

ESPEN LLL PROGRAMME IN CLINICAL NUTRITION AND METABOLISM

Summary of Topics 2018

Topic 3 Nutritional Assessment and Techniques

To learn nutritional screening and assessment; the methods used; To know the benefits and limits of laboratory and balance-studies for nutritional assessments; To be aware of the importance of the routine screening all patients for malnutrition and of the continued monitoring of those at risk; To learn how body composition can be measured and to learn how reliable these measurements are; To know the components of energy expenditure in human beings; To know the methods for measurement of energy expenditure; To be able to define how energy intake influences energy expenditure; To be aware of malnutrition; To know how to screen, assess, and monitor patients for nutritional risk and for response to nutritional support. Improvement of competencies and skills in CN, application of effective CN in the treatment of disease and health promotion; To acquire tools to interpret new scientific information, and link with nutrition, better practical management of nutritional support.

Topic 4 Nutritional Support in Paediatric Patients

The modules of this Topic summarize the evidence, and provide recommendations for clinical practice regarding the following 4 issues:

1. Cow's milk protein allergy as the commonest food allergy in infants and young children.
2. Intestinal failure, as the most severe form of the chronic GUT disorder is discussed in respect to parenteral and enteral nutrition approach.
3. Nutritional support of the VLBW infant in-hospital and after discharge.
4. Dietetic approach to children with hypercholesterolemia.

Topic 6 Malnutrition

Topic 7 Substrates for Enteral and Parenteral Nutrition

The health status and disease require regular intake of appropriate quantity and quality of nutrients. All dietary components: proteins, carbohydrates, fats, vitamins, minerals and water are essential for balanced diet. Nutrients can be delivered via enteral and parenteral route. Standard diets are suitable for most patients, while disease specific formulas or immunodiets has been modified to create optimal conditions for treatment and to increase nutritional status in aspect of disease related disorders.

Topic 8 Approach to Oral and Enteral Nutrition in Adults

Innovative approaches to increase nutritional intake of normal food in hospital patients. Sip feeding as supplemental nutrition. If oral nutrition cannot be maintained, artificial EN using a feeding tube may be used. Main indications and contraindications for EN, which formulae should be used in which conditions, the metabolic effects of specific nutrients added to some formulae and the most important complications of EN. Disease-specific enteral formulae.

Correct placement of the feeding tube to avoid dislocation and aspiration. "Know-how" to monitor patients on enteral nutritional (EN) support.

Topic 9 Approach to Parenteral Nutrition

To identify indications for parenteral nutrition; To understand the role of parenteral nutrition in clinical outcome; To select the best venous access for PN administration considering the advantages and risks of each site; To consider the best types of PN bags to assure adequate administration; To know the different systems for parenteral nutrition; their advantages and limits; To know the risks associated with the compounding/ready-to-use preparation of AiO PN admixtures (GMP and potential incompatibility reactions) and the pharmacist's tasks and responsibility for an admixing service; To understand to apply a risk assessment for adding an i. v. drug to an AiO admixture for both the influence of a drug on a PN admixture and the influence of PN admixture on the fate of the drug; To realise that monitoring, using data recorded in serial form is a vital tool for achieving optimal results; To understand how to implement monitoring protocols not only to optimise feeding methods and prescriptions but also to prevent complications or at least to detect them at an early stage, allowing timely action; Improvement of competencies and skills in CN, application of effective CN in the treatment of disease and health promotion; To acquire tools to interpret new scientific information, genetic predisposition and link with nutrition, better practical management of nutritional support.

Topic 10 Nutritional Support in Pediatric Patients

The modules of this Topic review the current evidence and provide guidance on:

- early nutritional interventions aimed to reduce the risk of allergic diseases, coeliac disease, type 1 diabetes, and obesity with the particular emphasis on the primary and secondary prevention;
- practical approach to the use of parenteral nutrition in the pediatric patients;
- use of enteral nutrition in the hospital and at home of the diseased child;
- nutrition of critically ill children hospitalized in the intensive care units.

Topic 12 Nutritional Support in Gastrointestinal Diseases (NSiGID)

To understand the nature and pathophysiology of intestinal failure and short bowel syndrome; To have an understanding of the pharmacological and nutritional therapy of intestinal failure and short bowel syndrome; To know the prognosis of intestinal failure and have an appreciation of the surgical and other experimental alternatives to long-term home parenteral nutrition; To learn about the nutritional management of patients with patients with gastrointestinal fistulas; To learn about the metabolic and nutritional complications of patients with gastrointestinal fistulas; To understand the epidemiological, environmental and genetic factors in the pathogenesis of inflammatory bowel diseases; To know the nutritional implications in inflammatory bowel disease patients; To understand the rationale for nutritional interventions; To perform evidence-based enteral and parenteral nutritional interventions. Improvement of competencies and skills in CN, application of effective CN in the treatment of disease and health promotion, To acquire tools to interpret new scientific information, and link with nutrition, better practical management of nutritional support.

Topic 13 Nutritional Support in Liver Disease

To learn the consequences of malnutrition in liver cirrhosis; To know how to diagnose malnutrition in liver cirrhosis and how to treat malnutrition in liver cirrhosis; The metabolic problems of patients with acute liver failure; The caveats regarding administration of glucose and amino acids; To learn how to discriminate between patients with mild or severe pancreatitis; To appreciate the impact of adequate nutritional support on clinical outcome in patients with acute pancreatitis; To learn about the benefits and the risks of enteral and parenteral nutrition in patients with acute pancreatitis; To learn the best approach to nutritional support in patients with severe and complicated acute pancreatitis; To know about the physiology and pathophysiology of CP (chronic pancreatitis); To know the treatment goals in CP with respect to nutrition; To understand the indications for different nutritional interventions in CP. Improvement of competencies and skills in CN, application of effective CN in the treatment of disease and health promotion; To acquire tools to interpret new scientific information, genetic predisposition and link with nutrition, better practical management of nutritional support.

Topic 14 Nutritional Support in Pancreatic Disease

To learn the consequences of malnutrition in liver cirrhosis; To know how to diagnose malnutrition in liver cirrhosis and how to treat malnutrition in liver cirrhosis; The metabolic problems of patients with acute liver failure; The caveats regarding administration of glucose and amino acids; To learn how to discriminate between patients with mild or severe pancreatitis; To appreciate the impact of adequate nutritional support on clinical outcome in patients with acute pancreatitis; To learn about the benefits and the risks of enteral and parenteral nutrition in patients with acute pancreatitis; To learn the best approach to nutritional support in patients with severe and complicated acute pancreatitis; To know about the physiology and pathophysiology of CP (chronic pancreatitis); To know the treatment goals in CP with respect to nutrition; To understand the indications for different nutritional interventions in CP. Improvement of competencies and skills in CN, application of effective CN in the treatment of disease and health promotion; To acquire tools to interpret new scientific information, genetic predisposition and link with nutrition, better practical management of nutritional support.

Topic 15 Nutrition Support in Renal Disease

Techniques for assessing nutritional status and nutrient needs in patients with acute renal failure (ARF), and chronic kidney disease (CKD) will be described. Dietary approach in CKD on controlled protein intake in the pre-dialysis phases will be discussed, along with the different nutritional supplementation modalities (oral supplementation, intradialytic parenteral nutrition) for patients on chronic hemodialysis and peritoneal dialysis. Practical management of enteral and parenteral nutrition in ARF will be presented.

Topic 17 Nutritional Support in the Perioperative Period

The phenomenon of stress encountered after surgeries is a useful response but if not controlled can lead to auto cannibalism. The counter regulatory hormones and inflammatory response to surgery causes insulin resistance and hyperglycemia which increases complication and mortality in postoperative critically ill patients. Insulin resistance can be reduced by use of anaesthesia and analgesia, fasting. As well as preoperative metabolic preparation using carbohydrates instead of overnight fasting. Preoperative loading of carbohydrates has shown

to reduce nitrogen losses and retain body mass. The more classical nutritional support has to be considered on individual basis, preoperative enteral or parenteral feeding in malnourished patients for five to ten days is associated with reduction of post operative morbidity. Another major complication is the postoperative ileus. Ileus is caused by inhibitory sympathetic activity of bowel, mid thoracic epidural analgesia promotes postoperative bowel function by blocking inhibitory reflexes, and also helps avoid the use of opioids that inhibit gut motility. Maintaining postoperative fluid balance is another key factor in preventing postoperative ileus. Malnourished patients are more prone to complication.

Topic 18 Nutritional Support in Intensive Care Unit (ICU) Patients

Understanding of the physiologic and metabolic changes during acute illness. Energy requirements and macronutrient utilization. Protein metabolism and its importance. Screening and assessment of malnutrition. Specific situations related to previous nutrition status (severe undernutrition, obesity, sarcopenia), comorbidity (cancer, age, renal or liver failure, ...), and previous stay in the hospital. Determination of nutritional prescription (calories, protein), choice of the route, decision regarding timing (early enteral or parenteral nutrition), requirement of supplemental parenteral nutrition. Choice of special nutrients and in which conditions: glutamine, omega 3 fatty acids, various lipid emulsions, high protein feeding, probiotics, vitamins and trace elements in special conditions (CRRT, liver failure, ARDS, ECMO). Adaption of the nutritional regimen according to the progress of the patient in the course of his therapy. Prevention of frailty during stabilization and preparing for best rehabilitation.

Topic 19 Nutritional Support outside the Hospital: Home Parenteral Nutrition(HPN) in Adult Patients

Learn about epidemiology and the extent of the use of HPN in adult patients; Learn about indications for HPN in adult patients and clinical features (including prognosis) of these patients; Understand the importance of training and monitoring patients on home parenteral nutrition; Learn about common practice on training and monitoring; Learn about different central venous access devices (CVAD); Catheter related complications of infectious and mechanical origin; Strategy to prevent problems and treatment of complications; To learn about the feeding of the incurable cancer patient (why, which and how); To understand the impact of HPN on survival and quality of life; Withdrawing HPN; How to adapt nutrition support in HPN patients? What are the nutritional needs of a patient? How to cover the needs for a patient? How to evaluate PN dependence?; Learn about identifying the main metabolic HPN complications in adult patients; Learn how to prevent and cure these complications. Improvement of competencies and skills in CN, application of effective CN in the treatment of disease and health promotion, To acquire tools to interpret new scientific information, genetic predisposition and link with nutrition, better practical management of nutritional support.

Topic 20 Nutrition and Prevention of Diseases

To understand the potential of nutrition in cancer prevention; To understand specific behaviours that can modify cancer risk; To gather insights into the role of gene-diet interaction in determining response to dietary components.

To appreciate the role of protein malnutrition in the development of osteoporosis; To appreciate the role of vitamin D in the development of osteoporosis and in fall risk; To understand how improvements in nutrition can reverse the pathological effects of low vitamin D and low protein intake on the musculo-skeletal system; To understand how the response to treatment for osteoporosis is modulated by protein intake; To demonstrate the importance of cardio-vascular diseases (CVD) in morbidity and mortality in the world;

To review the major risk factors for CVD; To give an overview on the importance of lifestyle components, particularly diet, in the modification of different risk factors, and in the prevention of CVD; To review the mechanisms through which nutrition may affect CVD; To provide global and specific recommendations on healthy diets. To improve competencies and skills in CN and in application of effective CN in the treatment of disease and health promotion; To acquire tools to interpret new scientific information, genetic predisposition and link with nutrition, better practical management of nutritional support.

Topic 21 Consequences of Diabetes on the Nutritional Status

Diabetes mellitus (DM) is a chronic metabolic disorder with disturbances not only of carbohydrate metabolism but lipid and protein metabolism as well. At diagnosis, Type 1 DM may be associated to malnutrition. However, Type 2 DM patients are generally obese and may have a relative reduction of fat free mass. Micronutrient deficiencies have been identified as risk factors for development of DM and poorer metabolic control, although therapeutic interventions have met variable success, depending on each individual micronutrient. When patients with stress hyperglycemia or DM require artificial nutrition, they may need the combination of insulin protocols and special formulas characterized by changes of the quality and/or quantity of carbohydrates and lipids, adjusting the energy provision to the nutritional requirements and metabolic control. The indications for specific formulas in diabetic patients are adjusted to the clinical setting and to the metabolic control achieved in the individual patient.

Topic 22 Nutrition in Lipidaemias

Dyslipidemia (DL) is an important cause of atherosclerosis and cardiovascular disease. It can also cause pancreatitis and skin deposit of lipids. International scientific societies have issued clinical guidelines. The recommendations for diagnosis and management of these disorders may vary among them. It is advisable that health care providers choose the guidelines that better adapt to local cardiovascular risk and patterns of established disease. Along with statins and fibrates, new drugs have recently joined the therapeutic options for dyslipidemia such as antibodies to proprotein convertase subtilisin/kexin type 9, (PCSK 9), cholesterol ester transfer protein (CETP) inhibitors, antisense oligonucleotides and Inhibitors of the microsomal triglyceride transport protein (MTP). On the other hand, systemic inflammatory response is characterized by changes in lipid metabolism. When artificial nutrition is prescribed patients may experience lipid metabolism alterations due to primary lipid disorders or to the associated disease requiring special nutrition. Therefore, this prescription should carefully take into consideration lipid metabolism, as well as quality and quantity of lipids. Periodic laboratory checking will indicate the changes that may be needed to minimize these disturbances.

Topic 23 Nutrition in Obesity

Obesity is one of the most frequent diseases all over the world. It is associated to many complications in all organs and systems of the body and makes difficult the management of these disorders. Genetic and environmental factors interplay in its pathophysiology. Along an intrinsic predisposition, cultural and lifestyle patterns, characterized by excess energy intake and limited physical activity, lead to weight excess. Epidemiological studies have analyzed the associations of macro and micronutrients to the development of obesity. There are also numerous studies about different dietetic approaches, combined with physical activity and behavioral changes. Drug therapy may be indicated when BMI is above 30 kg/m² and bariatric surgery may be considered for BMI higher than 35 kg/m², if there are associated comorbidities than can improve with weight loss and there has been failure to lose weight with conventional measures. Long term follow up is mandatory after bariatric surgery to contribute to the prevention of weight regain.

Topic 24 Nutritional Support in Metabolic Syndrome

The Metabolic Syndrome (MS) is a clustering of metabolic alterations including central obesity, hypertension, dyslipidaemia and hyperglycaemia. It carries increased risk of diabetes and long term cardiovascular disease (CVD), although short - term CV risk is better predicted by other means. Insulin resistance (IR) is a major underlying factor in the MS, with profound implications in terms of metabolic and CV morbidity.

Causes of IR are complex: altered adipose tissue endocrine functions, altered lipid metabolism also in non-adipose tissues, inflammation and oxidative stress are emerging as the key players. Important roles are also attributable to altered nutrient sensing in the gut and CNS. Measurement of IR with reliable surrogates provides an important tool for effective management of metabolic and CV risk in MS patients. Regarding therapeutic approaches, lifestyle modification improves diabetes and CV risk and is the first step in the treatment of MS. Modest weight loss and light physical activity significantly reduce IR. However, behavioral strategies are necessary to achieve long term success in maintaining adequate food intake and exercise. Finally, drug therapy of MS should address each of its components to prevent diabetes and CV disease and to reduce overall mortality. Metabolic effects and safety profile of each drug should be carefully considered.

Topic 25 Nutritional Support in Neurological Diseases

To identify different factors that may favour malnutrition in patients with acute and chronic neurological diseases, including metabolic changes, dysphagia, gastrointestinal consequences, drug therapy; To know the importance of individualized nutritional assessment in patients with neurological disease in order to address the different nutritional problems; To know the respective indications for oral and enteral feeding, and the most appropriate feeding route for each clinical situation; To know the compulsory assessment leading to decision of nutritional support and the indications and routes of the latter; To know the outcome of a stroke patient receiving enteral nutrition; To know the main metabolic characteristics of patients with acute brain or spinal cord trauma and the consequences for nutritional support; To know the ethical, legal, and moral implications of nutritional support in patients with progressive dementia; To know the problems of clinical decision making in the timing/safety/efficacy of PEG tube feeding in amyotrophic lateral sclerosis patients. To improve competencies and skills in clinical nutrition; To acquire tools to interpret new scientific information, genetic predisposition and link with nutrition, leading to a better practical management of nutritional support.

Topic 26 Nutritional Support in Cancer

Cancer cachexia is a systemic syndrome characterized by muscle loss, whose pathogenesis is triggered by tumour-induced inflammatory response and exacerbated by radio-chemotherapy. Consequently, appetite is disrupted and muscle protein catabolism is increased. Cachexia is clinically relevant since it increases morbidity and mortality. The effective treatment should be based on appropriate timing of nutritional support, modulation of inflammatory response and physical activity. Anti-cachexia drugs should also be integrated by nutritional support.

Topic 36 Nutrition in Older Adults

To understand the changes in body composition with ageing; To know the prevalence of undernutrition according to the subject's life setting; To know the factors contributing to undernutrition in the elderly; To know the main medical consequences of undernutrition; To know that elderly subjects are at risk for micronutrient deficiency; To know the recommended strategies for screening and assessing undernutrition; To know when and how to use nutritional supplements, and the results of this supplementation; To know the most frequent indications for artificial nutrition in the elderly; To know the techniques and outcome; To know the indications and results in specific clinical situations; To understand the need for ethical elements alongside the medical ones in deciding upon starting an elderly patient on artificial nutrition. Improvement of competencies and skills in CN, application of effective CN in the treatment of disease and health promotion; To acquire tools to interpret new scientific information, genetic predisposition and link with nutrition, better practical management of nutritional support. To understand sarcopenia, its causes, consequences, screening and interventions.

Topic 37 Nutrition and Sport

Explain the influence of exercise intensity, duration and mode, as well as of training status, diet and gender, on substrate utilization during exercise; Present the latest findings on the effect of physical activity and inactivity on *ad libitum* energy intake and on energy balance regulation; Clarify nutritional recommendations for endurance, strength and power sports; Discuss impact of physical activity on primary and secondary prevention of chronic diseases.

Topic 38 Nutritional Support in Pulmonary Diseases

To learn about the assessment and prevalence of nutritional depletion in Chronic Obstructive Pulmonary Disease (COPD); To understand the importance of weight loss and nutritional depletion, the mechanisms, the consequences and reversibility of weight loss and muscle wasting in COPD; To develop an overview of the results of clinical trials of nutritional support in COPD; To understand the aims of nutritional support in COPD and how support programmes might integrate with other therapies; To understand the reasons why nutritional support programmes might be unsuccessful; To learn about the magnitude of the burden of the disease and the systemic involvement of chronic respiratory failure; To learn about the integration of nutritional support in pulmonary rehabilitation including exercise training for patients with systemic chronic inflammatory diseases as chronic respiratory failure. Improvement of competencies and skills in CN, application of effective CN in the treatment of

disease and health promotion; To acquire tools to interpret new scientific information, genetic predisposition and link with nutrition, better practical management of nutritional support.

Topic 39 Let's talk about Nutrition: Communication Skills for Health Care Professionals