The changing development of medical foods for the dietary management of oncology

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Medical nutrition has evolved from a largely supportive measure to a strategic component of oncology care. Written by Grace Sobieszek, Strategic Evidence Manager, Nutricia, on behalf of BSNA, this article explores how decades of innovation in medical foods have shaped the dietary management of cancer, improving treatment tolerance, nutritional status and patient outcomes.

Cancer continues to be a major cause of mortality globally, with an estimated 10 million lives lost each year.[1] In addition to its mortality burden, cancer frequently leads to disease-related malnutrition. This affects up to 70% of patients and negatively impacts treatment tolerance and outcomes.[2] Malnutrition predicts treatment-related complications such as dose-limiting toxicity, longer hospital stays and poorer overall survival independently of the stage of the cancer.[3]

Among its various forms, cancer cachexia stands out as one of the most severe. This is a complex syndrome characterised by weight loss, muscle wasting and systemic inflammation that affects many patients with advanced disease. Unlike general undernutrition, cachexia cannot be fully reversed by standard nutritional support.[4] Adding to this complexity, side effects of cancer treatments such as nausea, taste changes, mucositis and early satiety often impair a patient's ability to eat, digest or absorb food effectively. Without timely nutritional intervention, patients can enter a

downward trajectory: reduced intake contributes to further clinical decline, ultimately compromising the ability to tolerate and respond to cancer treatment.

Despite its significant impact, nutrition has historically been perceived as a supportive measure rather than a core component of oncology care. However, this perspective is evolving, driven by decades of innovation in medical nutrition and growing evidence supporting its clinical relevance.

Dietary management of oncology: from supportive to strategic

Between 1940 and the early 1980s, nutritional care in oncology was primarily reactive, aiming to support patients who were already experiencing significant weight loss or difficulties with eating.[5] During this period, healthcare professionals often relied on general oral nutrition supplements (ONS) or prescribed enteral or parenteral nutrition when a patient's oral intake was no longer sufficient to meet their nutritional requirements.

This landscape began to shift with the development of Food for Special Medical Purposes (FSMPs). High-calorie liquid nutritional supplements began to emerge in clinical practice during the 1960s. These early formulas, providing approximately 1kcal/mL, were primarily used to stabilise weight in patients with gastrointestinal cancers, helping to avoid the need for hospital-based parenteral nutrition.[6]

Around a decade later, polymeric tube feeds became available, offering the same energy density but with a more balanced macronutrient profile. Their clinical success helped establish the modern principle, 'if the gut works, use it', gradually shifting practice away from exclusive reliance on parenteral nutrition.[7] As nutritional strategies became more tailored to oncology, new products were developed to address the specific metabolic and nutritional challenges faced by cancer patients... moving beyond simply supplying calories.

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In the late 1980s, researchers began enriching ONS with functional ingredients such as arginine and omega-3 fatty acids. Around the same time, energy-dense sip feeds delivering 1.5kcal/mL entered the market, offering the same caloric value in a smaller volume and improved palatability. These features significantly enhanced patient adherence.[8] A systematic review reported that energy-dense ONS were associated with improved compliance and increased energy intake compared to standard 1kcal/mL products.[9]

High protein intake is a cornerstone of oncology nutrition care. The European Society for Clinical Nutrition and Metabolism (ESPEN) guideline for cancer recommends providing

>1.0g/kg/day and where feasible, titrating toward 1.5g/kg/day to help preserve lean mass and function.[10] Similarly, the European Society for Medical Oncology (ESMO) cachexia guideline advises ≥1.2g/kg/day for adults with cancer-related cachexia.[11]

In clinical practice, a pragmatic initial goal of 1.0–1.2g/kg/day can be useful, with escalation as tolerated and aligned to treatment phase, inflammation and physical activity level. These protein targets should be pursued alongside adequate energy and strategies to counter anabolic resistance in older patients or those experiencing inflammation. High-protein ONS are an effective strategy when intake from food alone is insufficient. A recent systematic review and meta-analysis in oncology reports that their use is associated with fewer complications and a shorter length of hospital stay, supporting their role in routine supportive care during treatment.[12]

A notable development in oncology nutrition is the formulation of high-protein, high-energy ONS enriched with omega-3 fatty acids, particularly eicosapentaenoic acid (EPA). EPA, a long-chain omega-3 found in fish oil, has been shown to help reduce systemic inflammation and muscle degradation associated with cancer cachexia. Emerging evidence suggests that the use of EPA or fish oil supplementation may help stabilise appetite, increase food intake and support the maintenance of muscle mass and body weight in patients with advanced cancer undergoing chemotherapy.[13]

These specialised ONS are formulated not only to promote weight maintenance and support immune function but also to improve treatment tolerance.[14] Importantly, patient adherence remains a critical factor in the effectiveness of ONS. Characteristics such as flavour, taste, texture and consistency all influence compliance, with taste consistently identified as the most decisive factor.[15,16]

Personalised nutrition and symptom management

Building on earlier approaches, newer nutritional formulations are designed to address specific symptoms and improve tolerance, with a growing focus on personalising support based on cancer type, treatment stage and gastrointestinal function. For people undergoing chemotherapy or radiotherapy, particularly those with cancers affecting the gastrointestinal tract or head and neck, nutrition support must consider changes in digestion, absorption and swallowing.

This has led to the development of peptide-based enteral formulas and ONS that use enzymatically hydrolysed proteins to ease digestion and enhance nutrient uptake.[17] Studies have shown that these formulas can improve gastrointestinal tolerance and promote nitrogen retention in cancer patients, especially those experiencing malabsorption or mucositis.[18]

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Fibre modification in oral and enteral formulas has also become a key strategy in tailoring nutritional care.[19] Fibre-free or low-fibre options are commonly used during episodes of diarrhoea or bowel dysfunction to reduce irritation and improve tolerance. When tolerated, fermentable fibres such as fructooligosaccharides or galactooligosaccharides can support gut integrity and help maintain a balanced microbiota.[20] This level of personalisation helps manage treatment-related side effects and supports overall gut function, which is increasingly recognised as a key factor in regulating immune response and systemic inflammation.[21]

The wide range of condition-specific innovations enables healthcare professionals to tailor nutritional strategies to individual clinical needs, symptoms and patient preferences, ultimately supporting better adherence and improved outcomes.

Conclusion

Cancer is a complex and multifaceted disease that demands a comprehensive, multidisciplinary approach to care. As our understanding of cancer and its treatment advances, nutritional care has also progressed, emerging as a proactive, evidence-based component of cancer management with a clear role in improving outcomes and supporting patient well-being. Innovative FSMPs are helping to address cancer-related malnutrition, manage treatment side effects and enhance patient well-being in ways that were not possible a decade ago.

Clinical guidelines, such as those from ESPEN and ESMO, now reflect this shift, recommending early and ongoing nutritional screening and intervention throughout the cancer care pathway. Additionally, enteral nutrition is preferred over parenteral nutrition when the gastrointestinal tract is functional, with newer modular and semi-elemental feeds offering more tailored options for individual needs.