energy needs for solid foods. The amount consumed at a feeding will differ based on factors such as how they are feeling, the presence of distractions, the time of day, their breast milk or formula intake, their appetite and ability to eat, the energy density of the complementary foods, and variability in growth rate. It is important not to be overly strict about the amount of complementary foods to be eaten. It is important not to be overly
- Caregivers need encouragement and assistance to recognize and respond to cues of hunger and satiety, whether infants are breastfed or formula-fed. This will help them determine how much food to offer, and avoid under- or overfeeding.<sup>4</sup> [Level C Evidence]
- Solid foods should be safe, energy- and nutrient-dense, and offer variety, while reflecting the specific foods, meals and eating patterns of the family and local community. <sup>2,3</sup>[Level C Evidence]
- The number of times per day that infants are fed solid foods should increase as they get older and be based on hunger and satiety cues. For the average healthy breastfed infant at 6-8 months of age, caregivers should start slowly and work towards offering solid foods 3-5 times per day (2-3 meals and 1-2 snacks). At 9-11 months of age, infants can be offered solids 4-5 times per day (3 meals and 1-2 snacks). 1,5 [Level C Evidence]
- Children ≥12 months of age should be offered 3 meals and 2–3 snacks per day, to meet additional energy requirements.<sup>2,3</sup>[Level C Evidence]
- Caregivers will not know the precise amount of breast milk consumed, nor will they be measuring the energy content of solid foods to be offered. Therefore, the amount of food offered should be based on the principles of responsive feeding, while assuring that energy density and meal frequency are adequate to meet the child's needs. 4[Level C Evidence]
- The energy needs from solid foods for infants with "average" breast milk intakes are approximately 130 kcal per day at 6–8 months, approximately 310 kcal per day at 9–11 months and approximately 580 kcal per day at 12–24 months.<sup>3,5</sup>[Level C Evidence]
- Regular growth monitoring throughout the first two years of life is recommended to ensure that the child is growing along his/her normal growth curve.<sup>4,6</sup>
- A healthy feeding relationship is a division of responsibility between the parent and the child. The parent fosters an appropriate and nurturing feeding environment and provides appropriate healthy foods. The child decides whether to eat and how much to eat. Responsive parenting appears to be at the core of a healthy feeding relationship, and involves:
  - recognizing the child's developmental abilities or readiness with respect to feeding;
  - balancing the child's need for assistance with encouragement of self-feeding;
  - allowing the child to initiate and guide feeding interactions; and
  - responding early and appropriately to hunger and satiety cues<sup>4</sup> (see *Hunger and Satiety Cues* in *Section D. Feeding Relationships*).

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# **B.5 Choking Hazard Foods**

## Recommendations:

- a) Foods that are hard, small and round, or smooth and sticky are not safe for children <4 years of age.<sup>1</sup>
- b) The following foods are not safe for children <4 years of age:
  - Whole grapes Cough drops - Nuts Whole marshmallows Hard candy - Fish with bones - Snacks using Seeds - Gum Popcorn - Whole hot dogs toothpicks or skewers Jelly beans - Ice cubes and sausages - Raisins and other dried
- c) Peanut butter or nut butters served alone or on a spoon are potentially unsafe, as they can stick in the palate or posterior pharynx and lead to asphyxia; thus, this method of serving should be delayed until the infant is nearly 1 year old.<sup>1</sup>
- d) The following foods are safer for infants and children <4 years of age, when they are prepared as described:
  - wieners or sausage links, diced or cut lengthwise into 4 then into bite-sized pieces
  - hard vegetables and fruit, grated (e.g. carrot, apple)
  - fruit, pits removed
  - grapes, chopped or cut into quarters
  - peanut butter or nut butter, spread thinly on crackers or toast
  - foods that are fibrous or stringy (e.g. celery, pineapple), finely chopped
- e) Hard foods (such as raw vegetable sticks) should not be used for teething, as they are choking hazards.

## **Evidence**

- Most babies are ready for finger foods between 6 and 10 months of age. Some foods have a shape or consistency that can cause it to become lodged in the trachea, cause choking and should be avoided.<sup>2</sup> These foods include nuts, seeds, globs of nut or seed butters, raisins, popcorn, ice cubes, gum, marshmallows, hard candies and jellybeans.<sup>3</sup> Safer ways of preparing some of these foods include grating raw vegetables or cutting round foods like carrots, grapes and hot dogs in 4 pieces lengthwise and then into small pieces.<sup>4</sup> [Level C Evidence]
- Foods that could block a child's airway and lead to choking should be avoided until the infant's chewing and swallowing skills are developed. 1,4
- Choking risk can be minimized when caregivers match foods offered to infants and toddlers based on their developmental and physiological readiness, supervise infants/toddlers when eating and know how to handle choking if it occurs.<sup>4</sup>

• Supervision includes the infant sitting upright while eating, and not lying down, walking, running or being distracted from the task of safe eating. Eating in the car is considered unsafe since if choking should occur, it is difficult to pull over to the side of the road safely. In addition, there is the increased risk of choking if the car stops suddenly.

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# **B.6 Highly Allergenic Foods**

## Overview

In Canada, there are 10 foods (the priority allergens) that cause most allergic reactions:

- 1. peanuts
- 2. tree nuts (almonds, Brazil nuts, cashews, hazelnuts [filberts], macadamia nuts, pecans, pine nuts [pignolias], pistachio nuts, and walnuts)
- 3. sesame seeds
- 4. milk
- 5. eggs
- 6. seafood (including fish, shellfish such as lobster, and molluscs such as clams)
- 7. soy
- 8. wheat
- 9. sulphites
- 10. mustard

Trace amounts of these foods can potentially be found in a wide range of food and non-food products including snack foods, health foods, baked goods, seasonings, and many other foods. Reactions to these allergens among allergic individuals range from mild to severe. An estimated 2% of the Canadian population may be affected by life-threatening allergies and the numbers are increasing, particularly among children. 2

### Recommendations

- a) Infants are ready for solids at 6 months of age, based on their development and signs of readiness.
- b) There is no need to delay the introduction of the priority allergens or foods containing them. Once infants are eating a variety of iron-rich foods, priority allergens can be introduced around 6 months.
- c) The introduction of one food at a time makes it easier to identify the cause of an allergic reaction, were it to occur. A general guideline is between 2–3 days.
- d) Introduce foods at home, regardless of whether the infant has a parent or sibling with a confirmed allergy. Once introduced, they should be offered to the infant regularly to maintain tolerance.
- e) If an infant develops an allergic reaction to a food, counsel parents to stop feeding the food causing the reaction and contact a physician. Diagnosis is best done by an allergist. Other new foods can continue to be offered to the infant. If the mother is breastfeeding the infant, she should consult the child's physician to determine whether she needs to remove the allergen from her diet in order to avoid a reaction in her child.

- f) If an infant has been diagnosed with a food allergy, counsel parents to avoid feeding him these foods. Dietitians can ensure the child's diet is nutritionally complete, ensure normal growth and development and assist the family with meal planning and normalization of eating as the infant grows.
- g) Introduce peanuts and tree nuts to infants in an age appropriate form. Whole nuts and nut butter spread thickly or offered on a spoon should not be given to infants as they are choking hazards. Parents/caregivers can use the following recipe to introduce nuts to their infant: Mix 2 teaspoons of smooth nut butter with 3 or more teaspoons of water, breast milk or formula until smooth. Offer a small amount of the mixture to the infant and watch for signs of an allergic reaction. For more information, see the client resource "How to Introduce Peanut to Your Baby".

## **Evidence**

- Food allergy is most prevalent in the first few years of life, affecting approximately 6% of children under 3 years of age. The most common food allergies are cow's milk (2.5%), egg (1.3%), peanuts (0.8%), wheat (0.4%), soy (0.04%), tree nuts (0.2%), fish (0.1%) and shellfish (0.1%). Other foods could become allergens if introduced before 4–6 months of age. 1,4,5
- 80% of allergies to milk, egg, soy and wheat resolve by school age. Although peanut, tree nut and seafood allergies are often permanent, 20% of young children with a peanut allergy experience resolution. Recurrence of a peanut allergy is possible.<sup>6</sup>
- For all infants, Health Canada recommends introduction of solids from about 6 months of age, including common allergenic foods.<sup>7</sup>
- There is currently no international consensus on how to define infants at-risk or high-risk for developing a food allergy.<sup>8</sup> The Canadian Pediatric Society (CPS) defines a high-risk infant as one with a personal history of atopy, including eczema, or a first-degree relative (parent or sibling) with atopy (i.e. eczema, food allergy, allergic rhinitis, asthma).<sup>8</sup>
- There is no evidence to indicate the ideal interval before the introduction of the next new food. A general guideline is between 2-3 days.<sup>9</sup>
- The Canadian Pediatric Society recommends that once a common allergenic food has been introduced successfully, parents/caregivers should continue to offer the food regularly to maintain their child's tolerance to the food. 10
- Symptoms of food allergies may include the following. Anaphylaxis generally includes two or more of the following body systems:<sup>11</sup>
  - Respiratory: stuffy or runny nose, asthma and throat swelling
  - Skin: itchiness, rash, hives or swelling
  - Gastrointestinal: diarrhea, nausea, vomiting, bloating and/or stomach pain
  - Cardiovascular: dizziness or lightheadedness, turning pale, fainting
  - Other: headache, anxiety, "sense of doom"

## **Low-Risk for Food Allergies:**

- For infants older than 4 months of age without parental history of allergy, there is no conclusive evidence to support a delay in introducing highly allergenic foods (including fish, eggs and foods containing peanut protein) to prevent food allergy. <sup>12</sup> [Grade C Evidence]
- Additional randomized control trials are needed to determine whether earlier introduction of common allergenic foods (i.e. before 6 months) is beneficial for preventing allergy in lowrisk infants.<sup>8</sup>
- Brief early exposure to cow's milk-based infant formula does not increase the risk for cow's milk allergy among breastfeeding healthy term infants without a parental history of allergy. [Grade B Evidence]
- There is no evidence to suggest that brief early feeding with extensively hydrolyzed protein formula among breastfed infants without parental history of allergy will result in reduced risk for allergy in comparison to cow's milk-based infant formula. [Grade B Evidence]
- Feeding soy protein-based formula instead of cow's milk-based formula or breast milk does not reduce the risk for allergy among healthy term infants. 12 [Grade C Evidence]
- Limited, older evidence suggests that feeding healthy term infants cow's milk-based infant formula before the introduction of solid foods is associated with an increased risk of allergies compared to exclusively breastfed infants. <sup>12</sup> [Grade C Evidence]
- Among infants without parental history of allergy, there is insufficient evidence to suggest feeding partially hydrolyzed whey formula for the first few months of life decreases the risk for allergy as compared to cow's milk-based formula. [Grade D Evidence]

## **High-Risk for Food Allergies:**

- For infants at high risk for developing a food allergy (as defined by CPS), the Canadian Pediatric Society recommends introducing common allergenic foods at around 6 months of age (but not before 4 months of age), depending on the infant's developmental readiness.<sup>8</sup>
- In infants at high-risk for developing a food allergy (as defined by CPS), there is emerging evidence that early food introduction (between 4 to 6 months of age), may have a role in the prevention of food allergy, particularly for egg and peanut. More evidence is required for other allergenic foods.<sup>8</sup>
- There does not appear to be a protective effect on the development of atopic disease by delaying the introduction of solids beyond 6 months of age in children with a parental history of allergy based on data from observational studies. <sup>13</sup> [Grade B Evidence]
- There is no convincing evidence to suggest delaying the introduction of highly allergenic foods (including eggs, fish, wheat, and peanut products) will have a protective effect on the development of atopic disease in child with a family history of allergy. Controlled trials are required to examine the timing of introduction of these foods and the development of allergies. <sup>13</sup> [Grade C Evidence]
- The European Society for Pediatric Gastroenterology, Hepatology and Nutrition Committee on Nutrition comments that although avoiding foods such as nuts and shellfish is not likely to

- cause harm, evidence indicates that avoiding fish could lead to a reduction in omega-3 fatty acid intake and have potentially negative consequences on cognitive outcome or immune function.<sup>14</sup>
- The Learning Early About Peanut Allergy (LEAP) trial was a randomized control trial designed to study which strategy was most effective in preventing the development of peanut allergy in infants at high risk for allergy, defined as having severe eczema, an egg allergy, or both. Six hundred and forty infants were divided into two study groups. One group was exposed to peanut while the other group was restricted from peanut exposure until 60 months of age. Overall, peanut allergy was present in 17.2% of the group that avoided peanuts, while peanut allergy was present in only 3.2% of the group that was exposed to peanuts regularly. 15
- Based on the results of this study, the US National Institute of Allergy and Infectious Diseases (NIAID) released the NIAID Addendum Guidelines for the Prevention of Peanut Allergy in the United States. <sup>16</sup> These guidelines define high risk infants as those with severe eczema\*, egg allergy, or both. Low risk infants were those with no eczema or mild to moderate eczema, and no food allergy (regardless of whether a parent/sibling had a confirmed food allergy). Parents of high risk infants were recommended to consult with the infant's physician before introducing peanut and to consider having the infant tested for peanut allergy. Based on the consultation and/or test results, peanut-containing foods could be introduced at 4-6 months. Low risk infants could be introduced peanut-containing foods at 6 months, along with other common allergenic foods.
  - \*Severe eczema refers to a very bad itchy, dry, oozing or crusted rash that does not go away even with medication.
- The Canadian Pediatric Society does not recommend pre-emptive allergy testing based on the following (E. Abrams, personal communication, March 29, 2019):
  - The recommendation for pre-emptive allergy testing was based on only one randomized control trial (the LEAP study) that was not meant to be a population recommendation
  - Other guidelines, including those from the Australasian Society of Clinical Immunology and Allergy and the British Society for Allergy and Clinical Immunology, do not recommend pre-emptive allergy testing
  - Population studies have shown that pre-emptive testing is not feasible and is potentially harmful. There is the risk of false positive tests, has been shown to worsen quality of life, is not cost effective and could inadvertently delay peanut introduction due to the steps required.
- There is limited evidence on whether exclusive breastfeeding for 6 months reduces the risk for allergy. <sup>13</sup> [Grade C Evidence]
- There is limited evidence to suggest that prolonged feeding with a hydrolyzed formula for the first 6 months of life can reduce the risk of infant and childhood allergies compared to cow's milk-based formula. The limited evidence in favour of feeding a hydrolyzed formula is

- strongest for a reduced risk for eczema with an extensively hydrolyzed casein formula. 13 [Grade C Evidence]
- Although there is still some uncertainty, extensively hydrolyzed formulas have shown a stronger protective effect against the development of allergy as compared to partially hydrolyzed formulas, however additional high quality studies are required to establish this effect and to determine whether benefits extend into late childhood. <sup>13</sup> [Grade C Evidence]
- In infants with a family history of allergy, soy protein-based formulas are not protective against childhood allergies compared to cow's milk-based formula and are not recommended for preventing allergy. [Grade B Evidence]

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