

9. Education in Clinical Nutrition

Education of Physicians

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Basic education

In 1995, the Nutrition Section of the Swedish Medical Society approved a “Basic National Curriculum for Clinical Nutrition” to be included in medical education (1). The curriculum is organized under four main headings:

1. Basic physiology and pathophysiology
2. Diagnosis
3. Treatment
4. Prevention.

The headings and terminology correspond to those used in other areas of medicine, so that medical students and licensed doctors will feel at home and find it relatively easy to orient themselves within the large interdisciplinary field of nutrition.

The Nutrition Section also recommended that every medical school appoint a co-ordinator of clinical nutrition to participate in the Section’s co-ordinating committee which has regular discussions on how to implement the basic curriculum at various schools of medicine.

The basic curriculum covers all aspects of the nutritional competence which, in the judgement of the Nutrition Section, all medical students should have acquired after 5.5 years of education. But it does not stipulate any detailed knowledge within the various subareas, since requirements differ among medical faculties in relation to local conditions. Also, the intention was to recommend a set of objectives – not to specify the exact contents of the curriculum, which would require something on the order of a textbook.

For the past several years, work has been in progress at Sweden’s six medical schools to adapt the national objectives to local conditions. The medical schools at Lund and Stockholm have progressed the farthest, and have submitted proposals for local objectives in clinical nutrition to the National Board of Education and the Medical Education Programme Committee.

I. Basal Physiology & Pathophysiology	II. Diagnosis	III. Treatment	IV. Prevention
<p>Physical constitution Methods for determining constitution Normal body constitution</p> <p>Regulation of appetite, hunger and satiety</p> <p>Energy and nutrients Definitions, chemical properties Functions and cellular/molecular mechanisms</p> <p>Body's reaction to starvation, excess nutrition, trauma, illness</p> <p>Knowledge of basal diet and foods Amounts of nutrients in food Effects of process Toxins/foreign substances in food</p> <p>Energy-nutrient requirements Methods for determining energy use Principles for establishing energy-nutrient requirements Needs in various normal physiological states Adaptive mechanisms with various levels of nutrient intake</p>	<p><i>Nutrition anamnesis</i> Previous food and nutrient intake Weight and height changes Social situation of meals Eating function (e.g. appetite, chewing, swallowing) Digestive tract symptoms (e.g. nausea, vomiting, diarrhoea) Other appropriated details</p> <p><i>Co-operation between physician, dietician and other occupations</i></p> <p><i>Nutritional status</i> Height and weight Physical constitution Energy use (established with, for example, indirect calorimetry) Fluids balance Functional ability, e.g. mobility, muscle strength General physical status</p> <p><i>Biochemical status and relevance for nutrition</i> Lipids: s-triglycerides, s-cholesterol Proteins: serum proteins, N balance Vitamins and electrolytes/trace elements (e.g. s-B₁₂, s-folate, s-Na, s-K, s-Mg, s-Ca, iron status)</p>	<p><i>Peroral nutrition</i> Food types Adjusting diet Dietary supplements Enriched foods</p> <p><i>Enteral and parenteral nutrition</i> Complications Techniques Quality control</p> <p><i>Nutritional problems and treatment in connection with:</i> • diabetes mellitus • allergies • circulatory illness (e.g. heart disease, arteriosclerosis with associated risk factors) • congenital errors of metabolism • lung disease (e.g. chronic pulmonary disease) • diseases of the digestive tract (e.g. malabsorption syndrome, dysphagia, liver-pancreas disease) • malnutrition (e.g. in connection with geriatrics, malignancies) • kidney disease (e.g. kidney failure) • obesity</p>	<p>Relationship between food and health, national and international <i>Food as risk factor and protective factor for development of illness</i> (e.g. anti-oxidants/pro-oxidants, dietary fibre, lipids, mealtime arrangements)</p> <p><i>Preventive intervention: indications, potential, ethics</i> <i>Dietary messages to various target groups, e.g. children, youth, pregnant/nursing women, elderly</i></p> <p><i>Diet's significance for optimizing health</i></p> <p><i>Physician's role in , for example, paediatrics, school health programmes, dental care, old-age care</i></p>

I. Basal Physiology & Pathophysiology	II. Diagnosis	III. Treatment	IV. Prevention
<p>Energy-nutrient recommendations</p> <p>Food intake</p> <p>Methods of study</p> <p>Distribution and average intake of food in Sweden</p> <p>International comparisons</p> <p>Energy-nutrient intake</p> <p>Conversion of food intake to energy-nutrient intake</p> <p>Distribution and average intake of energy and nutrients in Sweden</p> <p>International comparisons</p>	<p>Endocrine status (e.g. B-glucose, HbA1c, thyroid status)</p> <p>Coagulation status</p> <p>pH status</p> <p>Immune function (e.g. skin test for food allergies or malnutrition)</p> <p><i>Integrated nutrition assessment</i></p> <p>Evaluation of nutrition anamnesis, nutritional status and biochemical status in relation to calculated energy-nutrient requirements and other influences, e.g.:</p> <ul style="list-style-type: none"> • current age and stage of life (paediatric, geriatric) • current metabolic state (anabolic-catabolic) • current pathophysiological processes • current living conditions (tobacco, alcohol, physical activity, psycho-social factors) • current treatment (pharmaceuticals, surgery, radiation therapy) 	<ul style="list-style-type: none"> • specific deficiencies (e.g. sideropenia, cobalamin, folic acid) • trauma, surgery • feeding problems in children • eating disturbances (e.g. anorexia, bulimia) <p><i>Interaction between nutrients and pharmaceuticals</i></p> <p><i>Co-operation between physician, dietician and other occupations</i></p>	

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N-rated education

In order to evaluate the breadth and extent of nutrition education acquired by medical students at Karolinska Institute near Stockholm, a survey was conducted in 1996 with the co-operation with the medical students association (2). One student in each of the eleven half-year terms of study kept a prospective daily record of all the nutrition-related incidents of any kind that she or he experienced during the term.

When the results were compiled and analysed, it turned out that the total time devoted to nutritional matters during the entire course of study amounted to 132 hours of real time (176 academic "hours"), which were distributed unevenly over the various terms. This corresponds to nine weeks of full-time instruction.

Described in this manner, clinical nutrition is one of most extensive courses of medical education. Nevertheless, many medical students have the impression that they receive hardly any training in clinical nutrition during their basic education. One of the most important reasons for this is probably the previous absence of a co-ordinated basic curriculum in the subject, an "N-rated" medical education.

A corresponding study of faculty members' experience of nutrition education has also been conducted at Karolinska Institute. The observations of students and teachers have been compared, and will serve to guide the future development of medical education at the Institute.

Test of knowledge

In co-operation with the medical students association, an anonymous written diagnostic exam in clinical nutrition was administered during the final term at Karolinska Institute in 1996 (2). A total of 103 students were enrolled during that term. Of these, 87 answered the questions, which were based on the Basic National Curriculum and devised by a committee of three clinical nutrition co-ordinators. Questions on all four main areas (see above) were included. It should be noted that the students did not receive any forewarning of the exam, and that their basic medical education did not include an integrated set of objectives.

The average score was 16.5 points out of a possible 37, or 44 percent. Several important knowledge gaps could be identified, and those issues will be emphasized in future medical education in Stockholm. Another diagnostic test was administered during the winter of 1998–1999 at Linköping, Lund and Stockholm. The results were published in the autumn 2000 edition of the Swedish medical journal, *Läkartidningen*.

Specialist training in clinical nutrition

In 1998, the Nutrition Section of the Swedish Medical Society approved a set of objectives for specialist training in clinical nutrition (3). Those objectives proceed from the Basic National Curriculum for medical edu-

cation in clinical nutrition (see below), and are significantly more detailed in all areas. The purpose is to equip doctors with a broad education in clinical nutrition so that they develop a competence in the subject which can be related to their main speciality. The fully-trained specialist may then bear the title of, for example, “specialist in clinical nutrition with internal medicine orientation. . . . geriatric orientation”, etc. The revised basic curriculum also provides the outline of a specialist training in clinical nutrition.

It is important to make the subject of clinical nutrition more interesting and attractive to doctors and medical students, so that analysis of nutrition is integrated with more general medical analysis and with the evaluation of treatment outcomes. It is also important for education in clinical nutrition to be followed by the development of suitable organizational structures in health care, so that various categories of student have the opportunity to apply their theoretical knowledge in practical situations (see the chapter, “*Struktur och organisation*”, in reference 3).

The widespread nutritional problems in health and old-age care, along with the great interest in nutrition among the general public and in the media, are good reasons to integrate the study of clinical nutrition with medical education, in terms of both analysis and organization.

References

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2. Akner G, Bäck M. Nutritionsrelaterade moment under läkarutbildningen vid KI. *Läkartidningen* 1997; 94: 1733–1739.
3. Läkaresällskapets sektion för nutrition. Utbildningsbok för specialistutbildning i klinisk nutrition. 1999. Kan beställas via Svenska Läkaresällskapet eller laddas hem via internet (www.svls.se).

Nursing Education

Mitra Unosson

The extent and contents of education in nutrition vary among nursing education programmes in Sweden. Since prevention and treatment of malnutrition are included in the nurse’s care-providing responsibility, a well-conceived basic curriculum in nutrition can raise the competence levels of trained nurses. Nursing education in Sweden normally takes three years, and includes a wide variety of subjects. In order to further develop competence in this area, it is important to provide continuing education and specialist training in nutrition to a greater extent than is the case today.

Nursing education takes place at the university college level, leading to a University Diploma in Nursing or a Bachelor of Science in Nursing, depending on the institution and its particular programme. Certification qualifies the nurse for employment in a number of areas, including primary care, hospitals, and municipal health care. In all of these contexts, there are nutritional problems related to the significance of diet for health, and to the prevention and treatment of malnutrition. Since universities and university colleges decide on the contents of their own courses and programmes, there are no overarching national objectives or course plans for nutritional theory and practice in nursing education.

In order to document the contents, breadth and methods of education and examination on the subject of nutrition in the basic education of nurses, a questionnaire survey was conducted among all schools of nursing during the autumn term of 1999. The survey also included a question on the availability of separate nutrition courses for nurses after their basic education. Of the 25 schools of nursing in Sweden, 23 replied to the questionnaire.

The results disclosed that nutrition education occurs primarily as an integrated part of education in other subjects. Only five nursing schools offered separate courses on the specific subject of nutrition.

The relationship between diet and health was found to be an important aspect of nursing education, and was included in the curricula of most nursing schools (21 of the 23 respondents). Knowledge of nutritional status, digestion, absorption and metabolism is necessary for an understanding of health and ill health. These issues were addressed at nineteen of the schools. Nutritional recommendations were taught at all 23.

It is part of the nurse's responsibility to ensure that the patient receives medically prescribed food and nutrition, either enterally or parenterally. The survey found that training in enteral nutrition was lacking at two of the schools, and parenteral nutrition at four. Three-fourths of the schools included education on preventive and curative dietary treatment, for example in cases of cardiovascular disease, kidney and intestinal ailments, diabetes, cancer, respiratory insufficiency and neurological illness. Equivalent education on starvation, overweight, alcoholism, infection and osteoporosis was offered at about half. Three-fourths reported that they offered training in the assessment, follow-up and documentation of oral and dental health, appetite, eating ability, feeding, dining atmosphere, energy-nutrient intake, liquid intake and gastrointestinal problems. Sixteen of the schools offered education on ethics and nutrition, and the assessment and monitoring of nutritional status.

Teaching methods include lectures, independent studies, seminars and skills training, all of which are employed throughout the entire six-term course of study. Few nursing schools were able to quantify their pro-

grammes in terms of hours. There were examinations on individual subjects at half of the schools; the most common formats were written exams, seminars, written assignments and combinations of these.

Dietician Education

Elisabeth Rothenberg

Three Swedish universities have programmes of dietician education, those at Uppsala, Göteborg and Umeå. Uppsala University offers a Master of Science degree; Umeå and Göteborg universities offer Bachelor of Science degrees, with the possibility of continuing on toward an M.S.

The education of dieticians has been lengthened since it was introduced in 1977, because their occupational role has changed significantly since that time. Today, dieticians are responsible for independently designing, following up and evaluating nutritional treatment, in accordance with medical prescriptions and in consultation with physicians. They are also responsible for educating other personnel in nutritional matters. Further, they are expected to be capable of conducting research, and to assume responsibility for the planning, implementation and analysis of dietary research in connection with various projects and studies.

To be certified as a dietician, students must have:

- acquired the necessary skills and knowledge to work independently as a dietician
- acquired knowledge of, and the ability to study and evaluate, nutritional intake and status
- the ability to plan and manage dietary needs of people in general and to educate the public about diet and health
- the ability to study and treat problems, symptoms and illnesses related to diet and nutrition
- an understanding of the dietician's role that is well-suited to teamwork and co-operation with other occupations, self-awareness and empathy, and thereby the capacity to safeguard the interests of patients and their close relations, with due consideration of ethical requirements and with a holistic conception of humankind.

Following advanced education in clinical nutrition, the dietician shall also have:

- acquired further knowledge of human physiology, biochemistry and nutrition
- acquired a good knowledge of research methodology

- met the formal qualifications for postgraduate education at a school of medicine.

The dietician's education includes the following subjects:

- Introduction to clinical nutrition
- Biochemistry with organic chemistry
- Human physiology and anatomy
- Basic nutrition; nutrients in food and their physiological functions
- Health occupations and clinical orientation
- Dietary habits and nutritional status of groups and individuals
- Food science and culture
- Communication and learning
- Psychology and the art of conversation
- Scientific method and statistics
- Prevention and treatment of diet-related conditions and illnesses
- Medical treatment of malnutrition
- Clinical nutrition in practice.

Dietary research methods with nutritional epidemiology

Special studies in clinical nutrition

Specialist training

Today, all three universities offer separate courses for continuing education which, in combination with special studies can lead to a Master of Science. However, there is no specialist training, per se. It would be desirable if, at some time in the future, it were possible to be certified as a dietician with special competence in various areas. Qualification for such a degree should be based on additional medical training and a review of the literature within the area in question.