Medical nutrition: a comprehensive, school-wide curriculum review\(^1\)–\(^3\)

Sachiko T St Jeor, Jessica A Krenkel, Raymond A Plodkowski, Tracy L Veach, Robbyn L Tolles, and Jennifer H Kimmel

**ABSTRACT**

**Background:** A school-wide nutrition program was established in 1982 and a required medical nutrition course (MNC) was established in 1985 at the University of Nevada School of Medicine. Emphasis was placed on developing an integrated curriculum and on using innovative methods to incorporate nutrition into the existing curriculum.

**Objective:** The objective of this review was to establish a baseline and make positive curricular changes to comply with the recommendations of the Liaison Committee on Medical Education for accreditation. The MNC and the nutrition curriculum were evaluated as part of this 3-\(\times\) comprehensive, school-wide evaluation process.

**Design:** The MNC was invited for review (December 2004) because of its position in the curriculum (first year), special content and methods, and relation to other courses. A review team, which consisted of the Assistant Dean for Medical Education (who chaired the team), a curriculum coordinator, faculty representatives, and a medical student, was appointed. The MNC coordinator prepared a review book that included the requested documentation. The initial 3-h review meeting culminated in a formal evaluation and recommendations. Follow-up meetings at 1 mo and 1 y were scheduled.

**Results:** The review was a positive process that reaffirmed the uniqueness of the nutrition program at the University. It supported the MNC as an important part of the required curriculum. Recommendations included use of the Web, encouragement to identify new opportunities with interested faculty, and a structure to further integrate and align nutrition into existing courses.

**Conclusions:** A positive, proactive review process supports the importance of nutrition in the medical school curriculum and encourages further integration. *Am J Clin Nutr* 2006;83(suppl):963S–7S.

**KEY WORDS** Nutrition, medical education, curriculum review, Liaison Committee on Medical Education, computer-based approach, teaching strategies

**INTRODUCTION**

The Liaison Committee on Medical Education (LCME) of the Association of American Medical Colleges is the accrediting agency for 126 US and 16 Canadian medical education programs (1). Emphasis on outcomes-based educational objectives directs curricular reform and creates opportunities for nutrition faculty to focus on problem-based learning, interdisciplinary teaching (2), and integration of nutrition into clinical skills assessments (2, 3). The challenges of reducing class time, encouraging self-directed learning, and diversifying teaching methods have encouraged innovative approaches to integrating nutrition further into the existing curriculum. Indeed, opportunities to work within the “formal” as well as the “informal” and “hidden” curricula to enhance the overall learning environment (4) are well suited for nutrition science and applications to medical practice. Preparing for the accreditation process can create new opportunities by encouraging faculty to work together. A carefully planned and guided review process can also “turn a negative expectation into a positive experience for faculty development and curriculum renewal” (5).

The opportunity to increase nutrition in undergraduate medical education is rare because of the crowded curriculum and the move toward decreasing class contact time for medical education (3). However, many medical schools have reportedly been introducing new subjects (including nutrition) of interest to the LCME, faculty, and students (6), and the number of full-time faculty has been increasing (7). Clinical departments have increased the number of PhD faculty (including in nutrition) with an emphasis on research development (8) and an increased emphasis on translation of basic science research into clinically relevant activities. Thus, interdisciplinary educational strategies and opportunities are being created to better address in the curriculum the treatment and prevention of obesity, cancer, cardiovascular diseases, and other nutrition-related disorders (9-13). Additionally, physician training in counseling regarding diet and exercise has been deemed important (14) to achieve the public health goals as outlined in *Healthy People 2010* (15).

Reportedly, 98% of medical schools now indicate that nutrition is a component of medical education, although it is often integrated rather than a separate part of their curriculum (16). Importantly, an integrated nutrition curriculum has been shown to be effective in improving clinical nutrition practice skills as

---

\(^1\) From the Division of Medical Nutrition, Department of Internal Medicine and Office of Medical Education, University of Nevada School of Medicine, Reno, NV.


\(^3\) Supported by the Nutrition Academic Award (NAA) Program of the National Heart Lung and Blood Institute (grant KO7 HL03972), National Institutes of Health.

\(^4\) Address reprint requests to S St Jeor, Division of Medical Nutrition, Department of Internal Medicine, University of Nevada School of Medicine, Redfield Building/153, Reno, NV. 89557. E-mail: sach@med.unr.edu.
measured by an Objective Structured Clinical Examination (OSCE) and the number of students reporting that the amount of nutrition taught was inadequate (which decreased from 68% to 11.5%) (16). Thus, increasing efforts to integrate nutrition as a theme throughout the medical school curriculum are resonating in the light of reducing class time and didactic lectures (17) and increasing popular interest in nutrition. Challenges exist for medical education to provide accurate and relevant nutrition information to improve the quality of future health care (18).

Innovative methods have included case-based integration (19), virtual seminars, Web-based strategies (20, 21), computerized cases, and computer-based nutrition courses (22), including interactive CD-ROM programs (23). Support through the Nutrition Academic Award (NAA) Program from the National Heart, Lung, and Blood Institute of the National Institutes of Health to 21 medical schools has helped overcome major barriers and has assisted the improved development and dissemination of methods and materials to encourage continuing activity in promoting nutrition in medical education (24). This article describes how the NAA program at the University of Nevada School of Medicine (UNSOM) survived a comprehensive, school-wide review process and gained appreciation and support for increasing activities in the curriculum.

METHODS

In preparation for the LCME accreditation site visit to the UNSOM scheduled for 2009, a 3-y school-wide curriculum review process was initiated in August 2004 to create a baseline and initiate as well as direct school-wide curricular reform. The medical nutrition course (MNC) was the fifth course to be invited for review (December 2004) because of its position in the curriculum (first year), unique and evolving content and methods, and relation to biochemistry (the fourth course to undergo review). A review team consisting of the newly appointed Assistant Dean for Medical Education (who chaired the team); the curriculum coordinator; faculty representatives, including an education specialist and clinical and basic science representatives; and a medical student was appointed. The MNC course coordinator prepared a review book (with instructions from the team chairperson) that included extensive documentation of the MNC and the nutrition curriculum. The Chief of the Division of Medical Nutrition responsible for the nutrition curriculum and the chair of the Department of Internal Medicine that houses the Division of Medical Nutrition were invited to participate in the preparation and review process. The initial 3-h review meeting culminated in a formal evaluation and recommendations. Follow-up meetings were scheduled for 1 mo and 1 yr.

Nutrition program

The Nutrition Education and Research Program was established at UNSOM as an independent unit under the Dean of Medicine in 1982 as supported and recommended by the Chairs of the Departments of Internal Medicine, Pediatrics, and Family Medicine at that time (25). The MNC was proposed and approved by the Curriculum Committee as a required 20-h course for freshmen medical students in 1985. Longitudinal integration of the 4 y of the undergraduate medical curriculum was initiated after contacting both basic science and clinical course coordinators and working with them to integrate nutrition cases, materials, and other nutritionally relevant content. The current UNSOM 4-y curriculum with the nutrition-integrated components identified is presented in Table 1.

A Special Qualifications in Nutrition Program was initiated in 1996 as a 4-yr, competitive fellowship program culminating in a recognition certificate at graduation. The program begins in the spring of the first year with student selection and special research project identification; the project is conducted during the following summer. In the second year, the research project is completed and presented at our local research symposium and a national meeting. During this year, the students also present a clinically relevant seminar to the faculty. The third year consists of evidence-based nutrition clinical activities integrated into the clerkships. Finally, the fourth year consists of a 2–4 wk required nutrition elective tailored to the student.

In 2003 the Nutrition Education and Research Program became the Division of Medical Nutrition housed in the Department of Internal Medicine in Reno. At the same time, the Center for Nutrition and Metabolic Disorders was established as a demonstration research and education clinic for the Division of Medical Nutrition that specialized in weight management. This administrative change was timely and necessary for the survival of nutrition in the medical school, because university-wide changes were occurring under a new university president (2002) and a new dean of UNSOM (July 2004).

Support

The major source of financial support for the Nutrition Education and Research Program and the Division of Medical Nutrition has been educational and research grants. The program is assigned 1.0 state-funded full-time equivalents, which forms the foundation of the program. Educational grants have been obtained from the National Fund for Medical Education (1983–1985) and the National Cancer Institute of the National Institutes of Health (R25 CA48062 from 1989 to 1994 and R25 CA64754 from 1996 to 2000). Importantly, the NAA Program (K07 HL0339972) from the National Heart, Lung, and Blood Institute provided critical support from 2000 to 2005. Major research grants have supported clinical research activities from 1985 to present. Ongoing funding has included R01 HL34589 (The RENO Diet-Heart Study from 1985 to 1996), R01 HL65133 (HOPSCHOT, a preschool overweight mother intervention trial from 1999 to 2003), and other small grants from industry and the state, including a major meal replacement trial funded by SlimFast (Englewood, NJ) from 1998 to 2001. The nutrition program also participated in the National Institute’s of Health Women’s Health Initiative from 1994 to 2005, and other grants were funded to principal investigators in other departments.

Components of the review

The goals of the review were: 1) to proactively initiate a systematic, positive review process in an effort to enhance, encourage, and evaluate curricular changes and 2) to establish a baseline to enable maintenance of and improvements to a consistent curriculum across time. This review was initiated by a newly appointed Assistant Dean for Medical Education (May 2003) who was “getting to know the curriculum.” The recommendations of the 2001 LCME accreditation site visit included 1) a reduction in required class time, 2) additional methods to involve self-directed learning, 3) encouragement of hybrid curriculum development to include small groups and students as teachers (Clinical
Problem Solving I and II and Introduction to Patient Care I and II, and 4) diversification of teaching methods (decreasing lectures overall). The review process was well planned and focused on a positive, proactive approach versus a needed, negative, or “in trouble” approach to support faculty success. Faculty members were encouraged to identify opportunities for change and clinical correlations. Student performance, methods, and redundancy with other courses were evaluated. Strengths and weaknesses of the curriculum were to be identified to facilitate enhancements and new directions.

The review book consisted of 15 major components, as outlined in Table 2. The contents of this book then formed the basis of the review process, which encouraged faculty input, self- and program evaluations, and projections and plans for needed future directions. The required MNC was evaluated in the context of the integrated nutrition curriculum. Historically, the MNC evolved (Table 3) to the current successful utilization of CD-ROMs from the Nutrition in Medicine series (22, 23). Our faculty have participated on the review board of Nutrition in Medicine under the direction of Steven H Zeisel in the Department of Nutrition, School of Medicine and School of Public Health at the University of North Carolina. Recently, an MD-RD team to emphasize current research and evidence-based clinical treatment has facilitated the course.

### Table 1

<table>
<thead>
<tr>
<th>MSI</th>
<th>MSII</th>
<th>MSIII</th>
<th>MSIV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Anatomy</td>
<td>Human Pathology</td>
<td>Transition to Clinical Medicine (week before start of clerkships)</td>
<td>Required Advanced Clinical Experience in Rural Health, 4 wk</td>
</tr>
<tr>
<td>Human Histology</td>
<td>Medical Microbiology</td>
<td>Family Medicine, 6 wk</td>
<td>Recommended elective course distribution: 12 wk: FM-, IM- or Pediatrics-related fields</td>
</tr>
<tr>
<td>Human Embryology</td>
<td>Molecular Genetics</td>
<td>Pediatrics, 6 wk</td>
<td>8 wk: Ob/Gyn, Surgery, or related fields</td>
</tr>
<tr>
<td>Medical Cell Biology</td>
<td>Pharmacology</td>
<td>Internal Medicine, 12 wk</td>
<td>12 wk: Electives or student’s choice</td>
</tr>
<tr>
<td>Biochemistry</td>
<td>Psychiatric Medicine</td>
<td>Psychiatry, 6 wk</td>
<td>based on residency of interest</td>
</tr>
<tr>
<td>Human Behavior</td>
<td>Introduction to Patient Care</td>
<td>Ob/Gyn, 6 wk</td>
<td>Nutrition Elective</td>
</tr>
<tr>
<td>Systems Physiology</td>
<td>Clinical Problem Solving</td>
<td>Surgery, 6 wk</td>
<td>Special recognition at graduation</td>
</tr>
<tr>
<td>Medical Neuroscience</td>
<td>Community Medicine</td>
<td>Clinical Reasoning in Medicine (concurrent with FM, IM, and Pediatrics)</td>
<td></td>
</tr>
<tr>
<td>Introduction to Patient Care</td>
<td>Professionalism Seminars</td>
<td>Cutting Edge of Medicine Seminars</td>
<td></td>
</tr>
<tr>
<td>Clinical Problem Solving</td>
<td>Presentations, seminars</td>
<td>Nutrition-integrated cases</td>
<td>(Clerkships)</td>
</tr>
<tr>
<td>Medical Nutrition</td>
<td>SQIN Program</td>
<td>Summer research</td>
<td></td>
</tr>
</tbody>
</table>

1. MSI, MSII, MSIII, MSIV, first, second, third, and fourth years of medical school, respectively; SQIN, Special Qualifications in Nutrition; FM, family medicine; IM, internal medicine.
2. Courses with nutrition integration or content, including nutrition electives.

### Table 2

**Review book content for the University of Nevada School of Medicine**

1. Rationale and course faculty with FTE
2. Syllabus with course and session objectives
3. Teaching and evaluation methods with hours
4. Inclusion of AAMC LCME topics
5. ACGME basic competencies match-up
6. Internal evaluation (grades, student course and faculty evaluations, graduation questionnaire, comments from alumni survey, peer review)
7. External evaluation (USMLE shelf exam scores for 3 y; Step 1 and 2 section scores for 3 y)
8. Planned curricular changes
9. New developments in the field
10. Proposal for reduced committed class time
11. Proposal for increased self-directed learning opportunities
12. Opportunities for increased clinical correlations and cases
13. Clear documentation of Reno–Las Vegas clerkship comparability
14. Other information
15. Updates

1. FTE, full-time equivalents; AAMC, American Association of Medical Colleges; LCME, Liaison Committee on Medical Education; ACGME, Accreditation Council for Graduate Medical Education; USMLE, US Medical Licensing Examination.

### Table 3

**Medical nutrition course content, 12 y**

<table>
<thead>
<tr>
<th>Year</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>10 blocks × 2 h (food labeling exercises, computerized dietary intake assessment, and CINCH board game)</td>
</tr>
<tr>
<td>1992</td>
<td>10 blocks × 2 h (lecture and application, small groups, role playing, MD-RD teams)</td>
</tr>
<tr>
<td>1994</td>
<td>10 blocks × 2 h (lectures with focus on health promotion, computer assessments)</td>
</tr>
<tr>
<td>1995 and 1996</td>
<td>20-h course with lectures: small group discussions with cases</td>
</tr>
<tr>
<td>1997 and 1998</td>
<td>20-h course with lectures: 9 cases were presented with nutrition faculty and guest faculty for each topic</td>
</tr>
<tr>
<td>1999</td>
<td>3 NIM CD-ROMs (Cancer, Anemia, and Nutrition Support) used over the spring semester: lectures with question and answer sessions after each CD with guest lecturer for Cancer</td>
</tr>
<tr>
<td>2000</td>
<td>3 NIM CD-ROMs (Cancer, CVD and Obesity, and Diabetes) with study guides implemented (one instructor)</td>
</tr>
<tr>
<td>2001</td>
<td>3 NIM CD-ROMs (Cancer, CVD and Obesity, and Nutrition Supplements) used with review and exam for each subject (one instructor)</td>
</tr>
<tr>
<td>2002 and 2003</td>
<td>3 NIM CD-ROMs (Cancer, CVD and Obesity, and Diabetes) with evidence-based medicine lectures and exam for each subject (MD-RD team)</td>
</tr>
</tbody>
</table>

1. CINCH, Curricular Integration of Nutrition in Cancer and Health; NIM, Nutrition in Medicine; CVD, cardiovascular disease.
TABLE 4

Review recommendations at the University of Nevada School of Medicine

1) Put CDs online for easier access and use (Web-based learning).
2) Work on cases (CPS I and II) and curriculum alignment.
3) Identify and work with interested clinical faculty to further integrate nutrition by MDs.
4) Institute lecture on taking a nutrition history into the IPC courses. (Students currently do a personal nutrition evaluation in IPC I)
5) Integrate nutrition assessment and treatment into CPS II Dxr cases, standardized patient examinations, and clerkships.
6) Target structure for nutrition (prevention, history, diagnosis, and treatment)
   Year 1: Interview, outpatient history, personal assessment
   Year 2: Diagnosis, inpatient history, case management
7) Work with biochemistry faculty on diabetes, lipids, and other sections and clinical correlations.
8) Make all CD-ROMs available at both campuses (Las Vegas and Reno).
9) Add nutrition to the transition course (beginning year 3)
   “Hospital Diets and Diet Rx” and “Nutrition Assessment Rules of Thumb”
10) Look for new opportunities (residents, grants, etc)

REFERENCES