



**Summary of the Guidelines of the European Society of Pediatric Gastroenterology, Hepatology and Nutrition** on the evaluation and treatment of gastrointestinal and nutritional complications in children with neurological impairment

Romano C, et al. *JPGN* 2017; 65(2):242-264.

# Rationale:

Children with neurological impairment (NI) suffer from gastrointestinal (GI) disorders that should be considered when assessing their nutritional status. The neurological damage can negatively affect the GI system, especially oral motor function and motility. Given the lack of a systematic approach to the treatment of children with neurological damage, the European Society of Gastroenterology, Hepatology and Nutrition, through an international working group of pediatricians and pediatric gastroenterologists, reached a consensus and defined evidence-based guidelines for clinical practice, in respect to the management of gastrointestinal and nutritional disorders in children with neuromotor disability.

# Methods:

The methodology used by the ESPGHAN Working Group (WG) considered some clinical questions related to the evaluation and treatment of GI and nutritional disorders in children with NI.

## 31 clinical questions were formulated on the following topics:

- Assessment of the nutritional status
- Calculation of nutritional requirements
- Identification of malnutrition
- Management of artificial nutrition
- Classification of gastrointestinal pathologies
- Artificial feeding routes (enteral and gastrostomy/percutaneous jejunostomy)
- Indications for digestive surgery

The Grading of Recommendations Assessment, Development and Evaluation (GRADE) was used to evaluate the results. The level and quality of the evidence have been assessed according to the Oxford Center for Evidence Based Medicine and the GRADE systems.

What Is Known	What Is New
<ul style="list-style-type: none"><li>• Children with neurological impairment have problems with swallowing and feeding.</li><li>• An altered nutritional status is the result of insufficient caloric intake.</li><li>• Infections of the respiratory tract with risk of bronchoaspiration and gastroesophageal reflux are adjacent factors.</li><li>• The goals of nutritional management include improving the quality of life of the child and their family.</li></ul>	<ul style="list-style-type: none"><li>• Several strategies on nutrition and on the management of oral motor skills have been developed.</li><li>• A multidisciplinary approach is useful in children with stunting growth.</li><li>• Feeding via gastrostomy reduces the risk of bronchoaspiration but could aggravate gastroesophageal reflux.</li><li>• The usefulness of anti-reflux surgery in addition to a gastrostomy is not yet fully understood.</li></ul>

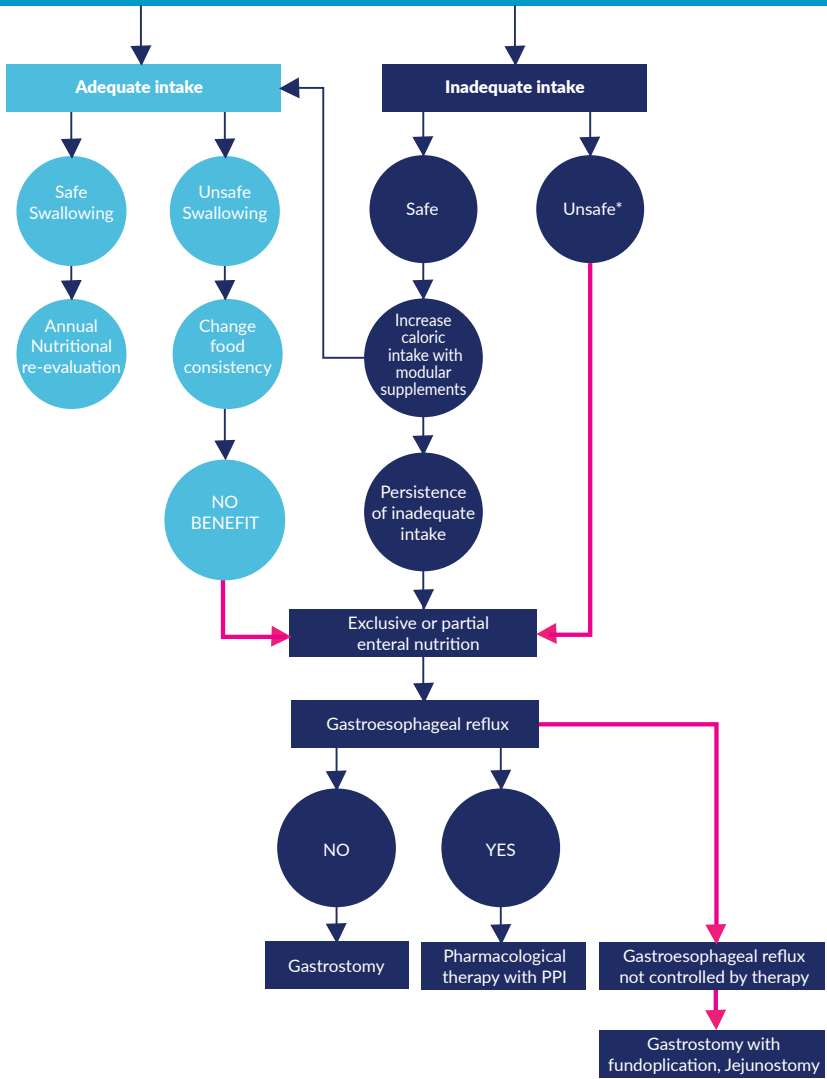
# Summary of some of the key recommendations from the 2017 ESPGHAN Guidelines:

NUTRITIONAL ASSESSMENT	
1:	ESPGHAN WG suggests that nutritional evaluation and management should be performed by a multidisciplinary team ideally including a physician, dietitian, nurse, speech therapist, physical therapist, psychologist, and occupational therapist.
2a:	ESPGHAN WG recommends that the assessment of nutritional status in children with NI should not be based solely on weight and height measurements.
2b:	ESPGHAN WG recommends that measurements of knee height or tibial length in children with NI should be performed routinely to assess linear growth, when height cannot be measured.
3c:	ESPGHAN WG suggests the use of 1 or more of the following red flag warning signs for the identification of undernutrition in children with NI: <ol style="list-style-type: none"> <li>1. Physical signs of undernutrition such as decubitus skin problems and poor peripheral circulation</li> <li>2. Weight for age z score <math>\leq 2</math></li> <li>3. Triceps skinfold thickness &lt;10th percentile for age and sex</li> <li>4. Mid-upper arm fat or muscle area &lt;10th percentile</li> <li>5. Faltering weight and/or failure to thrive</li> </ol>
NUTRITIONAL NEEDS	
5a:	ESPGHAN WG recommends the use of the dietary reference standards for typically developing children to estimate the caloric needs for children with NI.
6a:	ESPGHAN WG recommends the use of the DRI for protein in typically developing children to estimate the appropriate protein intake for children with NI.
6b:	ESPGHAN WG recommends the use of supplementary protein intake in specific clinical situations such as decubitus ulcers or in children with a low-calorie requirement.
8:	ESPGHAN WG recommends use of the DRI for micronutrients in typically developing children to estimate the appropriate intake for children with NI.
14a:	ESPGHAN WG suggests modification of enteral nutrition (thickening of liquid enteral formulas, whey-based formulas) in addition to other therapeutic options of GORD in children with NI.
17b:	ESPGHAN WG suggests increasing fluid and fiber intake as an additional strategy to treat constipation in children with NI.

## Summary of some of the key recommendations from the 2017 ESPGHAN Guidelines:

ENTERAL NUTRITION
19: ESPGHAN WG recommends using oral feeding in children with NI if it is nutritionally sufficient, safe, stress-free, and feeding time is not prolonged.
20: ESPGHAN WG recommends considering use of enteral feeding, if total oral feeding time exceeds 3 hours per day.
<p>21a: ESPGHAN WG recommends using standard (1.0 kcal/mL) polymeric age-appropriate formula including fiber for children with NI older than 1 year.</p> <p>21b: ESPGHAN WG recommends using a high energy density formula (1.5 kcal/mL) containing fiber in cases of poor volume tolerance in children with NI, provided hydration is carefully monitored.</p> <p>21c: ESPGHAN WG recommends using human milk, a standard infant formula or nutrient dense infant enteral formula as clinically indicated in infants with NI.</p> <p>21d: ESPGHAN WG recommends using a low fat, low-calorie, high-fiber, and micronutrient replete formula for the maintenance of enteral tube feeding after nutritional rehabilitation in immobile children with NI.</p> <p>21e: ESPGHAN WG recommends using a trial of whey-based formula in cases of gastroesophageal reflux, gagging, and retching in children with NI.</p> <p>21f: ESPGHAN WG recommends caution if pureed food is used for enteral tube feeding in children with NI, because of concerns regarding nutritional adequacy and safety.</p>
22: ESPGHAN WG recommends using a combination of nocturnal continuous feeds with daytime bolus feeds in children with high-caloric needs or poor tolerance to volume.

**Multidisciplinary nutritional assessment of the child with neurological damage:**  
weight, height, triceps skid fold, nutritional history, oral motor function evaluation



\* Unsafe swallowing is defined as occurring in a child who has both a history of aspiration pneumonia and objective evidence of aspiration or penetration on contrast video fluoroscopy.