

Nutritional Support in the Pediatric Oncology Patient

Children on treatment are at increased risk of compromised nutritional status because:

1. Many treatment protocols involve intensive chemotherapy regimens, multi-modal therapy (chemotherapy, radiation, surgery, and bone marrow transplantation), or “dose-intensive” regimens given over a shorter time period.
2. The location of the disease, especially when there is intra-abdominal disease, may result in digestive problems.
3. Treatment with chemotherapy and/or radiation can result in nausea and vomiting, decreasing the child's willingness to eat in order to avoid these symptoms.
4. Treatment with chemotherapy and/or radiation can reduce/alter sense of taste, making food unpalatable.
5. Children are still growing.
6. Children have high nutritional needs per kg of body weight and lower reserves.
7. Weight loss of even a small amount can be significant in proportion to their size. For example, a one kg weight loss in a child weighing ten kg is equivalent to a 10% loss in their body weight. This is significant and can have major impact on how they tolerate treatment.

A nutritional assessment at diagnosis can identify potential feeding concerns with the planned treatment course. Each child receiving treatment should have a detailed nutritional assessment prior to initiating treatment. Proactive **early** nutritional support is recommended.

Watch for:

- a child who cannot or will not eat/drink
- a child who is showing a trend downwards on a standard growth chart or growth that has remained stagnant. A 5% loss is worrisome and a 10% loss or more is significant.
- a child who is below the 5th percentile for growth on a standard growth chart at the time of diagnosis
- meal times that are becoming a “battle” **or** a parent/caregiver trying to “make” a child eat
- a child who has shown a 5% or greater loss before diagnosis
- a child on a treatment protocol that is intensive and/or involves multiple treatment modalities
- severe mucositis, diarrhea, or other toxicities that are making it impossible for the child to eat/drink

Nutritional support in the pediatric patient can be:

1. **Oral** – a child is eating/drinking but not well, and weight is holding/ falling. Emphasis is placed on nutrient-dense foods, frequent meals and snacks, and introduction of nutritional oral supplements such as Pediasure or Ensure, etc.
2. **Enteral feeding** is preferred when “the gut is working” but the child's intake is inadequate, the child is eating/drinking little, or when the child has been unable to recover weight previously lost. This can be provided by:
 - a) **Nasogastric (ng) or nasojejunal (nj) feeding tube** – a feeding tube is placed through the nose and positioned in the stomach or jejunum. This method requires no surgical intervention and is used as a first choice for a feeding tube.
 - b) **Gastrostomy feeding tube (g-tube)** - a g-tube is placed surgically and used when
 - the child is requiring frequent ng tube replacements due to vomiting. The g-tube is more comfortable for the child needing frequent ng tube replacements.
 - the child is expected to require intensive support for a long period of time. The g-tube is a potential site for infection and requires good skincare measures.

3. **Parenteral (total parenteral nutrition or TPN)** refers to nutritional support given through either a central line or peripheral vein. This is used in the hospital setting when it is important not to be fed orally or by a feeding tube. The gut may require a “rest”, or the child may have significant vomiting with feeding, or it is impossible to place a feeding tube at the time (for example, when severe mucositis has developed). TPN is reserved for short-term support. There is an increased risk of infection. Frequent monitoring of electrolytes, liver and kidney functions is needed to ensure tolerance and safety.

METHOD	ADVANTAGES	DISADVANTAGES
Oral feeding with calorie supplements	~ Simple	~ Requires cooperation of child
Nasogastric tube feeding	~ Simple, may be given at home	~ Not suitable for patients with mucositis or severe nausea ~ Tube may require frequent reinsertion
Gastrostomy tube feeding	~ Useful for long term feeding at home ~ May be used for patients with mucositis and moderate nausea	~ Requires surgical insertion ~ May be associated with increased risk of infection
Total parenteral nutrition* *Try to maintain some enteral feeding to maintain integrity of GI mucosa	~ May be used for patients with impaired GI function	~ Requires central venous catheter access ~ Usually has to be given as an inpatient ~ Less physiologically acceptable as the GI tract is not used