Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Editorial

A simple remote nutritional screening tool and practical guidance for nutritional care in primary practice during the COVID-19 pandemic

SUMMARY

Challenging periods like the COVID-19 pandemic require fast and efficient adaptations of the healthcare system. It is vital that every patient has access to nutritional care as a part of primary healthcare services, even if social distancing measures are adopted. Therefore, we propose a simple remote nutritional screening tool and practical guidance for nutritional care in primary practice, and their implementation into telemedicine processes and digital platforms suitable for healthcare providers. The acronym for the tool is R-MAPP, as for **R**emote – Malnutrition **APP**, while the tool will be available also as an app. This protocol consists of two simple validated clinical tools for identifying nutritional risk and loss of muscle mass and function –Malnutrition Universal Screening Tool ('MUST') and SARC-F (5-item questionnaire: **S**trength, **A**ssistance with walking, **R**ise from a chair, **C**limb stairs and **F**alls) - and additional practical guidance on nutritional interventions for family physicians.

1. Introduction

The COVID-19 pandemic has spread rapidly across the world within weeks, changing everyday life and significantly impacting healthcare systems. To fight this unexpected pandemic most of the healthcare systems have adapted their existing resources to try to meet the enormous need to test and track people with suspected infections and to provide care to patients with COVID-19 [1,2].

Additionally, the majority of affected countries have implemented strict measures to ensure social distancing and stringent rules on physical visits to healthcare facilities [3–5]. It has become obvious that remote contact with patients must be ensured to continue to provide adequate care for both non-COVID-19 patients and COVID-19 positive patients who are treated at their homes [6]. One of the recommendations from the World Health Organization (WHO) during the COVID-19 pandemics is to use telemedicine to optimize service delivery platforms and to strengthen the Health Systems Response to COVID-19 [7].

When health services or care are provided outside the traditional healthcare facility - telemedicine - it is critical to follow the standards set by expert organizations and legislation at country level [7,8]. Telemedicine is considered as a useful remote communication and information technology to provide medical and clinical services to patients in different locations. When providing remote nutritional assessment or intervention as a minimum it is vital to ensure that following criteria can be met: patients' clinical needs and interventions are straight forward, the patient's medical records can be accessed, there is no need for physical examination, all information on intervention can be shared remotely, there is a safe system to prescribe interventions and the patient has capacity to decide about treatment.

A Cochrane systematic review evaluated the effectiveness of interactive telemedicine (provided as remote monitoring and/or real-time video-conferencing) as compared to usual care alone in 93 trials, including 22.047 patients for the monitoring of chronic diseases, post-operative follow-up, etc. The authors concluded that the use of telemedicine can improve the control of blood glucose in patients with diabetes, and can be as useful as face-to-face attention, in the management of heart failure [9].

Telemedicine can be used in the monitoring of children and adult patients with medical nutrition at home, even though, very few articles have been published so far [10–14].

To ensure that adequate remote nutritional assessment and care can be provided to patients in their homes with decreased ability to reach to health care professionals, our aim is to propose simple remote nutritional screening tool and practical guidance for nutritional care in primary practice.

2. Patients in the era of COVID-19

In this practical guidance we are addressing all the patients that might need nutritional care during the COVID-19 pandemic. Non-COVID-19 out-patients with chronic and acute diseases have their regular needs provided by healthcare systems that might no longer be able to meet these in the same way as previously. Newly diagnosed patients with disease related malnutrition, or other forms of nutritional imbalances, should be prescribed timely and

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appropriate nutritional support by their family physicians. Also, chronic patients with previously prescribed nutritional support should be re-screened, monitored and their nutritional therapy should continue to be prescribed where indicated. Many consulting services can be done remotely by ensuring good digital communication channels between patients, family physicians and hospital physicians or specialists. National health services and health insurance funds should enable the use and reimbursement of referrals for a specialist's services that do not require the patient to physically attend the hospital. Such model is present in Croatia since the year 2015. The Spanish NHS has gradually included modality of e-consultation in different Spanish regions in primary care and hospital specialists during the last decade, and it has been recently included by the insurance companies during COVID - 19 pandemics. In Germany, remote monitoring of cardiology patients is well established since several years; a wider application of e-consultation has been facilitated only recently for family physicians and specialists with reimbursement by the NHS.

In Italy, remote monitoring of patients by GPs was not a standard approach, but it was implemented in a few regions for monitoring homecare patients with specific diseases or receiving tailored therapies like artificial nutrition [15]. Nowadays, during the COVID-19 pandemic, family physicians are relying more and more on telemedicine, but specific continuing healthcare teams will be sent to patients' homes in case of possible COVID-19 cases. So, it is essential that family physicians receive correct information by patients or caregivers, as guaranteed by the use of validated screening tools.

In terms of COVID-19 patients, we are aware that majority of confirmed patients have mild to moderate disease, which includes non-pneumonia and pneumonia cases. According to available preliminary data, the median time from onset to clinical recovery for mild cases is approximately 2 weeks and 3–6 weeks for patients with severe or critical disease [16]. During this time patients are confined to their homes or other closed facilities, most of them minimally mobile or bedridden. The consequence of inactivity is rapid muscle atrophy and loss of strength and function [17,18]. It has been shown that even 10-days of bed rest in older healthy individuals leads to a significant decrease in total lean body mass, even without a significant change in total body weight [19,20], and that the sarcopenic phenomenon is greater than observed in young adults after 14 or 28 days of bed rest [18].

3. Remote nutritional protocol

Even in the era of a COVID-19 pandemic every patient should have access to nutritional care as a part of healthcare services. With these new circumstances it is crucial to endorse pragmatic protocols for the nutritional assessment and prescription of nutritional support that are suitable for primary care physicians and completely adaptable to telemedicine services. Furthermore, every effort should be made to avoid in-person assessment of outpatients with COVID-19 by their primary care physicians, and therefore we are witnessing rapid attempts to overcome the limitations of our health care system [21]. Nutritional counselling can be performed by telephone, teleconference or other digital channels when appropriate and possible, in order to minimize unnecessary contacts.

In the present situation we promptly need tools for the remote evaluation of nutritional status for all patients that need nutritional care but do not have to visit their physicians in person. Also, clear protocols for assessment and nutritional care for COVID-19 outpatients and those in the recovery phase of the disease are needed. As stated in a recently proposed protocol for nutritional care in hospitalized non-ICU COVID-19 patients in Italy, protocols cannot cover every clinical situation [22]; but they can be of great help in providing practical guidance for the nutritional care of non-COVID-19 as well as COVID-19 patients outside a hospital setting with limited diagnostic tools.

Therefore, we propose the use of a combination of two simple validated clinical tools to identify nutritional risk and loss of muscle mass and function remotely by incorporating them into telemedicine processes and digital platforms suitable for healthcare providers; namely the Malnutrition Universal Screening Tool ('MUST') [23] and SARC-F [24,25]. The acronym for the tool is R-MAPP, as for **R**emote – **M**alnutrition **APP**, while the tool is being developed as an app. Since the tool is designed for the family physicians in the conditions of remote patient care, it can also stand for **R**emote – **MA**lnutrition in the **P**rimary **P**ractice. Three criteria are used in 'MUST' to assess the risk of malnutrition: body mass index (BMI), unintentional weight loss, and acute disease effect [26]. In order to assess loss of muscle mass and function without any diagnostic tools and procedures the SARC-F questionnaire ca be used as a rapid diagnostic test for sarcopenia based only on muscle contractile performance items: strength, assistance with walking, rise from a chair, climb stairs and falls [27].

As a first step, 'MUST' should be performed in all patients remotely. SARC-F should be performed in elderly patients and in all patients with acute and chronic muscle-wasting diseases [28]. If the patient is classified with or at risk of malnutrition and/or SARC-F is predictive of sarcopenia and poor outcomes, a nutritional care plan should be prescribed [29,30].

Calculation of energy, protein, selected micronutrient and pharmaconutrient needs should be performed in line with the appropriate guidelines in both COVID-19 [31] and non-COVID-19 patients, while taking into consideration all the specific requirements of the elderly [32], polymorbid [33], cancer [34], gastroenterology [35–37], neurology [38] and renal patients [39].

Nutritional therapy should be tailored according to the patient's needs and it can be met by food and supplements. For most patients, energy needs are between 25 and 35 kcal per kilogram body weight (BW) per day, and at least 1 g protein/kg BW/d should be ensured. For obese patients or those with sarcopenic obesity, ideal body weight should be used to calculate requirements. In terms of protein, caution is needed in patients with severe kidney disease (e. GFR$\leq$30 mL/min/1.73 m^2), and it should not be higher than 0.6 g/kg BW/d unless on dialysis which leads to higher requirements.

Loss of muscle mass and function (sarcopenia) is a common problem in the older persons and in other patients of all ages with acute and chronic muscle–wasting diseases, namely cancer, chronic heart failure, chronic kidney disease, liver cirrhosis, chronic obstructive pulmonary disease, neuromuscular diseases, chronic infection and polymorbidity [28]. Sarcopenia may be severe in post-ICU COVID-19 patients that present with ICU-acquired weakness (ICU-AW) [31]. While there is no reliable pharmacologic intervention for sarcopenia, conservative measures are the mainstay of the treatment. These measures include physical therapy and/or resistance training together with nutrition support: supplementation with protein (1–1.5 g/kg/d), specific anabolic amino acids or their metabolites (β-hydroxy-β-methylbutyrate, leucine), and vitamin D (800–1000 IU/d). In sarcopenic obesity, we recommend an energy restricted diet, accompanied by supplementation with protein and the other key (pharmaco)nutrients, an approach that is even more challenging than the in case of malnutrition related sarcopenia [40,41]. Supplementation with protein and key nutrients can be performed by use of oral nutritional supplements (medical nutrition) and/or food supplements. Duration and the appropriate dosage should be adapted individually for every patient.

Dysphagia (swallowing difficulties) is a common feature of geriatric patients and neurodegenerative diseases. EAT-10

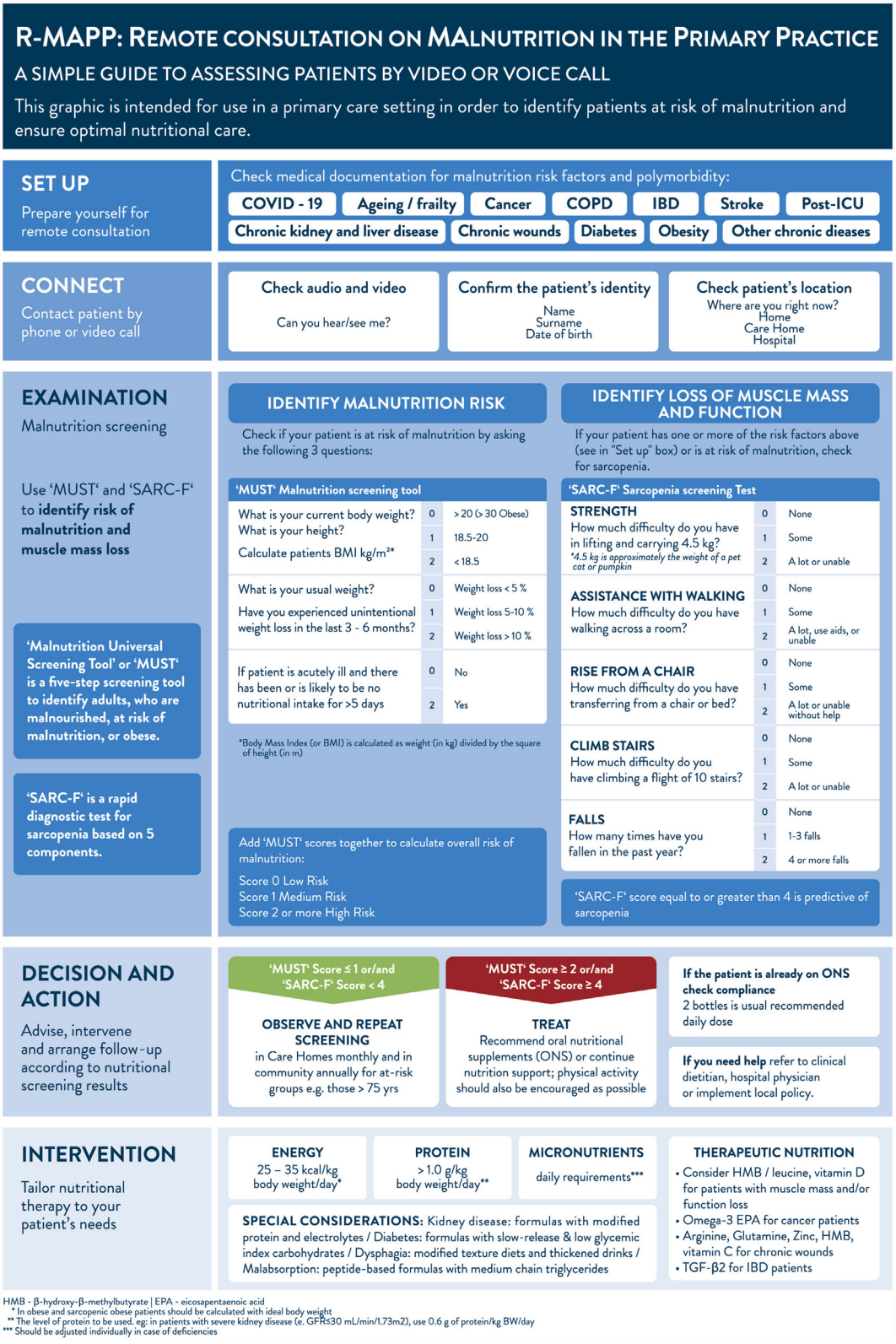

Fig. 1. R-MAPP: Remote Consultation on malnutrition in the primary practice.

questionnaire is an easy swallowing screening tool consisting of ten questions that could also be included in the remote evaluation of patients with dysphagia [42]. In COVID-19 patients, post-extubation dysphagia can be observed, and could be extended for to up to 21 days after prolonged intubation particularly in older persons [31]. Clinical nutrition, which entails different modalities of feeding, from oral diet therapy to specialized artificial nutritional support (enteral or parenteral), is essential for the management of dysphagia. Changes in the consistency (modified texture) of foods and liquids and use of oral enteral formulas with adjusted texture

may ease the ingestion process and help reduce the risk of aspiration [40], while enteral tube feeding should be considered for individuals with an unsafe swallow.

Another common clinical condition observed with older age is chronic wounds and decubital ulcers. Energy requirements for malnourished geriatric patients with chronic wounds are 30–40 kcal/kg BW/day, while protein intakes should be between 1.2 and 1.5 g/kg BW/d [43]. Some specific nutrients are important for wound healing and therefore pharmaconutrients like arginine, glutamine, zinc, β-hydroxy-β-methylbutyrate (HMB), and vitamin C should be considered, as well as high intake of proteins [44].

In patients presenting with severe malabsorption syndromes (food allergies, active inflammatory bowel disease, maldigestion, exocrine pancreatic insufficiency, short bowel syndrome, bowel fistulas), special peptide-based enteral formulas containing medium chain triglycerides might be more suitable than standard (whole protein) oral supplements [45]. Fig. 1.

4. Conclusion

A simple and rapid remote nutritional screening tool (R-MAPP) has been developed as a pragmatic measure to be used in primary practice as a part of telemedicine. Although it has been created in response to the COVID-19 pandemic crisis, it could be suitable for every situation in the future that might limit the availability of healthcare system.

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