

# Better care through better nutrition: Value and effects of Medical Nutrition



**SUMMARY BOOKLET**  
2018



**Malnutrition, specifically under-nutrition which is typically associated with disease, is a widespread problem affecting the lives of millions of people worldwide each year. The consequences of malnutrition have detrimental effects on both individuals and society. Malnutrition leads to increased healthcare resource use. The costs associated with malnutrition were thought to amount to a staggering €170 billion in Europe alone, but new data suggests that this might be a conservative estimate.**

Whilst most commonly identified in institutions, particularly amongst patients in hospitals and care homes, the majority of people who are malnourished or who are at risk of malnutrition live in the community. Across all these settings, the problem of malnutrition is often overlooked, undetected and untreated. With an increasingly ageing population across Europe, interventions to prevent, identify and manage malnutrition are vital.

The dossier 'Better care through better nutrition: Value and effects of Medical Nutrition' draws on a wide range of independent evidence and research and contains a collection of the latest data, including key insights and facts relating to malnutrition's causes, prevalence, and consequences. The dossier highlights the need for routine screening and verifies the importance of nutritional intervention using medical nutrition such as oral nutritional supplements (ONS), enteral tube feeding (ETF) and parenteral nutrition (PN), as clinically effective and potentially cost-saving interventions for healthcare systems.

This summary booklet provides an accessible, practical and condensed compilation of the research presented in the full dossier. The booklet also highlights key facts and figures relating to the implications of malnutrition, and showcases best practice examples and statements from independent experts.

The Medical Nutrition International Industry (MNI) aims to increase awareness about malnutrition and hopes you will join the fight against malnutrition.

Mike Wallace, Moreno Perugini and Tomaso Piaggio  
on behalf of the MNI



Use the QR code above to access the dossier on 'Better care through better nutrition: Value and effects of Medical Nutrition', or visit [www.medicalnutritionindustry.com](http://www.medicalnutritionindustry.com)

# ABOUT MNI



The Medical Nutrition International Industry (MNI) is the voice of the medical nutrition industry at international level. MNI gathers together companies that offer specialised nutritional solutions and services designed to meet the diverse nutritional needs of

patients. We represent companies providing solutions for nutritional therapy - oral nutritional supplements, enteral tube feeding (enteral nutrition via the gastrointestinal tract), and parenteral nutrition (intravenous feeding) - as well as other actors operating in the medical nutrition market, such as ingredients and medical devices for nutritional care, namely: Abbott, Baxter, B. Braun, Fresenius Kabi, Friesland Campina Ingredient, Nestlé Health Science and Nutricia Advanced Medical Nutrition.

MNI supports research into exploring the potential of Medical Nutrition in improving the health of patients, and promotes the translation of clinical nutrition research into standard practice through dissemination and implementation of best practices and clinical guidelines.

MNI is committed to achieving better care through better nutrition, across all ages and healthcare settings. MNI supports nutritional screening with validated tools in all relevant settings, followed by appropriate nutritional care of patients identified as being at nutritional risk.

Acutely aware of the pressures faced by healthcare organisations and that nutritional care is not always considered as an integral part of patient care, MNI aims to ensure that the evidence base for the use of medical nutrition is robust and available to decision-makers and practitioners. ONS, ETF and PN are nutritional support strategies that can be used to tackle malnutrition, improve patient outcomes and lower the significant financial costs associated with malnutrition.

For further information contact the MNI Secretariat at [secretariat@medicalnutritionindustry.com](mailto:secretariat@medicalnutritionindustry.com) or visit [www.medicalnutritionindustry.com](http://www.medicalnutritionindustry.com)

FOREWORD	2
ABOUT MNI	3
THE BURDEN OF MALNUTRITION	4
• Malnutrition as a health concern	4
• Prevalence of malnutrition	5
• Causes of malnutrition	6
• Consequences of malnutrition	7
• Costs of malnutrition	8
MEDICAL NUTRITION AS A SOLUTION	9
• Nutritional care as therapeutic target	9
• The role of medical nutrition	10
• Case studies	11
• Clinical benefits of Medical Nutrition	13
• Economic benefits of Medical Nutrition	16
• Medical Nutrition as part of good nutritional care	19
RECOMMENDATIONS	20
ACKNOWLEDGEMENTS	21
REFERENCES	22





## Malnutrition as a health concern

‘Malnutrition’ includes both over-nutrition (overweight and obesity) as well as under-nutrition, but in the context of this booklet ‘malnutrition’ (also known as disease-related malnutrition) is used to mean under-nutrition and nutritional risk. Malnutrition is widespread in Europe and it is estimated that 33 million people are at risk.<sup>1</sup>

Malnutrition is caused by poor food intake with disability and disease at the heart of the problem.<sup>2</sup> Despite the availability of reliable screening tools, malnutrition still goes undetected and untreated in hospitals, care homes and amongst people living in the community. Often less than 50% of patients identified as malnourished receive nutritional intervention.<sup>3,4</sup> The opportunity for early identification and appropriate management of malnutrition or risk of malnutrition is therefore a necessity to tackle the impact it has on patients.

Malnutrition is most commonly found in association with disease and can affect all age groups, from older adults to young children. Older people are particularly at risk – hospitalised patients over the age of 65 years have a 30% greater chance of becoming malnourished.<sup>5</sup> Malnutrition is widespread in hospitals and care homes.

Malnutrition has both clinical and financial consequences, for both the individual and society as a whole. Most notably, malnourished hospital patients experience significantly higher complication rates and the risk of infection is more than three times greater than in well-nourished counterparts.<sup>6,7</sup>

Malnutrition has a particularly adverse impact for the older person living in the community, by impairing function, mobility and independence. In the community, malnourished patients visit family doctors more often and have more frequent hospital admissions than well-nourished patients.<sup>8</sup>

Based on figures from the UK, the costs associated with malnutrition in Europe are estimated to amount to €170 billion each year<sup>1</sup> – although as new data emerges this is likely to be an underestimate. A growing body of evidence demonstrates the value of appropriate nutritional intervention in reducing adverse health outcomes.

**The cost associated with malnutrition amounts to €170 billion**

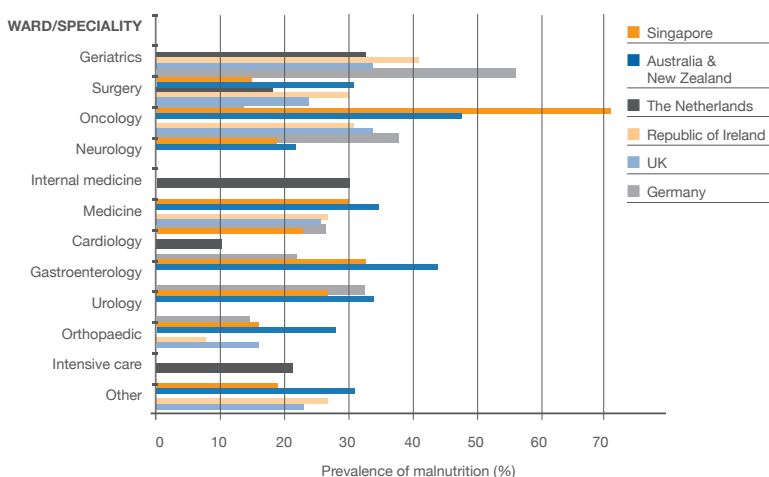
## Prevalence of malnutrition

Malnutrition is not a new problem. Malnutrition is widespread across all healthcare settings. However, a lack of routine screening for risk of malnutrition has often meant that the opportunity for early intervention and prevention is missed.

Malnutrition is prevalent across various settings, patients and age groups:

- Large scale studies show that about 1 in 4 adult patients in hospital are at risk of malnutrition or are already malnourished<sup>5,9-11</sup>
- More than 1 in 3 people in care homes are at risk of malnutrition or are already malnourished<sup>12-15</sup>
- 1 in 3 older people living independently are at risk of malnutrition<sup>12</sup>
- Almost 1 in 5 children admitted to Dutch hospitals have acute or chronic malnutrition<sup>16</sup>

Malnutrition is common across a variety of hospital wards and is especially prevalent in geriatric and oncology wards (see Figure 1). Despite the high prevalence of the risk of malnutrition in institutions, the greatest numbers of patients at nutritional risk are found in the community – an estimated 93% of the people who are malnourished or at risk of malnutrition in the UK live in the community.<sup>21</sup>



**Figure 1** Prevalence of malnutrition and risk of malnutrition according to hospital ward/primary admitting speciality<sup>5,17-20</sup>

### WHAT THE EXPERTS SAY

Professor Olle Ljungqvist is Professor of Surgery at Orebro University-Sweden. He is Co-Chair of the European Nutrition for Health Alliance and founder and Executive Chairman of the ERAS Society (Enhanced Recovery After Surgery):

*“Malnutrition is a serious and widespread health problem, which has been neglected for too long. However, the situation is improving: screening is becoming more common and the importance of nutritional care in the patient journey is increasingly being recognized. Cooperation between all stakeholders including political support is needed to keep progressing and to ensure patients receive the nutritional care they need.”*

### KEY ASPECTS

- Even when identified, malnutrition is not always treated
- Malnutrition is a widespread public health problem in Europe where 33 million people are estimated to be at risk
- Malnutrition affects all demographics and is most prevalent in the community amongst older adults
- Malnutrition causes disability, loss of independence and is associated with increased healthcare use

## Causes of malnutrition

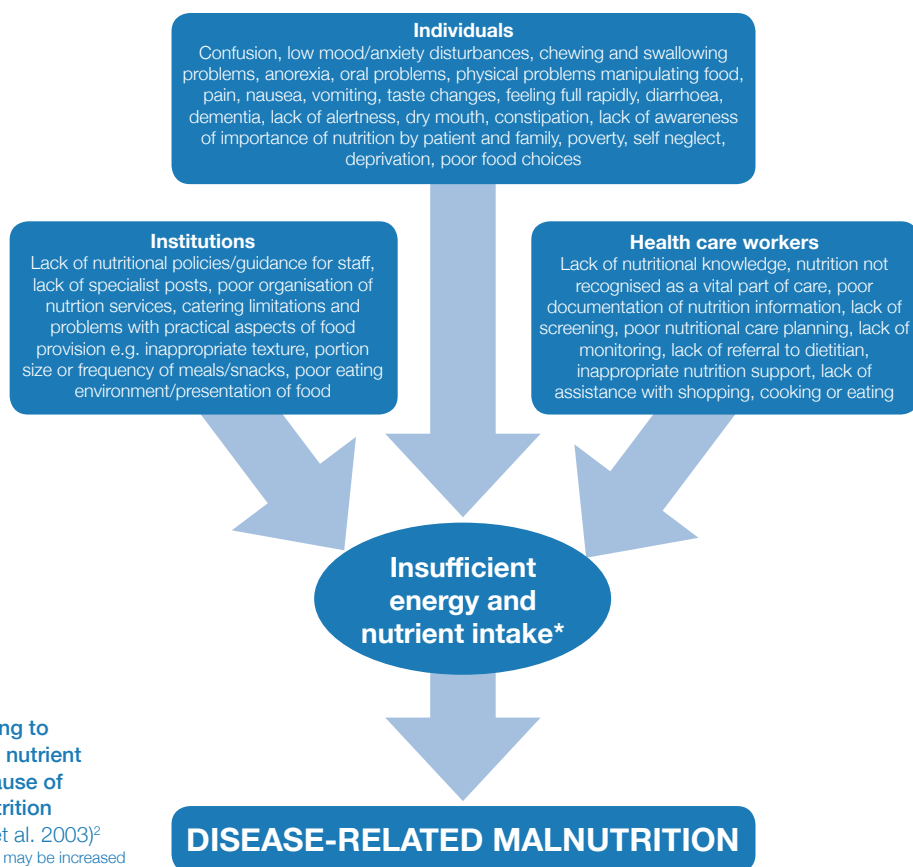
Malnutrition is primarily caused by insufficient dietary intake, with disease and its treatment being the underlying factors for decreased food intake.<sup>2,22</sup>

Food intake can decline for a variety of reasons, such as poor appetite, swallowing problems and the side effects of drugs.<sup>2</sup> Especially affected are patients with cancer, who may have taste changes or nausea due to treatment, and those with neurological conditions who may not be able to swallow or feed themselves. More than 50% of hospital patients don't eat the full meal they are given and 30% of nursing home residents eat less than half their lunch,<sup>23,24</sup> meaning that patients often fail to meet their nutritional needs.

But there is more to malnutrition than poor food intake (see Figure 2). Lack of a clear description of responsibilities for health authorities, institutions, and healthcare workers, and inadequate training and equipment for screening exacerbates the problem of malnutrition. Therefore a multi-disciplinary approach is needed to identify and implement appropriate and effective solutions.

### KEY ASPECTS

- Disease and its treatment, resulting in decreased food intake, are the major causes of malnutrition
- Especially vulnerable are patients suffering from cancer and patients with neurological conditions
- To tackle malnutrition most effectively a multi-disciplinary approach is needed involving healthcare workers, institutions and health authorities.



**Figure 2** Factors leading to insufficient energy and nutrient intake in adults as a cause of disease-related malnutrition

(adapted from Stratton et al. 2003)<sup>2</sup>

\*Requirements for some nutrients may be increased due to malabsorption, altered metabolism and excess losses

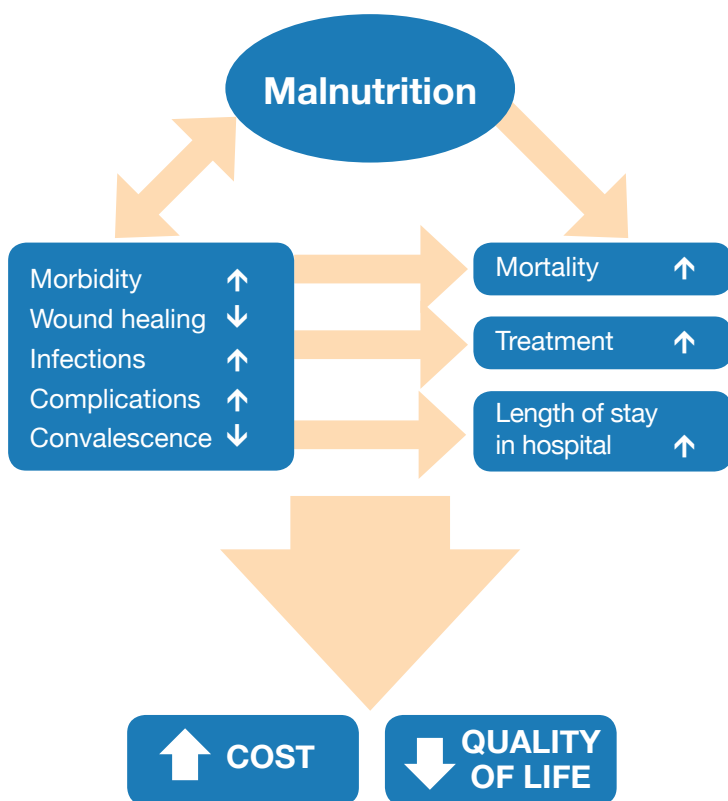


## Consequences of malnutrition

Malnutrition can adversely affect every organ in the body, and can lead to far-reaching physical and psycho-social consequences, such as impaired immune response, impaired wound healing, reduced muscle strength and fatigue, inactivity, apathy, depression and self-neglect.<sup>21</sup> For older adults, especially for those living in the community, it can severely impair function, mobility and independence. Overall malnutrition can result in a poorer quality of life.<sup>2</sup>

Malnutrition has a number of clinical consequences (see Figure 3).<sup>25</sup> Malnourished hospital patients experience significantly higher complication rates than well-nourished patients (30.6% vs 11.3%).<sup>26</sup> Mortality rates are considerably greater in 'at-risk' hospital patients compared with 'not-at-risk' patients.<sup>26</sup>

In turn, malnutrition can lead to adverse financial implications for national healthcare budgets, with increased healthcare resource use such as increases in length of hospital stay and increased readmissions. The average length of hospital stay may be increased by 30% in malnourished patients.<sup>27</sup>



**Figure 3** Prognostic impact of malnutrition (adapted from Norman et al. 2008)<sup>25</sup>

### WHAT THE EXPERTS SAY

Professor Alessandro Laviano is Associate Professor of Internal Medicine at the Department of Clinical Medicine, Sapienza University of Rome, Italy and Director of the European Society of Clinical Nutrition and Metabolism (ESPEN) educational programme (LLL):

*“Malnutrition is not seen as a priority in patients; their underlying pathologies take priority. We need to realise that poor nutritional status is part of the underlying disease, not an accidental finding, and that addressing nutritional status is treating the underlying disease. In fact, without proper nutritional care, malnutrition will lead to increased complications and longer recovery stays amongst patients. In every other walk of life, the emphasis is placed on losing weight, but here it is our intention to get patients to maintain or increase their weight. This is not always a popular intervention.”*

### KEY ASPECTS

- The risk of complications is more than 3 times greater among hospitalised malnourished patients
- Malnutrition can lead to longer hospital stays for patients
- Malnutrition is associated with higher mortality rates for 'at-risk' hospital patients






## Costs of malnutrition

Based on the fact that malnutrition is associated with increased use of healthcare resource as a result of longer stays in hospital, increased readmissions and greater levels of complications amongst patients, it is estimated that the costs associated with malnutrition and risk of malnutrition in Europe is €170 billion,<sup>1</sup> although as new data emerges this is likely to be an underestimate. The cost of treating a malnourished patient is more than 2-3 times greater than treating a non-malnourished patient.<sup>27,28</sup> The economic costs of malnutrition far exceed the costs of treating overweight and obesity and related morbidity.<sup>27,29</sup>

### KEY ASPECTS

- The costs associated with malnutrition and risk of malnutrition are estimated to be at least €170 billion in Europe
- Spending related to the management of malnutrition is as high as 15% of the annual health and social care budget in England
- Costs related to malnutrition are expected to rise in the years to come

**Table 1** Examples of estimated financial cost implications of malnutrition across Europe<sup>27,30-33</sup>

	Country	Population (approx.)	Estimated financial cost implications of malnutrition
	England	60.8 million	<b>€19.6 billion</b> - public expenditure on malnutrition in 2011-12, corresponding to more than 15% of the total expenditure on health and social care <sup>27</sup>
	Germany	82.4 million	<b>€9 billion</b> , rising to €11 billion by 2020 - Additional costs due to malnutrition across all care sectors in 2003 <sup>30</sup>
	The Netherlands	16.8 million	<b>€1.9 billion</b> - total additional costs of DRM in 2011, equalling 2.1% of the total Dutch national health expenditure and 4.9% of the total costs of the healthcare sectors included <sup>31</sup>
	The Republic of Ireland	4.1 million	<b>€1.4 billion</b> - public expenditure on malnutrition in 2007, 10% of the annual health and social care budget was spent on managing malnutrition in Ireland <sup>32</sup>
	Croatia	4.2 million	<b>€97.4 billion</b> - total cost of adult malnutrition in 2012 for selected diagnoses, accounting for 3.4% of the total Croatian national health care budget <sup>33</sup>



## Nutritional care as therapeutic target

Nutritional support is a necessary part of patient care. It starts with ensuring that people have access to appetising and nutritious food that meets their nutritional, cultural and religious needs. Good nutritional care includes nutritional screening to identify patients at nutritional risk, and care planning to ensure that patients receive the appropriate nutrition, at the right time.

The issue of malnutrition cannot be tackled in isolation. Efforts are being made to bring stakeholders together to raise awareness of the issue of malnutrition and to provide a coordinated approach to tackle the problem of malnutrition across healthcare settings.

In June 2009, representatives of health ministries from the EU member states and several other stakeholder groups met in Prague and issued a declaration and a set of action points under the banner 'Stop disease-related malnutrition and diseases due to malnutrition!' The 2009 'Prague Declaration' called for the following actions to fight malnutrition:

- Public awareness and education;
- Guideline development and implementation;
- Mandatory screening;
- Research on malnutrition;
- Training in nutritional care for health and social care professionals;
- National nutritional care plans endorsed and their implementation and funding across all care settings secured;
- Consideration of malnutrition as a key topic for forthcoming EU Presidencies.

In the declaration of Warsaw from October 2011, issued during the Polish Presidency of the European Union, key areas were reinforced to counter the wide range of adverse effects that malnutrition can have on patients and healthcare systems:

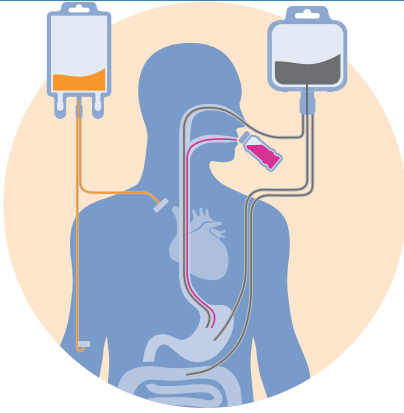
- Implementation of routine nutrition-risk screening across the EU
- Public awareness
- Reimbursement policies
- Medical education

Since 2014 the 'Optimal Nutritional Care for All' initiative (ONCA) is increasingly used by participating countries as an overarching principal on which to build their work. The campaign acts as an umbrella, bringing existing activities together and enabling planned activities; as countries report that being a part of a multi-country effort to address malnutrition has provided leverage on a national level.

## WHAT THE EXPERTS SAY

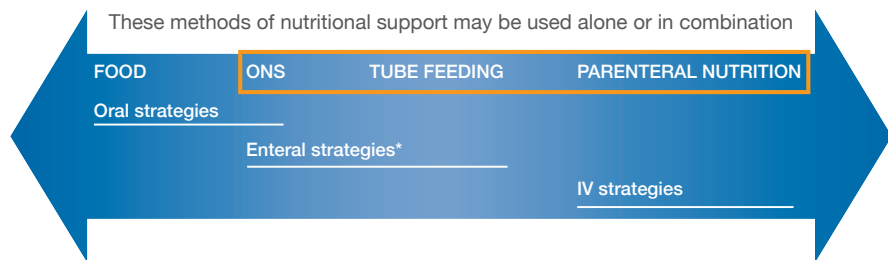
Professor Koen Joosten is a paediatric-intensivist at Erasmus MC - Sophia Children's Hospital in the Netherlands. He is chairman of the nutrition group of the Dutch paediatric association and of the association healthy food for children aged 0-4 years:

*"Multi-disciplinary collaboration within the whole hospital system is of paramount importance when fostering a new programme. Assigning responsibilities, defining goals and, building awareness and good lines of communication between doctors, nurses, senior management and information systems are all essential elements to success when introducing a new way of working in nutritional care, and this is critical when managing complex patients."*



## The role of Medical Nutrition

Good nutrition is an essential part of care, and it includes ensuring that the right people receive the right nutritional support at the right time during their care, regardless of whether that care is delivered in hospital, in an institution or in the person's own home. Good nutritional care also includes ensuring that people who are malnourished or at risk of malnutrition identified through screening programmes, receive appropriate and timely nutritional support. Nutritional support may take many forms, e.g. dietary counselling, food fortification, oral nutritional supplements (ONS), enteral tube feeding (ETF) and parenteral nutrition (PN).



**Figure 4** The spectrum of nutritional support. Strategies included in the orange area are classed as Medical Nutrition. (\*some definitions of enteral nutrition include ONS)

Where patients are unable to consume enough food to meet their nutritional needs to sustain life or optimize health, medical nutrition ONS, ETF and/or PN is used. Medical nutrition products are specific nutritional compositions for disease intervention that effectively contribute to the therapeutic regimen by improving a patient's general condition. Medical nutrition may be required from birth or at any stage during infancy, childhood, adulthood or in old age. It may be used for short-term nutritional support (days or weeks) or long-term for months, years or for life.

The next part of this booklet outlines the many benefits of medical nutrition.

### SUMMARY OF BENEFITS OF MEDICAL NUTRITION

- Medical nutrition provides an evidence-based, effective solution to tackling malnutrition in patients who are unable to consume enough food safely to sustain life or optimise health
- Medical nutrition has proven nutritional, functional, clinical and economic benefits for patients with a variety of conditions in different healthcare settings
- Reductions in the use of healthcare resources associated with the use of medical nutrition (ONS, ETF and PN) offer potential cost savings for healthcare economies

## CASE STUDY

Malnutrition should not be an inevitable part of illness and ageing. It is everyone's responsibility to demand that malnutrition is recognised through screening and that action is taken to make sure the right nutritional care is given at the right time.



Here is Anne's story – an example of a personal care plan to aid a patient's recovery.

### Anne's Background

Anne is an elderly lady who lives alone. Her husband died two years ago. Previously, Anne was very sociable and attended many events, but now she is rarely seen around town. She is unable to leave the house and relies on occasional visits from distant family for help. Her health is poor, and she has a respiratory condition.

Anne can't shop for food or cook her own meals. She may not see the importance of preparing nutritious meals for herself. She may be depressed. Respiratory disease can make it difficult to breathe and eat. Anne is admitted to hospital due to an acute infection and is unable to eat and drink enough to meet her needs.

### Anne's Nutritional Care

Anne's healthcare team should:

- Check for malnutrition risk using a validated screening tool and develop a suitable nutritional care plan to meet her needs
- Treat her acute infection, underlying respiratory disease and depression
- Provide oral nutritional supplements until Anne can eat enough to meet her needs
- Arrange support for shopping and cooking when she returns home
- Monitor her progress throughout her healthcare journey to ensure her nutritional goals are achieved

### WHAT THE EXPERTS SAY

Marco Greco is President of the European Patients' Forum since 2016. He is also founder and chairman of the European Federation of Crohn's and Ulcerative Colitis Associations (EFCCA) since 2008:

*"Patients need to be screened for malnutrition more systematically. If needed, nutritional support should be introduced in a timely manner. Too often nutritional care is de-prioritised and introduced too late, undermining patients quality of life and worsening their condition."*

## CASE STUDY

Medical nutrition can be a life-saving intervention. Whilst the majority of medical nutrition therapies rely on a functioning gastrointestinal (GI) tract to ensure nutrients are properly digested and absorbed, parenteral nutrition (PN) is used when the GI tract is unable to function or function sufficiently to sustain life. PN is often used in hospitals but can also be safely and effectively used for patients in their own homes.

Here is Peter's story - an example of how medical nutrition in a variety of forms can be used to support patients with complex nutritional needs throughout their treatment.



### Peter's background

Peter is a 38-year-old man with Crohn's disease, which was diagnosed as a young adult. He has had multiple bowel operations and further recent surgery has resulted in a high output jejunostomy and short bowel syndrome. Prior to his recent surgery, he enjoyed being active when he was able, playing football and keeping up with his young family.

Following surgery, he received specialist dietetic advice and support from a multidisciplinary team of experts to help manage his symptoms and ensure he receives adequate nutritional care.

### Peter's nutritional care

- He was maintained initially on total parenteral nutrition (TPN) as he was unable to tolerate any nutritional intake via his GI tract in the post-operative period.
- However, following specialist dietetic counselling Peter was able to introduce a small amount of food orally of around 500 kcal per day.
- Over time he was able to introduce 1-2 oral nutritional supplements (ONS) per day in addition to his food intake, and was discharged from hospital on supplementary PN at home to ensure his nutritional needs were met. His nutritional status and nutritional intake from diet, ONS and PN are regularly monitored by a multi-disciplinary team of experts including specialist doctors, dietitians, pharmacists and nurses, and as his oral intake improves, the supplementary PN is being reduced.
- He is supported at home with his PN by a specialist homecare company who provide the necessary equipment and feed to enable this to be undertaken in a home environment.

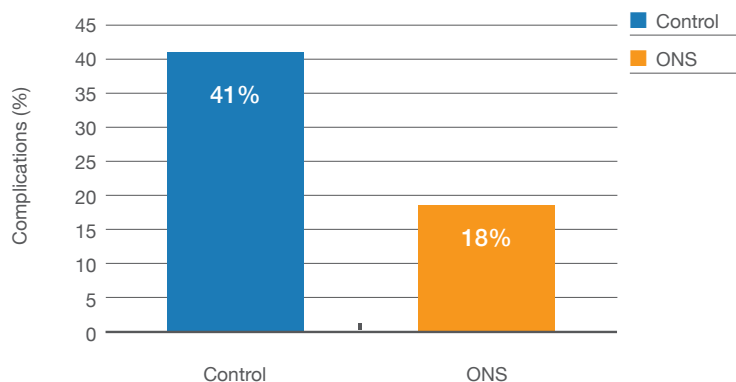
## Clinical benefits of Medical Nutrition: ONS

ONS are a clinically effective solution to tackling malnutrition. There is extensive and robust evidence to show that ONS are a successful nutritional support strategy that can be used to combat malnutrition and improve outcomes amongst patients who are able to consume food, but not enough to meet their nutritional requirements.

ONS have proven nutritional, functional and clinical benefits in both hospital and community settings in a wide variety of patient groups.

Key findings show that ONS have distinct outcome benefits:

- Reduction in mortality of up to 24% vs. standard care<sup>2</sup>
- Reduction in complication rates vs. routine care <sup>2,34,35</sup> (see Figure 5)
- ONS lead to weight gain in hospital patients and in those transferred to the community, including older people<sup>34</sup>



**Figure 5** Lower complication rates in supplemented vs control patients in hospital (adapted from Stratton et al. 2003)<sup>2</sup>

### KEY ASPECTS

- ONS are an effective and non-invasive solution to tackling malnutrition
- ONS lead to weight gain and prevention of weight loss in patients who are malnourished or at risk of malnutrition
- ONS use is consistently linked to lower mortality and complication rates for malnourished patients, when compared to standard care

## KEY ASPECTS

- For patients who cannot eat and drink enough, ETF is a life-saving solution to tackle malnutrition
- ETF leads to weight gain and prevention of weight loss in patients who are malnourished or at risk of malnutrition
- ETF use is associated with lower mortality and complication rates in hospital patients, with potential cost savings

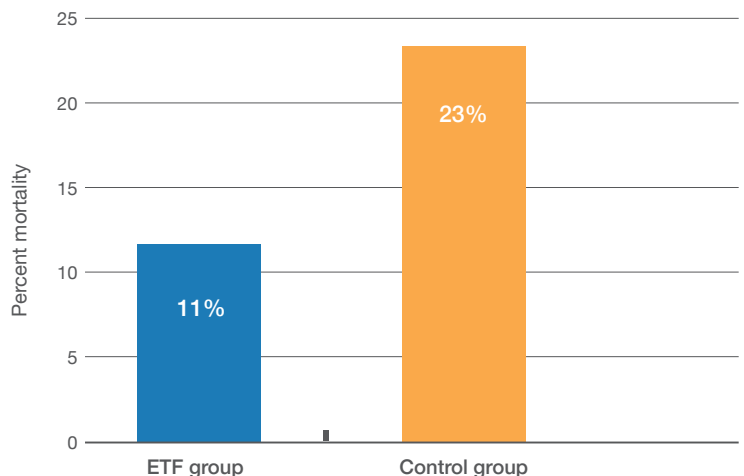
## Clinical benefits of Medical Nutrition: ETF

Enteral tube feeding (ETF) is a life-saving technique widely used in patients of all age groups with a wide variety of conditions in hospitals, nursing homes and in patients living in their own homes. Many people receiving home ETF (HETF) live independently and manage their own daily care whilst also achieving normal activity levels.

ETF leads to better nutritional intake, improvements in body weight or growth and has clinical and functional benefits.

Key findings show that ETF has distinct outcome benefits:

- Reduction in mortality rates vs. routine care in hospital patients (see Figure 6)<sup>2</sup>
- Reduction in complication rates vs. routine care in hospital patients (33% vs 48%)<sup>2</sup>
- ETF leads to weight gain in community patients, reduction in weight loss in hospital patients and improved growth in children in the community<sup>2</sup>



**Figure 6** Lower mortality rates with ETF compared with routine clinical care (12 RCT, n = 600) (adapted from Stratton et al. 2003)<sup>2</sup>

## Clinical benefits of Medical Nutrition: PN

Parenteral nutrition (PN) is a life-sustaining therapy for adults and children when oral and enteral nutrition are contraindicated (total PN is used) or inadequate (supplemental PN is used). PN is indicated in a wide variety of patients in particular patients with intestinal failure, patients in hospital who are critically ill or undergoing surgery, and for patients with cancer during active cancer treatment.

PN has nutritional, functional and clinical benefits and data is accumulating to show that timely use of PN leads to cost-savings resulting from reduced need for mechanical ventilation<sup>36</sup> and fewer infections.<sup>37</sup>

Use of home PN (HPN) is increasing and studies show clear benefits for patients and healthcare systems and budgets:

- HPN improves functional status<sup>38-41</sup> and quality of life in patients with cancer<sup>39,40,42-44</sup>
- HPN is associated with high probability of survival in patients with benign intestinal failure<sup>45,46</sup>
- HPN helps shorten hospital stay for patients ready for discharge but who need PN<sup>47</sup>, leading to potential cost savings



### WHAT THE EXPERTS SAY

Dr. Anibal Marinho is President of the Portuguese Society for Enteral and Parenteral Nutrition and is the Head of the main Intensive Care Unit of the Hospital Geral de Sto António in Portugal:

*“PN has transformed the prognosis for many patients with previously fatal conditions, and is considered one of the most important advances in therapeutics over the last four decades.”*

### KEY ASPECTS

- PN is a life-sustaining therapy for adults and children when oral and enteral nutrition cannot be used or is inadequate
- PN helps achieve optimal nutritional intake and improve clinical outcomes in complex patients in the hospital and at home with the potential to save healthcare budget
- Home PN can improve patients' QoL and probability of survival



## WHAT THE EXPERTS SAY

Dr. Jean-Pierre Michel, honorary professor of medicine Geneva University, past president of the European Union Geriatric Medicine Society (EUGMS) is currently World Health Organization (WHO) expert of the aging and life course program:

*“Under-nutrition is still unrecognized and undertreated in the old adult population: medical nutrition appears essential to prevent sarcopenia and frailty which complications lead to increase health care use and avoidable hospitalisations, complications and care costs”*

## Economic benefits of Medical Nutrition: ONS

Comprehensive systematic reviews show that managing malnutrition with ONS benefits the whole healthcare system,<sup>48,49</sup> (see Table 2). Economic modelling undertaken by NICE (2006) showed ONS to be cost-effective as part of a screening programme.<sup>34</sup> NICE classifies ONS as ‘a treatment deemed to be good value for money’.

Besides improving the well-being of patients, fighting malnutrition with ONS is an opportunity for healthcare providers to control costs. This is especially relevant in light of the ageing population and the high prevalence of chronic disease that adversely impacts nutritional status, which in turn contributes to an increased cost burden. Controlling and managing malnutrition can contribute to the solution. Even though costs might occur in one setting and beneficial effects might be measurable in another, effective prevention and management of malnutrition will realise cost savings across the social and healthcare system. Systematic reviews show that managing malnutrition with ONS can produce an average cost saving of around 10% compared to standard care across a broad range of patient groups.<sup>48, 49</sup>

**Table 2** Summary of findings from key systematic reviews on the cost and cost-effectiveness of ONS vs standard care<sup>48, 49</sup>

### HOSPITAL

- ONS reduced the cost of overall hospital care by 12%
- Cost savings were driven by reduced healthcare resource use
  - 1 in 3 fewer deaths
  - 1 in 3 fewer complications
  - reduced length of stay in surgical patients by about 2 days (~13% reduction)
- ONS use in abdominal surgical patients resulted in an average cost saving of £746 (€1,076\*) per patient. Adjusting for inflation, savings (in 2015) could be as high as £1014 or €1415\*

### COMMUNITY

- ONS use in the community led to 16.5% reduction in hospitalisations
- Many clinically relevant outcomes favouring ONS use were reported including improved quality of life, reduced infections, reduced falls and functional limitations

\*based on an exchange rate of 1 GBP = 1.1245 EUR (Source: Interbank 12/07/2017)

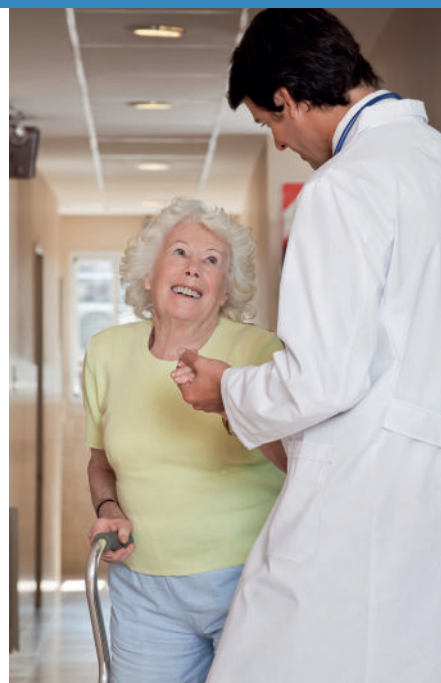
## Economic benefits of Medical Nutrition: ETF and PN

**Data on the economic benefits of ETF and PN is accumulating.**

For example, after introduction of reimbursement for commercial ETF in Poland there was a reduction in the number of hospital admissions and length of stay with savings in annual costs of hospitalization.<sup>50</sup>

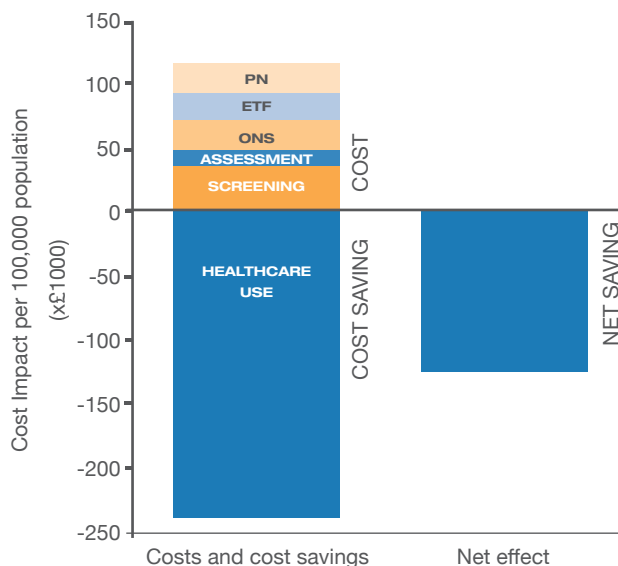
In patients with short-term contraindication to EN cost-minimization analysis showed that timely use of PN reduced the requirement for mechanical ventilation resulting in reduced total cost of acute hospital care by US\$3,150 per patient.<sup>36</sup> In another study, timely use of supplemental parenteral nutrition (ETF + PN) demonstrated cost-effectiveness in patients who were not able to achieve at least 60% of their target energy intake by day 3 of admission to ICU, through a reduction in the incidence of hospital-acquired infections.<sup>37</sup>

Home PN also plays a key role in shortening the length of hospital stay for patients who are ready for discharge but who need intravenous nutrition,<sup>47</sup> which may lead to considerable cost savings for the healthcare system.



## Economic benefits of implementing guidelines on nutrition support

Economic analysis suggests that implementing guidelines on nutritional support in adults including screening, assessment, ONS, ETF and PN ultimately saves money rather than costs money (between (€134,000 - €486,000' [£119,000 and £432,000] depending on the model used) (Figure 7). Cost savings are driven by reduced healthcare resource use.<sup>27</sup>



**Figure 7** The costs, cost savings and budget impact (net effect) of providing nutritional support to 85% of subjects with high risk of malnutrition (model 5) (adapted from Elia et al 2015)<sup>27</sup>

### KEY ASPECTS

- Implementing guidelines for managing malnutrition, including ONS, ETF and PN, saves money rather than costs money
- Potential cost savings from use of nutrition support are driven by improvements in patient's health and thus reduced use of healthcare resources

<sup>27</sup>Calculated based on an exchange rate of 1 GBP = 1.1245 EUR (Source: Interbank 12/07/2017)

## Medical nutrition as part of good nutritional care

Medical nutrition is increasingly recognised as an integral part of the overall patient management strategy for malnutrition in hospitals and in the community, supported by the evidence that medical nutrition leads to improvements in nutritional intake, clinical, functional and economic outcomes.

In many countries evidence-based guidelines on the management of malnutrition have been developed by national authorities, government agencies, health departments, clinical experts and professional organisations and in many cases through collaboration and joint working by these stakeholders.

Good practice in nutritional care in social and healthcare settings should incorporate a range of strategies and activities designed to ensure that each patient receives the most appropriate, individually tailored and timely nutrition intervention to optimise nutritional intake and status with a view to improving outcome.

There are many good examples of where implementation of nutritional guidelines can have positive effects for patients and healthcare providers. However, it is often difficult to identify examples either because gaps still exist between guidelines that are in place but are not yet fully implemented, or because good practice has not been documented and shared. Clearly, a coordinated multi-disciplinary approach must be undertaken to translate 'academic guidelines' into a practical approach for healthcare professionals.

Since 2008, MNI has awarded an annual grant for the best national initiative demonstrating translation of evidence into practical approaches to fight malnutrition. More information on these projects can be found at [www.medicalnutritionindustry.com](http://www.medicalnutritionindustry.com).



### WHAT THE EXPERTS SAY

Professor Anne E. de Looy is immediate past Honorary President of the European Federation of the Associations of Dietitians (EFAD) and Honorary Professor of Dietetics at the University of Plymouth, UK:

*"We all have to understand that when patients are unable to drink or consume enough food and sufficient nutrients for health and healing, it is of paramount importance to provide for all their hydration and nutritional needs to sustain life or to improve their health status."*

### BEST PRACTICE EXAMPLES

- Implementation of screening using 'MUST' improved nutritional care, improved appropriate use of care plans and reduced hospital stay and costs<sup>51</sup>
- Use of dietetic assistants to provide intensive feeding support, including ONS (as recommended by the Welsh Assembly Government guidelines) in older women with hip fracture significantly increased energy intake and reduced mortality both in the acute trauma ward and at 4-month follow-up<sup>52</sup>
- Implementation of a nutritional care protocol for patients with cancer in a Spanish hospital led to attenuation of weight loss in 60% of patients and weight gain in 17% of patients<sup>53</sup>
- Implementation of a nutritional care programme for older people in a Belgian hospital led to a significant reduction in length of hospital stay<sup>54</sup>

# RECOMMENDATIONS



In all aspects in the fight against malnutrition, from identification through to delivering the best care for patients in a cost-effective way, several key themes emerge:

- there must be **multi-stake-holder** involvement at all levels
- **awareness, training and education** are central to success
- **audit and quality improvement** activities are mandatory
- opportunities for sharing **good practice** need to be created

MNI is committed to increasing the awareness of malnutrition and supporting efforts to encourage the introduction of routine screening, assessment and appropriate nutrition support across healthcare and community environments. To achieve these aims, MNI makes the following recommendations:

<b>Identifying malnutrition</b>	<ul style="list-style-type: none"><li>• National nutrition policies should be in place that address malnutrition, as well as obesity and overweight</li><li>• Routine screening for vulnerable groups should be built into national nutrition policies</li><li>• Validated screening tools should be used to identify patients with or at risk of malnutrition</li><li>• Agreement is needed on who is responsible for performing screening for malnutrition</li><li>• Evidence based guidance used to ensure action is taken following screening</li></ul>
<b>Prevalence</b>	<ul style="list-style-type: none"><li>• A commitment should be made to systematically measure the prevalence of malnutrition and risk of malnutrition and to share the results</li><li>• A common approach taken to measuring and documenting malnutrition to facilitate comparisons</li></ul>
<b>Causes</b>	<ul style="list-style-type: none"><li>• Evidence based approaches for nutritional care plans should be used, taking into account the causes of malnutrition, the objectives of intervention but also environmental and practical constraints</li></ul>
<b>Consequences</b>	<ul style="list-style-type: none"><li>• Awareness should be raised about the wide ranging negative consequences of malnutrition for patients, for healthcare providers and for society in general</li></ul>
<b>Benefits of Medical Nutrition</b>	<ul style="list-style-type: none"><li>• A wealth of evidence demonstrates the benefits of Medical Nutrition. This should be translated into practice to ensure that patients who need nutritional intervention receive it in a timely and appropriate manner</li></ul>
<b>Guidance</b>	<ul style="list-style-type: none"><li>• Guidance on managing malnourished patients or patients at risk of malnutrition should reflect current evidence regarding nutritional intervention, such as ONS and provide clear and practical advice about how and when to use nutritional interventions</li></ul>
<b>Good Practice</b>	<ul style="list-style-type: none"><li>• Examples of good practice should be shared widely to facilitate the implementation of nutritional guidelines and ensure best use of resources</li></ul>

# ACKNOWLEDGEMENTS

The MNI would like to thank and gratefully acknowledge the input of the following experts who contributed with their knowledge and expertise:



**Professor Anne E. de Looy** is immediate past Honorary President of the European Federation of the Associations of Dietitians (EFAD) and Honorary Professor of Dietetics at the University of Plymouth, UK.



**Marco Greco** is President of the European Patients' Forum since 2016. He is also founder and chairman of the European Federation of Crohn's and Ulcerative Colitis Associations (EFCCA) since 2008.



**Professor Koen Joosten** is a paediatric-intensivist at Erasmus MC - Sophia Children's Hospital in the Netherlands. He is chairman of the nutrition group of the Dutch paediatric association and of the association healthy food for children aged 0-4 years.



**Professor Alessandro Laviano** is Associate Professor of Internal Medicine at the Department of Clinical Medicine, Sapienza University of Rome, Italy and Director of the European Society of Clinical Nutrition and Metabolism (ESPEN) educational programme (LLL).



**Professor Olle Ljungqvist** is Professor of Surgery at Orebro University-Sweden. He is Co-Chair of the European Nutrition for Health Alliance and founder and Executive Chairman of the ERAS Society (Enhanced Recovery After Surgery)



**Dr. Anibal Marinho** is President of the Portuguese Society for Enteral and Parenteral Nutrition and is the Head of the main Intensive Care Unit of the Hospital Geral de Sto António in Portugal.



**Dr. Jean-Pierre Michel** is honorary professor of medicine Geneva University, past president of the European Union Geriatric Medicine Society (EUGMS), and he is currently World Health Organization (WHO) expert of the aging and life course program.



**Fionna Page BSc (Hons), RD**, is a registered dietitian with many years of experience spanning both clinical practice and the medical food industry. She collated and wrote the full medical nutrition dossier on behalf of MNI, with the support of **Julie Winstone** for the chapter on parenteral nutrition.



**Julie Winstone PhD** is a medical writer with substantial expertise across a broad range of clinical areas, including nutrition. She wrote the new chapter on parenteral nutrition in the MNI medical nutrition dossier. Julie is a senior consultant and medical writer at Vitaccess, with more than 15 years' commercial and academic experience.

## REFERENCES

1. Ljungqvist O, de Man F. *Nutr Hosp* 2009;**24**:368-70.
2. Stratton RJ et al. Wallingford: CABI Publishing, 2003.
3. Meijers JM et al. *Nutrition* 2009;**25**:512-9.
4. Khalatbari-Soltani *Clin Nutr* 2016 **35**(6): 1340-6.
5. Russell C, Elia M. Redditch: BAPEN, 2012.
6. Sorensen J et al. *Clin Nutr* 2008;**27**:340-9.
7. Schneider SM et al. *Br J Nutr* 2004;**92**:105-11.
8. Guest JF et al. *Clin Nutr* 2011;**30**:422-9.
9. Schindler K et al. *Clin Nutr* 2010;**29**:552-9.
10. Imoberdorf R et al. *Clin Nutr* 2010;**29**:38-41.
11. Meijers JM et al. *Br J Nutr* 2009;**101**:417-23.
12. Kaiser MJ et al. *J Am Geriatr Soc* 2010;**58**:1734-8.
13. Suominen MH et al. *Eur J Clin Nutr* 2009;**63**:292-6.
14. Lelovics Z et al. *Arch Gerontol Geriatr* 2009;**49**:190-6.
15. Parsons EL et al. *Proc Nutr Soc* 2010;**69**:E197
16. Joosten KF et al. *Arch Dis Child* 2010;**95**:141-5.
17. Agarwal E et al. *Clin Nutr* 2012;**31**:41-47.
18. Lim SL et al. *Clin Nutr* 2012;**31**:345-350.
19. Meijers JM et al. *Br J Nutr* 2009;**101**:417-423.
20. Pirlich M et al. *Clin Nutr* 2006;**25**:563-72.
21. Elia M, Russell C. Redditch: BAPEN, 2009.
22. Gibbons T, Fuchs GJ. *Clin Pediatr (Phila)* 2009;**48**:356-61.
23. Hiesmayr M et al. *Clin Nutr* 2009;**28**:484-91.
24. Valentini L et al. *Clin Nutr* 2009;**28**:109-16.
25. Norman K et al. *Clin Nutr* 2008;**27**:5-15.
26. Sorensen J et al. *Clin Nutr* 2008;**27**(3):340-349.
27. Elia M. Redditch: BAPEN & NIHR Southampton BMC. 2015.
28. Rodriguez-Manas et al. *Value Health*, 2014;**17**(7):A507.
29. Morgan & Dent. Oxford: NBO, 2010.
30. Cepton. Malnutrition in Germany: Munich, 2007.
31. Freijer K et al. *Clin Nutr* 2013;**32**:136-41.
32. Rice N, Normand C. *Public Health Nutr* 2012; **15**:1966-72.
33. Benkovic et al. *Clin Nutr* 2014; **33**:689-93.
34. National Institute for Health and Clinical Excellence (NICE). Clinical guideline 32. London: NICE, 2006.
35. Milne AC et al. *Cochrane Database Syst Rev* 2009;CD003288.
36. Doig GS et al. *Clinicoecon Outcomes* 2013;**5**:369-79.
37. Pradelli L et al. *Clin Nutr* 2018; **37**:573-9.
38. Lundholm K et al. *Cancer* 2004; **100**:1967-77.
39. Culine S et al. *Support Care Cancer* 2014; **22**:1867-74.
40. Vashi PG et al. *BMC Cancer* 2014;**14**:593.
41. Ruggeri E et al. *Tumori* 2013; **99**:218-24.
42. Cotogni P et al. *Cancer Med* 2017;**6**: 1799-806.
43. Senesse P et al. *J Pain Symptom Manage* 2015; **49**:183-91 e2.
44. Aeberhard C et al. *Ann Nutr Metab* 2015; **67**:210-7.
45. Pironi L et al. *Clin Nutr* 2012; **31**:831-45.
46. Dibb M et al. *Clin Nutr* 2017; **36**:570-6.
47. Pironi L. *BMC Nutrition* 2017; **3**:6.
48. Elia M et al. *Clin Nutr* 2016; **35**:370-80.
49. Elia M et al. *Clin Nutr* 2016; **35**:125-37.
50. Klek S et al. *Am J Clin Nutr* 2014; **100**: 609-15.
51. Cawood AL et al. *Clin Nutr Suppl* 2009;**4**:81
52. Duncan DG et al. *Age Ageing* 2006;**35**: 148-53.
53. Caro MM et al. *Nutr Hosp* 2008;**23**:458-68.
54. Pepersack T. *J Gerontol A Biol Sci Med Sci* 2005;**60**:787-92.

For further details and a full list of references please refer to the dossier "Better care through better nutrition: Value and effects of Medical Nutrition".  
[www.medicalnutritionindustry.com](http://www.medicalnutritionindustry.com)





Medical Nutrition International Industry (MNI)  
c/o MCI - 280, Boulevard du Souverain, 1160 Brussels, Belgium  
secretariat@medicalnutritionindustry.com  
**[www.medicalnutritionindustry.com](http://www.medicalnutritionindustry.com)**  
Twitter: @MNInutrition