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# Enteral Nutrition in Neurological Diseases: A Review of Current Evidence

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**Abstract**

**Introduction**

Malnutrition is a frequent and serious complication in patients with neurological disorders, significantly affecting morbidity, mortality, and quality of life. Neurological diseases such as stroke, amyotrophic lateral sclerosis (ALS), Parkinson's disease, and dementia often impair swallowing (dysphagia), consciousness, or motor function, leading to insufficient oral intake [1,2].

Enteral nutrition (EN) is a well-established method of providing nutrients directly into the gastrointestinal tract via feeding tubes and is preferred over parenteral nutrition due to its physiological benefits, including preservation of gut integrity and reduced risk of complications [2].

In neurological populations, EN plays a crucial role in preventing malnutrition, supporting recovery, and improving clinical outcomes. However, its application varies depending on disease type, stage, and patient condition.

**Aim of the Study**

The aim of this review is to analyze the current state of knowledge regarding the use of enteral nutrition in various neurological diseases, focusing on its indications, clinical benefits, complications, and disease-specific considerations.

**Materials and Methods**

This study is a narrative literature review based on scientific publications retrieved from databases such as PubMed, Scopus, and Web of Science. A total of approximately 35 relevant publications were selected and analyzed.

**Conclusion**

Enteral nutrition is a fundamental component of care in patients with neurological diseases, particularly those with dysphagia and impaired oral intake.

Its benefits include improved nutritional status, reduced complications, and better clinical outcomes, especially in conditions such as stroke and ALS. However, its use must be individualized, considering disease stage, prognosis, and patient preferences.

Further high-quality randomized controlled trials are needed to strengthen the evidence base, particularly in neurodegenerative diseases.

**Keywords**

enteral nutrition, neurological diseases, dementia, dysphagia, nutritional support

## 1. Introduction

Neurological diseases constitute a major global health burden and are among the leading causes of disability and mortality worldwide. Conditions such as stroke, amyotrophic lateral sclerosis (ALS), Parkinson's disease, dementia, and traumatic brain injury are frequently associated with progressive functional decline, including impairments in swallowing, cognition, and motor coordination. These deficits significantly increase the risk of malnutrition, which in turn adversely affects clinical outcomes, prolongs hospitalization, and increases healthcare costs [1,19].

Malnutrition in neurological patients is multifactorial. One of the most important contributing factors is dysphagia, which occurs in a substantial proportion of patients, particularly after stroke and in neurodegenerative diseases. Dysphagia not only limits oral intake but also increases the risk of aspiration pneumonia, a serious and potentially fatal complication [3,7]. Additionally, factors such as reduced appetite, cognitive impairment, depression, and increased metabolic demands further contribute to inadequate nutritional intake [8].

Enteral nutrition (EN) has emerged as a cornerstone in the management of patients who are unable to meet their nutritional requirements orally. It involves the delivery of nutrients directly into the gastrointestinal tract via feeding tubes, thereby preserving gut function and supporting metabolic homeostasis. Compared to parenteral nutrition, EN is generally associated with fewer infectious complications, lower costs, and better physiological outcomes, including maintenance of intestinal mucosal integrity and immune function [2,25].

In neurological practice, the decision to initiate enteral nutrition is complex and depends on multiple factors, including the underlying disease, severity of dysphagia, expected duration of nutritional support, and overall prognosis. Short-term feeding is typically provided באמצעות nasogastric tubes, whereas long-term support often requires the placement of a percutaneous endoscopic gastrostomy (PEG). The timing of intervention is also critical, as early initiation of EN has been shown to improve outcomes in certain populations, particularly in critically ill and stroke patients [5,22].

Despite its widespread use, the application of enteral nutrition in neurological diseases is not without controversy. While there is strong evidence supporting its benefits in acute conditions such as stroke and traumatic brain injury, its role in chronic and progressive diseases—especially advanced dementia—remains debated. In such cases, ethical considerations regarding patient autonomy, quality of life, and the goals of care play a crucial role in decision-making [13–15].

Moreover, enteral nutrition is associated with potential complications, including gastrointestinal intolerance, metabolic disturbances, mechanical issues related to feeding tubes,

and the risk of aspiration. These risks necessitate careful patient selection, ongoing monitoring, and individualized nutritional planning [31,33].

Given the growing prevalence of neurological disorders in aging populations and the critical role of nutrition in patient outcomes, a comprehensive understanding of the indications, benefits, and limitations of enteral nutrition is essential. This review aims to synthesize current evidence and provide an updated perspective on the use of enteral nutrition across a spectrum of neurological diseases, highlighting both clinical and ethical dimensions of care.

## 2. Aim of the Study

The primary aim of this review is to comprehensively evaluate the role of enteral nutrition (EN) in the management of patients with neurological diseases, with particular emphasis on its clinical effectiveness, safety, and applicability across different disease entities. Given the high prevalence of malnutrition and dysphagia in neurological populations, optimizing nutritional strategies has become a critical component of multidisciplinary care [1,19].

A key objective is to analyze the indications for initiating enteral nutrition in various neurological conditions, including stroke, amyotrophic lateral sclerosis (ALS), Parkinson's disease, dementia, and traumatic brain injury. The review seeks to identify the clinical criteria—such as dysphagia severity, nutritional status, and disease progression—that guide decision-making regarding the initiation and continuation of EN [2,19].

Another important aim is to assess the impact of enteral nutrition on clinically relevant outcomes, including mortality, morbidity, functional recovery, and quality of life. Special attention is given to evidence regarding early versus delayed initiation of EN, as well as short-term versus long-term feeding strategies (e.g., nasogastric tube versus percutaneous endoscopic gastrostomy), particularly in stroke and ALS patients [3,6,9].

Furthermore, this study aims to evaluate the benefits and limitations of enteral nutrition in neurodegenerative diseases, where the balance between prolonging life and maintaining quality of life is especially complex. In conditions such as advanced dementia, where evidence for benefit remains controversial, the review explores current guideline recommendations and ethical considerations related to artificial nutrition support [13–15].

An additional objective is to summarize the most common complications associated with enteral nutrition in neurological patients, including gastrointestinal, metabolic, mechanical, and infectious adverse events. Understanding these risks is essential for improving patient safety and optimizing nutritional protocols [31–33].

The review also aims to highlight existing gaps in the literature, particularly the lack of high-quality randomized controlled trials in certain neurological populations, such as Parkinson's disease and advanced dementia. By identifying these gaps, the study seeks to provide direction for future research and clinical practice improvements [1,19].

Finally, this work intends to synthesize current evidence into practical recommendations that may support clinicians in making informed, individualized decisions regarding nutritional

support in patients with neurological diseases, taking into account both medical and ethical dimensions of care.

## 3. Materials and Methods

This study was conducted as a narrative review of the literature aimed at summarizing current evidence on the use of enteral nutrition (EN) in patients with neurological diseases. A comprehensive search of scientific publications was performed using major electronic databases, including PubMed, Scopus, and Web of Science. The search covered publications from 2000 to 2025 in order to include both well-established knowledge and the most recent findings.

Relevant articles were identified using combinations of keywords such as *enteral nutrition*, *neurological diseases*, *stroke*, *amyotrophic lateral sclerosis*, *Parkinson's disease*, *dementia*, *dysphagia*, and *nutritional support*. Boolean operators were applied to refine the results, and reference lists of selected papers were additionally screened to identify further relevant studies.

The selection of studies was based on predefined inclusion and exclusion criteria. Only peer-reviewed articles published in English and involving adult populations were included. Priority was given to high-quality evidence, such as randomized controlled trials, systematic reviews, meta-analyses, and international clinical guidelines, particularly those developed by recognized scientific societies [19,20]. Observational studies were also considered, especially in areas where higher-level evidence was limited. Case reports, conference abstracts without full text, and studies focusing exclusively on parenteral nutrition or pediatric populations were excluded.

Data from the selected studies were analyzed qualitatively. Extracted information included study design, patient characteristics, indications for enteral nutrition, methods of nutritional support, and reported clinical outcomes such as mortality, complications, and nutritional status. Due to the heterogeneity of the included studies, a meta-analysis was not performed; instead, the findings were synthesized descriptively and organized according to specific neurological conditions.

It should be noted that, as a narrative review, this study has certain limitations, including potential selection bias and variability in the quality of included studies. Additionally, the limited number of randomized controlled trials in some neurological diseases may affect the strength of the conclusions [1,19]. Nevertheless, an effort was made to base the analysis on the most reliable and clinically relevant evidence available.

Since the study was based exclusively on previously published data, no ethical approval was required.

4. State of Knowledge

### 4.1. Pathophysiology of Malnutrition in Neurological Diseases

Malnutrition in patients with neurological disorders is a complex and multifactorial process resulting from the interaction of neurological deficits, metabolic alterations, and reduced dietary intake. One of the primary mechanisms is dysphagia, which arises due to impaired coordination of the oropharyngeal muscles, frequently observed after stroke and in neurodegenerative diseases [7,16]. Dysphagia not only limits oral intake but also increases the risk of aspiration, leading to respiratory complications such as pneumonia.

In addition to swallowing disorders, neurological diseases often lead to reduced appetite caused by hypothalamic dysfunction, depression, or medication side effects. Cognitive impairment, especially in dementia, further contributes to inadequate food intake due to behavioral disturbances and inability to self-feed [13].

Moreover, certain conditions, such as ALS, are associated with hypermetabolism and increased energy expenditure, which exacerbate weight loss despite relatively preserved intake in early stages [11]. In critically ill neurological patients, systemic inflammatory responses and catabolic stress also contribute to protein-energy malnutrition [21].

### 4.2. Indications and Timing of Enteral Nutrition

Enteral nutrition is indicated in neurological patients when oral intake is insufficient to meet nutritional requirements or when swallowing is unsafe. According to current guidelines, EN should be initiated when patients are unable to maintain adequate intake for more than 3–5 days or are expected to be unable to eat for more than 7 days [19,20].

Early initiation of EN, particularly within the first 24–48 hours in acute conditions such as stroke or traumatic brain injury, has been associated with improved outcomes, including reduced infection rates and shorter hospital stays [22,23].

The choice between short-term and long-term feeding methods depends on the expected duration of nutritional support. Nasogastric tubes are typically recommended for short-term use, while percutaneous endoscopic gastrostomy (PEG) is preferred when long-term feeding is anticipated [4].

### 4.3. Enteral Nutrition in Stroke

Stroke is one of the most extensively studied neurological conditions in the context of enteral nutrition. Dysphagia occurs in approximately 30–50% of stroke patients and is a major determinant of nutritional status and clinical outcomes [3,7].

Evidence from large clinical trials, including the FOOD Trial, suggests that early enteral feeding may reduce mortality, although its impact on functional recovery is less clear [6]. Enteral nutrition helps maintain energy balance and prevents rapid nutritional decline, which is common in the acute phase of stroke [8].

Nasogastric feeding is generally the first-line approach, particularly in the acute phase. PEG feeding is considered when dysphagia persists beyond several weeks. However, early PEG placement has not consistently shown superiority over nasogastric feeding and may be associated with higher complication rates in some cases [4,6].

### 4.4. Enteral Nutrition in Amyotrophic Lateral Sclerosis (ALS)

In ALS, progressive muscle weakness leads to dysphagia and significant weight loss, both of which are associated with poorer prognosis and shorter survival [9]. Nutritional management is therefore a critical component of care.

Enteral nutrition is recommended when patients experience substantial weight loss (typically >10% of baseline body weight), prolonged meal times, or increased risk of aspiration. PEG is the most commonly used method for long-term nutritional support in ALS [9,10].

Studies indicate that early PEG placement—before severe respiratory compromise—may improve survival and quality of life [9]. Additionally, maintaining adequate caloric intake may help counteract hypermetabolism observed in some ALS patients [11].

### 4.5. Enteral Nutrition in Parkinson's Disease

Parkinson's disease is associated with both motor and non-motor symptoms that affect nutritional status. Dysphagia is common, particularly in advanced stages, and may lead to aspiration and malnutrition [16,17].

Gastrointestinal dysfunction, including delayed gastric emptying and constipation, further complicates nutritional management. These factors may reduce the effectiveness of oral feeding and necessitate the use of enteral nutrition in selected patients [18].

Although data on EN in Parkinson's disease are limited, PEG feeding may be beneficial in patients with severe dysphagia and significant weight loss. However, the decision to initiate EN must consider disease progression, comorbidities, and patient preferences.

### 4.6. Enteral Nutrition in Dementia

Dementia is frequently associated with progressive decline in feeding ability, leading to malnutrition and dehydration. In advanced stages, patients may lose the ability to swallow safely or recognize food [13].

Despite the widespread use of feeding tubes in this population, evidence does not support significant benefits in terms of survival, prevention of aspiration pneumonia, or improvement in quality of life [14,15].

Current guidelines recommend a cautious and individualized approach to the use of EN in dementia, emphasizing comfort feeding and palliative care principles when appropriate [13].

### 4.7. Enteral Nutrition in Traumatic Brain Injury (TBI)

Patients with traumatic brain injury often experience hypermetabolism and increased nutritional requirements, making early nutritional support essential [21].

Enteral nutrition should be initiated as soon as hemodynamic stability is achieved, ideally within 24–48 hours. Early EN has been associated with reduced infection rates, shorter ICU stays, and improved neurological outcomes [22].

Continuous feeding is generally preferred over bolus feeding in critically ill patients to improve tolerance and reduce the risk of complications.

### 4.8. Types of Enteral Access and Feeding Strategies

Various methods of enteral access are used depending on clinical circumstances. Nasogastric tubes are suitable for short-term feeding, while PEG is preferred for long-term use. In certain cases, jejunal feeding may be indicated to reduce aspiration risk [4].

Feeding regimens may include continuous, intermittent, or bolus administration. Continuous feeding is often better tolerated in critically ill patients, whereas bolus feeding may be more physiological in stable patients.

The selection of enteral formulas (standard, high-protein, fiber-enriched, or disease-specific) should be tailored to the patient's metabolic needs and clinical condition [2].

### 4.9. Complications of Enteral Nutrition

Although enteral nutrition is generally safe, complications may occur. Mechanical complications include tube displacement, blockage, and local infections at the insertion site [31].

Gastrointestinal complications such as diarrhea, constipation, nausea, and vomiting are relatively common and may be related to formula composition or administration rate [32].

Metabolic disturbances, including electrolyte imbalances and hyperglycemia, require careful monitoring, particularly in critically ill patients [21]. Aspiration pneumonia remains one of the most serious complications and necessitates preventive measures such as head elevation and proper tube placement verification [33].

### 4.10. Ethical and Clinical Decision-Making

The use of enteral nutrition in neurological diseases often involves complex ethical considerations. Decisions regarding initiation or withdrawal of EN should be based on a comprehensive assessment of the patient's clinical condition, prognosis, and preferences.

In progressive diseases such as dementia or advanced Parkinson's disease, the potential benefits of EN must be weighed against the burden of treatment and its impact on quality of life [13–15].

Shared decision-making involving healthcare professionals, patients, and caregivers is essential to ensure that nutritional interventions align with the patient's values and goals of care.

## 5. Conclusion

Enteral nutrition (EN) plays a fundamental role in the comprehensive management of patients with neurological diseases, particularly in those affected by dysphagia, impaired consciousness, or progressive functional decline. As demonstrated in the available literature, malnutrition is highly prevalent in this patient population and is associated with worse clinical outcomes, including increased morbidity, mortality, prolonged hospitalization, and reduced quality of life [1,19]. Therefore, early identification of patients at nutritional risk and timely initiation of appropriate nutritional support are essential components of neurological care.

The findings of this review indicate that enteral nutrition is an effective and generally safe method of providing nutritional support in a wide range of neurological conditions. In acute disorders such as stroke and traumatic brain injury, early implementation of EN has been shown to improve clinical outcomes, reduce complications, and support recovery processes [3,22]. In chronic and progressive diseases such as amyotrophic lateral sclerosis, EN contributes to maintaining nutritional status, stabilizing body weight, and potentially prolonging survival, although the strength of evidence varies across studies [9].

At the same time, the benefits of enteral nutrition are less clear in certain populations, particularly in patients with advanced dementia. In these cases, current evidence does not consistently demonstrate improvements in survival or prevention of complications such as aspiration pneumonia, highlighting the need for careful, individualized decision-making [13–15]. The use of EN in such contexts should take into account not only clinical indications but also ethical considerations, including patient autonomy, dignity, and overall quality of life.

Despite its advantages, enteral nutrition is not free from risks. Potential complications—ranging from gastrointestinal intolerance to mechanical and infectious issues—require ongoing monitoring and appropriate management [31,33]. This underscores the importance of a multidisciplinary approach involving physicians, dietitians, nurses, and caregivers to ensure optimal nutritional care.

An important limitation identified in this review is the relative lack of high-quality randomized controlled trials in certain neurological conditions, particularly in neurodegenerative diseases such as Parkinson's disease and advanced dementia. Future research should focus on well-designed clinical trials to better define the indications, timing, and long-term outcomes of enteral nutrition in these populations.

In conclusion, enteral nutrition remains a cornerstone of supportive therapy in neurological diseases. Its use should be individualized, evidence-based, and integrated into a broader, patient-centered care plan. A balanced approach that considers both clinical effectiveness and ethical dimensions is essential to optimize outcomes and ensure high-quality care for this vulnerable group of patients.

**Disclosures:**

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