

## Malnutrition

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### Question 1: What Can Be Done to Identify Patients with Clinically Relevant Malnutrition in Our Care?

*Blumenstein:* We use the NRS score on our wards at the university clinic Frankfurt (Main). By implementing this screening procedure, the awareness of clinically relevant malnutrition on the ward improved, but there is still a lot of work left!

*Gerlach-Runge:* The most important issue is to increase awareness of malnutrition in all areas of hospital care. The A.S.P.E.N. criteria and the MUST score are standardized tools to help identify and grade patients with malnutrition. Once identified, the diagnosis needs to be included in the patients' documents to inform all future hospital and care facilities. The diagnosis has to be reconfirmed and controlled regularly to determine any improvement or deterioration and action required. Screening is especially important in health care areas where patients make first contact to the care facility, e.g., emergency rooms, outpatient clinics, GP offices. Screening should be performed upon clinical concern, such as unplanned weight loss, appearing thin, fragile skin, poor wound healing, pressure ulcers, apathy, muscle wasting, poor appetite, altered bowel habit or prolonged intercurrent illness. Special screening should also be undertaken in risk groups with chronic diseases like cancer, renal/liver disease, inflammatory bowel disease, autoimmune diseases, progressive neurological disease such as dementia or Parkinson's disease, acute

illness, frailty or immobility, poor social support, rehabilitation after stroke or extended surgery or in palliative care.

*Hausen:* We need to incorporate screening strategies into our clinical routines, both in hospital as well as in our outpatient clinics. During longer hospital stays, we need repeated screening at predefined intervals, especially in the care of high-risk patients. In internal medicine, documentation of, and feedback on, daily food intake poses one of the biggest challenges. This may be partly due to a general lack of nursing capacity which we have to address.

*Maasberg:* Identification of patients with malnutrition is a difficult task in daily practice due to the lack of prominent symptoms especially in overweight patients. The impact of malnutrition, however, is large, since it is negatively influencing the prognosis of other concomitant diseases. Screening for malnutrition would be the first step to identify patients in need for nutritional counselling or even nutritional intervention. In my opinion, weight changes within the last 3–6 months should be screened for regularly in hospitalized patients and if larger than 5%, further nutritional assessments would be required.

*Vilz:* In clinical routine, there are several options to assess malnutrition such as systematic nutritional risk screening (NRS) in all patients upon hospital admission, documentation of oral intake, BMI, nutritionist evaluation, serum albumin.

## Question 2: Catheter-Related Complications in Chronic Intestinal Failure – What Can We Do to Maintain Sufficient Venous Access Routes?

*Blumenstein:* Every catheter-related complication is a life-threatening event for patients dependent on PN. Thus, these complications have to be reduced to a minimum. Firstly, the right choice of catheter type seems to be important. The use of tunneled catheters (e.g., Broviak catheter) instead of port catheters, single-lumen instead of multiple-lumen catheters are advised, also according to the DGEM guidelines for chronic intestinal failure [1]. Secondly, only experienced surgeons familiar with venous access surgery should implant the catheters, always having in mind that this might not be the last catheter for the patient. Lastly, patients should be trained extensively and repeatedly in the use of their catheter.

*Hausen:* Teaching patients and members of staff is vital for preventing catheter-related complications. In addition, there is evidence that taurolidine citrate block solution may be helpful in preventing central venous catheter-associated blood stream infections (CLABSI) although there is dissent on the exact impact of its use. A German regulatory board (KRINKI) recommendation also assesses the use of self-disinfecting caps for which there is positive but limited evidence [2]. Given the importance of maintaining venous access routes, maximum effort should be undertaken to prevent CLABSI.

*Maasberg:* Professional education of anybody involved within the handling of the catheter is essential to prevent catheter-related complications. Therefore, the patients themselves, their close family members or partners as well as every health care provider (nurses, doctors) should be perfectly educated on the correct and sterile usage of the catheter. Furthermore, it would be helpful to reduce the utilization of the catheter for obsolete purposes, e.g., routine blood sampling. In patients with repeated catheter infections, application of a catheter block solution (e.g., taurolidine citrate block) can reduce the frequency of infectious complications.

## Question 3: Is Malnutrition the New Hype for “DRG Coding Cosmetics” or Really a Clinically Relevant Problem in Hospitalized Patients – What about the Evidence?

*Blumenstein:* The DRG coding currently only helps to reimburse apart of the efforts of the nutrition team. The data on the prevalence of malnutrition in hospitalized patients and the compromised outcome in these patients

seem to be clear. However, the overall acceptance of a nutrition screening and consecutive intervention in daily practice must be improved.

*Gerlach-Runge:* There is large evidence that malnutrition is a condition affecting mainly the elderly population and is associated with increased mortality, decreased quality of life and fall risk [3]. Malnutrition has also been associated with increased length of stay among hospitalized patients [4]. Timely nutritional support in the elderly population has shown improved outcomes in the community or home setting [5]. As hospitalized and malnourished elderly patients commonly fail to meet their energy requirements, nutrition support is paramount for this population. Malnutrition is represented in the DRG system, thereby promoting its recognition as a diagnosis and, as a result, treatment through adequate nutritional therapy. For the coding guideline, a precise definition of malnutrition was determined, resulting in a viable and consistent handling. Initial analyzes show that the additional generated revenues reflect the increased support costs and that the additional resources required for personnel and material costs for the therapy are at least refinanced [6].

*Hausen:* As the “nutrition day data” show us, malnutrition has been a relevant problem in a wide range of clinical fields for a long time [7]. Amongst others, malnutrition negatively influences mortality, postoperative outcome and length of hospital stay. Nutrition is also part of the frailty syndrome, which is currently gaining attention as a vital factor in individualized medicine. Malnourished hospitalized patients need specific resources to address this aspect if adequate medical outcomes are to be realized. Therefore, the DRG coding system should be refined to enable hospitals to receive adequate funding as such interventions are costly and resource-intensive if applied on a wider basis.

*Maasberg:* Already in 1936, Hiram O. Studley [8] showed in his publication in *JAMA* that weight loss >20% prior to surgery due to peptic ulcers was associated with a tenfold increase in mortality rate. Since then, numerous studies evaluated the prevalence of malnutrition in hospitalized patients and the negative influence of malnutrition on different diseases. In 2006, Matthias Pirlich et al. [7] published in *Clinical Nutrition* data from Germany, which showed the significance of malnutrition in different medical departments. The tools and the criteria to define malnutrition, however, are not standardized among different publications, making comparisons between different studies difficult. The problem is identified, but more resources for nutritional counseling and interventions are needed within our hospital system.

*Vilz:* There is evidence from the surgical field that malnutrition is associated with worse outcome especially in oncologic upper GI surgery, and it is evident that major surgical stress and trauma further induce catabolism. Therefore, malnutrition is a relevant problem and possibly an outcome-determining factor in surgical patients. Further controlled studies are needed to assess the direct impact of nutritional interventions on patients with planned oncologic surgery, for example in colorectal cancer.

#### **Question 4: Are Visceral Surgeons and Gastroenterologists Aware Enough of the Potential Benefit of Nutritional Interventions before Major Surgery and What Can We Do to Improve Surgical/Clinical Outcome?**

*Blumenstein:* Unfortunately, these benefits are known but not sufficiently implemented in daily clinical practice. I think, the only way to improve this is to establish improved reimbursement systems for the extra effort in establishing a nutritional support.

*Gerlach-Runge:* Within specialized working groups, malnutrition has gained increasing attention over the last decade because its effect on morbidity, mortality, wound healing, quality of life etc. has been clearly shown in several studies. Among general surgeons and gastroenterologists, however, malnutrition is often only recognized at a very late stage. The treatment of malnutrition often only becomes apparent in the postoperative setting, especially in the ICU where wound healing, physical stability, and long-term outcome may be hampered due to cachexia or imbalanced nutrition. The fact that preoperative nutritional status may have an impact on the outcome of surgery and that a timely treatment of malnutrition may reduce morbidity and mortality is only rarely recognized and discussed.

*Hausen:* The potential benefit of nutritional interventions tends to be underestimated among hospital staff. Hospitals should develop in-hospital standards addressing nutrition-related local traditions and patient pathways. This way, adherence to national or international guidelines could be facilitated. Multidisciplinary nutrition support teams can help to clarify responsibilities and share workload.

*Maasberg:* In my opinion, there is an increasing awareness about the importance of malnutrition and the role of nutritional intervention in surgical and gastroenterological departments. Nutritional intervention prior to major surgery would be favorable, yet it would need the involve-

ment of outpatient caregivers (family doctors and/or outpatient nutritionists) to accompany the nutritional intervention, to provide nutritional supplements or even in some patients provide supportive parenteral nutrition.

*Vilz:* There is enough evidence that nutritional interventions can reduce postoperative complications after abdominal surgery. Using the ESPEN guideline, every surgeon can gather information about treating patients that are at risk for malnutrition or with proven malnutrition, however, the implementation in daily practice is often problematic. To further improve the outcome of patients scheduled for major surgery or being at risk for malnutrition, the use of simple, evidence-based and widespread screening tools (such as NRS, MUST or others) would be of advantage.

#### **Question 5: Do We Need Specialized “Visceral Medicine” Wards to Offer our Patients Better Interdisciplinary Care and Which Patients Would Profit Most from This Interdisciplinary Approach?**

*Blumenstein:* I truly believe these interdisciplinary wards are our future! We lose too much information and time by running completely separate wards at the moment.

*Gerlach-Runge:* In most cases, malnutrition is a treatable condition that can be managed using first-line dietary advice to optimize food intake and oral nutritional supplements where necessary [9, 10]. When possible, the factors contributing to the cause of malnutrition should be recognized and treated. However, a multidisciplinary team approach is more efficient to enlighten all aspects of the patients' condition and then determine the optimal nutritional strategy, according to the individual's clinical condition and social situation. The team may include surgeons, physicians, dietitians, nurses, physiotherapist, psychotherapists, and pharmacists. An interdisciplinary nutritional management is crucial in the field of intestinal failure and increases the sensitivity and knowledge about effects and treatment of malnutrition in these complex patients. Successful reconstruction surgery, early nutritional therapy and psychosocial support during the hospital stay may reduce complications, the overall hospital stay, and thus relevant costs.

*Hausen:* There certainly are disease entities, which routinely require a multidisciplinary approach. This approach seems to be especially rewarding in inflammatory bowel disease, transplantation medicine, and intestinal failure. “Visceral medicine wards” led by an interdisciplinary team can therefore facilitate decision making and

may offer a well-designed comprehensive treatment strategy for the patients. On the other hand, multidisciplinary may need additional communication and a clear definition of responsibility. Also, it can be challenging to establish highly disease-specific nursing routines on wards that care for such a variety of highly complex surgical and gastroenterological patients.

*Maasberg:* I do not think that specialized wards offer better interdisciplinary care to our patients. A good cooperation between a surgeon and gastroenterologist, however, is essential for the successful treatment of our patients and should therefore be implemented within every hospital. Within this cooperation, regular exchange about patients with a need for interdisciplinary treatment, maybe even in combined rounds or regular meetings would improve the quality of care.

*Vilz:* I think that we do indeed need visceral medicine wards to shorten communication channels in diagnosing patients with abdominal cancer or patients screened and scheduled for organ transplantation to improve interdisciplinary discussion and treatment. Also, intestinal failure/short bowel syndrome is a complicated disease relating to diagnosis, surveillance and treatment requiring outstanding professional and interdisciplinary competence (abdominal surgery for treatment of enteroatmospheric fistulas, vascular surgery for implantation of nutritional catheters; endoscopy and radiology for diagnosing bowel length, nutritional counselling, endocrinology, pharmacology for diagnosing different deficiencies or treatment with drugs in regard to impaired absorptive capacity...) and therefore an interdisciplinary approach is needed.

### **Question 6: What Processes Should Be Implemented in Our Institutions to Stimulate Cooperation between Doctors, Nurses and Nutritionists to Effectively Diagnose and Treat Malnutrition?**

*Blumenstein:* Let's start with establishing interdisciplinary nutrition care teams in all hospitals. This would improve the management and outcome of malnourished patients for sure. Treating physicians have to be trained in relevant parameters to increase awareness of this extremely relevant topic.

*Gerlach-Runge:* Regular staff meetings, interdisciplinary ward rounds, joint conferences and courses will facilitate team work and a better understanding of the key factors in other disciplines. In addition, one of the cornerstones is to acknowledge malnutrition as an independent diagnosis and improve the quality of treatment through the use of

standardized adequate nutritional therapy. Finally, documenting the diagnosis and explaining the special treatment plan in the discharge letters and handovers to the following health care associates may help to expand the network and to teach or at least sensitize patients, caregivers and doctors to the issue of intestinal failure/rehabilitation especially with regards to the importance of nutritional therapy. Integrating malnutrition as a proper diagnosis into treatment pathways, as well as training all team members involved in the treatment, may increase awareness and establish quicker appropriate care for these patients.

*Hausen:* Benefits of nutritional support should be made visible not only to the single patient but also to the members of staff. Very often, medical staff only see the patient at single time points and do not experience the long-term beneficial effects of nutritional interventions. Therefore, short periodical feedback about the patient's nutritional development to all involved team members can help to stimulate commitment. In general, there is great interest in nutrition in all parts of society at the moment. We need to transfer this general interest to the care of our patients on our wards.

*Maasberg:* Education of the hospital staff (nurses and doctors) to increase the awareness of malnutrition might be a first step to identify more patients. If a team of nutritionists exists, they should be involved early in this process and nutritional counseling should be offered to every patient at risk of malnutrition. In a perfect world, screening tools to identify malnutrition (e.g., nutritional risk score, NRS) would be recorded in every patient entering a hospital as part of the registration process and patients at risk would thereafter receive further nutritional assessment and even nutritional intervention.

*Vilz:* Every patient scheduled for major abdominal surgery or organ transplantation should have a standardized screening for malnutrition (i.e., Nutritional Risk Score, Albumin), as described above. When the screened patients are at risk for malnutrition, nutritional counseling should be scheduled. In case of severe malnutrition, an inpatient admission should be considered, and planned surgery should be postponed.

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