

HOW AND WHEN SHOULD NUTRITION BE TAUGHT TO DENTAL STUDENTS*

E. CHERASKIN, M.D., D.M.D.,† *Birmingham*

Several months ago I was asked to participate in this symposium on nutrition. Precisely why I was invited was not made clear to me. And, as I thought about it, it became ever more obvious that my forte lay in an ignorance of the problem which allowed me an unparalleled lack of bias as to how, when, and where nutrition should be taught in the dental curriculum. This self-appraisal is in no way a compliment. For, the fact of the matter is, I have been involved in the teaching of nutrition for a number of years without ever having asked myself the questions which I propose now to analyze as my contribution to this program.

To prepare for this meeting it was decided to interrogate other people in the field and learn from them how they would answer these questions. And so, a letter was developed and sent to the deans of the forty-four American and five Canadian dental schools. It was not my purpose, by this communique, to arrive at a quantitative index of the how, when, and where of nutrition. Rather, it was my hope to (1) learn how administrators of dental colleges would answer these problems, and (2) more importantly, to know who the people were they (the deans) would call upon to help me in this project. And so, the letter which was sent last September to the forty-nine deans included the following two paragraphs:

"On 25, 26, 27, and 28 March 1956 will be held the annual meeting of the American Association of Dental Schools in St. Louis, Missouri. Part of that program will be dedicated to the teaching of nutrition and dietetics to dental students. A series of questions will be posed including: How and when should nutrition be taught to dental students? Should nutrition and dietetics be taught as a separate course or as part of another course or courses? Should it be taught at the undergraduate, postgraduate, or graduate level? At which level can it be taught most effectively?"

"In preparation for these discussions a letter is being circulated to the deans of all of the dental schools in the United States and Canada. It is our hope that each dean will direct this letter to the person or persons involved in the teaching of nutrition to dental students. We would like to receive from these individuals their opinions regarding the questions which have just been posed and any other information they deem important for this symposium in March."

*Presented before the Conference Session on Nutrition and Dietetics, American Association of Dental Schools, St. Louis, Missouri, March 1956.

†Professor of Dentistry, University of Alabama, School of Dentistry.

The first highly interesting point to be mentioned is that only one-half of the schools replied. It is difficult to draw any cosmic statistical conclusions from so few replies. But, with our present understanding of motivation and interest, I feel sure any reputable psychologist would say that there are a significant number of responsible individuals in the dental teaching field who are not particularly interested in the problem which is being considered in this symposium. It would appear that if this meeting accomplishes nothing other than to bring the problem of nutrition into its proper focus, our time will have been well spent.

It should be recalled that the letters were addressed directly to the deans of the forty-nine schools. However, it must be emphasized that the letter requested the communication be referred to the person or persons involved in the teaching of nutrition. It was of interest to review the replies to ascertain the individuals whom deans regard as persons involved in the teaching of this subject.

Despite the fact the request was made that the letter be turned over to people involved in the teaching of nutrition, one out of every four replies came directly from the deans. Again, it is difficult to draw any profound conclusion from these figures. It may be that the high percentage of direct answers signifies that deans have been well-trained in a Pavlovian way to reply personally to everything which crosses their desks. Many of their comments were most interesting and helpful and some of their remarks are incorporated in this paper.

Of those letters passed on to staff members, it is of particular note that the greatest number were sent to biochemists. Specifically, over one-fourth of the replies were received from members of biochemistry staffs. The only conclusion which can be drawn from this observation is that a significant number of deans regard biochemistry as the hub for the teaching of nutrition. Therefore, it behooves us to analyze first and foremost the role of the course in biochemistry in the over-all teaching of nutrition and dietetics to dental students.

According to the best available statistics, the average course in biochemistry consists of one lecture three times a week for one semester, accompanied by a two-hour laboratory period three times weekly. This, translated into actual numbers, means that the average dental student receives approximately forty-eight didactic hours and ninety-six hours of laboratory exercises. It must be pointed out that there are truly great variations in the amount of time allocated to biochemistry. There are several schools much below the average just cited and there are some few which exceed it. But, the important point in analyzing these

figures lies in the fact that within a sphere of 144 clock hours the instructor in biochemistry must present the entire story of the chemistry of carbohydrates, proteins, and fats, an introduction to metabolism, energy exchange, the hormones, vitamins, and enzymes, to mention but a few essential biochemical facets.

In many institutions, where the students come badly prepared for physiological chemistry, it is the added responsibility of the department of biochemistry also to briefly review organic, quantitative and physical chemistry. Subsequent discussions with biochemists revealed that it is extremely difficult to see how, within this frame, it is possible to include even an adequate introduction to nutrition, let alone to pose the subject in any great detail. More important, the biochemists interviewed were the first to admit that, not clinically trained and not of that bent of mind, the most to be expected from them is a prelude to nutrition with the hope this would be pursued later in the clinical disciplines. Though the biochemistry department is usually assigned the major responsibility for the teaching of nutrition, it would appear to this observer to be an impossible task.

Perhaps belated, but nonetheless necessary before we proceed, one must define the terms nutrition and dietetics. It is generally held that nutrition embraces the processes which are concerned in the growth, maintenance, and repair of the living body as a whole and of its constituent parts. In contradistinction, diet simply includes the usual daily allowance of food and drink taken in by the individual. It should be clear from these definitions that diet is but one small aspect of the whole subject of nutrition. However, it is a fact that many nutritional disorders are fundamentally of a dietary nature. Thus, it becomes of interest to determine the emphasis placed upon diet in the average biochemistry course. Here again, there are wide variations and it is impossible to make any accurate over-all statement.

It is surprising, if one checks the three or four biochemistry textbooks currently in popular use, that, in one such book, twelve out of eight hundred pages are relegated to diet and in another four out of six hundred. This should not be interpreted to mean this is all that is provided the student in his course in biochemistry. However, it is a fact that teaching textbooks are usually designed and geared to the teaching of a subject and it would appear one can at least obtain presumptive evidence of the emphasis which is placed upon diet in a course in biochemistry by examining contemporary classroom books.

One must confess the fundamentals of nutrition are of a chemical

nature and that the course in biochemistry is indeed a logical starting point for the teaching of nutrition and dietetics. This appears to be the opinion of about one-half of the individuals who were kind enough to reply to our letter. Biochemistry is an excellent starting point for a second reason—namely, because the course is introduced early in the curriculum. Biochemistry, in most dental schools, is taught in the first year, more often in the very first semester. In only a limited number of institutions is the subject scheduled in the sophomore curriculum. It seems clear then that biochemistry is an excellent area in which to introduce the fundamentals of nutrition and dietetics.

We have just learned that a significant number of replies underscored the importance of biochemistry in the teaching of nutrition and dietetics. Strangely enough, only a very few remarks were made concerning the role of physiology in this regard. Specifically, not more than ten percent of the letters indicated in any manner that part or all of the teaching of nutrition should be incorporated in the course in physiology. This is rather strange because the practical application of nutrition requires a sound comprehension of the physiological mechanisms of digestion, assimilation, utilization, and excretion of foodstuffs.

In most schools, the number of hours allocated to physiology is slightly more than that relegated to biochemistry. Roughly speaking, the average physiology course encompasses about 160 to 180 hours. The subject customarily is presented in the last half of the first year or during the sophomore term and, in almost every case, it is preceded by a course in biochemistry. In the usual physiology program, major emphasis is given to basic physiological processes. Surveys show one-third to one-half of the average course is devoted to nerve and muscle physiology. Generally, only a small segment of the program is assigned to alimentation and an even smaller portion to the specific physiological problems which relate to nutrition. It is the opinion of teachers that, as in the case of biochemistry, the fundamental material which must be presented in the allotted time plus the talents of the faculty does not allow for a comprehensive review of practical nutrition. However, it would appear that, since the course in physiology is given early in the curriculum, is preceded by biochemistry, does indeed include important mechanisms necessary for an understanding of nutrition, it would logically follow that here is an excellent opportunity to pursue the fundamentals of nutrition which have been initiated in the course in biochemistry.

Again, the general statement can be made that textbooks are usually geared to the teaching of a subject. If this be true, it is of note that, in

the main, physiological texts allocate much more space to the subject of nutrition than is customarily found in the usual biochemical textbooks. But, as in the case of biochemistry textbooks, very little space is relegated to diet. Specifically, in one very popular physiology text used in a number of schools, only ten pages of a one thousand page book are reserved for a discussion of diet. In another widely used textbook, twenty pages out of eight hundred are given over to a consideration of diet. One must admit this is not proof-positive of the distribution of subjects in the course in physiology, but it does provide an inkling into what author-physiologists think. It is also a fact that many teachers do use textbooks as a guide in formulating their lecture and laboratory series.

Of the twenty-five replies received, the role of pathology in the treatment of nutrition was considered by only one individual. This should not be interpreted to mean that nutritional disorders are not discussed in the usual course in pathology. It is of interest that so many letters made direct reference to biochemistry particularly, physiology to a lesser degree, and little attention to the course in pathology.

In most schools, there are two courses in pathology or at least the subject is considered in two sections. Usually, in the sophomore year, there is a course in general pathology which spans about 130 to 140 hours though there are wide variations, much greater than those encountered in biochemistry and physiology. Consequently, the amount of material taught must necessarily be quite different in the various schools. There is no question but that nutritional disorders are considered in the frame of general pathology. However, even a superficial study reveals that the nutritional disorders are only viewed in their classical forms. Thus, the student gains the impression, more by act than by word, that a vitamin C deficiency does not exist unless the patient has full-blown scurvy, a vitamin B lack is not present unless there is classical evidence of pellagra, beriberi, or ariboflavinosis.

In addition, most schools conduct during the second or third year a course in oral pathology. This is usually of the magnitude of 100 clock hours, though there are very wide variations, ranging from as few as 20 hours to as many as 150. If one examines such courses in some detail, it becomes clear that most of the time is spent on pulpal and periapical pathology. However, there is usually a sizeable fraction of time allocated to a consideration of nutritional disturbances. Precisely how detailed the teaching is and how much time is reserved for the more subtle symptoms and signs of nutritional deficiency states is impossible to estimate.

According to the replies obtained and personal communications with people involved in the field of pharmacology, it is clear that the problems of nutrition seldom enter into the teaching of this particular basic science course. Usually, pharmacology is offered late in the sophomore year or, less often, early in the junior program. According to the best available figures, the course ranges from 60 to 180 hours, with an average of about 120 hours devoted collectively to the lecture and the laboratory. It is extremely difficult to make any quantitative appraisal of the course content. However, it seems clear that much time is spent on the principles of pharmacodynamics and considerable energy devoted to a discussion of the autonomic nervous system from a pharmacological standpoint. In some institutions, there is even great emphasis on drugs which affect the cardiovascular and the respiratory systems. The general statement can be made that when nutritional agents are discussed, they appear late in the course and are usually given very hurriedly and sketchily. Logically, if nutrition were to be introduced early in biochemistry, then pursued in physiology and pathology, a neatly tied package could be accomplished by considering its pharmacotherapeutics in some detail in the course in pharmacology.

There is no question but that in some schools the fundamentals of nutrition are adequately covered and that, in most of these institutions, the problem of nutrition is attacked from various angles by a consideration of the subject in biochemistry, physiology, pathology, and sometimes even in pharmacology. But the one impressive point is that there is still great divergence of opinion as to which department will include at all, and if so what aspect of, nutrition. One gathers the impression that the subject of nutrition has never been truly crystallized in the basic science curriculum in most dental schools.

In only three of the replies was mention made of the fact that nutrition is or should be encompassed in the course in periodontia and pedodontics. In most institutions, these two clinical courses are introduced in the junior year. It is true, in isolated cases, that periodontia is initiated in the second year by way of oral hygiene, but this is not the usual sequence of events. It is extremely difficult to even estimate how many hours are relegated to periodontia and pedodontics. In some cases, the didactic teaching of periodontia is an independent course. In other colleges, periodontia is taught in conjunction with oral medicine, oral diagnosis, possibly even operative dentistry. It is even more difficult to quantitate the clinical teaching of periodontia. In some few colleges the number of hours allocated to the practical work in periodontology

is clearcut. But, in a significant number of schools, clinical periodontology is part of clinic practice and, for that reason, it is difficult to calculate the emphasis placed upon the treatment, let alone the diagnosis, of periodontal disease. Usually, about thirty-two lecture hours are devoted to periodontia though, again, there are wide variations. It is difficult to conceive how one can in an average thirty-two-lecture-hour period include a satisfactory discussion of nutrition and diet with all of the other problems of a technical nature which must be discussed. This conclusion is supported by many teachers of periodontology.

Pedodontics is usually offered both in lecture fashion and clinically in the third and fourth years. There are a number of institutions which do not begin the pedodontic course until the senior year. In any case, generally sixteen to thirty-two lectures comprise the entire didactic course in pedodontics and, in some cases, this also includes preventive dentistry and public health. Again, it is impossible to calculate the precise number of hours allocated for clinical pedodontics. After having examined a number of course schedules in pedodontics and following conversations with instructors, it is difficult to see how an adequate course in nutrition can be included in sixteen to thirty-two hours with the numerous other problems which must necessarily take priority.

There is, in most schools, an independent department of oral diagnosis and/or oral medicine. In a significant number of institutions the service is nothing more than a screening clinic from which patients are directed to other departments. In other programs, the functions of oral diagnosis and oral medicine are swallowed up by another service. Thus, the department of periodontology, radiology, or the treatment planning service may encompass the functions of oral diagnosis. Often, the converse is true. To mention a few, the department of oral diagnosis and oral medicine may teach radiodontic interpretation, treatment planning, internal medicine, therapeutics, oral cancer, and oral manifestations of systemic disease. Usually, it is the responsibility of the oral diagnosis staff to teach the diagnostic method, correct history-taking, proper examination techniques, and the use of diagnostic tools, such as transillumination and pulp testing. In isolated cases, the department of oral diagnosis or oral medicine is charged with the responsibility of teaching nutrition and dietetics. The varied programs of such a department make it impossible to make any sweeping statement about the efficacy of teaching nutrition. Surely, there are a limited number of such departments contributing effectively to the teaching of nutrition and dietetics.

It is a simple matter, when one is dealing with a subject which

crosses departmental borders, to assume that the other teacher is covering the material. For example, there is little question that the subject of halitosis is important to the dental practitioner. Yet, we learned several years ago in our institute that the Department of Periodontology assumed that the Department of Oral Medicine was presenting the subject in its entirety. The Department of Oral Medicine took it for granted, since cases of Vincent's infection are odoriferous and are referred to Periodontia, that it was being taught in that course. The Department of Operative Dentistry and Prosthetics never thought it was a problem at all. And, the Department of Pedodontics was certain, but incorrectly, that the subject was covered in a course in internal medicine which is offered in the senior year. Everybody hinted about halitosis but no one really discussed the problem in its broadest dimensions.

More recently, it has become evident in our institution that no one department brings into the classroom a critique on headaches of dental origin. Surely, the dental practitioner is often sent a patient with the request that there be a full mouth extraction for the relief of headaches. It was learned that the subject never found its way into any course because everyone assumed that the other professor was adequately presenting the subject.

One gains the impression that nutrition and dietetics may well fall into this category. The subject is touched in a number of disciplines. Whether or not the graduating student leaves with a crystallized notion of what to do about nutrition is a moot point. Probably the best evidence we have of the incompleteness of our training in nutrition and diet can be gleaned from an examination of dentists who return for refresher courses. Any one involved in postgraduate education knows the knowledge of the average dental practitioner regarding the nutritional factors in dental health leaves much to be desired. It is difficult to find the correct locus in the dental curriculum where all nutritional information can be pooled, where the student can direct his special, practical, immediate question to one or more persons, and come out with an answer which can be applied to the patient sitting right there in the chair.

In the final analysis, the nutritional aspects of dentistry are still poorly defined. Dental research along these lines is incomplete and leaves much to be desired. We still need studies in the interplay of malnutrition in combination with local stress. There is, even today, considerable information which should be made available to the student so he may learn that pellagra, beriberi, and scurvy, although rare, are

manifestations of food deficiencies. For example, will it be the biochemist who will take the time to tell the student that the vitamin C requirement is higher in the millions of individuals who smoke excessively or who eat large amounts of carbohydrates? Will the physiologist take time out from chronaxie and rheobase to point out the nutritional hazards in the hundreds of thousands of patients who are chronic laxative-takers? Is the pharmacologist prepared to digress and expound on the nutritional problems which arise in the tens of thousands of severe cardiac patients who are taking mercurial antidiuretic agents?

Ideally, if each department were to accept its true responsibility by consulting with other divisions and attending other courses, full integration is accomplishable and the student would graduate fully equipped to handle the nutritional aspects of stomatology. We are still far away from such integration even on paper and most certainly in actual practice. Hence, it appears that a quick and relatively atraumatic solution lies in the creation of a course in nutrition and dietetics taught either by one expert acquainted with all intricate facets of the problem or by a group of clinicians integrated into one meaningful whole.

Perhaps, the same end-result could be accomplished by or in conjunction with a nutrition clinic to which patients are referred, just as we now selectively send cases to a cleft palate center or a tumor board. There is one distinct objection to this recommendation. It makes nutrition something separate and distinct. One gets the feeling that a few, select souls require such analysis. Actually, the more one works in the field of nutrition, the more one is impressed with the magnitude of the problem. Hence, there is a justifiable objection to such a center. On the other hand, it is a means of concentrating a group of staff members for a specific purpose. More important, the exchange of such information would undoubtedly filter back into their respective courses and ultimately modify the teaching program. Then, perhaps, with someday perfect integration of the classical courses, there would no longer be a need for a course in nutrition.

It appears, in the light of the data collected, that ideally each department should accept its unique responsibility in the teaching of nutrition and dietetics. Until such time as this becomes possible as an integrated whole, the recommendation is made that a course in nutrition and dietetics at a didactic level and a nutrition clinic be established to underscore the importance of the problem, allow a center for the diagnosis of cases, and permit a place for both teacher and student educa-

tion. Actually, this is done to some degree in approximately ten schools. And, from what can be gleaned, most such colleges conduct the best over-all teaching of the subject.

It should also be clear from this discussion that the teaching of nutrition and dietetics is unquestionably an undergraduate problem. If the dentist who does not continue into graduate school is not exposed to this system, and this includes the majority of practitioners, then one can hardly expect any progress in this direction. Naturally, those interested persons should be provided, as they are even today, with the opportunity to pursue their interest in nutrition by way of refresher and postgraduate courses.

The remaining question is what to do about dietetics. The opinions received were quite varied. Some teachers insisted, and I use the word deliberately, that there is no place in the dental curriculum for such a course of study. The suggestion was made that dietetics can be learned after graduation. An equal number of teachers, just as vigorously, insist that dietetics should be included in undergraduate teaching, not as a separate subject, but as an integral part of a course in nutrition and dietetics. The medical student spends four years in a diagnostic environment. It is presumed his appreciation of therapy will come later in his hospital training. The dentist is trained for four years in a therapeutic milieu. The chances are great that the dental graduate terminates his formal training when he receives his diploma. Perhaps the place of dietetics in the dental curriculum should be more carefully studied. To this observer, the answer appears simple—perhaps too simple. We are in accord that the student must be taught how to prepare a satisfactory cavity. It is assumed there is little argument that he must also be shown how to condense amalgam and polish the restoration. Though we have admitted that nutrition and diet are not synonymous, it is a fact that a knowledge of nutrition without a concept of dietetics would be comparable to a situation where the student cuts a perfect cavity and then condenses the amalgam with his thumb. It would, therefore, seem advisable to include dietetics in the undergraduate curriculum.

In conclusion, a desirable state of affairs will be reached when schools are so integrated that each department is administratively and professionally ready to accept its unique responsibility in the teaching of nutrition and dietetics. From a practical standpoint, a gesture in this direction may be made by creating a course in clinical nutrition and dietetics and a nutrition center. By these means, patients will profit through better diagnoses, and teaching will be improved.

Reprinted from the
JOURNAL OF DENTAL EDUCATION
November, 1956, issue

Pages 304-313