



# PEDIATRIC NUTRITION RESOURCE LINE

INTEGRATIVE MEDICINE REPORT®

## Simple Strategies and Solutions for Common Nutritional Deficiencies in Infants and Children

**Vancouver** - Here at the Canadian Paediatric Society Conference, the nutritional needs at different stages of infants' and young children's lives were discussed. Firstly, very low birth-weight preterm infants require fortified feeding to ensure growth matches growth rates of in utero infants of the same gestational age. Secondly, for all infants, both term and preterm, breast-feeding is recommended for up to 6 months of age. With the exception of vitamin D, breast milk is nutritionally complete but after six months, infants require iron, ideally from iron-fortified foods such as infant cereals or formula. Vitamin D supplements are recommended for infants that are breast-fed until they consume enough vitamin D from other sources. Finally, various feeding difficulties can occur and are mostly seen in older children. These require different approaches, and some if not all may require a balanced nutritional supplement until healthy growth and development resumes.

Optimizing nutrition for very low birth-weight (VLBW) preterm infants on through to children with a variety of feeding difficulties was the focus of a co-developed presentation here at the Canadian Paediatric Society's (CPS) annual conference.

### Preterm Nutrition

According to Dr. Réginald Sauvé, Professor of Pediatrics and Community Health Sciences, University of Calgary, Alberta, "For a long time, we debated whether the very early preterm infant should grow at the same rate of a normal fetus of the same gestational age growing in utero." With corroborative evidence, specialists now make every effort to approximate growth rates in VLBW preterm infants to in utero rates through the use of special preterm formulas that contain considerably higher proportions of protein, fat, carbohydrates and other constituents compared to formulas for the term infant.

"We know breast milk is the ideal food for term infants but it does need to be fortified for VLBW, preterm infants," Dr. Sauvé added. Suboptimal growth in early life for a preterm infant can significantly increase the rates of cognitive delay and disability as compared to a preterm infant following an optimal growth rate.

### Iron Deficiency

As discussed by Dr. Stanley Zlotkin, Professor of Pediatrics, Nutritional Sciences and Public Health, University of Toronto, Ontario, the major cause of severe iron deficiency anemia (IDA) is likely enteric blood loss from inappropriately early introduction of cow's milk.

In an ongoing survey carried out to determine if parents are following the CPS's recommendations for age-appropriate introduction of cow's milk, very preliminary results suggest that severe IDA, defined as a hemoglobin <80 g/L and a low mean cell volume for age plus one additional IDA feature, is being diagnosed in Canadian infants between 3 and 36 months of age, and that dietary factors "are likely to be involved," suggested Dr. Zlotkin. A wide variety of food is the key to the prevention of nutrient deficiencies, he added. "When variety is limited, nutrient deficiencies will appear unless the food eaten is very high-quality or unless it is fortified." Babies are born with a reserve of iron which will support their iron requirements for the first 6 months of life.

However, from the age of 6 months, the infant's diet needs to be supplemented with iron-rich foods, the best source of which are iron-fortified cereals and meat. In addition, all infant formulas are fortified with iron; since most iron-fortified formulas contain approximately 680 kcal/L, this works out to at least 6.8 mg iron/L. Infant cereals also have high iron content at approximately 7 mg per serving.

As Dr. Zlotkin pointed out, parents need to be aware that foods they may assume are high in iron may actually contain very low amounts of iron. For example, jarred baby foods such as strained chicken and beef noodle (jar of 113 g) contain approximately 0.5 to 0.7 mg of iron per serving while a serving of beef stew for toddlers (jar of 170 g) contains approximately 1.2 mg of iron. The CPS also recommends that parents introduce cow's milk between 9 and 12 months of age and not sooner. Furthermore, infants should be weaned off the bottle and use a cup no later than 15 months of age in order to control the amount of cow's milk they consume and to encourage the consumption of other foods.

"We are finding that IDA is occurring either because the infant is getting too much cow's milk or is being breast-fed

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beyond 6 months of age without any complementary feeding,” Dr. Zlotkin observed. “But parents need to understand that cow’s milk has virtually no iron in it, nor does breast milk.” All infants, whether they are breast-fed or formula-fed, need to start complementary feeding as of 6 months of age.

## Feeding Difficulties

Among the most common disorders seen in pediatric practice today are feeding difficulties. As discussed by Dr. Glen Berall, Assistant Professor of Pediatrics and Nutritional Sciences, University of Toronto, 50 to 60% of parents report feeding difficulties in physically normal children and up to 80% of children with neurological or developmental disorders exhibit some sort of feeding difficulty, especially swallowing disorders. A recent attempt by experts to categorize feeding difficulties led them to define seven different categories, all multifactorial in nature and which require different types of interventions.

The first is parental misperception. “The child may be small but is achieving satisfactory growth based on mid-parental height,” Dr. Berall explained, “but excessive parental concern can lead to coercive feeding even when there is no underlying issue.” In this situation, health care providers need to educate and reassure parents. “Pull out the growth charts,” suggested Dr. Berall, “and if it helps to allay parental fears about nutritional inadequacy and reduce the use of force or coercion, recommend a balanced nutritional supplement.”

The second most common feeding difficulty is seen in “fundamentally vigorous” children who consume substantially more milk than is usual or necessary. Children who are interested in “anything else but food” require structured mealtimes, i.e. breakfast, lunch, dinner, but no grazing and no juice, only water and limited milk between meals. The child should also be fed in a high chair or at the table and be kept there for 20 to 30 minutes but no longer. Because some of these “fundamentally vigorous” children develop strong behavioural issues around feeding, “we commonly see growth faltering and we use a supplement given after supper so it does not suppress appetite,” Dr. Berall told delegates.

Neglect or abuse must be considered in an apathetic or withdrawn child. These children often need to be admitted and an experienced feeder involved who can encourage them to eat and who may then transfer their knowledge to the parent,

under supervision. Supportive nutrient intake in these cases is also indicated. Children who have a highly selective food intake typically have other sensory issues—they dislike loud noises, playing in the sand or with modelling clay—in addition to widespread food refusal.

Health care providers need to explain to parents that “picky-eating” behaviour is part of a sensory constellation of issues and that parents need to model the consumption of new foods without offering them to the child and to tempt—not push—them to eat. If their dietary intake is very narrow, picky eaters again may require a nutritional supplement, as Dr. Berall indicated. When colic interferes with infant feeding, parents need to introduce calming strategies, including swaddling the infant and feeding them in a dim, quiet room with background white noise.

Treatment of children who fear feeding due to a post-traumatic situation depends on what caused their fear. “[In the case of] a single choking episode, parents may be able to desensitize children with relatively mild fears,” Dr. Berall suggested. Children are often resistant to the use of a certain utensil, “so if they have been force-fed with a spoon, there is nothing wrong with a toddler feeding with their hands or with using a cup,” he added. Children who develop severe food refusal from tube-feeding, for example, will require a nutritional supplement at the least.

Lastly, feeding difficulties secondary to organic disease may resolve when the underlying pathology has been treated but if not, then some of these children may need nutritional supplementation as well.

## Summary

Optimal nutrition is the foundation of infant and child care and it offers the opportunity to improve their outcome. Parents are often unduly concerned their child is not eating well. Most commonly, feeding difficulties are a form of parental misunderstanding of a child’s nutritional needs and health care providers need to educate and reassure parents that their child’s needs can often be met through simple measures. Feeding difficulties in turn can often be resolved with behavioural strategies such as limitation of milk intake. Where nutritional deficiencies do exist, the introduction of a nutritionally balanced supplement can help adjust nutrient intake until the difficulty resolves and children experience healthy, age-appropriate growth and development. □

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