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Extended Abstract

# Nutrition Congress 2016: Development of integrated support software for clinical nutrition- Pedro Javier Siquier Homar- Hospital Comarcal de Inca

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## Abstract

**Introduction:**

**Objectives:** 1. To progress an incorporated computer software demonstration for dedicated nutritional support, integrated in the electronic clinical record, which detects automatically and early those undernourished patients or at risk of emerging undernourishment, defining points of opportunity for enhancement and appraisal of the results.

2. To describe the characteristics of a new computer program for assisted electronic prescription of parenteral and enteral nutrition. To define the different prescription assistances involved in the nutritional support process, with the aim to standardize nutritional support and include it in protocols.

3. To define any passes lead with the electronic clinical record of the Hospital Comarcal de Inca.

**Methods:**

The standard standards published by the Nutrition Work Group of the Spanish Society of Hospital Pharmacy (SEFH) and therefore the recommendations by the Pharmacy Group of the Spanish Society of Parenteral and Enteral Nutrition (SENPE) are taken under consideration . According to these quality standards, the nutritional support has got to include the subsequent healthcare stages or sub-processes: Nutritional screening, nutritional assessment and plan for nutritional care, prescription, preparation and administration.

For the development of the computer software, the characteristics which all new technologies applied to medication use should include were taken into account, according to the recommendations by the Group for Assessment of New Technologies (TECNO Group) of the Spanish Society of Hospital Pharmacy (SEFH), as well as clinical practice standards published by the Work Group on Nutrition by the SEFH. According with said quality standards, the healthcare stages or processes that must be covered by the nutritional support system are: nutritional screening, nutritional assessment, nutritional care plan, prescription, preparation, administration, monitoring, and end of treatment. The characteristics of each sub-process are described below, together with the different prescription assistances implemented.

The map of the healthcare process of the nutritional support in said software is initiated with the inclusion of patients through computer entry in the admission department. All patients will be screened within the first 48 hours since admission. The nutritional screening selected for adult patients was NRS-2002 (26) or who are severely undernourished, or who have certain degrees of severity of disease in combination with certain degrees of under nutrition. Results of sternness of syndrome and under nutrition were well-defined as inattentive, mild, moderate or severe from data sets during a selected number of randomized controlled trials RCTs and FILNUT as computer screener27. For paediatric patients, the PYMS Nutritional Selection System was selected28. This section also includes an alternate method developed by British Association for Parenteral and Enteral Nutrition (BAPEN), to work out patient size supported distance between olecranon and ulnar styloid process, and the age and gender of patients.

If the adult patient has no nutritional risk, the appliance won't request the screening until after one week, as long as there's no FILNUT score of risk; and in paediatric patients, this will depend on the PYMS score.

Adult patients with nutritional risk are assessed according with the Nutritional Assessment Registry, and paediatric patients are assessed according to the recommendations by the Spanish Society of Paediatrics (AEPED). If the patient is not undernourished, the program will classify him/her as a patient without nutritional risk. The plan for nutritional care is defined for those patients who present undernourishment; said plan features an alarm system, which will inform if the limits of intake of different nutrients are exceeded, and if the way of administration chosen is adequate, according with the estimated duration of the specialized nutritional support. If during the estimation of requirements, the planned osmolality for parenteral nutrition is superior to 800mOsm/L, the software will indicate that the parenteral nutrition must be administered through a central line. In central lines, except for the umbilical for paediatric patients, the left or right side can be selected. After determining the plan of care, the pharmacist must validate the prescription.

In the specific case of parenteral nutrition, according to the formulations for three-chamber, two-chamber and saline

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bags included in the program database, together with the stability conditions that any preparation must present, the program will generate automatically the preparation which better adjusts to said conditions. If it was decided to modify said preparation due to clinical criteria, this can be confirmed again with the aim to determine its physical-chemical stability. If there is any physical-chemical incompatibility, the program will issue an alert through the relevant warning signals.

For treatment monitoring, there is a section for collection of Vital Constants (systolic pressure, diastolic pressure, temperature, heart rate, and partial oxygen saturation), fluid balance, and record of test results. Regarding the end of treatment, the following options were determined as possible causes: hospital discharge, death, oral or enteral transition, loss of line, indisposition, worsening of the condition, or others. In this last case, there is a Notes section for specifying the cause that was the reason for ending treatment. To obtain Quality Indicators, a module was selected for searching into the software database, in order to generate those indicators considered relevant, because it allows relating all variables collected in sub-processes, as well as any prescription assistance implemented.

**Results:**

This software allows conducting in an automatic way, a selected nutritional assessment for those patients with nutritional risk, implementing, if necessary, a nutritional treatment plan, conducting follow up and traceability of outcomes derived from the implementation of improvement actions and quantifying to what extent our practice is on the brink of the established standard.

**Conclusions:**

Finally, it is worth highlighting that a closed module with the quality indicators published so that was not implemented, because said software allows to meet some of them per se, like an universal screening of all hospital population, and nutritional diagnostic coding of patients. So that the application can be more versatile, all information contained can be used through the generation of dynamic tables combining all variables of different sub-processes; for example, it is possible to determine the relationship between patients at nutritional risk and the level of undernourishment, the prevalence of undernourishment, the number of days on nutritional support based on level of undernourishment, etc. All these data can be exported in excel, csv and pdf format, so that they can be treated with other information systems for subsequent treatment, if required. Summing up, this software introduces the concept of quality control by processes in specialized nutritional support, with the objective to determine any points of likely improvement, as well as the assessment of its outcomes. Once the software has been developed, it is necessary to set it into production, in order to determine if the standardization of specialized nutritional support with said tool will translate into an improvement in quality standards, and in order to assess its limitations.

This software allows standardizing the specialized nutritional support from a multidisciplinary point of view, introducing the concept of internal control per processes and including patient because the main customer. Regarding entries, in the specific case of the Hospital Comarcal de Inca, the set of standards for electronic information exchange HL7 version 2.5 are used. This is integrated with the clinical record of the centre: vital constants (systolic pressure, diastolic pressure, temperature, heart rate, partial oxygen saturation), clinical test unit (blood test and biochemical tests), and admission (hospitalization, transfer, and hospital discharge).

**Note:** This work is partly presented at 5th European Nutrition and Dietetics Conference, June on 16-17, 2016 held at Rome, Italy