Conventional Versus Preventive Medicine

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Introduction

In the final analysis, a logical and fruitful discourse on conventional medicine versus preventive medicine must be predicated upon general agreement regarding definitions of [1] *the nature of prevention,* and [2] *the genesis of health and disease.*

The Different Definitions of Prevention

For pragmatic purposes and as an immediate working hypothesis, *preventive* medicine may be defined as the clinical discipline designed to *anticipate* disease in man[1]. The intent, by such an approach, is to foretell illness before it erupts in its *classical* form.

Notwithstanding this etymologic analysis, in actual practice there are *two* different types of prevention. Figure One pictorially portrays the two faces of the problem. First, it will be noted that, with advancing age, shown on the abscissa, there is progressive disease described on the ordinate. This point is clearly shown by the oblique line rising from left to right labelled as the natural course of events. It is sometimes possible with proper therapy to bend the line minimally and thus slow the process. Occasionally, the line may be more diverted so as to arrest or stop the problem. Finally, in some instances, the pattern is actually reversible. All of these three sequences on the right have a common denominator and are collectively referred to as *secondary prevention* or *prevention of recurrence.* On the other hand, it is conceivable to anticipate the problem much earlier in life so that one subtends an angle of zero and thus actually effects *primary prevention* or *prevention of occurrence* as indicated on the left. Clearly, the latter is the ultimate goal and the frame of reference for this report.

The discipline of preventive medicine is not new. For example, Hippocrates recognized that, in the female, there was a striking positive parallelism between obesity, menstrual aberrations, and sterility. Since that time and

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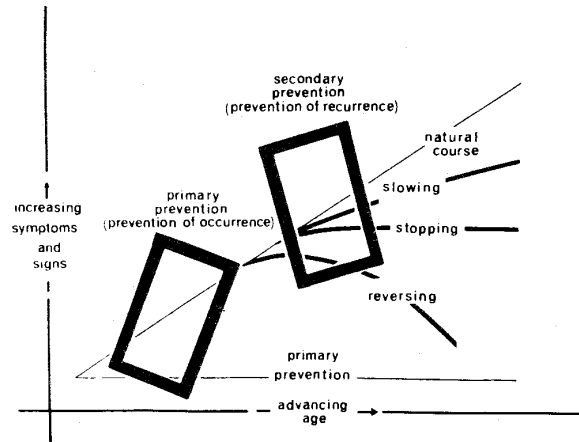
Figure One. The two types of prevention. The slowing arrest, or reversal of the disease process collectively signifies secondary prevention or prevention of recurrence. In contrast, when one subtends an angle of zero, so that the usual rise of symptoms and signs does not occur, then primary prevention or prevention of occurrence follows.

continuing right up to the present, there are scores of publications designed to underline the prognosticative worth of many and diverse clinical, biochemical, social, psychologic, and economic parameters with regard to different disease states.

The Genesis of the Disease Process

All disease is preceded by an incubation period[2]. In the instance of acute mechanical trauma such as an automobile accident, the incubation time is clearly too brief for predictive purposes. In the case of acute infectious disorders such as the measles, the incubation period is somewhat longer, approximately ten days, and more significant from a prognosticative standpoint. With chronic disorders, like a myocardial infarct, cerebrovascular accident, rheumatoid arthritis, or periodontal disease, the incubation time extends for months and frequently over several years or decades. Obviously, the longer the incubation period, the greater the opportunity to *anticipate* the end problem and, hopefully, abort the process. In order to effect *primary prevention* or *prevention of occurrence,* it is
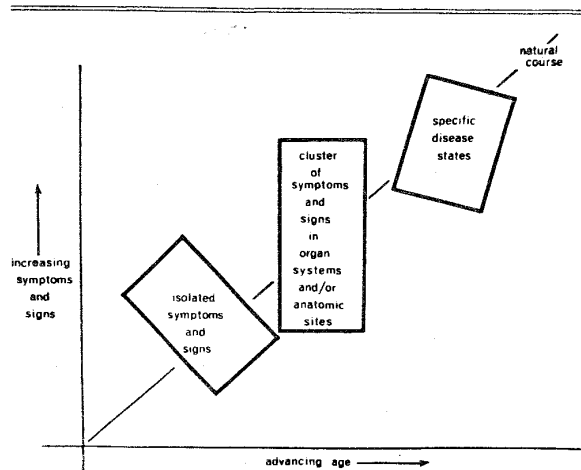
Figure Two. The clinical sequence of events in chronic disease. At first, there are few and diverse symptoms and findings [box on the left]. With time, the findings become more numerous and localized in a system or organ [middle box]. Finally, the clinical evidence fits the textbook picture of a particular disease or syndrome [box on the right].

necessary to analyze the sequence of events which eventuates in the classical disease syndrome.

Initially, the patient notes only few and seemingly unrelated findings [Figure Two]. There may be irritability, for example, associated with leg cramps which would be fitted into the box on the left. Because these apparently unrelated symptoms and signs do not fit any textbook description of a particular well-defined disease, the complaints are either ignored, assigned a meaningless label, or regarded as a minor psychic problem and treated symptomatically. Parenthetic mention should be made that the latter diagnosis is frequently made by exclusion. In other words, a failure to relate the signs and symptoms to classical disease nomenclature usually results in the decision that the problem is likely an emotional one.

If the clinical situation just described continues as it so often does, then the number of symptoms and signs progressively multiplies. This is the center box. Sooner or later, the findings begin to crystalize in systems, organs, or in localized sites. For instance, a subject may find himself with several gastrointestinal complaints such as indigestion, anorexia, and hemorrhoids. At this stage, the constellation is still not classifiable with textbook disease terminology. Hence, treatment is usually symptomatic and/or the patient is advised that the problem should be under observation. If many organ systems and/or anatomic sites are involved, the syndrome might be ascribed a psychologic etiology. Finally, and this is the box on the right, when the syndrome is clearly identifiable in terms of its classical description, then the illness is assigned a label. *In conventional medicine, it is only at this point that a diagnosis is usually deemed justifiable.*

As one proceeds from the box on the left towards the box on the right, the *identification* of disease becomes easier. *This is the goal of conventional medicine.* As one moves from the right to the left box, the *anticipation* of

disease increases. *This is the purpose of preventive medicine.* Phrased another way, the concern of conventional medicine is *disease;* the denominator in preventive medicine is *health.*

Health Versus Disease Detection

There are presently in operation over one hundred *alleged* health programs in the United States of America. A number of examples come to mind to underline the basic distinction between the fundamentals of *preventive medicine* versus existing *health evaluation systems.*

For instance, there is no question regarding the desirability of a periodic vaginal Papanicolaou smear for the detection of gynecologic cancer. The hope, always, is that the smear will prove to be negative. Obviously, this testing technique is to be applauded, and women should be encouraged to undergo this periodic checkup. In the event that the results are negative, the patient is requested to return at a later date [usually in six to twelve months depending upon age] for another *health,* as it is usually phrased, checkup. There is no question but that periodic reexamination is desirable. At each revisit the hope prevails, by both the patient and the doctor, that the smear will continue to prove negative. This is also admittedly by a commendable goal. Unfortunately, sooner or later, the smear is positive. Hence, it becomes necessary in present conventional medicine to institute surgery and/or irradiation. This, again, is desirable since all will concur that *early* detection and treatment prove more successful and yield a better prognosis than cancer recognition and therapy in later stages.

There is, in the sequence just outlined, one serious semantic trap with significant practical overtones. While all that has been described is to be applauded as a demonstration of *therapeutic* medicine, the one point overlooked is that the procedure is *not a health examination* but rather a *disease detection* program.

Ideally, in this particular illustration, a *true* health examination commences with the patient's showing a negative smear. Additionally, this evaluation should allow the opportunity to point out to the patient her degree of cancer proneness. Finally, a true health appraisal should include proper counsel so that the patient is provided with whatever information is available to *reduce* the risk of cancer. Hence, it is obvious that the traditional *health* examination is, in fact, a *disease* detection program. There is a justifiable niche for such a conventional system in present-day medicine. However, there is also a crying need for a *true health evaluation and maintenance program.*

Proneness profiles, designed to *anticipate* rather than to *identify* disease, are now being developed[3]. A discussion of two such experimental models will be the theme of the remainder of this report. One, the *coronary proneness profile*[4], has been extensively studied and now allows great predictive potential. The other, a *mental illness* proneness profile[5], is much more recent and has been less investigated. Since it is still in the process of development, its predictive worth is limited.

Coronary Proneness Profile

It is abundantly evident that coronary artery disease is epidemic today in the United States. For example, the possibility of a heart attack in presumably healthy male subjects before the age of sixty is about twenty per cent. The incontestable need for primary prevention, that is, prevention of occurrence, is heightened by the facts that [1] acute mortality approaches forty per cent, and [2] half of this latter group or about twenty per cent of first attacks terminate in death within sixty minutes after the initial symptoms and signs appear. Clearly, it is imperative to perfect and activate a *primary* prevention treatment program. Such a profile is a function of a number of already-identified parameters including [1] age and sex, [2] serum lipids, [3] blood pressure, [4] weight, [5] blood glucose, [6] uric acid, [7] diet, [8] tobacco consumption, [9] physical activity, [10] electrocardiography, [11] family history, and [12] personality structure.

The Mental Illness Proneness Profile

There is no question but that, in the field of proneness profiles, more energy and money have been expended to study coronary artery disease than any other single syndrome. It is, therefore, not at all surprising to find that the coronary proneness profile is more complete and has greater utility than any other profile.

Limited work is being carried on in other areas. It follows, hence, that the end-results are more incomplete. However, for purposes of this discussion, brief mention should be made of one such program.

Four interdependent points serve as a justification for and the prelude to this portion of the report.

First, the evidence is abundantly clear that mental illness is one of the biggest disease problems in the United States of America today. For example, almost half of all hospital beds are occupied by patients with mental syndromes. Data from the National Health Survey indicated that an estimated twenty million adults have either had a nervous breakdown or have experienced an impending nervous collapse.

Second, the therapeutic armamentaria presently employed for mental illness include few chemical agents other than those designed for the symptomatic care of depression and excitement. Phrased somewhat differently, the cardinal therapeutic emphasis today rests upon various psychoanalytic techniques though the evidence indicates that the success factor by these methods, under the most ideal circumstances, leaves much to be desired.

Third, the fundamental problems in treating mental illness are not particularly different than those encountered in other areas. For example, coronary artery disease is also recognized to be of epidemic proportions. Additionally, it is now granted that the present therapeutic approach can never resolve the problem. Thus, there is increasing interest in *primary* prevention, meaning *prevention of occurrence.* Because of this preventive concern, there is now available a *coronary proneness profile* of considerable effectiveness.

Finally, there is now an increasing interest in orthomolecular therapy for certain psychiatric and quasi-psychiatric disorders.

For these and many other reasons, it would be extremely helpful to develop a *mental illness proneness profile.*

Approximately six hundred health practitioners and their wives have been participating in a multiple testing project for one to seven years. The common denominator is that these subjects are members of the health professions interested in studying their own health patterns. As far as can be determined, no one in the group can be regarded as suffering with a classical psychiatric disorder requiring psychotherapy.
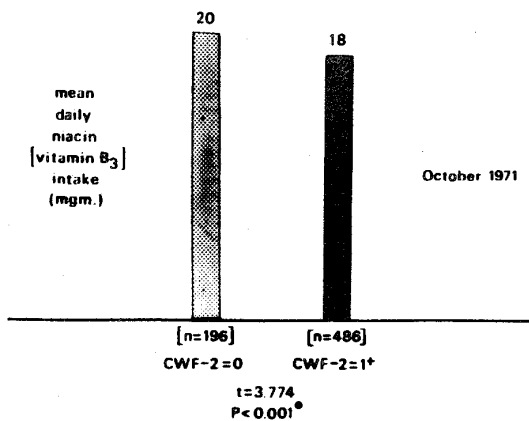
On an annual basis, the group is studied clinically, electrocardiographically, biochemically, and nutritionally. Each subject, once a year, has completed the Cornell Medical Index Health Questionnaire and the Cornell Word Form-2 which are here employed for psychometric purposes. At each of these visits each subject also completed two dietary forms.

The Cornell Medical Index Health Questionnaire [CMI] is a list of 195 questions followed by two responses, yes and no. The subject is asked to choose the response he or she thinks is appropriate. If in doubt, the subject is asked to guess. The CMI, as it is abbreviated, has been devised as an instrument for quickly obtaining a descriptive sketch, for clinical interpretation, of a person's attitudes, moods and feelings, emotions, and bodily reactions. A medically significant emotional disturbance may be suspected when three or more affirmative responses appear in sections M through R of the CMI. Although there are other diagnostic criteria in the CMI for suspecting an emotional problem, only the M-R affirmative responses will be considered in developing the mental illness proneness profile.

Each subject also completed the Cornell Word Form-2, abbreviated CWF-2. This questionnaire is a modification of the ordinary type of individually administered word association technique in that it is a "forced choice" method. The subject is presented with a list of stimulus words, each followed by two other response words. The patient is asked to choose the one he or she thinks relates better with the stimulus word. The CWF-2 has been devised as an instrument to make quickly a descriptive clinical sketch of an individual's emotional status from responses relating to attitudes, feelings, moods, and bodily reactions. It has been devised to do so in a manner not readily discernible to the subject in order to increase the degree of objectivity. A word form score of eight or more screens between 40 and 50 per cent of those persons with serious neuropsychiatric and psychosomatic disturbances and a few ostensibly health persons. A score of five or more screens between 70 and 80 per cent of those with serious neuropsychiatric and psychosomatic disturbances and a moderate number of ostensibly healthy persons. While the assessment techniques vary, there is a significant relationship.

At each visit, each subject also completed two dietary records. One consists of recording all foods consumed for a seven-day period. The chart is then submitted to a computer center and a printout becomes available outlining
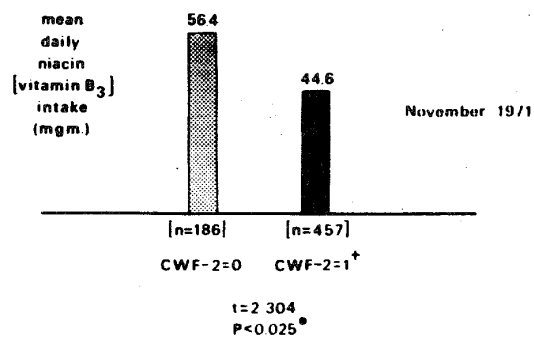
relationship of psychologic state [CWF−2] and
daily niacin [vitamin B₃] consumption [seven day dietary survey]

relationship of psychologic state [CWF−2] and
daily niacin [vitamin B₃] consumption [food frequency questionnaire]

Figure Three (left chart):

mean
daily
niacin
[vitamin B₃]
intake
(mgm.)

20

18

October 1971

[n=196] [n=486]
CWF-2=0 CWF-2=1⁺
t=3.774
P<0.001•

• statistically significant difference of the means

Figure Three. The relationship of psychologic state as judged by the CWF-2 score and daily niacin [vitamin B₃] consumption as measured by the seven-day dietary record. Niacin must be viewed as a resistance agent since those subjects consuming the greater amount of niacin tend to have fewer psychologic findings.

Figure Four (right chart):

mean
daily
niacin
[vitamin B₃]
intake
(mgm.)

56.4

44.6

November 1971

[n=186] [n=457]
CWF-2=0 CWF-2=1⁺
t=2.304
P<0.025•

• statistically significant difference of the means

Figure Four. The relationship of psychologic state as measured by the CWF-2 technique versus daily niacin [vitamin B₃] consumption by the food frequency method. The subjects with the greater number of psychologic scores consume the lesser amount of niacin, making vitamin B₃ a resistance agent.

the daily intake of all of the major foodstuffs as well as the most common vitamins and minerals. A second form, called the Dietronics Dietary Analysis, is a simple questionnaire designed to determine the dietary habits based upon a food frequency technique. This dietary form is also submitted to a computer center and a printout is derived spelling out the daily intake of the major foodstuffs and the vitamins and minerals.

In the final analysis, what eventuates as health or disease is a function of the world we live in [commonly referred to as the seed] and our capacity to live in the world [popularly referred to as the soil]. Actually, it is frequently much more practical to alter the individual to live in the world than it is to make the world consonant with the individual. In this connection, *host resistance* and *susceptibility* become of major import. These terms may be viewed in two different ways. From a *descriptive* standpoint, resistance and susceptibility are simply antonyms. Hence, in this frame of reference, it matters little whether a patient succumbs because his resistance was low or his susceptibility was high. On the other hand, from an *analytic* standpoint, these terms take on entirely different meaning. A *resistance* agent is one which, when administered, tends to *discourage* disease and when absent encourages disease. For example, vitamin C must be viewed as a resistance agent by this definition since its addition discourages scurvy. In contrast, a *susceptibility* agent *invites* disease when present and discourages disease when it is absent. Sugar is a susceptibility agent, for example, since it encourages dental caries. In other words, *resistance* agents may be viewed as pluses; *susceptibility* agents must be regarded as *minuses*. In the final analysis, health follows when the pluses are in abundance and the minuses are at a

minimum. Disease occurs when the pluses are few and the minuses are many.

Without question, major effort is presently being directed toward the relationship of vitamin B₃, that is, niacin, to schizophrenia. This is a logical outcome of the history of pellagra and its relationship to vitamin B₃ and its precursor, tryptophan. An analysis of the relationship of daily niacin consumption to *marginal* psychologic findings supports the general research pattern.

Figure Three is designed to study the relationship of psychologic state [as measured by the Cornell Word Form-2 score] versus daily vitamin B₃ [niacin] consumption in milligrams [as judged by the seven-day dietary survey]. Three points warrant special mention. First, the mean daily vitamin B₃ intake in the group with the better psychic state on the left [as determined by a CWF-2 score of zero] is 20 milligrams. This is illustrated by the stippled column. In contrast, the vitamin B₃ daily consumption in the CWF-2 group with one or more pathologic responses is 18 milligrams, shown by the black bar on the right. This is a 14 per cent difference in the two groups. Second, the niacin intake in the group with the poorer psychologic score is lower on a mean basis. Thus, by earlier definition, niacin is to be viewed as a resistance agent since, when added, it tends to discourage disease. Third, the difference between the two groups is statistically highly significant as judged by a t = 3.774 and a P<0.001.

Additional study corroborates the observations just made utilizing a different dietary survey, the food frequency questionnaire, and the same psychometric technique, the CWF-2 score. Figure Four pictorially relates the relationship of psychologic state as measured by the Cornell Word Form-2 versus a different dietary appraisal, the food
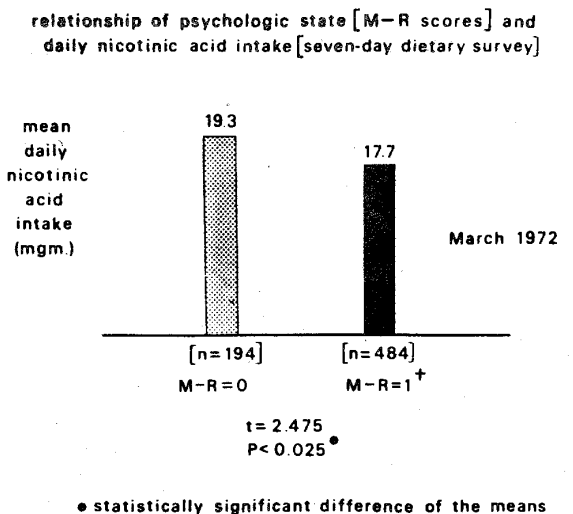
relationship of psychologic state [M—R scores] and
daily nicotinic acid intake [seven-day dietary survey]

mean daily nicotinic acid intake (mgm.)

19.3 [n=194] M−R=0

17.7 [n=484] M−R=1+   March 1972

t = 2.475
P< 0.025 •

• statistically significant difference of the means

Figure Five. The relationship of psychologic state, as established by the M-R question sections versus daily vitamin B_3 intake measured by the seven-day diet survey. The group with the positive M-R responses consumes the lesser amount of vitamin B_3 making vitamin B_3 a resistance agent.

the mental illness proneness profile [CWF-2 scores] [dietary analysis]*

December 1971

dietary parameter	CWF-2 scores		percentage difference	t	P
	0	1+			
iron	14.5	12.8	12	4.477	<0.001**
iodine	0.061	0.049	21	3.985	<0.001**
niacin	20	18	14	3.774	<0.001**
phosphorus	1.451	1.315	9	3.519	<0.001**
vitamin B_1	1.06	0.94	12	3.411	<0.001**
vitamin B_2	1.90	1.68	12	3.223	<0.005**
fat	106	97	9	3.116	<0.005**
base	30.5	27.3	11	3.024	<0.005**
animal protein	82	75	9	3.010	<0.005**
refined carbohydrates	62	71	14	2.982	<0.005**
vitamin C	148	128	13	2.873	<0.005**
unrefined carbohydrates	95	87	8	2.647	<0.010**
total protein	105	97	8	2.641	<0.010**
vitamin A	9495	8163	16	2.374	<0.025**
total calories	2054	1948	5	2.334	<0.025**
vegetable protein	22	20	8	1.965	<0.050**
acid	41.5	37.5	10	1.776	>0.050
calcium	0.753	0.706	6	1.154	>0.100
vitamin D	82	79	3	0.419	>0.500
total carbohydrates	158	157	0	0.042	>0.500

* seven-day dietary survey ** statistically significant difference of the means

Figure Six. The mental illness proneness profile as described from the CWF-2 test and the seven-day dietary survey. The data suggest that refined carbohydrate foodstuffs represent a susceptibility agent. Conversely, unrefined carbohydrates suggest a resistance factor. Many other vitamins, minerals, and major foodstuffs seem to serve as resistance variables.

frequency approach, for vitamin B_3. It will be noted that the group with no pathologic scores, the stippled column on the left, consumes statistically significantly more vitamin B_3 than the group with one or more pathologic responses, the black column on the right. It is true that the vitamin values in this chart versus the last illustration are different since the food measuring methods are different. For example, the food frequency questionnaire is programmed for intake via vitamin-mineral supplements. However, it is clear that the *patterns* are strikingly similar.

Finally, Figure Five relates psychologic state by a different psychometric device, the M-R score on the Cornell Medical Index Health Questionnaire, versus the nicotinic acid consumption from the seven-day dietary survey. It will be noted that the group with the better psychic state, M-R score of zero on the left, shows the higher nicotinic acid pictured by the stippled column. The point of the story is that niacin [vitamin B_3] tends to behave as a resistance agent in the *genesis* of emotional symptoms and signs as judged by several different methods of analysis.

Much has been written to indicate that single dietary deficits are rare if not nonexistent[6]. There are countless dietary interrelationships, and it is virtually impossible to produce a single vitamin deficit with all other vitamin fractions in the optimal state. Hence, it becomes advisable to ascertain whether other dietary fractions may also serve as resistance or susceptibility agents in the mental illness proneness profile.

Shown [Figure 6] is an outline of the relationship of the CWF-2 scores in terms of all nutrients studied by the seven-day dietary survey technique. Additionally, the point should be made that the nutrients have been arranged in

decreasing order of statistical importance as determined by the t value. Five points deserve particular mention.

First, it is clear that niacin, the third item from the top, fits into the scheme as a factor in the mental illness proneness profile as previously discussed. However, arrayed in statistical order, it ranks third among the sixteen significant nutrient analyses. This observation, per se, is quite consistent with the earlier mentioned statement of extensive nutrient interrelationships.

Second, it will be observed that iron appears to be the most statistically dominant variable in this particular experiment as judged by a t = 4.477 and a P<0.001. Specifically, those subjects with the better psychic state show the higher iron intake. Hence, iron is to be viewed as a resistance agent. This point is noteworthy since iron is usually not considered to play a role in mental illness.

Third, this chart shows that, quite consistently, the group with no psychologic illness [CWF-2 = 0] is characterized by higher mean nutrient intakes except for *refined carbohydrate food intake*. Hence, on a mean basis, the other nutrients must be viewed as *resistance* agents while refined carbohydrate foodstuffs are to be regarded as a *susceptibility* agent. This is in keeping with the knowledge that hypoglycemia and emotional or psychologic disorders are significantly interrelated[7].

Fourth, it should be underlined that the group with the greater intake or refined carbohydrate foodstuffs is associated with the greater psychologic score. This makes *refined carbohydrates* a *susceptibility* agent. In contrast, the subjects with the greater intake of unrefined carbohydrates show a better CWF-2 score. This should be interpreted to mean that the *unrefined carbohydrates* serve as a *resistance* agent. For this reason, the *total* carbohydrate

dietary parameter	CWF-2 scores 0	CWF-2 scores 1+	percentage difference	t	P
Percentage of calories from refined carbohydrates	16.2	21.9	36	5.042	<0.001**
pantothenic acid	16.7	13.4	20	4.004	<0.001**
calories from refined carbohydrates	359	470	31	3.406	<0.001**
vitamin B$_6$	4.2	3.5	16	3.320	<0.001**
vitamin A	19341	15048	22	3.316	<0.001**
vitamin C	294.9	249.9	23	3.169	<0.005**
vitamin B$_{12}$	11.1	8.6	23	2.886	<0.005**
total protein	111.3	102.5	8	2.739	<0.010**
iodine	0.7	0.6	12	2.583	<0.010**
valine	5573	5065	9	2.535	<0.025**
vitamin B$_2$	5.1	4.1	19	2.490	<0.025**
tryptophane	1275	1084	15	2.431	<0.025**
vitamin E	60.7	48.1	21	2.423	<0.025**
methionine	2327	2127	9	2.351	<0.025**
niacin [vitamin B$_3$]	56.4	44.6	21	2.304	<0.025**
leucine	7674	7101	7	2.178	<0.050**
threonine	3902	3605	8	2.073	<0.050**
phenylalanine	4254	3958	7	2.040	<0.050**
potassium	1450	1144	21	1.984	<0.050**
lysine	7139	6588	8	1.957	>0.050
iron	28.3	23.8	16	1.787	>0.050
polyunsaturated fatty acids	13.3	12.1	9	1.627	>0.100
iso-leucine	5264	4964	6	1.534	>0.100
magnesium	310	292	6	1.449	>0.100
phosphorus	1514	1448	4	1.415	>0.100
percentage polyunsaturated to saturated fat	11.0	10.4	6	1.222	>0.200
fat	135.5	131.7	3	0.861	>0.200
total calories	2166	2067	5	0.812	>0.400
calcium	1052	1017	3	0.710	>0.400
ratio calcium/phosphorus	0.65	0.66	1	0.348	>0.500
total sodium	2609	2628	1	0.223	>0.500

* food frequency questionnaire
** statistically significant difference of the means

March 1972

Figure Seven. The mental illness proneness profile as developed from the CWF-2 test and the food frequency questionnaire.

consumption is insignificant since the resistance or plus effect of the unrefined carbohydrates is cancelled out by the susceptibility or minus action of the refined carbohydrates.

Finally, it is evident that the majority of the nutrients studied show statistically significant relationships. Actually, 16 out of 20 nutritional evaluations were significantly related to emotional state.

Figure Seven is an attempt to reexamine the concept of the mental illness proneness profile shown in the earlier illustration utilizing the same psychometric tool [CWF-2 test] but a different dietary analysis technique [food frequency questionnaire]. It will be observed that vitamin B$_3$ is a dominant resistance agent though actually fifteenth in order. This again suggests the possible importance of other dietary constituents. The percentage of calories derived from refined carbohydrate foods is number one and is a susceptibility agent since those subjects consuming the higher amounts of these foodstuffs show the higher psychologic score. Vitamin E, measured by this particular

mean psychologic score [CWF-2] in terms of daily vitamin-mineral supplementation [Question # 75, OHI]

December 1971

[n=483] [n=157]

daily supplements   no daily supplements

t = 3.221
P < 0.005*
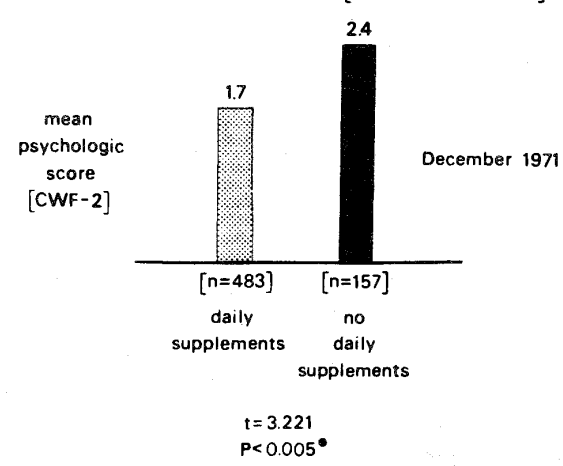
*statistically significant difference of the means

Figure Eight. The relationship of daily multivitamin supplementation versus psychologic state. Daily vitamin supplementation must be viewed as a resistance agent because, when added, it tends to discourage psychologic symptoms and signs.
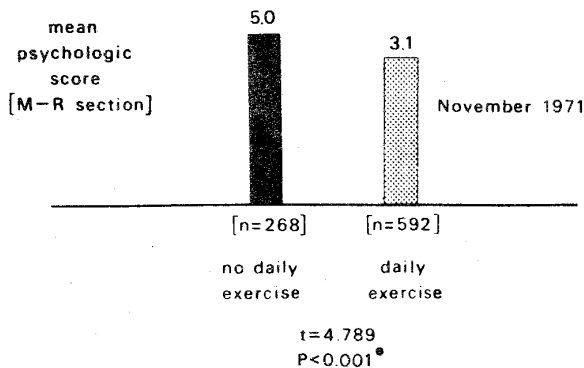
food frequency technique and not by the seven-day dietary method turns out to be a resistance agent. There are many similarities in the mental illness proneness profile as fabricated by these two methods. However, the different psychometric and dietary methods produce somewhat different results for many explicable and some unknown reasons.

Finally, it is noteworthy that even vitamin-mineral supplementation may be viewed as a resistance agent [Figure Eight]. It will be observed that the number of pathologic scores is significantly higher [2.4] in the group characterized by no daily vitamin supplementation, the black column on the right versus a mean score of 1.7 in the vitamin-supplemented group shown as the stippled bar on the left.

The observations shown here are quite in accord with the reported salutory effect of vitamin B$_3$ in schizophrenia. However, the evidence also suggests that multiple dietary factors may also be involved in the genesis of mental illness. Emphasis on providing an adequate intake of all essential nutrients may enhance the therapeutic effect of B$_3$ and possibly reduce the amounts needed to achieve the desired effect upon emotional state.

There is now reasonable evidence to suggest that non-dietary risk factors also prevail in the mental illness proneness profile. For example, Figure Nine underlines the point that subjects who take daily exercise [the stippled column on the right] tend to be associated with lower [better] psychiatric scores. Specifically, the no daily exercise group [the black column on the left] has a score of 5.0 versus 3.1 for the exercise group [stippled bar]. Thus, by definition, exercise may be viewed as a resistance agent for mental illness. Based on the high t value of 4.789, it can be regarded as a dominant resistance factor. Parenthetic

psychologic state [M-R section of CMI]
in terms of daily physical activity [Question # 141, CMI]

mean
psychologic
score
[M-R section]

5.0

3.1

November 1971

[n=268]

[n=592]

no daily
exercise

daily
exercise

t=4.789
P<0.001 •

• statistically significant difference of the means

Figure Nine. The relationship of psychologic state as determined by the M-R sections of the CMI versus daily exercise. The group characterized by daily exercise is associated with the fewer psychologic findings making exercise a resistance factor.
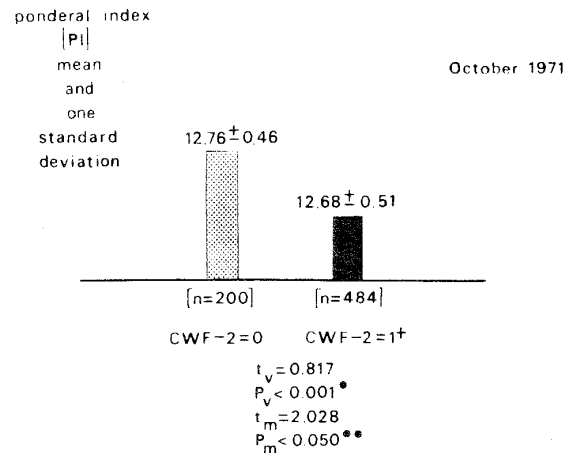
mention should be made that physical activity has also been identified as a resistance agent for cardiovascular and oral disease. Phrased another way, a resistance agent in one profile is a resistance agent in all profiles; conversely, a susceptibility agent remains a susceptibility agent.

Actually, a number of nondietary parameters such as tobacco, alcohol, and coffee/tea have been analyzed with regard to their possible role in the mental illness proneness profile. From such data, exercise must be viewed as a resistance agent and tobacco, alcohol, and coffee/tea must be considered as susceptibility factors.

Other parameters of another order have been studied as possible contributors to the mental illness proneness profile. For example, weight may well be one such variable [Figure Ten]. The ratio of height to weight is known as the ponderal index [abbreviated PI]. In actual practice, the ponderal index is derived from the height [expressed in inches] devided by the cube root of the weight [in pounds]. For practical purposes, the lower the ponderal index, the heavier is the subject for his height. Conversely, the higher the ponderal index, the lighter is the individual for his height. Figure Ten shows that the subjects with the better psychic picture [CWF-2 = 0] on the left, are statistically significantly lighter than those with psychologic complaints. Or, put another way, the heavier the individual, the greater the possibility for psychologic findings as indicated by the black bar on the right. Hence, within the limits of this observation, weight must be viewed as a susceptibility agent.

In fact, if one studies the groups with and without psychic symptoms and signs in terms of organ systems, it is noteworthy that the mental illness-prone individual is more beset with general complaints, meaning symptoms and signs. Figure Eleven shows that those individuals with no

relationship of psychologic state [CWF-2] and ponderal index [PI]

ponderal index
[PI]
mean
and
one
standard
deviation

October 1971

12.76 ± 0.46

12.68 ± 0.51

[n=200]

[n=484]

CWF-2=0

CWF-2=1+

$t_v = 0.817$
$P_v < 0.001$ •
$t_m = 2.028$
$P_m < 0.050$ • •

• statistically significant difference of the variances

• • statistically significant difference of the means

Figure Ten. The relationship of psychic state [as judged by the CWF-2 scores] versus weight [as measured by the ponderal index]. Those subjects with the greater number of psychologic symptoms and signs are the subjects who tend to be heavier.
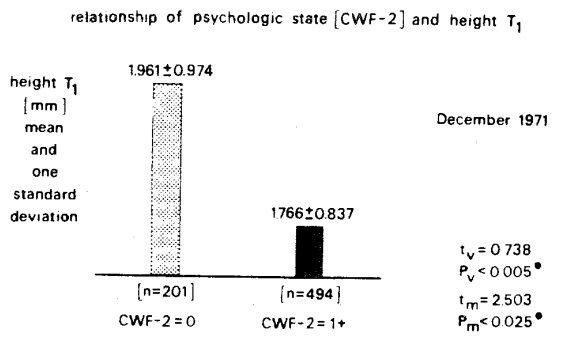
relationship of psychologic state [CWF-2] and reported gastrointestinal symptoms and signs [CMI]

mean
reported
gastrointestinal
symptoms
and
signs

2.2

1.5

[n=236]

[n=564]

CWF-2 = 0

CWF-2 = 1+

t = 5.328
P<0.001 •
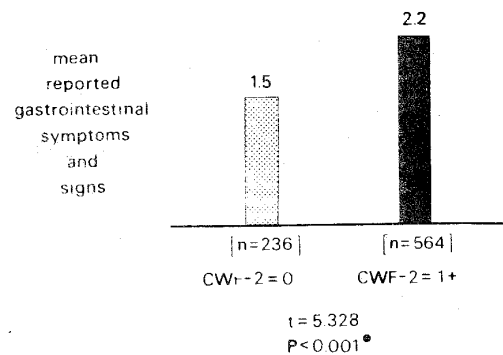
• statistically significant difference of the means

December 1971

Figure Eleven. The relationship of psychic scores and gastrointestinal findings. It is clear that the group characterized by no psychic findings [CWF-2 = 0[reveal the lesser number of gastrointestinal symptoms and signs.

relationship of psychologic state [CWF-2] and height T_1

1.961 ± 0.974

height T_1
[mm]
mean
and
one
standard
deviation

December 1971

1766 ± 0.837

[n=201]   [n=494]
CWF-2 = 0   CWF-2 = 1+

$t_v = 0.738$
$P_v < 0.005$ •
$t_m = 2.503$
$P_m < 0.025$ •

• statistically significant differences of the means and variances

Figure Twelve. The relationship of psychic state [as measured by the CWF-2 score] versus cardiac status [as determined by the height of T in Lead I in the electrocardiogram]. The subjects with the better psychic state [CWF-2 = 0] show the higher T wave.

classical oral glucose tolerance test in terms of psychologic state [CWF-2]

blood glucose mean and one standard deviation mgm per cent

173
161
126   123
136
131
111
100
97
93
96
90   82   89   76
81   91   77   64
72   63   57   56   41

fast   1 hr   2 hrs   3 hrs   fast   1 hr   2 hrs   3 hrs
CWF-2 = 0   CWF-2 = 1+

statistically significant difference of the variances fasting 2 and 3 hours

Figure Thirteen. The classical glucose tolerance patterns in subjects with and without : psychologic complaints as determined from the Cornell Word Form-2 test. The evidence suggests that there is more evidence of hyper- and hypoglycemia at the two and three hour temporal points in the group with the CWF-2 = 1+ than in the group with no psychologic findings [CWF-2 = 0].

psychic symptoms and signs on the left tend to have significantly fewer gastrointestinal findings [1.5 in the stippled column versus 2.2 in the black bar].

Many other clinical and physiologic parameters seem to be significantly different in individuals with and without psychologic complaints. For instance, Figure Twelve shows that the height of the T wave in Lead I of the electrocardiogram is significantly higher [1.961] and presumably more physiologic in the subjects with the healthier psychic stroma [CWF-2 = 0, the stippled column].

Attempts have also been made to identify biochemical correlates in terms of the mental illness proneness profile. For example, Figure Thirteen outlines the classical oral three-hour glucose tolerance patterns for subjects with and without psychic complaints as judged by the Cornell Word Form-2 test. The evidence indicates that there are statistically significant differences in variance at the two- and three-hour temporal points. Translated into nonstatistical language, this means that at two and three hours there were more subjects with hyper-or hypoglycemia in the group with psychologic findings than in the group without psychologic symptoms and signs. Specifically, the ranges were plus or minus 20 versus 30 milligrams per cent at two hours and 20 versus 35 milligrams per cent at three hours.

These last four illustrations are noteworthy for two reasons. First, they represent possible risk factors in the mental illness proneness profile. Second, too often in conventional medicine, a psychiatric diagnosis is made by exclusion, specifically, when no organic pathosis is evident. These four illustrations pose the interesting point that, even in the most subtle psychologic states, there are already significant organic changes.
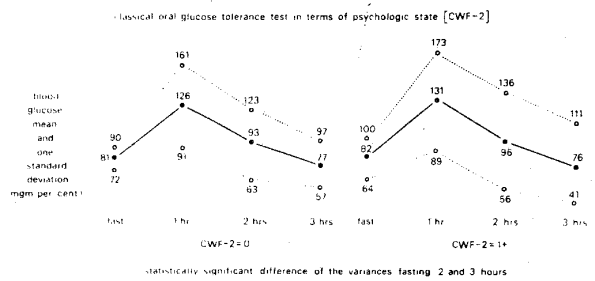
Correlation Versus Cause-and-Effect

For purely predictive purposes, simple correlation suffices. In other words, if variable A correlates with regularity with variable B, then one can predict A from B or B from A whether the relationship is causal directly, indirectly, or not at all. However, it is helpful and more significant if there are indeed cause-and-effect relationships in addition to purely correlations. Two such examples will be utilized for this discussion.

Earlier mention was made that the data for this report were derived from a multiple testing program conducted to determine the health of members of the health professions. It is, therefore, interesting to observe the changes in psychologic state in terms of changes in some of the variables described earlier as resistance agents. Those consuming vitamin-mineral supplements are in the stippled columns while the black bars represent those not taking supplements.

Figure Fourteen outlines three groups. First, those subjects taking multivitamin supplementation at the beginning and end of one year of the program. These are pictured on the extreme left. Second, there is a group which started to take supplementation during the year. This is the center series. Finally, the third group is characterized by no supplementation during the experimental year as shown on the right. You will note that there are fewer psychologic findings initially [3.8 versus 4.7 and 6.0] in the group taking daily multivitamin supplementation. Second, it will be observed that there are only statistically significant reductions in psychologic scores in the two groups with supplementation. Finally, the most significant change
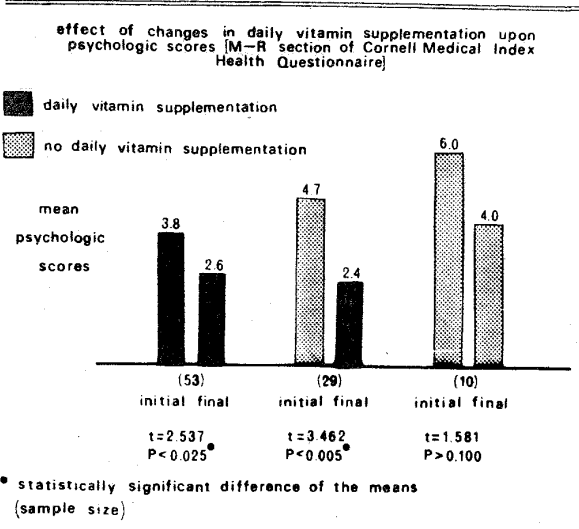
effect of changes in daily vitamin supplementation upon
psychologic scores [M—R section of Cornell Medical Index
Health Questionnaire]

▓ daily vitamin supplementation

▒ no daily vitamin supplementation

mean
psychologic
scores

(53)   (29)   (10)
initial final initial final initial final

t=2.537   t=3.462   t=1.581
P<0.025*   P<0.005*   P>0.100

* statistically significant difference of the means
(sample size)

Figure Fourteen. The effect of multivitamin supplementation upon psychologic state as judged from the M-R section of the Cornell Medical Index Health Questionnaire. Initially, the group characterized by daily supplementation shows a lower score [3.8] than those without supplementation [4.7 and 6.0]. After one year, there is a statistically significant reduction in psychologic scores only in the two groups taking daily supplements.

occurred in the group which started a supplementation program [the center group]. This simple observation tends to support the finding earlier described showing a simple relationship between multivitamin supplementation and psychic state suggesting that supplementation may be viewed as a resistance agent.

Finally, Figure Fifteen outlines the changes in tryptophane intake versus psychologic score during a one-year period. In the subjects who increased their tryptophane consumption [Group I on the left] from 947 to 1331 milligrams, there was a statistically significant reduction in the CWF-2 score by almost 50 per cent from 1.9 to 1.0 [Group I on the right]. In the individuals who did not increase tryptophane intake [group II on the left], there was no significant changes in psychologic scores [Group II on the right]. This is consistent with the recent findings that 1-tryptophane supplementation in insomniacs and depressed patients serves as a tranquillizer and significantly enhances sleep.

The New Terminology

Thus, as we have learned, preventive medicine is not new. It is cloaked under diverse terms such as *predictive, prognostic, protective, anticipatory, social medicine,* and *propetology.* All of these labels are perfectly respectable, descriptive, valid and useful. One might then question the need for generating new nomenclature such as *predictive medicine.* Four explanations are offered. First, from a purely etymologic standpoint, *predictive medicine* is the most precise term since the Latin derivative for prediction means to foretell. Hence, the term *predictive medicine*
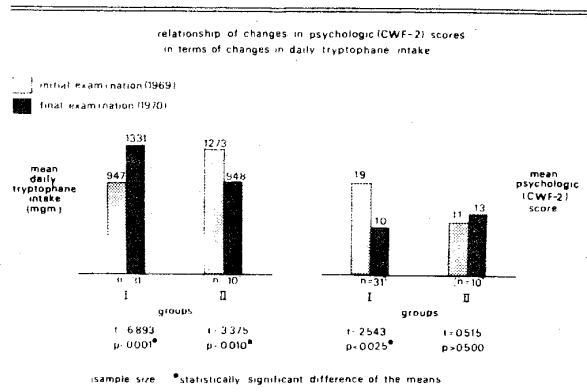
relationship of changes in psychologic (CWF-2) scores
in terms of changes in daily tryptophane intake

Figure Fifteen. The effect of change in tryptophane consumption upon psychologic state. In the group characterized by an increase [Group I on the left,] there is a decrease in psychologic score [Group I on the right]. In the group with no increase in tryptophane [Group II on the left], there is no decrease in psychologic score [Group II on the right].
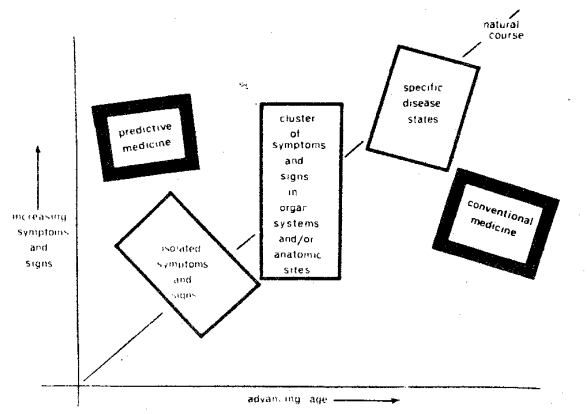

Figure Sixteen. One of the most glaring distinctions between conventional and preventive medicine is underlined in this diagram. Conventional medicine concerns itself largely with the identification of disease as shown in the box on the right. In contrast, true preventive medicine or predictive medicine is concerned with the anticipation of disease. Thus, the emphasis is shifted to the left.

spells out unequivocally the unique anticipatory character-
istics of this philosophy of medicine. Second, unlike the apt
term *propetology* which means leaning toward, *predictive
medicine* is a simple and self-explanatory term. Third,
predictive medicine, as a relatively new label, is not
shrouded with historic misconceptions and semantic over-
tones. For example, present-day preventive medicine is
largely concerned with public health in the traditional sense
such as acute infectious diseases and embraces relatively
few prognostic connotations relating to the common
chronic killing and crippling disorders such as ischemic
heart disease, cancer, and rheumatoid arthritis. Fourth,
predictive medicine, is an unique discipline which encom-
passes concepts and instrumentation from many different
well-established specialties like epidemiology, biostatistics,
clinical pathology, clinical medicine, psychology, ecology,
nutrition, physical education, and stomatology, which are
not currently utilized in *packaged form* in any other single
discipline.

Summary

There are many differences between conventional and
preventive medicine. One of the most glaring distinctions is
that, in the traditional practice of medicine, a diagnosis is
only made when a set number and constellation of
symptoms and signs prevail. Thus, the emphasis in con-
ventional medicine is on the box on the right [Figure
Sixteen]. Hence, for practical purposes, the long and
tortuous incubation period, clinically and biochemically,
goes frequently unlabelled or tagged as an ill-defined
psychologic syndrome. Sensitivity to the most subtle
clinical and biochemical events is an integral part of a
preventive medicine plan with the emphasis shifted to the
area on the left [Figure Sixteen]. As Danowski so aptly
pointed out, it is time think in terms of twenty per cent of
disease X and forty per cent of disease Y. This approach
not only invites the earlier *identification* of disease but,
more importantly, its *anticipation* with the institution of
earlier therapy for primary prevention. ●

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