

## A Holistic Perspective on the Digestive System of Infants & Children

Lawrence B. Palevsky, MD, FAAP, DABHM

Infants and children are not simply small adults, especially when it comes to feeding and nourishing their little bodies. They are less able than adults to receive, transform and assimilate the nutrients given to them. Infants and children are born with immature digestive systems. Digestive enzymes are not as plentiful and efficient. Intestinal materials, including undesirable particles, are more readily absorbed into the bloodstream through the porous lining of the digestive tract. Their digestive capacity may be weakened and impaired due to an early exposure to poor dietary choices and environmental stressors. This weakness can persist well into adulthood increasing the likelihood of chronic childhood and adult illnesses.

If children are fed appropriately, their digestive systems will naturally strengthen and mature by age 6 or 7. With proper maintenance and barring any genetic or other environmental problems, their digestive systems will continue to strengthen as they grow. Western science, nutritional and functional medicine, and Chinese and Ayurvedic medicine teach that the overall health of infants and children correlates with the strength and health of their digestive system. The digestive lining interfaces with the outside world and houses the largest part of a child's immune system. The nervous system plays a key functional role in maintaining the health of the digestive lining and its immune system. Due to their immaturity, children require different food choices and preparations to allow their systems to mature.

The digestive system is more than a physical space that provides enzymes, hormones and surface area for digestion. The digestive system is also an energy system, one that is affected by the energy of the food and the environment. The digestive energy system works by generating a certain amount of heat, or kinetic energy, to help ignite the digestive processes. In chemistry lab, stirring and heating are two processes that help drive the efficiency and completion of a chemical reaction. Stirring helps to generate heat, break up molecules and provide greater surface area in order to maximize enzyme efficiency and the completion of a chemical reaction. Digestion is also a series of chemical reactions. In the body, the physical act of chewing food or the ingestion of food that appears to have already been chewed, accomplishes for digestion what stirring does for chemical reactions.

**Stirring → Heat + ↑ Surface area + Mechanical breakdown of molecules → Efficient, completed chemical reaction**

**Chewing → Heat + ↑ Surface area for enzyme activity + Mechanical breakdown of food into smaller particles → Efficient, completed digestion, maximal absorption and assimilation of micronutrients**

Children, and especially infants, have few teeth and rarely chew their foods well. The ingestion of incompletely chewed foods places an undue stress on a child's digestive and immune systems. The mechanical work of digestion increases. Energy reserves are called on through the work of the autonomic nervous system to help increase the mechanical breakdown of the food. There is a demand for an increase in the secretion of enzymes and digestive juices. Invariably, digestion is incomplete, diarrhea may ensue or larger macronutrients are inappropriately absorbed into the body stimulating an immune system response. Over time, added stress is placed on the digestive, immune and nervous systems, potentially weakening the child's defense and limiting absorption of important nutrients.

Our bodies are also equipped with an innate ability to generate necessary digestive heat within a narrow range of body temperature to cook (digest) the foods even further. On the whole, children, and especially infants, have an inherently weak digestive heating system, which I refer to as a weak or flickering pilot light. Giving a predominance of foods to infants and children that are either cold in temperature or cool in nature may further weaken this fire and reduce the child's capacity to heat and digest foods efficiently. Foods given to infants and children that are heating in nature, like spicy foods, or prepared under high temperatures, like frying, may also weaken the pilot light. Foods that are heavy and thick will tend to smother the digestive fire as well.

We know that infants and children begin life with a weak pilot light therefore, it is important to offer them a balance of foods that either strengthens, or at the very least, does not weaken it. For optimal digestion, infants and children require foods that are whole, simple, warm, cooked and easy to digest since they have few if any teeth and are not apt to chew their foods well. In addition, foods that will potentially weaken the digestive fire include those that are 1) **cold**, both in temperature and in quality; 2) **damp**, otherwise known for their ability to produce mucus and phlegm; and 3) **smothering**, those that are heavy and thick in quality.

Items that are **cold** and **damp** in quality to a child's digestive fire include:

Dairy products--milk, cheese, sour cream, yogurt, ice cream

Soybeans and processed soy products--soy milk, soy cheese, TVP, soy bars, soy burgers, soy powders

Commercial infant formulas--milk and soy based

Other commercial milks, e.g., rice milk

Raw fruits and raw vegetables

Wheat and most flour products

Baby cereals & commercial cereals

Juice, soda, soft drinks, shakes, smoothies

Sugar, high fructose corn syrup, etc.

Artificial sweeteners

Fried foods and oils, foods cooked under high heats

Iced or refrigerated foods and beverages

Peanuts

Processed, packaged and refined foods with dyes, chemicals, preservatives, additives, metals, colorings, partially hydrogenated oils, margarine, shortening

Antibiotics

Overfeeding

Multiple food choices at a time

Items that are **smothering** in quality to a child's digestive fire include:

Wheat and most flour products

Baby cereals

Heavy, thick fruits, e.g., bananas

Thick, creamy foods

Overfeeding

Greasy, oily foods

Multiple foods in one meal

The above list of cold, damp and/or smothering foods may seem daunting. Most of the foods that children eat are found on this list. In many cases, adults eat a diet containing many of these foods as well. Nonetheless, the prevalence of these foods/items in children's diets often contributes to the development of many of the undesirable clinical symptoms that are seen in the pediatric population. Mucus and inflammation is a byproduct of poor digestion. The symptoms that are produced include colic, vomiting, spitting up, constipation, diarrhea, ear fluid and chronic ear infections, fever, chronic nasal congestion, sinusitis, acute and chronic allergies, acute and chronic coughs and asthma and eczema, among others. The acute illness, like fever, vomiting or diarrhea, is a healthy way for the body to cleanse itself of the accumulation of foods and environmental stressors that are difficult to receive and digest. In the chronic illness, the child's body is often unable to cleanse itself of the accumulation of foods and stressors that have weakened the digestive, immune and nervous systems.

There are many environmental factors that can stress a child's digestive, immune and nervous systems. Aside from the dietary factors listed above, children are exposed to heavy metals, pollutants, solvents and carcinogens found in food, water, air, medicine, plastics and injected materials that can injure the digestive/immune/nervous systems. Other stressors include poor sleep, disharmony in the home, problems at school or with peer groups, conflicts with siblings and parents, a lack of play time, down time and sufficient exercise, and a lack of attention paid to who children really are and how they are feeling. Children need to be able to digest their environments as well as the foods they ingest.

So what and how to feed infants and children? Optimal foods for infants and children (and for adults) consist of a balance of cooked foods made up of whole fresh vegetables, pre-

soaked and well cooked legumes, antibiotic and hormone free meats, poultry and eggs from grass fed animals, wild and ideally mercury-free fish, whole grains, fruits and water. Feed children based on the foods that are local and in season. Healthy cooking methods for children include stewing, pureeing, potting, steaming, boiling, sautéing, baking and roasting all of which use lower flames for longer periods of cooking time. Soups, casseroles, dips and spreads are fun foods to feed children that provide them with the nutrients they need. One way to enhance the flavor of these foods is to add warming culinary herbs either while cooking or before serving. Many of them can be hidden or blended into foods or made into teas. Some of these culinary herbs are used to treat many of the common ailments so frequently brought on by food choices that produce mucus and inflammation and weaken the digestive system. While it is hard to avoid many of the cold, damp and smothering foods, culinary herbs help to counter balance the weakening effects these foods have on a child's digestive and immune systems.

Most of the chemicals that make up the body's immune system are derived from the diet we feed our children. The proteins, fats and carbohydrates in our food become the amino acids, fatty acids and saccharides of pro- and anti-inflammatory chemicals in the immune system. These nutrients also stimulate the activity of the sympathetic and parasympathetic branches of the autonomic nervous system in different ways specific to each individual child. Most of the vitamins, minerals and water needed as co-factors for these reactions are derived from the diet as well. A diet of foods that contain healthy proteins, fats, carbohydrates, vitamins, minerals and water will feed the immune and nervous systems the necessary nutrients for maintaining health and homeostasis. A weakened and stressed digestive system in a child is more likely to contribute to a state of acute and/or chronic illness than one that is balanced, supported and nurtured with the proper nutrients and environment.

A child's body consists of almost 70% water. Water is the best beverage for children and adults. A diet of salty and sweet beverages and foods has a dehydrating effect on the body as does a low consumption of water. The body naturally responds to dehydration by increasing the production of moisture, especially along the lining of the mucus membranes. This moisture appears as an increase in mucus production, most often seen in the airways, nasal passages, oropharynx, intestines and skin, sometimes even as rashes or inflammation. Excess mucus is produced in these areas to maintain hydration and a strong defense against invading pathogens. Over time, an increase in mucus production can be excessive, often providing a nidus for bacterial or viral growth. If a child's system is strong enough, he/she will get sick and burn off the excess mucus, usually with a fever, to restore the proper lining of the mucus membranes. If the child is not strong enough, or continues to be given too much salt and sugar, overproduction of mucus in the body will continue. By lifting the burden of excess sugar and salt in the diet and offering water as the main beverage, a child's body can then use its innate healing ability to clear the excess mucus and restore homeostasis to the defense system.

When a child presents with any of the above undesirable symptoms or illnesses, a switch to a diet of whole, simple foods and a reduction and/or elimination of the cold, damp or smothering foods will often alleviate many, if not all, of the clinical problems. In so doing, the child's digestive, immune and nervous systems will become stronger, allowing him/her to better deal with external environmental stressors. In many cases this normal healing process occurs without complication or even an awareness that it is happening in the body at all.

In some children, the digestive, immune and nervous systems may be so weak that additional treatment modalities can be employed to help strengthen them. The treatments may offer these children an increased chance to achieve greater resolution of their symptoms. Lifestyle changes, vitamins and supplements, Chinese medicine, Ayurveda, homeopathy, essential oils, cranial osteopathy, cranial sacral therapy and chiropractic are some of the many modalities that can, along with a healthier diet, contribute to strengthening a child's digestion and immunity and restoring the body's innate capacity to cleanse and detoxify.

The presentation of any of the above conditions may alert the parent(s) that a change is needed. Often a child's condition can provide the family with the impetus to seek a greater awareness about the way in which some or all of the family members are choosing to live their lives. Usually, many of the answers can be found by looking at diet and/or lifestyle choices. At this juncture, the symptoms appear as a signal for the family to reassess.

As practitioners, we can introduce and discuss with families some of the contributing factors as well as the other options for treating their child's condition(s). In many cases, pharmaceutical treatments may bring satisfactory relief to the child's symptoms although it is often temporary. Unfortunately, the ongoing factors that contribute to the presenting symptoms often remain and are never addressed. In some cases, the ongoing condition may be driven further into the body with suppressive medications leading to more serious illness down the line. By beginning to question and expand dietary, cultural and medical knowledge and beliefs, we can offer parents a world of possibilities for them to create greater health for themselves and their children through education about healthier food choices and reduction of exposure to environmental stressors.