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## Semi-automation of nutritional risk screening in the hospital results in systematic scoring

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### SUMMARY

**Background:** Hospital malnutrition is a costly phenomenon as it contributes to complicate and prolong hospital stays. Optimal care of malnutrition requires the identification of patients at risk with an early screening: the latter is not systematically carried out due to lack of specific education, but also of time and user-friendly tools. The aim was to achieve a systematic nutritional screening of all hospital patients and to increase the recording of the diagnosis in the discharge letter.

**Methods:** Multidisciplinary work group to create nutrition protocols and equivalences between three patient assessment tools: nursing ePA-AC, nutritional risk screening (NRS) and Mini Nutritional Assessment (MNA-SF); mapping of the related variables of the 3 tools. Validation by the physician of automatically generated score triggers a dietician visit. Validation of malnutrition by the dietician prompts malnutrition diagnosis proposal for the discharge letter.

**Results:** After the pilot phase, NRS or MNA-SF scores are now available in all patients of the 2 first implementation sites (geriatrics, surgery). Assessment of the patients stress level generated difficulties (over-scoring) that required additional teaching. Doctor validation of pathological scores has increased request for dietician visits. Economical impact of increased diagnosis in discharge letter is yet to come.

**Conclusion:** The semi-automation of nutritional risk screening is possible without increasing the nurse workload, by mapping their nursing activities to specific nutrition scores adapted to the patient

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age. The increased diagnosis of malnutrition within 48 h of the hospital admission should lead to better care and optimize hospital reimbursement.

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## 1. Introduction

Hospital malnutrition is a costly phenomenon as it adds to patient suffering, complicating and prolonging hospital stays [1,2]. In 2001 the Council of Europe, of which Switzerland is a member, has issued guidelines on organization of hospitals for its prevention [3]. Among the major causes of the persistence of insufficient attention to this problem, the caregiver training gaps, the absence of defined responsibilities of each professional, and of involvement of administrators and patients were identified. Fifteen years later, neither the doctors nor the nurses still receive education on nutrition during their studies, and are therefore very little sensitive to this issue [4]: the identification of malnutrition occurs at random and is much lower than its true incidence.

The prevention and early treatment of malnutrition require the identification of patients at risk by professionals responsible for the management of nutrition, to enable the establishment of nutrition programs that are both global and individualized [3]. A European screening score was developed (NRS: Nutritional Risk Screening) [5] and validated by the European Society of Clinical Nutrition (ESPEN). In Switzerland, the situation is as critical as in the rest of Europe [6–8], remaining dependent on isolated individual initiatives for improvement. The completion of screening and nutritional therapy is extremely variable, as demonstrated by the “Nutrition Day” investigations [9]. This variability of practice and capture of the diagnosis of malnutrition was confirmed prospectively in our hospital. Among 190 internal medicine patients prospectively evaluated with the NRS, 120 (63%) had a score above 3: despite that, the mention of malnutrition as diagnosis in discharge letters occurred in less than 10% of the patients with this high score, and worse, none of these patients received nutritional treatment. This denial of malnutrition has consequences both on the patient’s clinical course [10], on the costs of stays [11], but does also reduce the financial income of the hospital. Indeed the encoding of malnutrition is weighting the reimbursements allocated by the DRG system (diagnosis related group): the “cost weight” of the cases increases with the inclusion of the diagnosis of malnutrition as comorbidity in the discharge letter.

Faced with the demonstration that malnutrition was under-diagnosed and therefore undertreated, the general direction of the Hôpital du Valais (HVS) first decided to create a clinical nutrition unit. Its main objectives were to standardize screening and nutritional practices, to improve education and nutrition care. The analysis of the barriers to implementation of efficient nutrition practices showed that interdisciplinarity was a pre-requisite to the project [12], as was the implementation of a computer-assisted systematic scoring. This work aims to report the steps and professional integration levels required for semi-automation, and close to full screening of all admitted patients.

## 2. Methods

The Hôpital du Valais is a multisite (9 sites), bilingual hospital supporting 40,000 patients a year with more than 5000 employees: the French speaking part counts 700 beds and the German speaking part 260 beds. The patient file is fully computerized (Phoenix<sup>®</sup>, Compugroup Medical AG, Niederwangen, Switzerland).

### 2.1. Project development

Although strongly supported by the General Direction of the HVS, the project required the search for external funding resources to hire a dedicated dietician. Upon her engagement in June 2014, numerous

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