

# Medical Core Curriculum

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## Introduction

Clinical nutrition problems are common in most medical specialities and much research has been carried out regarding various clinical and preclinical aspects of nutrition. In this light, it is remarkable that the medical system deals with clinical nutrition problems in such a disorganised way without standardised assessment and treatment plans. Thus, there is no consensus on how diagnostics and treatment of nutrition disturbances should be performed, documented and evaluated. There are a number of reasons for this paradoxical situation. Important factors are probably the lack of stringent terminology and diagnostic precision regarding e.g. criteria of type and degree of malnutrition states. Doctors also often argue that their own training as a student or resident in clinical nutrition has been insufficient. The described situation is not unique to Sweden but is similar in many other countries (1-3). Much effort has been given to improve the situation (3-4).

The lack of interest in and structure of clinical nutrition in regular medical practice is reflected in the medical schools where the education and training of medical students and residents in clinical nutrition has been a neglected area for many years. In Sweden, none of the six medical faculties offer any required or elective comprehensive course in clinical nutrition to medical students. Instead, nutrition education is split into all of the 11 semesters (during the 5,5 year medical education), however, without an integrated nutrition curriculum or examination. There is also very little or no practical training in how to examine and assess clinical nutrition issues in patients and prescribe individual nutrition treatment programs.

## Core Curriculum for Medical Students

The Section of Nutrition within the Swedish Society of Medicine has initiated a national program for the development of an integrated nutrition curriculum plan for the entire education in the medical schools in Sweden. A task committee within the Section prepared a National core curriculum in clinical nutrition and the proposal was approved of by the Section of Nutrition in 1995.

The core curriculum is presented in the enclosed box. It is divided into four main areas:

1) Basal physiology and pathophysiology; 2) Diagnosis; 3) Treatment and 4) Prevention.

This division and terminology was chosen so that medical students and doctors should recognise the similarity in structure from other medical fields. It also gives the co-ordinator in clinical nutrition a simple and distinct structure helping the students to orient themselves in the multidisciplinary subject. The curriculum represents the width of nutrition competence that we believe that doctors should have acquired when they leave medical school. However, we have intentionally refrained from defining the depth of the various parts; this will be part of the ongoing process of local modifications in the various medical faculties. In Stockholm, we have organised a reference committee within the Karolinska Institute and have presented such a local modification to the board of the program committee for the medical education.

The newly developed educational program for the specialist training in clinical nutrition in Sweden is based on this core curriculum and essentially represents an increase in depth in the various parts. A specialisation in clinical nutrition requires a previous specialisation in a broad medical speciality such as internal medicine, geriatrics, surgery, pediatrics, anaesthesiology etc. The specialist is then designated e.g. "specialist in clinical nutrition aimed at geriatric medicine" etc.

## "N (Nutrition) -Labelling"

As an attempt to investigate the depth of nutrition education in the present medical education at the Karolinska Institute, we conducted a study together with the medical student organisation. One student in each of the 11 different semesters wrote a prospective diary regarding all N-related education and training during the respective semester. The total education time amounted to 132 full hours unevenly spread over all semesters, corresponding to 9 weeks full time education. Analysed in this way, clinical N-related topics constitute a major course during medical school. Still, many students feel that they hardly get any education at all in clinical nutrition during medical school. One important reason for this is the lack of co-ordinated curriculum in clinical nutrition, i.e. the program is not N-labelled. We are presently performing a study regarding the teacher's opinions on how much N-related education there is during medical school in Stockholm. The opinions from the students and the teachers will later be compared and analysed and will hopefully be of help in the implementation of the local version of the national core curriculum in clinical nutrition at the Karolinska Institute.

## Examination

In collaboration with the medical students, we have given a written anonymous diagnostic test in clinical nutrition to 103 students (87 % response rate) during the 11:th (last) semester. The examination was based on the national core curriculum and included equal amounts of questions from all four parts of the curriculum put together by three senior lecturers in clinical nutrition. It should be stressed that this test was given to students that had passed medical school during the present system without an integrated nutrition teaching plan. The result was meager and showed an average score of 16,5 of a maximum of 37 points (44 %). Many medical students lacked important knowledge in clinical nutrition; e.g. 31 % did not know the definition of body mass index (BMI) and 52 % were unable to diagnose the metabolic syndrome from a typical case report. The result of the examination certainly warrants continuing efforts to improve the education in clinical nutrition in medical school.

## Conclusion

A prerequisite for the development of the speciality of clinical nutrition is that medical doctors take an active part in the process. Thus, there are strong reasons to teach clinical nutrition integrated with the curriculum of medical schools and to provide well structured specialist training programs. It is, however, imperative that this educational effort is paralleled with a development of a structure and organisation of clinical nutrition within the medical system so that theory can be put into practice. This requires the establishment of a regular clinical and academic structure within the university hospitals with in- and outpatient facilities, regular academic research and teaching positions with combined research and clinical work similar to the organisation of other recognised medical specialities. There is a widespread interest in nutrition issues in the society. The described reform program in Sweden aims to channel and integrate this interest into the established medical system in order to improve the science and practice of clinical nutrition.

See Table 1

## References

1. Position of the American Dietetic Association: Nutrition - an essential component of medical education. *J Am Diet Assoc* 1994; 94: 555-7.
2. Heber D, Halsted CH, Brooks M, Chesney RW, DiGirolamo M, Heimburger DC, Hensrud DD, Mark DA, Sitrin MD, Tillman HH, Zeisel SH. Biennial survey of physician clinical-nutrition training programs. *Am J Clin Nutr* 1993; 57: 463-9.
3. Boulton J, Wahlqvist ML. Nutrition in medical education. *Med J Australia* 1989; 151: special supplement pp S1-S36.
4. Bringing physician nutrition specialists into the mainstream: rationale for the Intersociety Professional Nutrition Education Consortium. *Am J Clin Nutr* 1998; 68: 894-8.

**Table 1**

**CORE CURRICULUM IN CLINICAL NUTRITION**

**MEDICAL SCHOOLS IN SWEDEN**

**I. Basic Physiology and Pathophysiology.**

**Body composition**

Methods to determine body composition  
Normal body composition

**Regulation of appetite/hunger and satiety**

**Energy and nutrients**

Definitions, chemical properties  
Digestion, absorption and metabolism  
Functions and cellular/ molecular mechanisms

**Basic diet- and food science**

Nutrients in food  
Effects of processing  
Additives and toxins in food

**Energy and nutrient requirements**

Methods to determine energy metabolism  
Principles to determine energy- and nutrient requirements  
Requirements in different physiological situations  
Adaptive mechanisms at different levels of nutrient intake  
Recommendations for energy- and nutrient intake

**Food intake**

Methods to study food intake  
Mean and variance of food intake in Sweden  
International comparisons

**Energy and nutrient intake**

Transformation of food intake into energy- and nutrient intake  
Mean and variance of energy- and food intake in Sweden  
International comparisons

**Reactions of the body to starvation/overnutrition/trauma/disease**

**II. Diagnosis**

**Nutrition history**

Previous food and nutrient intake  
Weight and height development  
Social situation in relation to food intake.  
Eating function (e.g. appetite, chewing, swallowing)  
Gastrointestinal symptoms (e.g.

nausea, vomiting, diarrhoea)

Other relevant aspects of the medical history

Cooperation among physicians, dietitians, hospital staff

**Physical examination relevant to nutrition**

Weight and height  
Body composition  
Energy metabolism (determined e.g. by indirect calorimetry)  
Fluid balance  
Functional capacity (e.g. mobility, muscle strength)  
Other relevant findings during physical examination

**Biochemistry relevant to nutrition**

Serum-lipids: cholesterol, triglycerides  
Serum-proteins, nitrogen balance  
Vitamins, electrolytes and trace elements (e.g. B12, folate, Na, K, Mg, Ca, Fe)  
Endocrinology, e.g. blood glucose, HbA1c, thyroid hormones  
Coagulation  
Acid-base balance  
Immune function (e.g. skin tests examining food intolerance or malnutrition)

**Integrated nutritional assessment**

Assessment of medical history, physical examination and biochemistry in relation to calculated energy and nutrient requirements and other concomitant factors, e.g.:

- current age and developmental phase (e.g. pediatrics, geriatrics)
- current energy metabolic state (anabolism, catabolism)
- current pathophysiological processes
- current living conditions (e.g. tobacco, alcohol, physical activity, psycho-social factors)
- current treatment (e.g. pharmacological, surgical, radiological)

**III. Treatment**

**Peroral nutrition**

Diets  
Dietary adjustment  
Dietary supplements

**Enteral and parenteral nutrition**

Indications and contraindications  
Complications  
Techniques  
Control and monitoring

**Nutritional problems and nutritional treatment of:**

- Diabetes mellitus
- Food intolerance (e.g. coeliac disease, lactose intolerance, food allergy)
- Cardiovascular diseases (e.g. cardiac failure, atherosclerosis)
- "Inborn errors of metabolism"
- Pulmonary diseases (e.g. chronic obstructive lung disease)
- Gastrointestinal diseases (e.g. malabsorption syndroms, dysphagia, liver and pancreatic diseases)
- Malnutrition (e.g. in geriatric patients, malignant diseases)
- Renal diseases (e.g. renal failure)
- Obesity
- Specific nutrient deficiencies (e.g. Fe, B12, folate)
- Trauma/surgery
- Infant feeding
- Eating disorders (e.g. anorexia/bulimia nervosa)

**Interactions between drugs and nutrients**

Cooperation between physicians, dietitians, hospital staff

**IV. Prevention**

**Relation between diet and health nationally and internationally**

**Diet as a risk factor or protective factor for the development of disease, e.g.**

Antioxidants, prooxidants  
Dietary fibre  
Dietary fat  
Eating habits

**Preventive intervention**

Indications  
Possibilities  
Ethics

**Dietary counselling of different groups, e.g.**

Children  
Adolescents  
Women (pregnant, breast feeding)  
Elderly

**The role of diet to optimise health**

**The role of the physician, e.g. in:**

Child and maternal health care  
Health care in schools  
Dental care  
Geriatric care