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# 91-68 NUTRITION AND PREDICTIVE MEDICINE

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## HEARING

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## SUBCOMMITTEE ON

## PUBLIC HEALTH AND WELFARE

OF THE

## COMMITTEE ON

## INTERSTATE AND FOREIGN COMMERCE

## HOUSE OF REPRESENTATIVES

NINETY-FIRST CONGRESS

SECOND SESSION

TO HEAR A STATEMENT PRESENTED BY EMANUEL CHERASKIN, M.D., D.M.D., ON THE PREDICTIVE MEDICINE PROGRAM, SPONSORED BY THE SOUTHERN ACADEMY OF CLINICAL NUTRITION, TAMPA, FLA., SOUTHERN CALIFORNIA ACADEMY OF NUTRITIONAL RESEARCH, LOS ANGELES, CALIF., AND OHIO ACADEMY OF CLINICAL NUTRITION, COLUMBUS, OHIO

JULY 22, 1970

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## NUTRITION AND PREDICTIVE MEDICINE

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WEDNESDAY, JULY 22, 1970

HOUSE OF REPRESENTATIVES,  
SUBCOMMITTEE ON PUBLIC HEALTH AND WELFARE,  
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,  
*Washington, D.C.*

The subcommittee met at 2 p.m., pursuant to notice, in room 2322, Rayburn House Office Building, Hon. Paul G. Rogers presiding (Hon. John Jarman, chairman).

Mr. ROGERS. The subcommittee will come to order, please.

We are delighted to have with us a distinguished group of doctors who have been involved in a very interesting research project. I think we might start off by having you come to the witness table. You all may come at once or, if you desire, you may come one at a time.

I believe Dr. Cheraskin will start. Emanuel Cheraskin lives in Birmingham, Ala., and is with the University of Alabama Medical Center. It might be well if you could introduce your colleagues before we start and then we will let you get right into your testimony.

**STATEMENTS OF DR. EMANUEL CHERASKIN, UNIVERSITY OF ALABAMA MEDICAL CENTER; DR. KARL FOOSE, WEST PALM BEACH, FLA.; DR. JOSEPH DIAZ, TAMPA, FLA.; AND DR. WILLIAM HEMBREE, JACKSONVILLE, FLA.**

Dr. CHERASKIN. Thank you, Mr. Rogers. I am here with Dr. Karl Foose, Dr. Joseph Diaz, and Dr. William Hembree, all from Florida. These gentlemen have been working with me in the program that I am about to describe.

Mr. ROGERS. We are delighted to have all of these gentlemen present.

Dr. CHERASKIN. I have a prepared statement, Mr. Rogers, which you and the members have. I shall not read it in the interest of expedition. What I would like to do is take 30 minutes to summarize it with illustrations, if I may.

Very briefly, my responsibility in this program has been one of collecting and interpreting data which we had now derived from a study of 433 health practitioners and their wives. As far as I know, this is the first study of this magnitude and depth that has been done on doctors.

I say "health practitioners," because all members of the health profession are invited. There are some few medical physicians and osteopathic physicians, but overwhelmingly these are dentists.

Mr. SKUBITZ. Of the 433 that participated, most of them are dentists?

Dr. CHERASKIN. Ninety-eight percent, whatever it is, all but four of five. There are one or two laymen and children in the group, but for practical purposes these are dentists and their wives.

This study has now been going on in Florida under the auspices of the Southern Academy for Clinical Nutrition for approximately 5 years. Part of the program has been operating out of Los Angeles under the auspices of the Southern California Academy of Nutritional Research for 3 years and another segment of the study is being done in Ohio, in Columbus, under the aegis of the Ohio Academy of Clinical Nutrition.

The 433 is the collective group. It is interesting that the findings in these three groups are very similar, suggesting if nothing else that the values, the data must be reasonably reliable, since here are people in different sections of the country with no knowledge of each other, who are reporting essentially the same findings.

There are, of course, many, many multiphasic screening purposes operating in the United States right now. They range from executive programs at the University of Pennsylvania to longshoremen in the Bay area in San Francisco. So multiple testing is no new.

I should like to point out at least six differences between this program and all of these other several score programs that are operating across the Nation. I think we could do it best by illustration.

First of all, there are many many people who have gone to the trouble to define health and disease. Books have been written on the subject and this is not the place to discuss all of the definitions. Of the many who have discussed this problem, there is one who has said it as eloquently or as lyrically as anybody that I know and quite fortuitously he happens to be one of your countrymen here in Washington, Dr. Jacques May, medical director of the American Geographical Society.

This is what he said:

It is as if I had on this table in front of me three dolls, one made of glass, one made of celluloid, and one made of steel. And I choose to hit these three dolls with a hammer, using equal strength.

So all three dolls will be struck with the same force. The hammer, for Dr. Jacques May is the environment, the germs in the world, if you will, the seeds. And the dolls are the soil, which can be called host receptability or constitution. It matters little.

So Jacques May says:

It is as if I had on this table in front of me three dolls, one made of glass, one made of celluloid and one of steel, and I choose to hit these dolls with a hammer using equal strength. (Fig. 1.) Why is it that the glass doll shatters, just falls apart? (Fig. 2.) Why is it that the celluloid doll only scars (fig. 3) and why is it that the steel doll just emits a beautiful musical sound? (Fig. 4.) Why is it some people just can take the trauma of the world and others cannot?

This is the first unique feature of this program. We are interested in the fabric of man. We want to know why some people are made of steel, others of celluloid and others of glass and, of course hopefully, if we can determine the ingredients, then we can change them.

So the first unique feature of this program is the fact that we are interested in this multifactorial system. We want to know the fabric of man. Diet has something to do with the fabric of man. This automatically makes this program unique.

The second unique feature of this program is the way we look at man (fig. 5). Man can be viewed like a sphere made up of a series of layers. The outside layer is what we see about man. We can see if he limps or he has pimples on his skin or a cataract. This is the obvious evidence of disease. This is where curative medicine has put its money. It spends most of its time concerned with the end-products of disease, the sins of disease.

There is absolutely nothing wrong with examining the periphery except that one must realize this is the end result. This is the periphery. This is not the beginning. This is the end. Even within this layer, our program is unique for this reason. If one plots out age here on the axis, time, and plots out complaints on the ordinate, what usually happens is with time at first there are isolated complaints (fig. 6). A person just feels badly, as they say, or he has headaches occasionally or his skin itches.

These are unrelated or seemingly unrelated symptoms and signs. At this point, traditional medicine does not know what to do with a man, because he does not fit a textbook definition of a syndrome. He is told to go home and take a rest.

Sooner or later these isolated symptoms and signs begin to crystallize (fig. 6). They concentrate so that they begin to collect in the gastro intestinal tract. At this point we begin to wonder. Maybe there is something wrong. We usually say, "Let's watch it. Let's observe the patient."

Sooner or later we give it a name (fig. 6). In our section of the country, the most popular disease is dyslexia. Every child in our area has dyslexia, which is nothing more than difficulty in reading, and hanging a name on it does not really contribute much to our understanding of it. But traditional medicine is interesting in the periphery and principally interested when we can change the names on people.

This program is unique because it wants to find these isolated symptoms and signs and nip them before they ever become specific syndromes. So we have a second distinctive feature of this program.

We are not interested in name calling. We are interested in recognizing that people start by having complaints, as they get older they have more complaints. People with more complaints are sicker. We would like to get rid of these complaints before they become sick.

This is a third unique feature of the program. To return to that onion, (fig. 5) that sphere, in healthy man, there are no signs of disease. Before there are signs of disease there are symptoms. Before a person breaks out with a rash and has all the classical evidence of disease, he is irritable and does not sleep well and has ill-defined symptomology which is usually ascribed some to psychic state or nothing or to working too hard or not working too hard, whatever the case might be.

So in a sense, symptoms precede signs, hence symptoms are predictive of signs. So we are more concerned with symptoms than we are with signs in this program.

Before there are symptoms of disease there is a disturbance in performance. One can measure, for example, the speed with which secretaries type in late afternoon. We find as they get older and sicker, they type more slowly and make more errors. This is a very quantitative

way of measured performance. I am sure there must be techniques that could be developed even more Congressmen. I don't know.

Be that as it may, performance begins to suffer before there are symptoms and symptoms appear before there are signs. So performance is predictive of symptoms which, in turn, is predictive of signs. So we are even more concerned with performance.

Before performance begins to suffer, there is already some biochemical aberration, the cholesterol goes up or the uric acid goes crazy, something happens biochemically.

To give you some idea of how predictive this layer is, there is an article that recently appeared in the leading journal of diabetes, indicating that the average person who becomes diabetic peripherally has been diabetic biochemically for 10 years. So we put a great deal of emphasis on the biochemical picture for that reason.

Hormones can be out of balance, enzymes can be out of sorts, and the important thing is that deep down in that sphere is the core of the problem. There are a number of things that are the core of our diseases. Diet is certainly not the only one.

Genetics is one and one we can do little about. Actually there are only two things that the consumer can do anything about. One is his activity and the other, the food he eats. The air he breathes has been federalized and the water he drinks is under Government control. So there are only two things he can do: One is to walk or run, and the other is to make some decision about his food.

I repeat, diet is not the only problem, but it is a nice one to begin with for a number of reasons. One was eloquently said by Ashley Montagu when he pointed out that at conception we are one-fourth the size of a period at the end of a sentence, and we weigh about one twenty-millionth of an ounce. Within 9 months we have got to go from that to 7 pounds and 20 inches and, as he said, this is all done with groceries.

So groceries have something to do with health and disease. This is interesting, because if you go and have the average physical examination, the doctors will shove things down and up into the patient and never ask what the individual eats or rarely asks what he eats. It is rare indeed.

So this is a healthy man (fig. 7). He has no problems. His performance is good. He has no symptoms and has no signs.

If the diet is bad (fig. 8), down in the core, then problems erupt through this sphere out to the periphery. There is a long incubation period. That is one of the problems in this area. We can accept an incubation period of 10 days for measles. We know that our child played with a neighbor's child, the neighbor's child had measles last week and our child has measles now. That is easy to understand.

It is difficult to appreciate that you have to eat badly for many years. It is difficult for traditional medicine to recognize this. So this is another unique feature of this program.

All of these layers have been studied in these doctors and their wives. We studied the doctors and their wives because we found there are patterns in the family. Men who are complainers are living with women who are complainers. Men who are not complainers are living with women who are not complainers.

If the blood glucose in the husband is high, then the blood glucose in the wife is high. If the blood glucose in the husband is low, then the

blood glucose in the wife is low. Obviously this cannot be genetic since the average doctor does not marry his cousin. So we have studied every one of these layers including diet.

The fourth unique feature of this program is that it was done on doctors. There are only two programs reported on members of the health profession. One is the study being done on physicians at the annual meeting of the American Medical Association. This is the editorial which appeared when the study was first done. The title is "You may be sicker than you think."

It points out, in effect, that of the doctors, the physicians who subjected themselves to this testing procedure, approximately one out of five had elevated blood sugar and about one out of three had elevated cholesterol and one out of three had elevated uric acid.

These are deplorable figures. This is in the health profession. Moreover, this is in the health-conscious doctor, because those who are not interested in their health wouldn't even show up for this study.

So if the figures are this high among healthy doctors, one can only project what they would be among not so healthy doctors. But the important point here is that a study has been done to show that the average physician's definition of who is overweight is directly related to his own weight.

It would, therefore, follow that the average doctor's attitude about the health of his patients is very much a function of his attitude about his own health. I think this shows very graphically why there is very little interest in health in the health professions.

This study has been done among dentists. This is the American Dental Association health program and they say it is safe to assume that those dentists who submit to this type of an examination are health-conscious. So this is the healthy group.

You must project from this to what it is in the average dentist or physician and among the healthy dentists, 17 percent have abnormal blood pressure, over one out of four have abnormal electrocardiograms, one out of eight have abnormal breathing, and one out of four abnormal blood sugar, et cetera.

The figures are not good. This makes our program unique because it is our hope that by showing the dentist his problems, he will do something about them. Having done something about them and finding results, he will be able to then translate it to the patients.

This makes the program very singular since there is no program in the world that has attempted to do that. There are many people who talk about diet. I have cited Ashley Montagu. This is not a food faddist business, though it has been accused of that. The camps are sharply divided.

Either one is a Communist, or one believes that everybody in the United States is eating well. Dr. Willard Krehl, a very reputable pro-American nonfood faddist and anti-Soviet at the University of Iowa, writing in a leading journal, says:

Greater realization is needed in medicine and in public health that good nutrition along with good oral hygiene are the best weapons available in the prevention of disease. If one were bold enough to make a prediction, it would be that the most important measure that could be taken to prevent the development of many chronic diseases would be the provision of consistently good nutrition.

This is just representative of thousands of such statements that appear in respected medical journals every day and have been appear-

ing for years and years. So we have looked at these people and we have tried to look at them in a unique way.

The sixth unique feature of this program is we have looked at them with a microscope, as it were. At the moment, all of our standards for health are based on the assumption that 95 percent of Americans are healthy. That is a mean and two standard deviation, for those statistically oriented.

If you accept the assumption that your blood pressure is OK if it is like 95 percent of Americans, you are OK. If you accept the assumption that 95 percent of the Americans have tooth decay, then one must admit that dental decay is good since 95 percent of Americans have it. That is absurd.

What it amounts to really is we have got to start fishing with a finer mesh net. The man who has said that most eloquently is Leo Krall. He says the detection of diabetes can be compared to fishing with a small mesh net that increases the catch of fish, but also seines out some nonfish or the wrong variety. If we use a coarse net, we catch big fish.

We must use a fine mesh net to catch little fish. That is the sixth unique feature of our program. We look at these people with a small, fine mesh net. We are looking with small differences before these folks get very sick.

So we have looked at every level of these individuals. Here are some representative findings of what the doctors eat (fig. 9). You must remember the average doctor in this group is 40 years of age, young, and his wife is 36. They can afford anything. They are in a socioeconomic privileged group. It is the health-conscious doctor who comes to these meetings.

We are told that the average male should be eating about 2,600 calories, according to the recommended dietary allowance of the Food and Nutrition Board here in Washington. The average doctor is eating 2,282 calories. He is 12 percent less calories-wise than what he should be; 69 percent of the doctors are eating fewer calories than they are told to eat.

It is rather interesting that 25 percent of them admit to being overweight. Just for the record, there are more people who are overweight and undercaloried than there are people overweight and overcaloried.

So the calorie per se is not what makes people overweight. It is only part of the story.

Just to take some representative items here, 43 percent of the group are not consuming enough vitamin A, according to our U.S. Department of Agriculture. Vitamin A is one of our major deficiencies in the United States; 65 percent of the people in the group are not getting enough calcium.

And interestingly enough, 99 percent, almost every woman, every lady in the group, is not consuming enough iron (fig. 9). All of these figures are quite consistent with the national averages. This is in a health-oriented, socioeconomically privileged group. So we showed the group their results. These are the kinds of things we showed them.

Then this is probably the most unique feature of the program. We discussed with them how to change one's ways.

For example, just to get calories out of the way, here are two breakfasts (fig. 10) of precisely the same number of calories, 700. So whatever the differences are between these two breakfasts, it cannot be calories.

Let's take a breakfast which any mother would be proud to have her kid eat: Three hotcakes with butter, sirup, one cup of coffee with sugar and cream would make a lot of mothers happy. We shall call that an inadequate breakfast as against the half a grapefruit, two eggs, 3 ounces of ham, one slice of whole grain bread and butter, and a glass of milk.

Here are the nutrients of these two breakfasts with precisely the same number of calories. Here we have divided the inadequate versus the adequate. There are 50 times as much vitamin C in the grapefruit-egg breakfast than there is in the hotcake-sirup breakfast, 25 times as much nicotinic acid as vitamin B-3, eight times as much phosphorus, and so on.

The carbohydrates are higher in the hotcake breakfast. There are a lot of people eating these kinds of breakfasts. This is an attempt to show them they can get more nutrients than otherwise.

Next is the lunch (fig. 11). This is again representative of the kind of discussions we held. Same number of calories, so whatever the difference is, it cannot be calories.

We took a typical lunch, a ham sandwich, a soft drink, and a piece of pie, which we will call inadequate and compared it to a bowl of vegetable soup, et cetera. The nutrients in the adequate breakfast lunch are far superior to the inadequate and the inadequate, I think you will admit, is a common lunch, probably even here at the House of Representatives.

Finally, again by way of illustration, we took two dinners of precisely the same number of calories (fig. 12), one anybody would be proud to have their kid eat, spaghetti and meatballs, mixed salad, with French dressing, French bread, square of butter, French pastry, et cetera, as against a small piece of roast beef, a salad with vinegar dressing.

There is nine times as much vitamin C in the adequate dinner, and so on.

We showed the people some of the peculiar things they were doing. For example, the average American is eating 150 pounds of sugar a year. Translated, that is a teaspoon every 30 minutes around the clock, day and night, 365 days a year. That is the average.

There are some doing better than that. People say that is ridiculous. "I am not doing that." If you eat 4 ounces of hard candy, you are eating 20 teaspoons of sugar (fig. 13). That will exceed a tumbler. That is what many people are eating at one sitting.

Just a carbonated drink is about three to six teaspoonsful, depending on the size of the drink, of course. Even a Lifesaver is a third of a teaspoonful which isn't much, but people eat Lifesavers all day. This is the kind of information we showed.

Finally, again by way of illustration, we said money is not the problem (fig. 14). For example, here is 10 cents worth of a cola drink, a ginger ale, 10 cents worth of a grapefruit, orange juice, and tomato.

You will note in the ginger ale and cola drink there is absolutely nothing except calories and carbohydrates. In the society in which we live, where we are told to watch our calories, every calorie must count. Here we are spending calories for nothing as against what you get in the same 10 cents out of grapefruit juice, orange juice, et cetera, in terms of major foodstuffs, vitamins, and minerals.

These are the kinds of lectures that were given. Then the group was reexamined annually so we have an opportunity to see how they did at every layer in the sphere in terms of their dietary changes.

For example, we know that with age people have more complaints. This is the natural course of events. This is the usual sequence of events. With age you have more complaints. What is seldom pointed out is that there is a great spread that develops with age, this gray area. There are men at 70 who have fewer complaints than others at 30.

Let's see what happens to this group.

Mr. ROGERS. Doctor, excuse me. We have a rollcall in the House. Could you hold it at this point and let us go answer and we will resume immediately after answering.

(Whereupon, a brief recess was taken.)

Mr. ROGERS. The committee will please be in order.

Dr. CHERASKIN. What we wish to do is to resolve problems. Shown here on the X axis is age, moving from left to right, and on the Y axis is whatever you wish to put on the Y axis, increasing symptoms of signs, of any particular disease (fig. 15).

The usual sequence of events which I described a moment ago is this line going up the natural course. With time people have more and more complaints. Everybody knows that. It is assumed that they should. As I indicated a moment ago, there are some 70-year-olds who have fewer complaints than those at 30. We would like to show if we can stop or reverse the process. Any one of these is a form of prevention. But it is secondary prevention, prevention of recurrence (fig. 16).

What we really want is primary prevention (fig. 16). Primary prevention is prevention of occurrence and to do that we hope one day Public Health will give money for obstetrical clinics, because that is the last time you can do anything of the primary prevention type. But from the practical standpoint, we are talking about secondary prevention, remembering the line goes up. We are going to try to bend that line.

Here are the complaints in these individuals at the first and second examination done by a particular test called the Cornell Medical Index Health Questionnaire (fig. 17). That isn't important. It simply defines the number of complaints.

At the initial examination, shown by the interrupted line here, the individuals categorized by age have more and more complaints. Precisely what you would expect.

As people get older, they have more complaints. Following lectures on diet, as shown earlier, breakfasts, lunches, dinners here is the pattern (fig. 17).

You will notice that it still goes up with age, but at every temporse point these people have fewer complaints that they did initially. Furthermore, if you look at line AA, it says 50-year-old dentists, after dietary advice, have the same number of complaints as 40-year-olds did before. In other words, we have bent the line. These people in a sense are clinically younger, even though after 5 years they should be getting older.

Well, the argument here is this is only a questionnaire, you can't trust questionnaires.

Mr. ROGERS. Excuse me. Go over that slide once more for Dr. Carter, if you would.

Dr. CHERASKIN. This is the line showing the increase of complaints initially with dentists, 40-year-olds, less than 40, 40 and over 40—13, 15, 18. That is what ordinarily happens to doctors (fig. 17).

Here is the line, second examination, following dietary instructions. You will notice the line still goes up, but at every age group there are fewer complaints than there are initially. And, in effect, line AA shows that the oldest group of doctors after dietary counsel had the same number of complaints as the middle group did before.

What we have done here is slowed the line. That is what we have done, clinically. But the argument is, "Well, you can't trust questionnaires." So let's see if it is true biochemically.

Here are the triglycerides rising with age, with doctors' wives (fig. 18). Here it is after dietary counsel. You will notice, in effect, we have bent the line. The risk of these women for cardiac disease has been reduced, if triglyceride is one predictor of heart disease, which it is.

The story isn't quite as simple as I am making it here, but time does not allow more detail.

With triglycerides what we have done is stop the line. Finally, I would like to show you something from the electrocardiogram. I realize this is a very difficult subject. This is a graphic representation (fig. 19). I would like to call your attention to this little item, P-R interval. This little wave here looks like that in the young and as people get older, this little wave gets longer and longer and longer, and it is said that as we get older, this little wave should get longer.

Of course, as we get sicker, this little wave gets longer.

Here is the length of that little wave with age (fig. 20) and you notice, sure enough, with people in general, this isn't doctors, just people in general according to Dr. Lepesehkin, who is the expert in this field, that little P-R interval gets longer with age.

Let's put into that chart the dentists (fig. 21). Sure enough, with age it gets longer, but as a group they do better than people in general. It isn't dentists who do better than people in general. It is this group of dentists who are health-oriented.

This is what people are like in general. The black columns are the dentists when we first saw them (fig. 21). Here are the dentists after they had health education lectures, the black columns (fig. 22). You will notice that the P-R interval still increases with age, but the dentists are doing better than they did initially.

In effect, here are normal people. Here are the dentists before we started our program and here are the dentists after our program started. (fig. 22). You will notice that the elderly dentists after our program started (fig. 22). You will notice that the elderly dentists after dietary instruction have a shorter electrocardiogram, if you will, these dentists have been made younger at heart!

So just quickly, Dr. Roger Williams, the famous Dr. Roger Williams, tells us here, "I want to call your attention to the idea that every one of these signs"—referring to old age—"probably is connected with failure of cells." In other words, most of old age is not old age. It is sickness.

A good part of the problem is diet. That is what Dr. Williams is telling us in the Geriatric Focus issue as recently as February 1970. All we are saying is that this program becomes meaningful only when one recognizes that man is made of layers which can be peeled off.

Down deep, one of the core problems, one of the true core problems, is diet. It is not the only one, and that in a healthy man, who has a good diet, we have good layers all the way out, and in the sick man, with a poor diet, sooner or later the problems seep out and finally erupt peripherally in the form of stroke, cancer, heart disease or whatever the problem may be.

So it is true, as Dr. Jacques May says, it is as if I had on this table in front of me three dolls—one made of glass, one made of celluloid, and one made of steel. And I choose to hit them with a hammer using equal strength. This is the seed, and this is the soil.

Why is it that some people just shatter? Why is it some people just emit a beautiful musical sound?

Thank you very much.

(Dr. Cheraskin's prepared statement and illustrations follow:)

Statement of Emanuel Cheraskin, M.D., D.M.D., on the Predictive Medicine Program, sponsored by the Southern Academy of Clinical Nutrition, Tampa, Florida, Southern California Academy of Nutritional Research, Los Angeles, California, and Ohio Academy of Clinical Nutrition, Columbus, Ohio.

Gentlemen: It is my understanding that the purpose of this meeting is to present for your consideration a multiple testing health evaluation program presently in operation among a group of health practitioners.

At the present time, there are virtually scores of multitesting programs operational in the United States. There are unquestionably many denominators common to all of these projects. In the interest of expedition, I shall confine my remarks to how this Predictive Medicine Program differs from other current plans. In general terms, its singularity stems from its: [1] philosophy, [2] mode of operation, and [3] quality control.

#### Philosophy of the Program

Much already has been written about the nature of health and disease. The thesis which dominates the Predictive Medicine Program and gives it some singularity has been described by many but most eloquently by Doctor Jacques M. May of the American Geographical Society in Washington, D. C., when he wrote:

It is as though I had on a table three dolls, one of glass, another of celluloid, and a third of steel [Figure 1], and I chose to hit the three dolls with a hammer, using equal strength. The first doll [Figure 2] would break, the second would scar [Figure 3], and the third would emit a pleasant sound [Figure 4].

This lyrical but no less scientific pronouncement underlines the point that whether man remains healthy or succumbs to disease depends largely upon his metabolic machinery which, for want of a better word, may be termed host resistance, host susceptibility, constitution, defense systems, or conditioning. Simply, whether man develops tuberculosis, to select one example, is not just a question of inhaling a particular microbe [a seed if you will]. If the latter were the case, then all of us should be suffering with this malady because all of us have been exposed to this microbial challenge. The big question is why some individuals can withstand the bacterial onslaught. Or, apropos to Doctor May's statement, why is the metabolic fabric of steel in one person and glass in another? Hence, how we fare is a function of the seed and the soil. Herein lies the first of the unique features of a Predictive Medicine Program for it is most concerned with the ingredients which influence host resistance and susceptibility. In simple terms, whereas most health programs place emphasis upon the seed, this project gives more consideration to the soil.

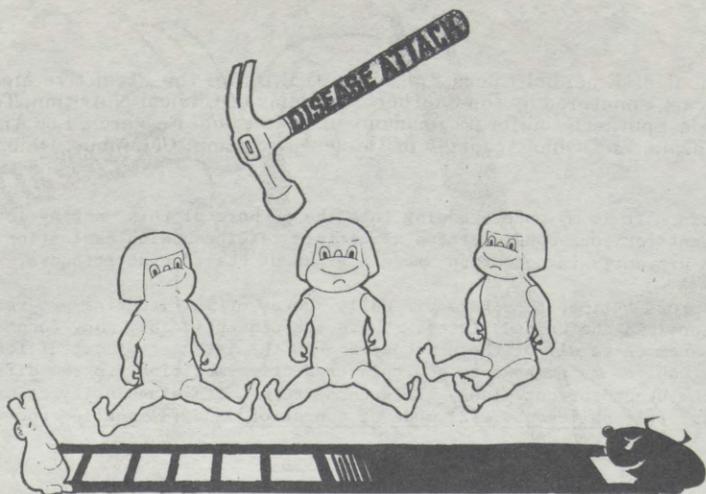


Figure 1. Doctor Jacques M. May states, "It is as though I had on a table three dolls, one of glass, another of celluloid, and a third of steel, and I chose to hit the three dolls with a hammer using equal strength..."

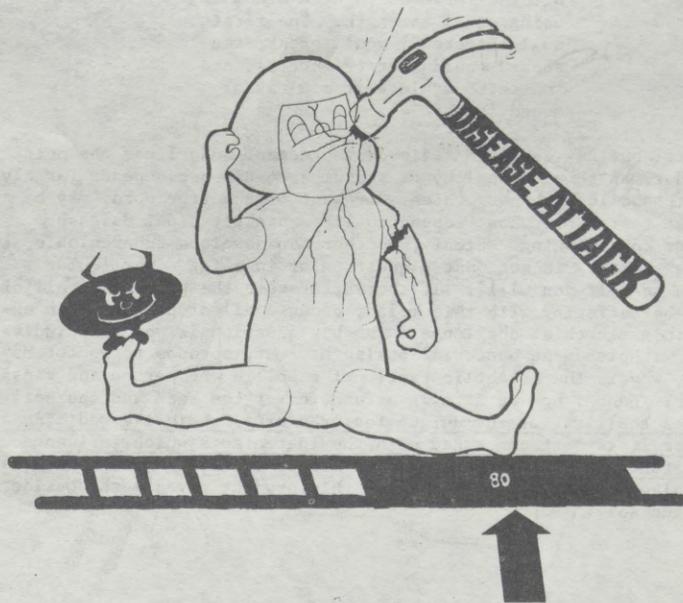


Figure 2. Doctor Jacques M. May continues, "The first doll would break..."

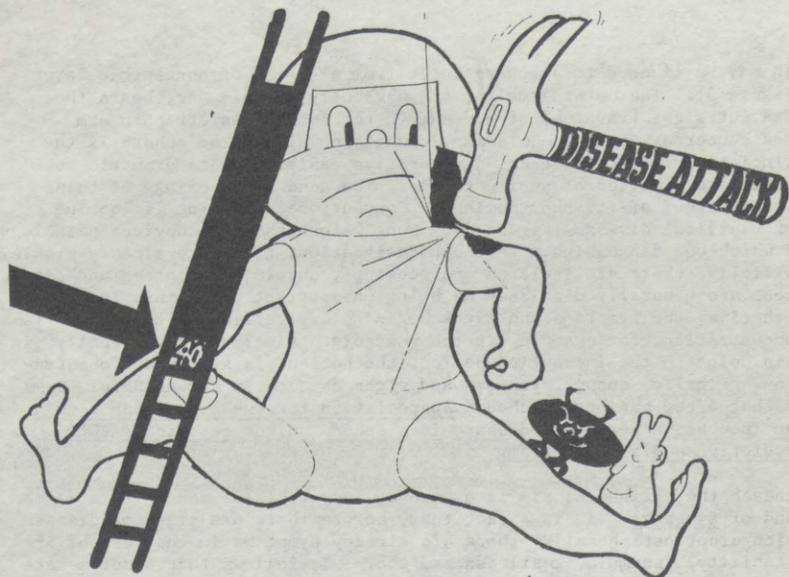


Figure 3. Doctor Jacques M. May adds... "the second would scar..."

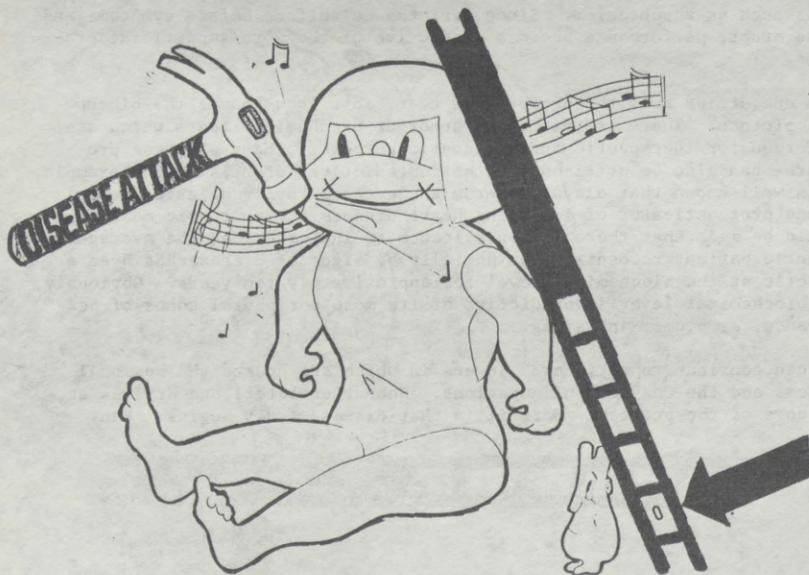


Figure 4. Doctor Jacques M. May concludes... "and the third would emit a pleasant sound."

Man may be likened to a sphere built from a series of concentric layers [Figure 5]. The outer lamella, the obviously visible one, bears the clearcut signs [ravages] of disease in the form of an atrophic arm or a cancerous canker. This mantle which envelopes the sphere is the principal purview of present-day curative medicine. Its dramatic successes are a matter of public record. The need for meetings of this kind is proof of its shortcomings. Conventional medicine is looking for classical disease [Figure 6]. Long before there is obvious pathology to which one can assign a textbook designation, there are already problems. Initially, there are isolated and seemingly unrelated symptoms and signs. These are generally dismissed as being unimportant or psychic in origin. With time, the symptoms and signs begin to crystallize so that there is a concentration, for example, in the gastrointestinal system. Usually, in this point in the incubation period, the patient is kept under observation. Finally, enough symptoms and signs develop in a meaningful frame so that a tag can be attached. Appreciation for the significance of the incubation period of disease is a second unique feature of this Predictive Medicine Program.

Beneath the peripheral rim is a second, less visible, zone. This is the land of symptoms. It is a fact that, before there are signs of disease which erupt peripherally, there are already symptoms in the form of irritability, insomnia, restlessness, etc. It follows that symptoms are predictive of signs.

Beneath this layer is the zone of performance. Before there is obvious peripheral evidence of disease, particularly the common killing and crippling chronic syndromes [which is the real problem in the United States], there is already a decrease in productivity. This can take many and diverse forms from difficult-to-measure fatigue to highly quantifiable expressions such as absenteeism. Since performance suffers before symptoms and signs erupt, performance becomes predictive of the more superficial problems.

When one strips away the performance coat, into focus comes the biochemical picture. There are virtually hundreds of chemical tests which are performed for therapeutic and diagnostic purposes. Many of these procedures can also be utilized for their predictive potential. For example, it is well known that elevated serum cholesterol [hypercholesterolemia] is one prognosticator of impending heart disease. Parenthetical mention should be made that there is now evidence to indicate that the average diabetic patient recognized peripherally by signs of disease has been a diabetic at the biochemical level for approximately ten years. Obviously, the biochemical layer is predictive of its more peripheral zones of performance, symptoms, and signs.

One can continue to strip away layers in which are housed the hormonal systems and the enzyme configurations. Sooner or later, one arrives at the core of the problem. Here it is that disease truly begins. Many

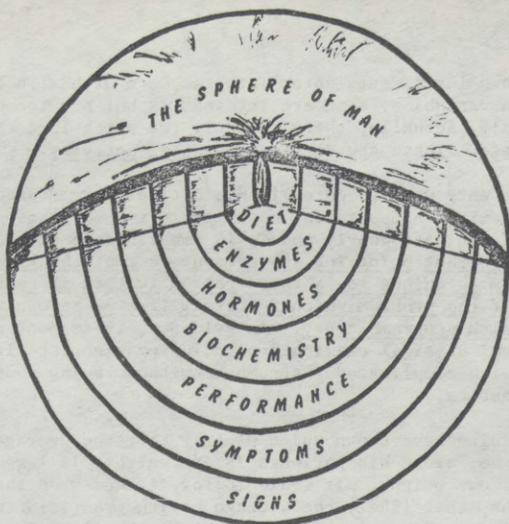


Figure 5. Man viewed as a sphere built of concentric layers. Each layer is predictive of the more peripheral lamella. One important core problem is diet.

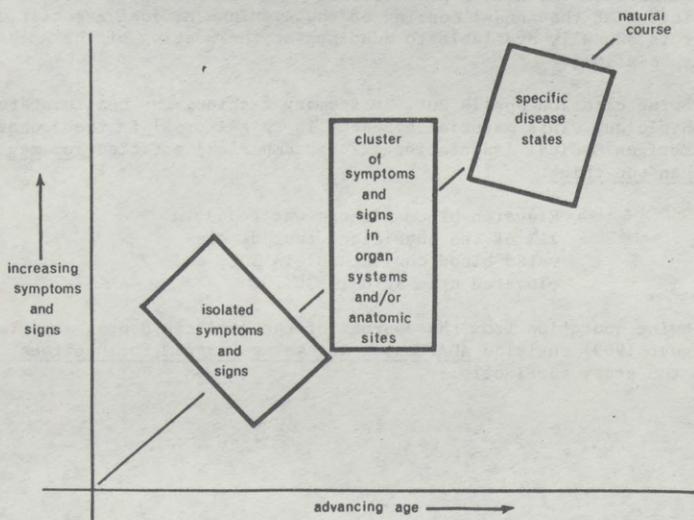


Figure 6. The development of disease. At first there are isolated and seemingly unrelated symptoms and signs [box on the left]. With time, the clinical findings begin to cluster in an area or system [middle box]. Finally, the number of symptoms and signs and their configuration fit the textbook definition of a specific disease [box on right].

known and unknown ingredients enter into the core of health and disease. Among the known variables, some are interesting but not too manageable [e.g., genetics]. Actually, there are only two which lend themselves readily to change. These are diet and physical activity.

The healthy man eats well [Figure 7], has optimal enzyme and hormonal function, biochemical homeostasis, no symptoms and no signs. In contrast, the sick man eats poorly and is in imbalance at all levels [Figure 8]. The important point for the present is that the Predictive Medicine Program is unique for a third reason in that it concerns itself with the core of the problem which is rarely if ever recognized in the traditional health programs today. As evidence, it is most common to undergo an annual physical examination including elaborate intensive investigation with complicated instruments without being ever asked about dietary habits.

Studies in medicine have shown quite clearly that the average physician's definition of who, among his patients is overweight, is largely a function of his own weight. It would follow, if and when the appropriate studies are done, that likely the average health practitioner's concept of who is healthy is directly related to his own health status. This point is particularly relevant in this report because the Predictive Medicine Program under consideration was initiated by, designed for, and has continued to be the property of a group of health practitioners. It has been open to all members of the health professions though about ninety-nine per cent of the membership is represented by dentists and their wives.

At the present time, there are only two organized programs for the evaluation of members of the health professions. One is annually conducted for physicians at the annual meeting of the American Medical Association. The other is annually available to dentists at the meeting of the American Dental Association.

The following citation spells out, in summary fashion, the health status of the physician. This material appeared in an editorial in the Journal of the American Medical Association [22 September 62] entitled You may be sicker than you think.

Elevated blood glucose was found in 21% of the physicians tested, elevated blood cholesterol in 30%, and elevated uric acid in 36%.

The following quotation from the Journal of the American Dental Association [August 1969] entitled ADA Health Screening Program for Dentists captures the story succinctly:

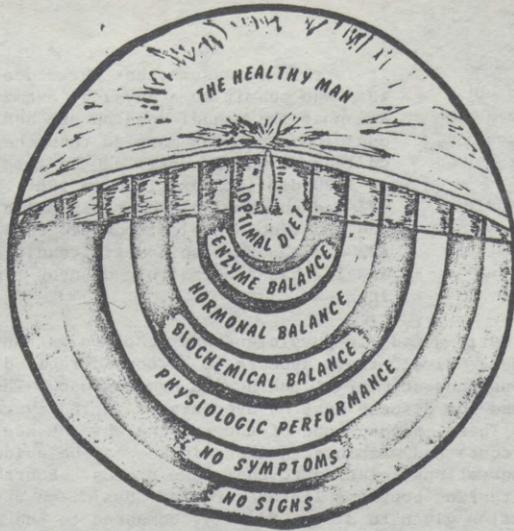


Figure 7. The sphere of the healthy man.

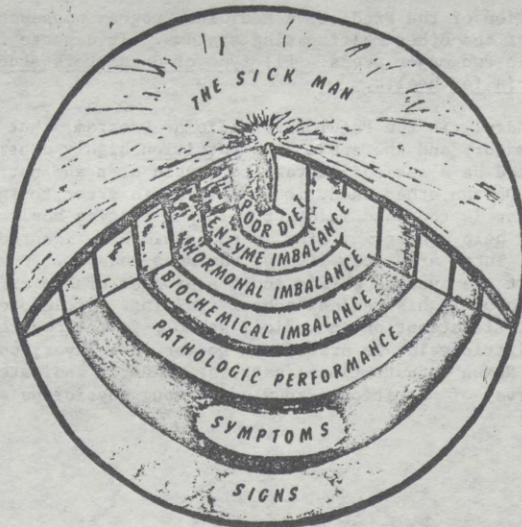


Figure 8. The sphere of the sick man.

It is safe to assume that those dentists who submit to a physical examination at the annual session are health conscious, perhaps more so than their colleagues who do not...of the total of 1620 dentists examined in 1968... 17% had abnormal blood pressure, 28% had questionable electrocardiograms, 12% had abnormal spirometry readings and 25% had abnormal blood sugar findings.

The observations made in physicians and dentists warrant the following five points. First, there appears to be considerable disease among the health-conscious segment of the health professions. Therefore, second, the figures for disease must be even higher in the average physician and dentist. Third, perhaps one of the reasons why the health professions are less concerned with health than disease may be evident here from these observations relating to their own status. Fourth, in neither of the multitesting programs listed here for physicians or dentists is any consideration given to diet. Finally, compared to the Predictive Medicine Program, the present studies of physicians and dentists are truly very superficial in terms of number of parameters investigated. In brief, this Predictive Medicine Program is unique for a fourth reason. Specifically, it is hoped that health education of the members of the health profession may spill over in professional practice.

#### Mode of Operation

The operation of the Predictive Medicine Program possesses much in common with all of the other multitesting systems. It departs from these other programs in two major areas: [1] type of parameters studied, and [2] the criteria for health.

We are mindful, in the Predictive Medicine Program, that the term diet is inflammatory and the subject of nutrition highly controversial. It would indeed be a serious mistake to regard diet and nutrition as a panacea. On the other hand, it is no less in error to ignore diet and nutrition as is the case in other multiple testing health programs. One cannot but help wonder why diet is so unanimously ignored by traditional medicine. There are, very likely, numerous reasons. One very obvious one is that the average physician is a product of his childhood. For him, childhood is his medical school training. Since diet and nutrition receive little attention in medical school, it follows that it should be accorded little value in practice. Doctor Jean Mayer, consultant to President Nixon on nutritional matters, recently indicated the results of his survey of nutritional knowledge among physicians at Harvard. He

concluded that the average physician knows a wee bit more about nutrition than the average secretary unless the secretary suffers with a weight problem. In which case, the average secretary knows a wee bit more about nutrition than the average physician! The importance of diet and nutrition to health and disease has been considered by many outstanding investigators. Doctor Willard A. Krehl of the University of Iowa puts the subject into proper perspective with the following statement:

Greater realization is needed in medicine and in public health that good nutrition along with good oral hygiene are the best weapons available in the prevention of disease. If one were bold enough to make a prediction, it would be that the most important measure that could be taken to prevent the development of many chronic diseases would be the provision of consistently good individual nutrition, supervised by physicians with a strong assistance from the housewife, from conception to the grave.

For these and other reasons too cumbersome to enlarge upon here, the Predictive Medicine Program recognizes the rightful role of nutrition by the inclusion of dietary analysis and, as we shall note later, health education measures which include diet instruction. Here is a fifth unique feature of this program and one which very definitely sets it apart from other health evaluation systems.

All of the existing multiple testing programs employ biochemical tools. Some use more and others fewer biochemical parameters. However, the interpretation of the data is a function of the definition of norms. Practically all health standards are based upon averages and so-called standard deviations of presumably healthy persons. The common statistical tool utilizes 95 per cent of the tested population. In other words, the presumption prevails that an individual is healthy if his profile agrees with 95 per cent of the tested population. The illogic of this approach is amply demonstrated by the fact that 95 per cent of the population suffers with dental caries and periodontal disease which cannot be regarded as desirable! Here again is another unique feature of this program which is explained by Doctor Leo P. Krall of the Joslin Clinic in Boston with the following fascinating analogy:

The detection of diabetes can be compared to fishing with a small mesh net that increases the catch of fish but also seines some nonfish or the wrong

variety of fish, as opposed to using a larger mesh which would be more specific for the size and type of fish sought but bring a smaller yield.

The point of the story extends far beyond diabetes and fish. The tale deals with methods of eliminating disease and maintaining health. This can be likened to the task of removing all of the fish from the lake. If one employs a coarse mesh, then all of the big fish will be caught. This is not unlike identifying the major diseases in their classical and obvious forms at the periphery of the sphere. But sooner or later, the little fish must grow to become big fish. Repeated dredging with the coarse mesh will never accomplish the prime mission of removing all of the fish. And so in man, the mildly ill will eventually become obviously ill. The solution to the lake problem is to employ a fine mesh net which will trap all of the fish and even the eggs! Hence, what is needed are sensitive tools and more restricted health standards. This is a sixth unique characteristic of the Predictive Medicine Program. Specifically, it appreciates small differences as significant for the anticipation if not the identification of disease.

#### Quality Control

At this time, the Predictive Medicine Program includes 443 dentists and wives. Specifically, 243 subjects are participating under the auspices of the Southern Academy of Clinical Nutrition, 127 in Los Angeles under the direction of the Southern California Academy of Nutritional Research and 73 in Columbus under the aegis of the Ohio Academy of Clinical Nutrition.

The Florida group has now been underway for approximately five years; the Southern California and Ohio contingents have now been operational for three years. Hence, it is now possible to ascertain the merits and limitations of the program.

At the initial sessions, parameters from all of the layers of the sphere earlier described were studied. After the information was collected, group sessions were held to discuss the dietary habits of the group, to identify the defects, and indicate how they could be eliminated. At subsequent annual meetings, testing has been redone at all levels of the sphere. Hence, it is now possible to make some statements regarding the initial dietary patterns, the initial clinical state, the changes in dietary habits, and the alterations in clinical patterns.

The dietary habits of the group have been investigated most intensively. In fact, as far as can be determined, there is no other multitesting program which has looked at diet in such depth. All of the major foodstuffs and the spectrum of vitamins and minerals have been measured and compared [Figure 9] to the Recommended Dietary Allowances put forth by the Food

food group	daily consumption [initial examination]		percentage difference from RDA	percentage subjects below RDA
	mean	RDA*		
total calories [males] [females]	2282 1683	2600 1850	-12 -9	69 60
total carbohydrates [gms.]	164	-	-	-
refined carbohydrates [gms.]	74	-	-	-
total protein [males] [gms.] [females] [gms.]	108 80	65 55	+66 +45	3 7
animal protein [males] [gms.] [females] [gms.]	85 62	- -	- -	- -
fat [gms.]	102	-	-	-
vitamin A [I.U.]	7611	5000	+52	43
vitamin C [males] [mgms.] [females] [mgms.]	144 113	60 55	+140 +105	7 15
iron [males] [mgms.] [females] [mgms.]	15 11	10 18	+50 -39	8 99
calcium [mgms.]	760	800	-5	65

\* Recommended Dietary Allowances  
-no RDA

Figure 9. The customary daily consumption of representative foodstuffs by the dental family.

and Nutrition Board of the National Research Council. For example, approximately 7 and 15 per cent of dentists and their wives, respectively, were consuming suboptimal amounts of vitamin C. Almost half [43 per cent] were below the recommendations for vitamin A. Just about 99 per cent of the ladies did not meet the dietary specifications for iron!

The dietary habits were discussed with the membership in group sessions. The deficits and excesses were demonstrated. Examples of poor and good diets were analyzed [Figure 10-12] as well as satisfactory and unsatisfactory sources of nutrients [Figure 13-14].

Since the inception of the program, on an annual basis, each subject has been reexamined so that before-and-after clinical state can be compared to before-and-after diet. Three examples will be cited to demonstrate the observed patterns.

It is well known that, with advancing age, there is an increase in symptoms and signs. This is generally regarded as the natural course of events [Figure 15]. What is usually not emphasized is that the variance also increases with age [Figure 15]. Thus, there are some older subjects with fewer findings than some younger people. This suggests that, while it may well be normal [average] to display more clinical findings with time, it may not be physiologic [healthy].

The additional point is that the line depicting the natural sequence of events [Figure 16] can be altered. In some, the clinical course can be slowed, in others probably stopped and, in some, possibly reversed. A comparison of the symptoms and signs [expressed as CMI scores having been derived from the Cornell Medical Index Health Questionnaire] in the dentists before and after dietary counsel is graphically portrayed [Figure 17]. It is obvious that the complaints increased with age initially. This is quite consistent with general medical observations. It is also clear that the symptoms and signs increased with time after dietary counsel. However, at every temporal point, the clinical findings are less after dietary lectures. In fact, Figure 17 shows [line a-a] that the oldest group had the same number of complaints after dietary advice as did the middle group before. Hence, in a sense, the group is clinically younger!

Earlier mention was made that there are a number of biochemical tests which are presently being employed as predictors of impending disease. The greatest emphasis is presently being placed upon tests which measure fat metabolism. The most popular procedures in this area are serum cholesterol and serum triglyceride. As in the case of clinical symptoms and signs, it is well known that serum cholesterol and serum triglyceride rise progressively with age. Also, there is considerable evidence to show that the higher the values for these tests, the greater the risk for certain types of heart disease. Figure 18 shows the serum triglyceride levels in the female subjects at the start of the program.

## comparative nutritional value of two isocaloric breakfasts

nutrients	adequate <sup>•</sup> breakfast (700 calories)	inadequate <sup>••</sup> breakfast (700 calories)	adequate: inadequate ratio
ascorbic acid (mg.)	50	0.0	50.0
nicotinic acid (mg.)	15	0.6	25.0
phosphorus (mg.)	760	100	7.6
calcium (mg.)	460	65	7.1
riboflavin (mg.)	1.07	0.18	5.9
protein (gram)	45	8	5.6
iodine (mcg.)	17	4	4.3
iron (mg.)	7	2	3.5
vitamin A (I.U.)	4200	1400	3.0
thiamin (mg.)	0.8	0.4	2.0
fat (gram)	40	30	1.3
carbohydrate (gram)	40	100	0.4

- 1/2 grapefruit, 2 eggs, 3 oz. ham, 1 slice whole grain bread and butter, 1 glass of milk
- 3 hot cakes with butter and syrup, 1 cup coffee with sugar and cream

Figure 10. Comparative nutritional value of two isocaloric [one adequate; the other inadequate] breakfasts.

nutrients	comparative nutritional value of two isocaloric lunches		adequate inadequate ratio
	adequate* lunch (655 calories)	inadequate** lunch (655 calories)	
iodine (mcg)	34	1.4	24.3
ascorbic acid (mg)	10	1	10.0
iron (mg)	4	0.6	6.7
riboflavin (mg)	0.53	0.1	5.3
calcium (mg)	370	75	4.9
vitamin A (I.U.)	1930	420	4.6
phosphorus (mg)	440	120	3.7
thiamin (mg)	0.26	0.07	3.7
protein (gram)	28	11	2.5
fat (gram)	27	21	1.3
nicotinic acid (mg)	3	2.5	1.2
carbohydrate (gram)	75	105	0.7

\* 1 bowl vegetable soup, shrimp salad, 1 slice whole grain bread and butter,  
1 glass buttermilk, 1 apple

\*\* 1 ham sandwich, 1 soft drink, 1 piece of pie

Figure 11. Comparative nutritional value of two isocaloric [one adequate; the other inadequate] lunches.

nutrients	comparative nutritional value of two isocaloric dinners		adequate: inadequate ratio
	adequate* dinner (890 calories)	inadequate** dinner (890 calories)	
ascorbic acid (mg.)	90	10	9.0
riboflavin (mg.)	1.4	0.29	4.8
iodine (mcg.)	45	11	4.1
nicotinic acid (mg.)	16	4.5	3.6
calcium (mg.)	600	175	3.4
thiamin (mg.)	0.84	0.26	3.2
phosphorus (mg.)	860	321	2.7
vitamin A (I.U.)	4900	1900	2.6
protein (gram)	70	28	2.5
iron (mg.)	10	4	2.5
fat (gram)	30	40	0.8
carbohydrate (gram)	85	105	0.8

\* 4 oz. tomato juice, mixed green salad with vinegar dressing, 6oz. roast beef, baked potato with 1 square butter, green peas, 1/2 canteloupe with 1oz. cheddar cheese, 1 glass buttermilk

\*\* spaghetti and meat balls, mixed salad with french dressing, french bread and 1 square butter, french pastry, coffee with sugar and cream

Figure 12. Comparative nutritional value of two isocaloric [one adequate; the other inadequate] dinners.

approximate amount of sugar added  
to popular foods and expressed in  
teaspoonsful of granulated sugar

food item	size portion	sugar content in teaspoonsful
hard candy	four ounces	20
chocolate cake (iced)	four ounce piece	10
cherry pie	one slice	10
sherbet	one-half cup	9
ice cream	one	7
donut (glazed)	one	6
jelly	one tablespoon	4-6
rice pudding	one-half cup	5
fig newton	one	5
orangeade	eight ounces	5
jello	one-half cup	4 1/2
ice cream cone	one	3 1/2
fruit salad	one-half cup	3 1/2
chocolate sauce	one tablespoon	3 1/2
cola drink	six ounces	3 1/2
chocolate bar	one and one-half ounce	2 1/2
oatmeal cookie	one	2
gumdrop	one	2
whiskey sour	three ounces	1 1/2
chewing gum	one stick	1/2
lifesavers	one	1/3

Figure 13. Approximate amount of sugar added to popular foods and expressed in teaspoonsful of granulated sugar.

comparison of nutrients furnished per ten cents' worth of soft drinks and fruit juices

nutrients	tomato		orange		grape-		ginger ale (8 oz.)	cola drinks (8 oz.)
	juice (12 oz.)	oz.)	juice (4 oz.)	frozen)	fruit juice (4 oz.)	frozen)		
protein (gm.)	3.6		0.4		0.3		0	0
fat (gm.)	0.7		1.0		0.5		0	0
carbohydrate (gm.)	15.0		50.0		52.0		20	19
calories	75.0		200.0		200.0		86	78
calcium (mg.)	25.0		46.0		42.0		0	0
phosphorus (mg.)	54.0		80.0		68.0		0	0
iron (mg.)	1.5		1.4		1.6		0	0
vitamin A (I.U.)	3800.0		440.0		40.0		0	0
thiamin (mg.)	0.2		0.3		0.2		0	0
riboflavin (mg.)	0.1		0.1		0.1		0	0
nicotinic acid (mg.)	2.7		1.0		1.0		0	0
ascorbic acid (mg.)	60.0		180.0		180.0		0	0

Figure 14. Comparison of nutrients furnished per ten cents' worth of soft drinks and fruit juices.

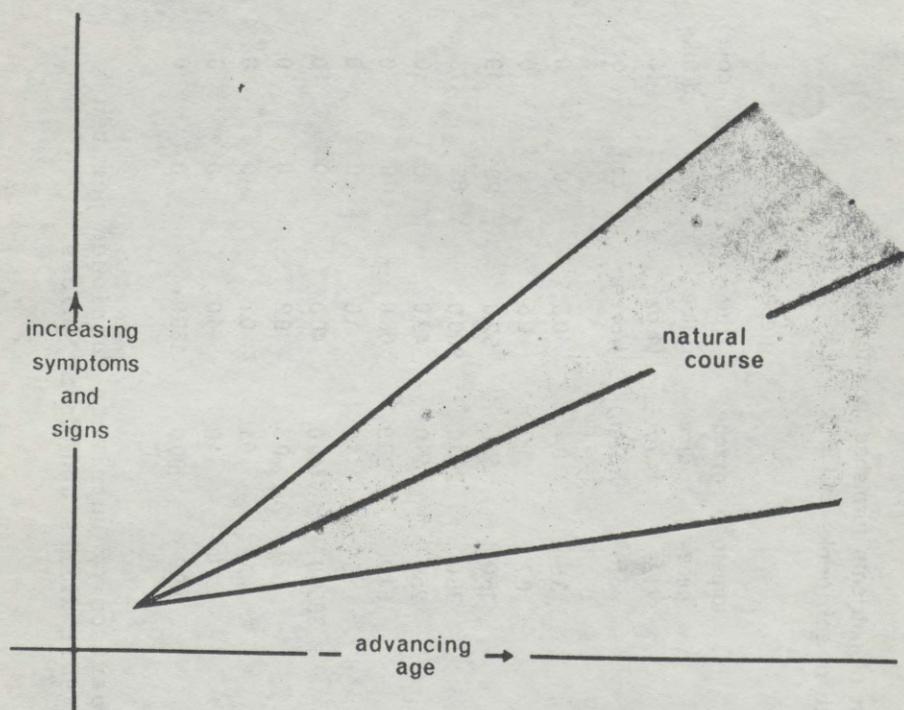


Figure 15. The relationship of age [on the x-axis] and symptoms and signs [on the y-axis]. On the average, with time, the scores rise. However, there is considerable variation [gray area] as shown by the fact that some older subjects have fewer clinical findings from some younger people.

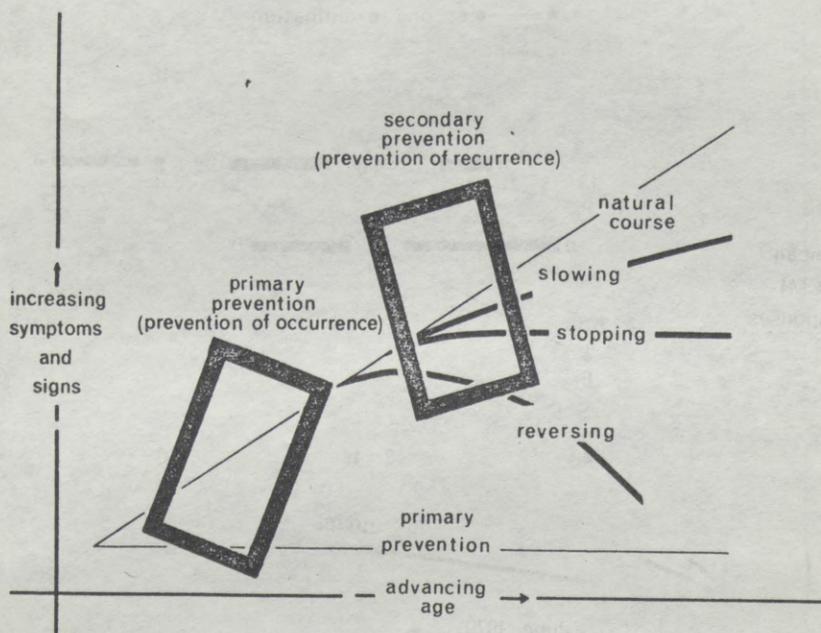
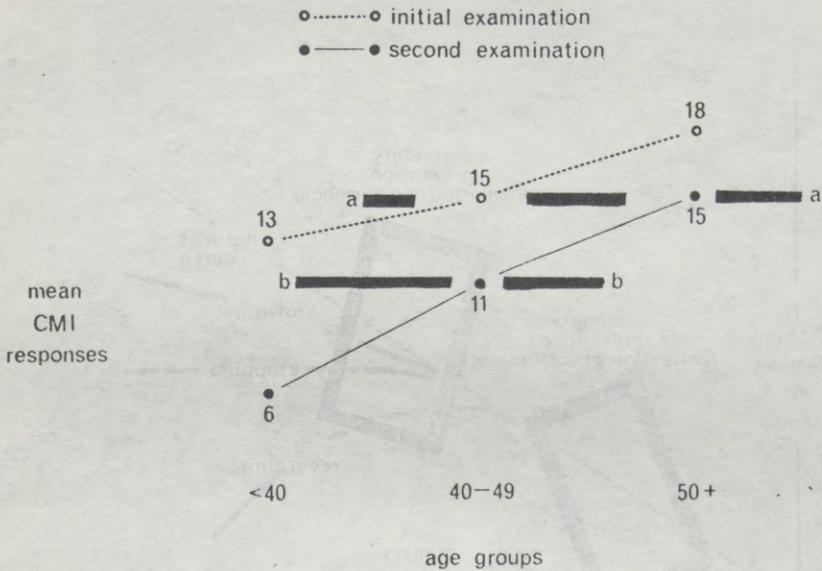


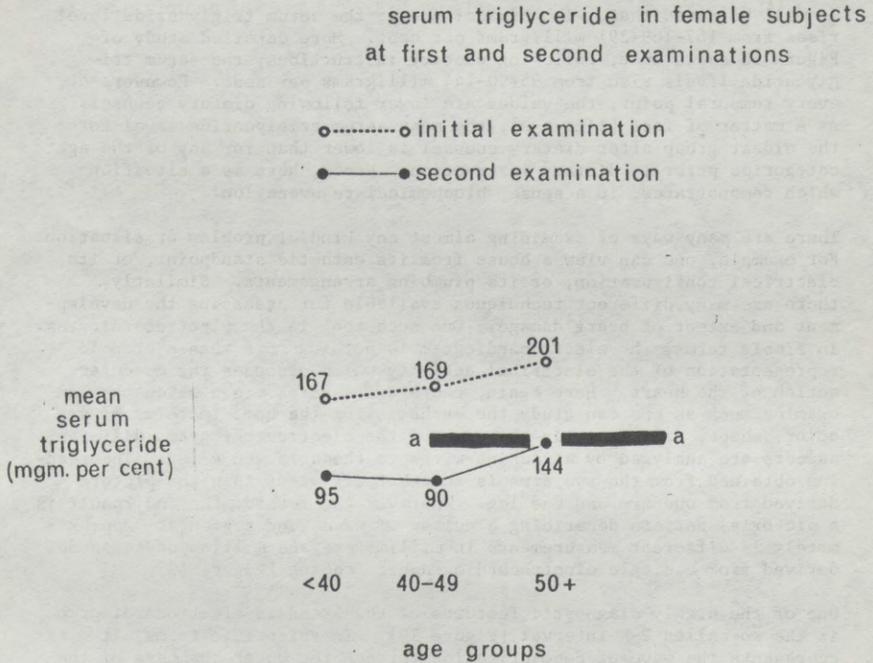
Figure 16. Present-day curative medicine attempts to alter the natural course of disease by slowing, stopping, or reversing the symptoms and signs. In a sense, this is secondary prevention [prevention of recurrence]. Primary prevention [prevention of occurrence] means to subtend an angle of zero.

## CMI responses in male subjects at first and second examination



June 1970

Figure 17. A comparison of the CMI responses before and after dietary counsel in male subjects. It is noteworthy [line a-a] that the mean CMI scores in 50+ year old subjects after dietary counsel is the same as the mean CMI responses in 40-49 year old males prior to dietary advice. Thus, referring to Figure 16, the process has been slowed.



June 1970

Figure 18. The relationship of age [on the horizontal axis] versus serum triglyceride levels [on the vertical axis] in female subjects. Both before [interrupted line] and following [continuous line] dietary counsel, the mean triglyceride level rises with age. However, the rise is much less after dietary instruction. For example, line a-a shows that the oldest group [50+ years] after counsel has a mean score lower than the youngest group initially.

It will be noted that, with advancing age, the serum triglyceride level rises from 167-169-291 milligrams per cent. More detailed study of Figure 18 shows that, following dietary instructions, the serum triglyceride levels rise from 95-90-144 milligrams per cent. However, at every temporal point, the values are lower following dietary counsel. As a matter of fact [line a-a], the mean serum triglyceride level for the oldest group after dietary counsel is lower than for any of the age categories prior to dietary instruction. Hence, here is a situation which demonstrates, in a sense, biochemical rejuvenation!

There are many ways of examining almost any kind of problem or situation. For example, one can view a house from its esthetic standpoint, or its electrical configuration, or its plumbing arrangements. Similarly, there are many different techniques available for assessing the development and extent of heart damage. One such tool is the electrocardiogram. In simple terms, the electrocardiogram is nothing more than a graphic representation of the electrical activity which precedes the muscular action of the heart. Here again, there are several views which one can examine much as one can study the esthetics of the home in terms of its color, shape, and size. In the case of the electrocardiogram, different aspects are analyzed by attaching wires to the arms and a leg. The reading obtained from the two arms is somewhat different than the picture derived from one arm and one leg. Whatever the method, the end result is a pictorial pattern describing a number of waves and segments. Approximately 13 different measurements in millimeters and milliseconds can be derived from a single electrocardiographic tracing [Figure 19].

One of the highly diagnostic features of the standard electrocardiogram is the so-called P-R interval [Figure 19]. In scientific terms, it represents the wave of depolarization through the upper chambers of the heart. In simple language, it expresses one feature of the electrical ripple in its passage through the upper heart chambers.

The duration of the P-R interval, expressed in milliseconds, has been carefully studied in health and disease. It is generally held that, with advancing age, the P-R interval lengthens. The question arises as to whether this particular characteristic of the aging process can be regarded as normal or physiologic. On the assumption that normal is synonymous with average, it is clear that with age, it is normal to demonstrate an increase of the length of the P-R interval [Figure 20]. An examination of this particular electrocardiographic parameter in dentists and their wives also shows that, with advancing time, the P-R interval lengthens [Figure 21]. However, the evidence presented suggests that it is not physiologic to show a progressively longer P-R interval with time [Figure 22]. This is underlined by the fact that lines a-a and b-b show that, following dietary instruction, the mean P-R interval shortens, suggesting that, as the group becomes chronologically older, it becomes electrocardiographically younger [Figure 23]. In simple terms, by dietary means, it is actually possible to reverse the process and demonstrate that people can be made younger at heart!

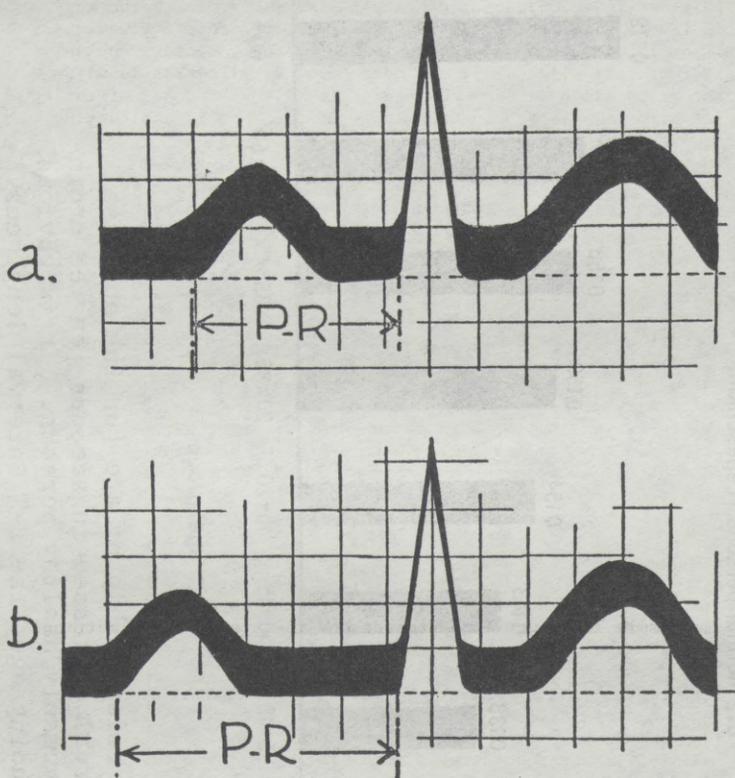


Figure 19. A typical electrocardiogram showing the waves and segments which can be expressed in millimeters [in the vertical direction] and milliseconds [in the horizontal axis]. Particular attention is directed to the P-R interval. With age and/or disease, the parameter increases from a to b.

the relation of P-R interval (seconds) to age in  
872 normal persons [Lepeschkin]

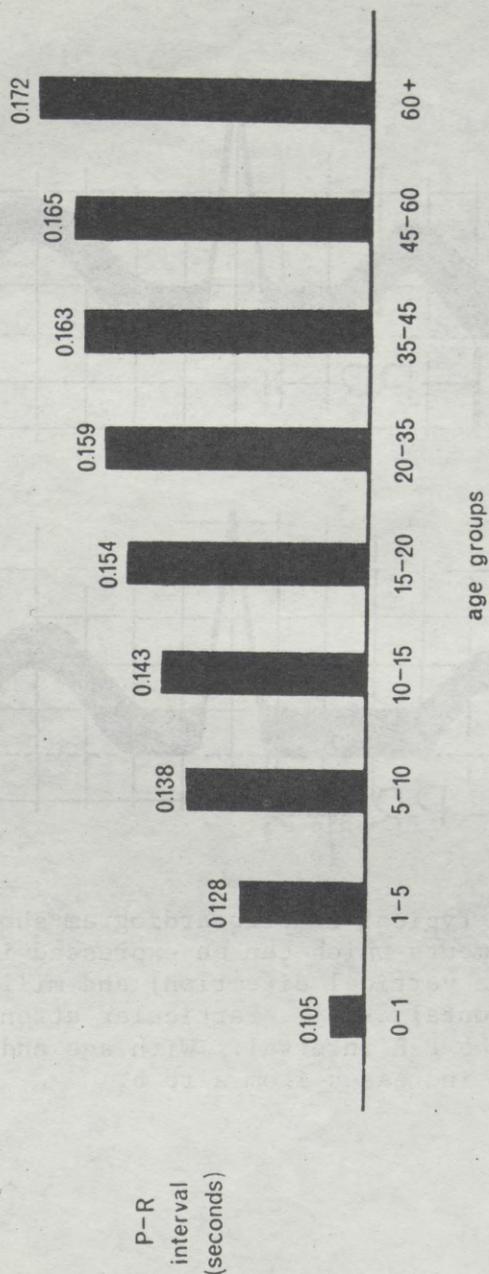


Figure 20. The relationship of age [on the abscissa] to the P-R interval expressed in seconds [on the ordinate] in 872 presumably healthy persons. It is obvious that, with advancing age, the P-R interval lengthens.

the relation of P-R interval (seconds) to age in  
872 normal persons [Lepeschkin] versus  
250 dentists and wives

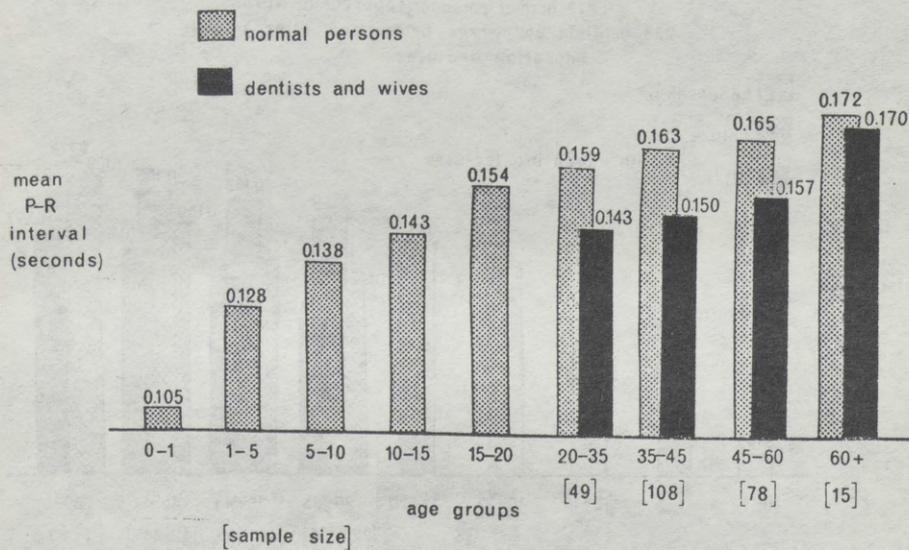


Figure 21. The relationship of age [on the horizontal axis] to the P-R interval [on the vertical axis] in presumably healthy persons [stippled columns] and 250 dentists and wives [black columns], It is clear that the P-R interval lengthens with age in people in general and in the dental family. However, the rate of lengthening is slower in the dental group.

the relation of P-R interval (seconds) to age in  
 872 normal persons [Lepeschkin] versus  
 238 dentists and wives before and after health  
 education lectures

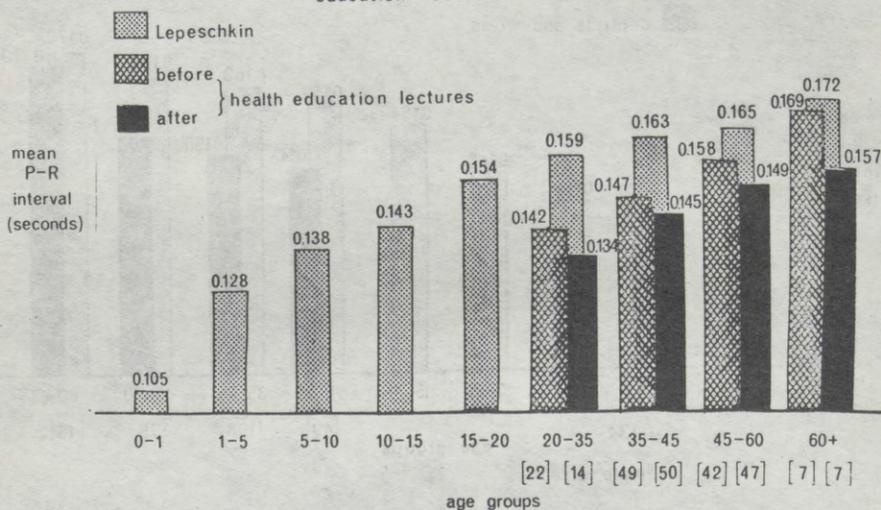


Figure 22. The relationship of age [on the x-axis] to the P-R interval [on the y-axis] in presumably healthy persons [lightly stippled columns], 250 dentists and their wives before dietary counsel [heavily stippled columns] and after dietary instruction [black columns]. It is clear that the P-R interval lengthens with time. However, in the dental family, there is a decided reversal following nutritional counsel.

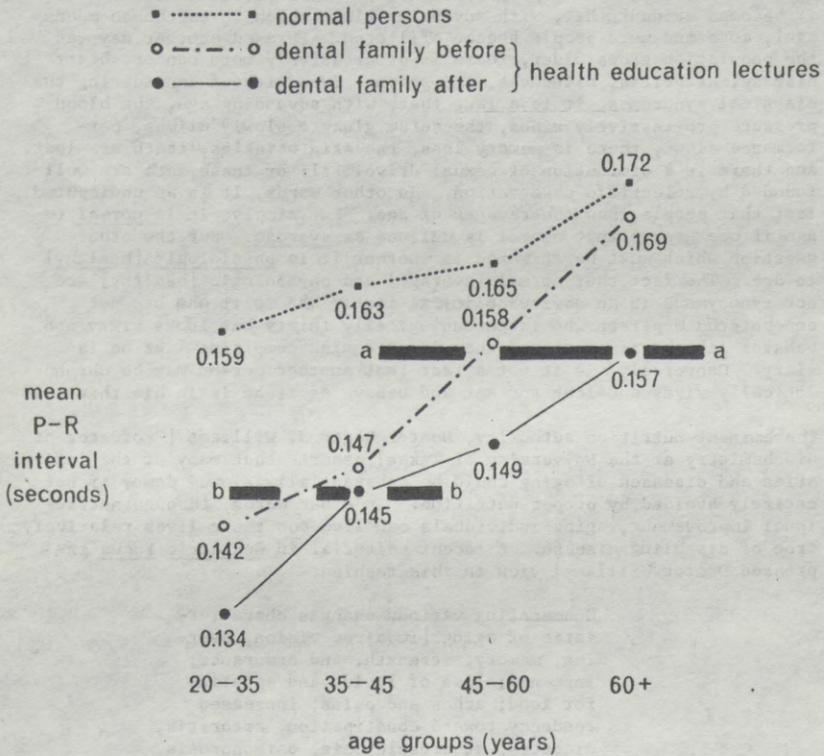


Figure 23. Lines a-a and b-b show that, following dietary instructions, the mean P-R interval shortens. This suggests that, as the group grows chronologically older, it becomes electrocardiographically younger after health education [diet] lectures.

Summary

If one investigates the appearance of any of the classical disease states, it becomes evident that, with advancing time [which in the human means age], more and more people become afflicted. Phrased another way, as the population grows older, there is progressively more cancer, heart disease, arthritis, blindness, and so on. Even without considering the classical syndromes, it is a fact that, with advancing age, the blood pressure progressively rises, the serum glucose slowly climbs, performance slows, there is memory loss, the skin wrinkles, teeth are lost, and there is a diminution of sexual drive. All of these data are well founded by scientific observation. In other words, it is an undisputed fact that people show the ravages of age. Put simply, it is normal to age if one grants that normal is defined as average. But the other question which must be answered is whether it is physiologic [healthy] to age. The fact that normal [average] and physiologic [healthy] are not synonymous is an obvious clinical fact. Who is it who has not encountered a person who is chronologically thirty but looks sixty and behaves like he is sixty and when interrogated complains like he is sixty. Conversely, is it not a fact that another person may be chronologically sixty and look and act and behave as if he is in his thirties?

The eminent nutrition authority, Doctor Roger J. Williams [Professor of Biochemistry at the University of Texas] asserts that many of the infirmities and diseases of aging could be substantially slowed down, if not entirely avoided by proper nutrition. In other words, through nutritional improvement, aging individuals can live out their lives relatively free of disabling disease. A recent editorial in Geriatric Focus expressed Doctor Williams' view in this fashion:

Enumerating various changes characteristic of aging [impaired vision, hearing, memory, strength, and endurance; insomnia; loss of libido and appetite for food; aches and pains; increased tendency toward constipation, arthritis, diabetes, atherosclerosis, osteoporosis, senility, etc.], he said: "I want to call attention to the idea that every one of these signs of old age probably is connected with failure of the cells and tissues somewhere in the body to perform their functions properly; and also that every one of these failures is related to cell and tissue nutrition..."

"Without concerning ourselves with the problem of whether there is an irreversible aging process in all cells that cannot be overcome, we can state

with assurance that the longer cells are furnished with the necessities of life, including good nutrition, the longer they will continue to remain in good working order."

While much about health and disease remains to be clarified, several points seem abundantly clear. First, older persons are greater risks for sickness and death. Second, older individuals have more complaints, more pathologic biochemical patterns, more electrocardiographic aberrations, than younger folks. Third, older subjects with more complaints, poorer biochemical state, more pathologic electrocardiograms represent greater morbidity and mortality risks than older persons with relatively few complaints, better biochemical electrocardiographic state. Granting these qualifications, it is noteworthy that members of the health profession and their wives in the Predictive Medicine Program show a reversal to a better clinical, biochemical, and electrocardiographic pattern following simple dietary counsel.

In the final analysis, as put forth by Doctor Jacques M. May, there are only two variables in the genesis of health and disease. One is the external world which he describes as a hammer [Figure 1]. Thus, man is constantly being clobbered by physical, chemical, and microbial challenges. Obviously, any change in the environment is desirable though difficult. The other possibility is the host which, for Doctor May, is the doll either made of glass [Figure 2], celluloid [Figure 3], or steel [Figure 4]. The only other avenue available is to try to alter the fabric of the doll so that the glass doll becomes one of celluloid and the one of celluloid becomes of steel. The evidence suggested by the Predictive Medicine Program is that the fabric of man can indeed be changed and, quite interestingly, by simple dietary means.

Mr. ROGERS. Thank you, Doctor. That is very interesting and I am sure the committee has gained a great deal from your presentation. It was excellently done.

There may be questions now. I am sure there will be. Mr. Kyros?

Mr. KYROS. Thank you, Mr. Chairman.

Doctor, assuming all the things that you say are correct, and I certainly would assume that, what should we be doing in our committee particularly, which is interested in the health of Americans, to get this nutritional information to young people and their mothers throughout the United States?

Dr. CHERASKIN. I do not know that I have all of the answers of all of the things that should be done. I do not know who does. There are some obvious things that could be done rather quickly and simply. For one thing, I think the committee, if it has not already, must recognize the importance of this, at least if one looks at the record. The committees of this kind are not even aware of these problems.

I think the committee should be educated to what the problem is here and having been educated to that, the next thing is who to educate. I indicated earlier the statement about the knowledge of physicians regarding nutrition. I think grants to schools, specifically directed for the teaching of nutrition and health, so that moneys are used to teach nutrition. I think it would be a very distinct forward step. It would be a very inexpensive step in terms of moneys as they are spent now for other purposes.

Surely educational campaigns for the public would be extremely helpful. I would think support either direct or tangential to multi-phasic screening programs that are going on now that do not include nutrition. There are several score programs, executive programs for example. I mentioned one in Philadelphia, the longshoremens in the bay area. There are many of these programs going on where they are simply identifying disease in its classical form and providing the classical treatments.

I think getting to these people and encouraging them either by financial support or otherwise to include some of these in ongoing programs already, I think, would be a distinct step. I think these kinds of things could be done.

These are some illustrations of some of the immediate things that could be done tomorrow and rather inexpensively in view of how we are spending our medical dollars now.

Mr. KYROS. Is there any program we could put in schools? I know they already have hundreds of programs all the way from drug abuse education to driver training, but what do you think we could be doing in the schools?

Dr. CHERASKIN. There are many things that could be done in education. I think we have got to first admit we are not talking here about undernutrition. Undernutrition is starvation. I think that has been kicked around enough.

There is malnutrition, faulty nutrition, that even occurs in doctors. This requires education. These doctors were not aware of it. I think the evidence shows we could bend those lines with education, if we could do it in this group, that incidentally is self-supported. This group receives no money from anybody. This is their own money and time spent.

I think this program could be supported, as a matter of fact, which wasn't my purpose in coming here, but it could stand some healthy support and come out with some very fine results that would help people. Educational programs in schools must be based on a realistic philosophy, not just that Biafra is the place where people are starving to death and in the United States everybody is eating well.

This kind of a program will not work.

Mr. KYROS. What do you know now of activity in the Federal Government, in any agencies, that does clinical nutrition and does put out material for the public health? Do you know of any?

Dr. CHERASKIN. There are many agencies putting out information for the public regarding nutrition. Some of it is very fine, but I think as Henry J. Kaiser once said, "If your work speaks for itself, don't interrupt."

The fact of the matter is these agencies must not be doing too well because we are not solving the problem.

Mr. KYROS. I know every Congressman, practically, sends out those baby care books. I know every home I have been in, I have seen how to bring up babies, even pet cats, on nutrition. So it is getting out somewhere.

Dr. CHERASKIN. As far as that goes, the emphasis on nutrition and veterinary medicine is extraordinary. They do a very good job of nutrition in thoroughbred horses, much better than in humans.

Mr. KYROS. We are taking better care of the animals than our people?

Dr. CHERASKIN. No question about that. I would say we get more requests from veterinary agencies than we do from human agencies regarding our human research program.

Mr. KYROS. One final question: Doctor, in the last 3 or 4 years, maybe the last several years, I have noticed a great number of books coming out on doctor's diets, and weight reducing, and a great interest by a lot of people. Maybe to approach it in vanity is even better, for the sake of selling it, than people's health.

But what about the value of such books? Are you concerned that some of those books perhaps contain misinformation about good nutrition?

Dr. CHERASKIN. Yes. Some of those books contain misinformation, but I have not seen a book yet that I have read or one that I have written that does not have some misinformation in it. If we are going to take the attitude that no book should be allowed unless it is all true, every statement, then we had just better burn every book in the medical library, because there isn't one.

Mr. KYROS. Are some of these weight reduction regimens and books harmful to good nutrition or are some of them actually worthwhile?

Dr. CHERASKIN. Some of them are harmful. I think a number of them make some very good statements. I think they do as well as standard medical literature.

I think we have to be careful. To categorically say if it is not a physician who wrote it, therefore it can't be good, or the usual criteria that we assign, I think it is unfair. I have not read all of these books obviously. I don't agree with much that appears in many of them, but I think all of them have something good about them and something bad.

I think across the board they are not harmful.

Mr. KYROS. Do I understand also your testimony this morning to suggest or tell us expressly that because of your concern for the studies you made of these dentists, who were people who were pre-disposed to take good care of themselves, and yet you found certain problems, your conclusion is that we should be indeed highly concerned about the rest of the population in the United States?

Dr. CHERASKIN. Indeed. That is my major point, yes, that if this can happen to a socioeconomically privileged and health-oriented group, then just imagine what is happening to the Nation. Might not this be part of some of the killing and crippling diseases like cancer and heart disease and whatnot which we are now attacking at the wrong end instead of way down deep, prior or during the incubation period.

Yes, that is precisely the point I was making.

Mr. KYROS. Thank you very much, Doctor.

Mr. ROGERS. Mr. Hastings?

Mr. HASTINGS. Doctor, what is the AMA's reaction to your presentation?

Dr. CHERASKIN. I have no idea. We have now published some 30 articles dealing with these studies. The American Medical Association, the American Dental Association, as far as I know, have never made any statements. They have never asked us to consult in their programs that I have recited to see if there is any connection. There is just nothing so far as I know that has happened.

Mr. HASTINGS. No agreement or disagreement?

Dr. CHERASKIN. As far as I know, there has been no statement pro or con.

Mr. HASTINGS. What about HEW? Have you made an attempt to make this presentation to officials at HEW?

Dr. CHERASKIN. I have never made an attempt to make this presentation, unsolicited to anybody. It has only been presented to invitation. They have never invited me.

I would be happy to go, if they invited me.

Mr. HASTINGS. Were there any conclusions that you make in relation to good dietary practices that is different from that generally accepted in the medical community today?

Dr. CHERASKIN. It depends on who in the medical community. The U.S. Department of Agriculture does not agree with the Department of Health, Education, and Welfare. So you will have to tell me who are the good guys and then I will tell you whether I am a bad guy or not.

Mr. HASTINGS. Let me state it, in common medical practice, there are certain good things about nutrition. Is there something completely different in your conclusions? I have not seen your conclusions.

Dr. CHERASKIN. For some people there would be. For example, we think that refined carbohydrate foods are detrimental. Obviously there are certain interests in this country that sell carbonated drinks that do not hold to that view. They have the ear of some people of authority in industry and perhaps in the Government. I don't know.

I would say we would be far apart on that. We hold to the idea and we are not alone, the view we share with Dr. Robert Harris at MIT, for example, that it is practically impossible for the average American to eat a well balanced diet in our culture today.

Mr. ROGERS. Why is this?

Dr. CHERASKIN. Because from the moment—from the garden to the gullet there changes in the food. At every point we lose, we never gain. For example, there are studies to show that foods plucked from the ground in Mexico are of higher nutrient value than like foods plucked from the ground in the United States.

Transportation means loss of nutrients. Storage, light, heat, oxidation, processing, washing, rinsing, defrosting, cooking. All of these links in the chain make for loss.

Mr. CARTER. Would you suggest we not rinse our foods?

Dr. CHERASKIN. I am not suggesting we not rinse it. I suggest we realize when we do rinse it, we do something to food.

Mr. CARTER. How else would we get rid of amoeba?

Dr. CHERASKIN. We have a choice of rinsing the food and perhaps taking a supplement.

Mr. CARTER. If you take a supplement, it doesn't matter how many supplements you take, if you have amoeba on that food. You will get amoebic dysentery.

Dr. CHERASKIN. First of all, I wasn't suggesting we do not rinse foods.

Mr. CARTER. I don't know what else you said. I can't interpret it any other way.

Dr. CHERASKIN. Even Pasteur said it isn't the germ that causes the disease, it is the terrain on which the germ lands.

Mr. CARTER. Pasteur may have said that, but certainly we know that that is not always true. We know that if people go to tropical areas where there is a high incidence of amoeba, many of them get it, particularly who take care of their diets. I would have to disagree with you.

If you eat it, I am satisfied you will come down and I dare you to do it. If you say you are a nutritionist and such as you can't get an infection, go ahead and take it and then we will see.

Dr. CHERASKIN. I didn't say that, Mr. Carter.

Mr. CARTER. You may not have said it, but you certainly indicated it.

Dr. CHERASKIN. It has been indicated in the literature.

Mr. CARTER. Your literature is not good then, no matter what it is.

Dr. CHERASKIN. Certain people are made of steel who could eat an amoebic sandwich and wouldn't come down with it.

Mr. CARTER. I would like to accept your theory that a man, if he ate the food you suggest, would live forever. I am afraid I can't accept that, because that has never been done.

Dr. CHERASKIN. To answer your question, Mr. Hastings, we depart and share the view of people like Dr. Robert Harris at MIT.

Mr. HASTINGS. Are your conclusions in this printed material?

Dr. CHERASKIN. It is very limited obviously. My curriculum vitae lists documents in this field. Obviously all of this could not be discussed at this meeting.

Mr. HASTINGS. If I wanted to find out what I should eat and how I should eat in order to start bending that curve, can I find out from the information you have provided us here?

Dr. CHERASKIN. No, sir; you cannot, but you can find out some of the references in here. We have written a book called "Diet and Disease," which has a chapter called the "Optimal Diet" which attempts to develop precisely what you are asking.

I wasn't here to sell the book. I was here to present the story of these doctors.

Mr. HASTINGS. I can't find out how different your conclusions might be than somebody else's.

Dr. CHERASKIN. I started to mention there are many people in the United States who are well known nutritionists, who hold that in our culture it is practically impossible to eat a well-balanced meal or at least difficult, and therefore we should be taking supplements. This would be a view that would be at variance with many of the people in the Government service.

Mr. CARTER. I must say it is in a great disagreement with our markets such as they are today. A wholesome diet is available to anyone who wants to go and get it. I would assure you of that.

The fact that they don't get an adequate diet is because they don't know what is right.

Dr. CHERASKIN. That is true. It is possible, but you would have to go to great extremes to get it.

Mr. CARTER. You can go to any supermarket in this town and get whatever you want. If you eat what you should eat, if you know what to get, there is no reason why you shouldn't have a diet which is adequate in everything you need.

Dr. CHERASKIN. I can only refer you to the people in the field of home economics, dietetics.

Mr. CARTER. I refer you to the same ones, the heads of those departments.

Dr. CHERASKIN. That is the question I was answering, that we are at variance, and there are two schools of thought on this.

Mr. CARTER. I belong to the one which is by far the largest school of thought.

Dr. CHERASKIN. All I can do in answer is say that there was once an equally august committee that said the earth was flat.

Mr. CARTER. You are saying that today.

Dr. CHERASKIN. Just because the majority say that doesn't impress me. I am interested in the proof.

Mr. CARTER. I can't accept a lot of these things you say.

Dr. FOOSE. I am a practicing dentist in Palm Beach and have been for 10 years. I also am an oral surgeon. I would like to show you this.

This is a dietary analysis of Dr. Walter Hoover, a general surgeon in Lake Worth, Fla. I don't think Bob would object for me showing this. Bob came to my practice about 5 years ago and he had a very severe case of pyorrhea and a very bad occlusion, a bite.

At this time I referred him to Dr. Rosenberg, who treated his paradental condition and did a very fine job.

What we have done is reduced the local environmental factors in this arithmetic disease down to as low as we can, being that arbitrary numbers of 10 is bad, and one being better. We have reduced them down as best we can humanly.

Dr. Hoover came back, who has been coming to me for a few years, for his normal checkup. He comes to me for 3 months and the next 3 months he goes to Dr. Rosenberg. So he has the advantage of both of our knowledge and care and skill. Dr. Hoover came in to me with a paradental abscess. This man is 42 years old.

His father is a retired man from the clinic in Boston. Of course, the thing of it is, why after doing the very finest that we have available

in treatment, in knowledge, the very latest, did this man break down and have a reoccurrence of his pyorrhea problem?

Of course, the obvious thing is maybe we didn't do it right, but he did just fine for 3 or 4 years and now he broke down. So I asked Bob to write down everything he ate for 1 week, which he cooperated very nicely on.

Of course, if you will look on there, you will see he is very low in calcium intake, he is very low in niacin, riboflavin and vitamin D. Also you have a question there of the sorbic acid, which I don't want to get involved in. It is vitamin C.

But the standards listed on here at the bottom are standards set by the Government agencies. He didn't come up even to the standards of the Government agency. This is a man who treats people, is very well educated and very conscious of it.

I think with this last episode I have finally reached him in the value of nutrition.

I have other surveys here and I have to agree with Dr. Harris that it is very difficult to be able to eat properly. Here is one of myself. You will also notice his acid base balance is incorrect in the amount of food he is eating. You can compare mine with him.

Mr. CARTER. What do you mean his acid base balance?

Dr. FOOSE. A certain amount you eat forms acid, certain foods form a base, and so forth. We don't want to get involved in this.

Mr. CARTER. Go ahead and explain that.

Dr. FOOSE. In other words, you have got to eat a balanced diet.

Mr. CARTER. What do you mean? What is your definition of a balanced diet?

Dr. FOOSE. We feel that you ought to have an adequate intake of proteins, not a high protein, but adequate. We feel that the standards are low, because we have seen corrected diets. We definitely feel you should have fruit servings, depending on whether you are a man, a woman, and you need your fresh vegetables and you need your dairy products.

Yogurt is fine. If you want to, also include your grain products.

Mr. CARTER. What are the three basic elements of a diet? You have named only one basic food element that we have. All diets are calculated usually in three factors.

Dr. FOOSE. You are talking about carbohydrates, fats, and proteins?

Mr. CARTER. You told me one of them.

Dr. FOOSE. It depends on how you are getting into semantics on that.

Our group has spent about \$300,000 over the past 5 years of our own money to try and prove this. I think that what we are trying to say is in dental school and medical school, you look at a disease, you define the signs, the symptoms, the recognition of this, and how to treat these patients and get them well.

These are things that we do every day in our office, but there is also the preventive aspect and we turn the coin over and we would like to look at it. What is health? How do you maintain health? How do you get it, too?

These are the factors we are trying to define.

Mr. CARTER. Has the Florida Dental Association published your work?

Mr. FOOSE. Mr. Cheraskin has the list.

Mr. CARTER. Has the American Dental Association?

Dr. CHERASKIN. Some of the articles appeared in the American Dental Association.

Mr. FOOSE. I would like to read an excerpt from a nutritionist and biochemist at the University of Wisconsin Medical School. This letter was written to me February 10 of this year.

Indeed, it must be admitted at present almost synonymous with metabolism which deals with the total chemical functioning of the body. People are no longer searching for new vitamins, but they have become instead much more concerned about the way in which nutrients are used and the interrelationships between the known nutrients to produce a state of good health.

Mr. ROGERS. Mr. Preyer?

Mr. PREYER. Doctor, you mentioned that your theory was that even if we eat the optimal diet, instead of quick sandwiches and so forth, but eat what we should eat, that because of conditions under which the vegetables might have been grown and so forth, we still wouldn't come out with a properly nutritious diet and we would need supplements.

What sort of supplements are you talking about? Are these vitamin pills?

Dr. CHERASKIN. First of all, I should like to correct the statement which I may have made, that this is a theory of mine. This is not a theory of mine. This is simply a set of facts that have been popping up and quite consonant with a lot of other facts by a lot of other people, so I have no theory I am selling.

Secondly, it is true that it is possible by going to a supermarket, as Dr. Carter has pointed out, that one could get a reasonably good meal.

I think even the Government admits that it is impossible to eat an adequate meal and the Food and Nutrition Board of the National Research Council in the seventh edition of the Recommended Dietary Allowances in 1968 says for the first time that every woman should take iron as a supplement.

They are saying one thing without knowing it, that whatever the woman eats, she very likely cannot obtain enough iron and so they are recommending across the board a supplement. That is the Food and Nutrition Board, that is the Government.

Mr. CARTER. Where was that?

Dr. CHERASKIN. That is the Recommended Dietary Allowances.

Mr. CARTER. I am sure most women, particularly in certain ages, should have iron. There is no question about that.

Dr. CHERASKIN. I am only mentioning it because even the Government admits that it is very difficult, if not impossible, to get a square meal.

Mr. CARTER. That doesn't say it. You are mentioning one element out of so many.

Dr. CHERASKIN. That is an illustration.

Mr. CARTER. Most of our diets are certainly not deficient?

Dr. CHERASKIN. All nutrients are interrelated, so when you mess up one, you mess up others.

Mr. CARTER. Not necessarily.

Dr. CHERASKIN. There is a book on that subject.

Mr. CARTER. There are libraries full of books. Many of them, as you stated, have mistakes within them.

Dr. CHERASKIN. They sure do.

Precisely what a person needs is a function of the individual. For example, let me give you an illustration of what kind of supplement a person would need.

All other things being equal, which they never are, a person who smokes has a vitamin C level half as good as a person who doesn't smoke.

Mr. PREYER. So he would need vitamin C.

Dr. CHERASKIN. All other things being equal, a person who has chronic psychiatric stress has a vitamin C level half as good as a person who doesn't.

Mr. CARTER. I don't accept those. I don't believe he can substantiate all of these things medically.

Dr. CHERASKIN. This is in the literature.

Mr. CARTER. Where is your literature?

Dr. CHERASKIN. All other things being equal—

Mr. CARTER. Let's substantiate this.

Dr. CHERASKIN. I am trying to answer the question without bringing out all of the books here. All other things being equal, people under psychic stress have vitamin C levels lower—about half of those who don't.

When you add all of those, a person who smokes and under psychic stress and with chronic infection, the ratio is not 2 to 1, it is 7 to 1. That kind of person should surely take vitamin C. He is not an unusual person. There are people who smoke and many people under psychic stress.

I am using that, Mr. Preyer, as an illustration of the kind of supplementation that would be required. Obviously, this is not the whole story.

Mr. PREYER. I wasn't trying to pass on the merits of the theory.

Mr. CARTER. How many of you gentlemen drink orange juice each morning which does have at least 50 milligrams of vitamin C? Or other fruit juice?

Mr. ROGERS. I have some kind of fruit juice.

Mr. CARTER. I assure you that is adequate.

Dr. CHERASKIN. The mere fact one drinks a glass of orange juice does not guarantee there is 50 milligrams in it.

Secondly, we did a study that supports other studies, that 40.9 percent of children living in Hollywood, Calif., never take citrus, never. So this doesn't prove anything, that the Congressmen take it.

To answer your question about smoking, I would suggest you look up an article by Cheraskin, Dunbar and Flynn, III, "A Study of 42 Dental Students."

Mr. CARTER. That is a study which is not widely accepted.

Dr. CHERASKIN. This is the best study that has ever been done in the world on this, and it is also the worst, because it is the only study that has ever been done. I would suggest you read it.

Mr. CARTER. I would say all of your studies, according to you, are eminently correct.

Dr. CHERASKIN. I have never said that.

Mr. CARTER. You have indicated it very strongly.

Dr. CHERASKIN. I would like to apologize for that.

Dr. HEMBREE. Five years ago, we did a study using the sorbic acid test on 498 dental patients, half of which lived in the heart of the citrus country in Crescent City, Fla., and half in Jacksonville. 43 percent of these people were deficient in vitamin C.

This is a pretty big indictment for the State of Florida, I think, which indicates that maybe the people down there do not get an adequate amount of vitamin C either and, as Dr. Cheraskin has pointed out, all of the vitamins are interrelated in their relationship. Therefore, we can expect that the other vitamins which are not quite as easily tested, people might be just as deficient or more so.

When I make my small presentation, I would like to point out that most of my patients appear to be deficient in vitamin B. I would suspect maybe as many as 95 percent of the American people are deficient in the vitamin B complex.

Mr. ROGERS. Are there any other questions?

Mr. Skubitz?

Mr. SKUBITZ. Doctor, looking at this figure 7, in this document, if I understood your statement you seem to stress the importance of the diet. Am I correct?

Dr. CHERASKIN. No, sir. I said that traditional medicine centers on the periphery. We must center on the core. There are many factors operating in the core. Genetics is one, but we cannot do anything about it.

Diet is one of the two we can do something about, so we are centering on it, not because it is the only one, only because it is one way of getting to people quickly and cheaply and one way that we think should be of interest to this committee. It is not the only problem.

Mr. SKUBITZ. I never said it, or didn't mean to say that. I thought you were laying more stress on diet than anything else.

Dr. CHERASKIN. Only for purposes of this meeting. We are also concerned with exercise.

Mr. SKUBITZ. The only thing I wanted to say is that a person could eat properly, have a proper diet, and he could still have an imbalance of the chemistry of his body.

Dr. CHERASKIN. That is very true. One could eat perfectly and still have problems. One could eat badly and exercise and have a better cholesterol than eat well and not exercise.

Perhaps if he did both together, he would be in better shape. This is one of the few areas we can get to. We can get to this a lot easier. I am convinced as tough as it is to change diet, it is easier to change the diet than to get the average American out at 5 o'clock in the morning and jog 5 miles. He might push himself away from the table.

The Government has not gone into this field to the extent, I think, this group thinks, as we should. That is why I am here.

Let me repeat, it is not the only problem.

Mr. SKUBITZ. But you had stressed that. I wanted to bring out the point that you can eat properly, have the proper foods, and still get ill and have these imbalances.

Dr. CHERASKIN. Yes. As a matter of fact, one out of one has to die.

Mr. SKUBITZ. The thing that bothers me really is, I for one would have to confess, that I don't know what a proper diet should contain. How much of an intake of ascorbin, iron, calcium, vitamin—how

much each day? You say to me take some orange juice and you get vitamin C. I know this.

How much do I actually need, is my question.

Dr. CHERASKIN. That is why you should be able to go to somebody and get that information. But you can't get that information.

Mr. SKUBITZ. Could you tell me how much iron I need in my body each day?

Dr. CHERASKIN. I could give you a rough estimate based on what the reference is, but I could measure the iron in your body and know whether it is good or bad. I could do it two ways: Give you a suit of clothes or I could customize a suit of clothes for you.

Mr. SKUBITZ. Couldn't that change from day to day?

Dr. CHERASKIN. It does to a degree, but there are more similarities between people than there are differences. We have to play percentages. We play percentages in everything else we do. We walk across the street with the green light. It isn't 100 percent sure.

Mr. SKUBITZ. One of you gentlemen said "take adequate protein." What do you mean by the word "adequate"? Does it mean a quarter of a pound, a pound of steak?

Dr. CHERASKIN. The Government has certain specifications. They would say a man of your size and age should be getting about 65 grams of protein per day. That is what the Food and Nutrition board of the National Research Council would say to you.

Mr. SKUBITZ. What about fruit? How much fruit should you take a day, how much vegetables?

Dr. CHERASKIN. To answer your question, that information is available, but it is not easy to get. That is precisely one of the points we are making here.

Mr. SKUBITZ. I think basically this is what you have got to have. Is it possible for me to get on to a diet of some sort that I would get too much iodine?

Dr. CHERASKIN. It is possible, yes, sir.

Mr. SKUBITZ. Is it possible for me to take in too much iron and calcium?

Dr. CHERASKIN. It is possible.

Mr. SKUBITZ. We talk about a proper diet. I haven't been able to find anyone who could tell me how much of each essential food element I ought to have each day to be a healthy man.

Dr. CHERASKIN. It depends on whom you have asked.

Mr. SKUBITZ. Well, I have talked to dieticians and others. They hand me a little book. They say potatoes has so many calories in it, so much iron and so on. Now I have got to be a mathematician to figure out what I should and shouldn't take each day.

Dr. CHERASKIN. That is precisely why we are here. That information should be made available to you.

Mr. SKUBITZ. Can you make it available to us?

Dr. CHERASKIN. Yes; sir, I couldn't make it available to you in 30 minutes, not any more than I could have an attorney discuss my estate in 10 minutes. It requires time and dignity.

Mr. SKUBITZ. There are 200 million of us that you are talking about.

Dr. CHERASKIN. This information should be made available. That is what we are talking about, but it can't be done in 30 minutes. It is

a medical problem that should be handled with all the dignity, and respect, and sophistication that any other problem gets. Under those circumstances, the answer to your question is, yes, it can be made available to you.

Mr. SKUBITZ. What is the Southern Academy of Clinical Nutrition?

Dr. CHERASKIN. That was the group of dentists in Florida.

Mr. SKUBITZ. When was it organized?

Dr. FOOSE. In 1965.

Mr. SKUBITZ. How many members?

Dr. FOOSE. At the present time we have 65 members in Florida, and after we got started, the group in Ohio and then the group in California. It is about 300.

Dr. CHERASKIN. There are 433 individuals studied initially at this point, and 200 who have been studied serially.

Mr. SKUBITZ. How many years have you practiced dentistry?

Dr. HEMBREE. Three years.

Dr. FOOSE. Ten years, private practice.

Dr. HEMBREE. Before that, I had 5 years.

Mr. CARTER. What kind of protein do you advise particularly?

Dr. CHERASKIN. I think it is generally accepted that what we need is a critical arrangement of amino acids, and a critical ration and all other things equal, one is more apt to get a complete arrangement of amino acids from animal protein and meat, fish, fowl.

Mr. CARTER. You advise animal protein?

Dr. CHERASKIN. No, vegetable protein, too, but one should include animal protein.

Mr. CARTER. Did I understand you to say by the way that in examining man and wife, usually you find their glucose levels to be similar?

Dr. CHERASKIN. Yes, sir. That is interesting. If one has an elevated blood sugar, immediately the answer is does diabetes run in your family? It is for sure he doesn't marry somebody from his family.

We have published that in the Journal of the American Geriatrics Society, showing that the blood sugar levels of husband and wife correlate, showing that the enzymes of husband and wife correlate, showing that their psychic complaints correlate.

Mr. CARTER. What if one is a diabetic? How does their blood sugar correlate?

Dr. CHERASKIN. If the husband is a diabetic, the woman may not be a diabetic. That is a question of definition. He will tend to have an elevated blood sugar unless he is under control, and watching the diet.

Mr. CARTER. What about the lady?

Dr. CHERASKIN. Whatever his blood sugar is like, hers will be similar in a group.

Mr. CARTER. Even if he is a diabetic?

Dr. CHERASKIN. That is correct.

Mr. CARTER. If his is under control, her blood sugar will—

Dr. CHERASKIN. Tend to be lower. This is not 100 percent, but the correlations are statistically significant.

Mr. CARTER. Is diabetes an inherited disease?

Dr. CHERASKIN. According to the best medical opinion, there is a genetic factor in it, but it is not a genetic disease, no.

Mr. CARTER. If a diabetic man marries a diabetic woman, what about their children? Will they be diabetic or not?

Dr. CHERASKIN. There are figures on the incidence of diabetes in offspring. If a father or mother is diabetic, the incidence is possibly 100 percent that the offspring will be a diabetic.

Mr. CARTER. I would agree with you that that is quite true. On the other hand, if a man is a diabetic and his wife is not a diabetic—

Dr. CHERASKIN. The odds are 80 percent.

Mr. CARTER. Hardly that.

If there is no tendency found toward diabetes, then their children would probably be since the man is dominant, 50 percent, but if it is subdominant, less than—

Dr. CHERASKIN. I was only citing figures.

Mr. CARTER. There could not possibly be a parallel between the blood sugar of a diabetic and a nondiabetic. This is totally impossible, absolutely. You can consult any scientist, anyone in the country for the truth of what I said. It is impossible.

Dr. CHERASKIN. There are also environmental components. People in the same family eat alike.

Mr. CARTER. I want to say this categorically, that it is absolutely impossible for the blood sugar of a diabetic to be parallel by that of a nondiabetic wife. I will take that to anyone in the country. It doesn't matter where he is.

Thank you, Mr. Chairman.

Dr. CHERASKIN. I have no answer to that.

Mr. ROGERS. Doctor, I think your studies have been very interesting and novel and I think you should make a presentation to the Department of Health, Education, and Welfare, particularly to the people involved in these problems, and to the Food and Drug Administration.

Dr. CHERASKIN. If and when they invite us, we would be very happy to.

Mr. ROGERS. I think we can see to that, and I think it would be interesting to them.

I think some of you may have had some statements you would like to make.

Mr. FOOSE. We tried to appear before the vitamin committee on the hearing of supplements. They have refused us to even appear there. Of course, we do not represent any manufacturers, any products, or anybody.

Of course, we feel that these products should still be made available to the general public, but still, we think that they need to go to the physician for a private consultation. We were denied the privilege of appearing before this committee.

Mr. ROGERS. I think that has been going on about 2 years. There has been quite a problem there. I think you had to indicate in the beginning if you wanted to be a part of those proceedings.

Dr. FOOSE. We didn't have anything to offer at that time.

Mr. ROGERS. I think it would be well to make this study available and the results you have gotten to the Department of Health, Education, and Welfare.

Dr. CHERASKIN. We have published this information in the public domain. Anybody can read it.

Mr. ROGERS. I think your presentation is excellent.

Dr. CHERASKIN. We have now published 30 articles which are public. Anybody can read them. We are still publishing, so there is no secret about this.

Mr. ROGERS. I understand. The Department actually should be briefed on this and the people who are involved.

Dr. HEMBREE. I had a couple of slides of patients I would like to show if we have time. I can make this relatively short.

I have been in the general practice of dentistry for 13 years and in the last 10 I have been vitally interested in nutrition.

This happens to be one of my patients who came in for routine care. This girl is in my opinion suffering from a right serious vitamin complex deficiency. As evidenced by this lesion here. We put her on B complex and here is the slide taken 1 week later. I think you can see there is some improvement and another week later and here we are. So there is not any question about these things. These things are fairly common in dental practice. The reason most dentists don't treat them is simply they don't recognize them.

Many patients will go for years with sores in the corner of their mouths and think this is normal.

Mr. ROGERS. What about those little ulcers that get in the inner lip?

Dr. HEMBREE. They are little virus ulcers. There is not much we can do about those that I have ever found. Here it is 4 weeks later. This girl has nothing but vitamin therapy.

Mr. CARTER. What do you call this condition, Doctor?

Dr. HEMBREE. I don't know that it really has a common name.

Dr. FOOSE. Angular cheilosis.

Dr. CHERASKIN. Rhagades is a term applied usually to syphilis. These are usually called angular cheilosis in the textbook.

Mr. CARTER. Rhagades is the name, and it is quite often a vitamin B deficiency, most often.<sup>1</sup>

Dr. HEMBREE. Here is another patient that came in. She had had this fever blister for about 2 months. We all know that so-called fever blisters are quite self-limiting to about 10 days.

We put her on the supplement vitamin B complex known throughout the medical and dental profession. Then 3 days later this is what she looked like.

I attempted to take her off of it. She would not get off it because it had been 6 years. She is still taking the supplement because she says now when she goes home at night her legs no longer ache. Of course we all know that B complex is utilized in muscle metabolism as well.

If this is as common in everybody's practice as it appears to be in mine, then we do have some right serious B complex deficiencies throughout our society.

I would like to quote from this Modern Medicine Topics, December 1962. "The American Diet Paradox" is the title of the article.

Except for those individuals who took supplementary vitamins and minerals Americans in 1958 even if they had eaten all of the kinds of foods available would have been deficient in vitamins and minerals.

They would also have been over supplied with calories by one-third. Both of these conditions constitute malnutrition.

Assuming as widespread as it is, we should look a little bit further at a study done by Dr. Saguri at the Sloan Kettering Institute for Cancer

<sup>1</sup> The following definition was submitted for the record by Congressman Carter: Definition of rhagades: Fissures or cracks in the skin, especially such lesions around a body orifice or on regions subjected to frequent movement. (Source: The American Illustrated Medical Dictionary, W. A. Newman Dorland; Philadelphia and London: W. B. Saunders Co.: 1951).

Research, written up in the Journal of Nutrition, July 1951, in which he took two groups of rats, a control group and an experimental group, and he fed one group butter yellow and rice.

This particular strain of rats, if you feed them butter yellow, a chemical, everyone of them will get cancer of the liver. The other group he fed butter yellow and rice but only 90 percent of the rice and then added 10 percent desiccated liver, which is extremely rich in vitamin B complex.

All of the rats in group 1 which was the control group, had cancer within 150 days. None of the rats in group 2 had cancer within 150 days.

So this might be one of the things that is contributing as Dr. Cheraskin said to some of the widespread maladies in our society.

Dr. Otto Warburg, Nobel Prize Winner, at the Institute for Physiology in Berlin says one of the big problems in cancer is the lack of enzyme production in the cells and that this is created primarily by not having enough riboflavin, any niacin and pantothenic acid in the body, all vitamin B complex.

If we look at the food available in our country, there are really not again very many areas that are extremely rich in B complex, when you consider the losses in our society, the storage, transportation and so on that Dr. Cheraskin has talked about.

For example probably the best source available to most people would be freshly ground whole grains. This is not available under our present society, because you can't get freshly ground whole grains unless you go to an extremely great deal of trouble.

You can get stale grains, but unfortunately not freshly ground and the B complex is lost through storage. Yeast is an extremely good source of B complex, but hardly anyone eats brewer's yeast unless they are involved in nutritional studies and find out how good it is for you and then perhaps a lot of those people do.

The other area, fresh nuts provide a lot of B complex. But if you go into any of our stores today and try to buy fresh nuts, you will find this is a little bit on the difficult side because most of them have been shelled and stored for a good long period of time and are stale.

If you go to the trouble of getting some nuts, crack them yourself, and compare the flavor and the taste, there is a great deal of difference, no question about it. The ones that have been prepared previously are stale.

So I think we should certainly consider that many of our people are suffering from nutritional deficiencies and certainly a great number of people in my practice are, as I pointed out to you.

Forty-three percent suffer from vitamin C deficiencies. We know this because we ran the studies with a test. To do B complex studies is much more difficult.

But if we learn some of the symptoms of clinical B complex deficiencies and subclinical, then I think that most of the practitioners would be aware that they have a great number of these people in their practices as well.

Mr. CARTER. Who does your test for you?

Dr. HEMBREE. I do them myself, this vitamin C test.

Mr. CARTER. What does that consist of?

Dr. HEMBREE. It is an ascorbic acid test. I have the slides right here, if you would like to see them. It is a relatively simple test. That actually should be done by all of the practicing dentists.

They could help a great deal.

Mr. CARTER. You test a person's vitamin C by taking his blood?

Dr. HEMBREE. No, that is not correct. We take dye and draw off the dorsum of the tongue and put one drop expressed from a 25 gage needle on the dried dorsum of the tongue. And time it from the time it touches the tongue at this point until it reaches this high point right here and if you do this and it is less than 20 seconds, the person has an adequate amount of serum, vitamin C in the serum.

Mr. CARTER. Vitamin C in the serum or the clear part of the blood?

Dr. HEMBREE. That is right, in the blood. This has been well documented as Dr. Cheraskin can tell you, in Europe as well as in the United States.

The test is very reliable and accurate.

Mr. CARTER. By whom in the United States?

Dr. HEMBREE. Dr. Cheraskin for one—

Mr. CARTER. Does that test occur in any laboratory texts in our country?

Dr. HEMBREE. I can't answer that.

Dr. CHERASKIN. It has appeared in isolated places. It is not in standard texts because it is a relatively new test.

Mr. CARTER. Do you back this up with blood tests?

Dr. CHERASKIN. Yes, that has been incorporated.

Mr. CARTER. Who has done that?

Dr. CHERASKIN. We have done it. Others have done it.

Mr. CARTER. You have the equipment to do this in your laboratory?

Dr. CHERASKIN. Yes, sir; I am with the University Medical Center. We have done this and reported it in the International Journal of Vitamin Research on the relationship of this test.

Dr. Giza in Poland has done this test on the tongue as shown.

Mr. CARTER. Are you acquainted with Dr. Spiess?

Dr. CHERASKIN. I was before he died; yes, sir.

Mr. CARTER. You were acquainted with his work. He had done a lot of work on this over a period of many years.

Mr. ROGERS. Thank you very much.

What do you mainly get B from?

Dr. HEMBREE. Freshly ground grains would be the best available source I think in this country if we made them available to people.

Mr. KYROS. How about liver?

Dr. HEMBREE. Yes, liver is available.

Mr. CARTER. What about ordinary meat, beef?

Dr. HEMBREE. Not a very good source, it is fair. There are many, many foods that have B complexes. We are talking about the ones extremely rich in B complex. Liver is an excellent source, but unfortunately it is not sought after greatly by the people by evidence by the fact that there is not much liver in the animal and it still sells less than most other cuts of meat.

Mr. KYROS. What about vitamin supplements?

Dr. HEMBREE. Then in my opinion that is the best way of doing it. I have taken them myself for 10 years and certainly expect to take them for many more years.

Mr. ROGERS. Thank you very much, Doctor.

Dr. Foose, you are doing this on your patients now? You make a study now, do you not?

Dr. FOOSE. Yes, sir; here is a list you might be interested in. Normal patients who come walking into my dental office, and this is called dytronics. It is done in California. In this you will see that these patients come in, we normally have them fill in this thing and we send it to California. On the right-hand side, right over here, on the daily intake, you see the governmental standards.

Of course, on the left-hand side, you see the ones underlined where the patients are deficient. This is typical and these patients do have dental problems.

Mr. ROGERS. So then the food that they eat is analyzed on what they are absorbing into the system?

Dr. FOOSE. Yes.

Dr. CHERASKIN. This is an attempt to quantify diet. If you go and have your usual physical examination, they won't even do this. While this has many limitations, the plea is not here for this form. It is simply that the more one looks, the more one finds. This is an attempt to quantify this. The answer is once you go to the trouble to do this, it is amazing what you find.

That is the point we are trying to make, whether it is this technique or another is irrelevant.

Dr. FOOSE. In other words, the care and skill and judgment which I give my patients, how much do I care about them, what skill do I apply, and what judgment.

Do you come into a dentist and you think what are you going to do, put something in here, fill a tooth, and is that all you are interested in? Is that all we are going to do for a patient?

Or are we really going to give them nutritional counsel? Are we trying to say is the mouth isolated? What happens to the mouth, does that not happen to other parts of the body?

Mr. ROGERS. I think you have pointed out certainly a deficiency in our health system that we are not giving adequate attention to the diet, and I think this committee would be interested in following up to see what we can do to encourage greater use of knowledge of diet and research in diet to actually be used in the public health field.

I think you have made some very vivid points that are most helpful to the committee. We appreciate very much your taking your time and I think all of your group is to be commended for doing these studies with your own money and letting the public benefit.

So I would like to commend you for the work you are doing.

Mr. HASTINGS. I would like to ask one question. It is not a loaded one, but based on the experience with another doctor, who made an observation to me some number of years ago, in relation to milk.

His feeling was nutritionally milk was good for infants and invalids. Do you have any judgment of your own?

Dr. CHERASKIN. As you might expect in my field, I am sure in yours, there are certain areas in which one is very clear cut in one's course.

In other areas, we have blind spots. This is one of the areas. The enzymes necessary to take care of milk disappear as soon as the teeth erupt into the head. This kind of information is available to suggest that at least milk may not be the ideal that the National Dairy Council says, whether we should avoid it or not is another story.

I am being very quick here and categoric and somewhat inaccurate therefore. It is not the answer to the nutritional problem, to give everybody milk.

That is for sure.

Mr. ROGERS. Mr. Kyros.

Mr. KYROS. I want to thank these gentlemen for coming up here, Mr. Chairman. I know in our considerations and deliberations with so many medical problems which come before us: the drugs we have had, mental retardation, developmental disabilities, I think we can now begin to ask questions about nutrition.

I am very thankful that you appeared before us.

Mr. ROGERS. Thank you very much.

This concludes the hearings.

(Whereupon, at 4:20 p.m. the committee adjourned.)

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