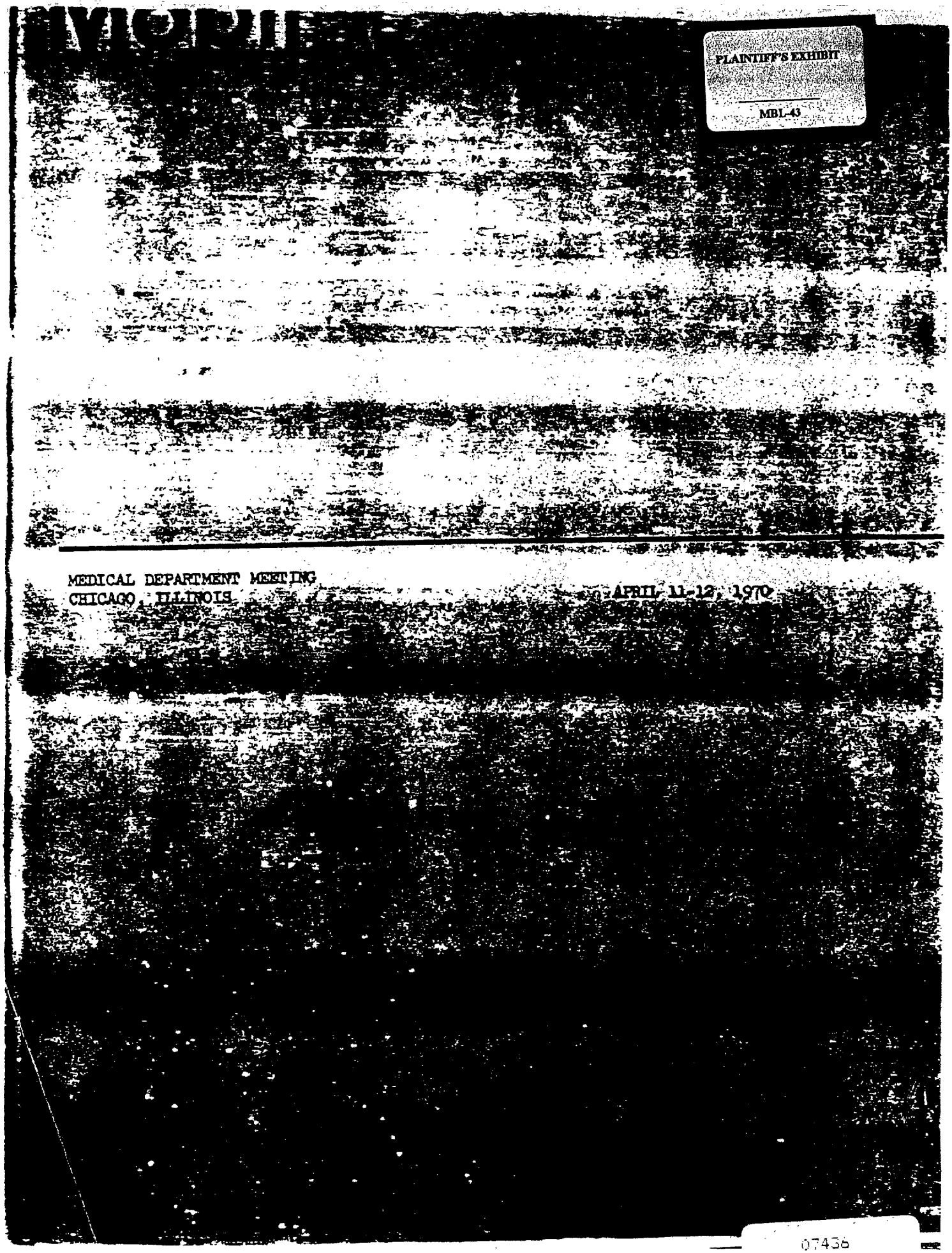


MEDICAL DEPARTMENT MEETING
CHICAGO, ILLINOIS APRIL 11-12, 1970

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INTEROFFICE CORRESPONDENCE

DATE July 6, 1970

TO

D. W. Anderson, M.D.-Augusta
J. L. Barber, M. D.
Att. E. Tinker, R. N.
J. J. Esslinger, M. D.-Beaumont
Att. B. Moitoso, R. N.
J. K. Stewart, M. D.-Beaumont
Att. Nurses
M. N. Howard, M. D.- Brocklyn
Att. D. Krieger, R. N.
M. Clinton, M. D.-Buffalo
Att. E. V. Morgan, R. N.
H. C. Worrall, M. D.-Calgary
Att. P. Shelton, R. N.
N. Carson-Dallas
P. Greenberg, M. D.-Dallas
Att. P. Melton, R. N.
R. J. Potts, M. D.-Dallas
J. C. Greisen, M. D.-East Chicago
Att. E. Dzurilla, R. N.
R. Raine, M. D.- East St. Louis
Att. M. Weiss, R. N.
B. Kotler, M. D.-Edison
Att. L. Liddane, R. N.
P. James, M. D.-Ferndale
Att. R. Davis, R. N.
F. B. Norbury, M. D.-Jacksonville
Att. M. Riggs, R. N.
J. Burnett, M. D.-Kankakee
Att. J. Legg, R. N.

C.C.

G. Petersen, M. D.-Kansas City
Att. V. Andrew, R. N.
W. H. Smith, M. D.-Los Angeles
Att. M. Mulvihill, R. N.
J. D. Bramer, M. D.-Macedon
Att. O. Schaaf, R. N.
F. L. Bergquist, M. D.-Nichols
Att. L. Kerr, R. N.
J. R. Meredith, M. D.-Paulsboro
Att. Nurses
A. Thomas-Philadelphia
J. R. Harding, M. D.-Philadelphia
Att. E. Brooks
G. B. Meyers, M. D.-Philadelphia
P. J. Maguire, M. D.-Torrance
Att. G. Widener, R. N.
R. Murray, M. D.-Woodhaven
Att. M. Seaver, R. N.

A. Alfaro-24 fl.
T. E. Allen, M. D.-14 fl.
E. R. Averill-14 fl.
A. E. Bertone-14 fl.
E. K. Daniels-14 fl.
R. A. Eskesen, M. D.-14 fl.
A. M. Harris, R. N.-14 fl.
F. A. Johnson-23 fl.
J. F. Koester, M. D.-14 fl.
Att. Nurses
P. C. Krist-25 fl.
R. B. Peters-14 fl.

MOBIL MEDICAL DEPARTMENT
MEETING - 1970

Attached you will find a copy of the proceedings of the Mobil Medical Department Meeting held on April 11 and 12, 1970 in Chicago. For those of you who attended, we thought you would like a copy for your files. For those of you who did not attend this year, we hope that it will be of interest to peruse these proceedings.

H. A. Sinclaire

H. A. Sinclaire, M. D.

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attachment

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MOBIL MEDICAL MEETING
DRAKE HOTEL - CHICAGO, ILLINOIS
11-12 APRIL 1970

Saturday, 11 April 1970		5:30 - 7:30 P.M. Cocktail Party - Venetian Room
Sunday, 12 April 1970		
9:00-9:10 A.M.		H. A. Sinclaire, M. D. Open Meeting - Welcome
9:10-9:30 A.M.		Peter C. Krist "The Role of the Medical Department in the Achievement of Mobil Objectives".
9:30-10:30 A.M.		PANEL ON NOISE G. B. Meyers, M. D. - Panel Chairman
	(15 mins)	(a) Wiley Harrison, M. D. "Noise and the Ear".
	(15 mins)	(b) E. K. Daniels "Noise Detection and Protection and ISO Standards".
	(10 mins)	(c) P. Melton, R. N. "Audiometric Testing".
	(15 mins)	(d) F. A. Johnson Compensation for Hearing Loss .
	(10 mins)	QUESTION PERIOD
10:35-10:50 A.M.		COFFEE BREAK
10:50-12:00 Noon		PANEL - FITNESS TO RETURN TO WORK. R. J. Potts, M. D. - Panel Chairman
	(20 mins)	(a) J. R. Meredith, M. D. "Orthopedic Problems".
	(20 mins)	(b) R. A. Eskesen, M. D. "Cardiovascular Disease".
	(20 mins)	(c) J. K. Stewart, M. D. "Respiratory Problems"
	(10 mins	QUESTION PERIOD

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MOBIL MEDICAL MEETING
DRAKE HOTEL - CHICAGO, ILLINOIS
11-12 APRIL 1970

12:30-1:30 P.M.		LUNCH
1:45-2:30 P.M.		R. B. Peters "Long Term Disability - Coordination Between the Insurance Carrier and Mobil's Medical Department".
	(15 mins)	QUESTION PERIOD
2:45-3:15 P.M.		Charles Thompson, M. D. "Significance of Multiple Blood Analyses in Detection of Early Coronary Disease".
	(15 mins)	QUESTION PERIOD
3:30-4:00 P.M.		Abraham Alfaro "Mobil Oil Corporation's Medical Fitness Unit: A Pilot Program".
	(10 mins)	QUESTION PERIOD
4:15 P.M.		H. A. Sinclaire, M. D. Summation

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H. A. SINCLAIRE, M. D.
OPEN MEETING - WELCOME

Good Morning everybody. It's nice to welcome you to our third Mobil Medical Meeting. We continue to have them because the grapevine tells me that you are willing to give up a Sunday, because of the gleanings and facts that you have obtained from past meetings. I am sorry that Dr. Allen had to be on a foreign trip to Africa and was unable to be with us. He does send his greetings to you all.

It is now a pleasure to introduce Mr. Peter Krist. Mr. Krist is a Vice-President of Mobil Oil Corporation. His portfolio comprises the Corporation's Employee Relations, Medical, Security and Safety Departments. He is a native of Connecticut, and still resides there. He received an A.B. from Dartmouth College in 1942. He also studied Industrial Relations at New York University. In 1946 he joined the American Airlines, in 1951 he moved to the Bendix Corporation,and in 1953, became associated with the Railway Express Agency. He joined Mobil's Corporate Employee Relations Department in New York in 1960.

From 1961 to 1965 he was Employee Relations Advisor of Mobil Europe in London. He returned to New York in 1966 as General Manager of Corporate Employee Relations. In July 1969 he was elected a Vice President of the Corporation and given responsibility for the Medical, Security and Safety Departments, in addition to the Employee Relations Department.

Mr. Krist will speak to us on "The Role of the Medical Department in the Achievement of Mobil Objectives".

PETER C. KRIST
THE ROLE OF THE MEDICAL DEPARTMENT IN
THE ACHIEVEMENT OF MOBIL OBJECTIVES

Good Morning. I appreciate the opportunity to participate in your program today. As you know from your conference program, I have been asked to discuss with you "The Role of the Medical Department in the Achievement of Mobil Objectives." To do this intelligently, we need to look at the future, as well as the present. Before we look at The Future - let me say that Mobil has a Medical Department which is second to none- one which through its accomplishments has rightfully earned an important place on the management team.

THE FUTURE

We live in a dynamic society -- so dynamic that at times, it is explosive (witness the incidence of March 12 in the New York Headquarters). Another sign that our society is dynamic, is the change taking place in our work force. The trend in the Mobil work force over the years ahead will probably

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be towards:

More Women,
More Minority Members, and
More White-Collar Workers (Professional and Clerical).

Over the next 10 or 15 years the average age of the Mobil work force will be down and the average educational level will be up. Paradoxically government and social pressures in the years ahead may require us to hire some underskilled and undereducated people, even as we contend with the problem of providing more challenging work for better educated and more sophisticated young people. This means we'll have to be concerned with work simplication and job enlargement simultaneously.

MOBIL'S PHILOSOPHY ON PEOPLE

In the past, Employee Relations in Mobil have been influenced by a variety of factors. I would say that our present management is seeking to move towards a philosophy based on a mutuality of interests between the Company and its employees. To communicate this idea to Mobil employees, the Company has just issued a statement of its Employee Relations philosophy. The first part of this statement, which has already been distributed to employees in the New York Headquarters, says that:

Mobil is guided by three fundamental beliefs about its employees:

1. Each employee is important as an individual and should be free to express his individuality within the limits required for organizational teamwork and effectiveness.

2. Mobil must serve the interests of its employees, stockholders, and customers. To do this, Mobil must operate effectively and profitably.

3. Mobil can function best when it provides employees with opportunities for growth, development, and recognition through challenging and satisfying work assignments.

In any discussion of objectives, therefore, we have to take as a given the overriding objective of every function and every department -- to contribute to the profitability of the business. This holds for the Medical and the Employee Relations, as it does for the other functions and departments of the Company. Employee Relations and Medical can contribute to profitability by helping management capitalize on Mobil's human resources.

The complicating factor in the management of human resources is the fact that individuals have needs and objectives which sometimes are at variance with the needs and objectives of the organization. The challenge for those of us who are concerned with human resources is to help create an organizational climate in which,to the extent possible, individuals can satisfy their basic needs and achieve at least some personal objectives in the process of helping the organization operate effectively and profitably.

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THE MEDICAL DEPARTMENT'S ROLE

To contribute to Mobil's profitability, the Medical Department has to achieve a number of sub-objectives that you're all acquainted with --

1. The medical screening of candidates for employment and employees for placement.

2. Maintenance of healthful and safe working conditions.

3. Maintenance of employee health - both physical and mental.

4. Diagnosis and treatment of occupational injury and disease and emergency care or first-aid for non-occupational injury or illness.

5. Maintenance of product safety.

THREE PROBLEM AREAS

I'm not going to try to explore each of these objectives in detail. What I would like to do is focus on three interrelated problem areas that are very much related to the objectives of the Medical Department.

-- Absenteeism
-- Alcoholism
-- Alienation

I am using the term "alienation to cover two types of employees who are not in tune with the organization or actually working against it:

-- Individuals who are rebelling against the "Establishment" in general, and

-- Individuals who are being worn down by problems in the work environment.

The chronic absentee, the problem drinking employee, and the aliented employee are a burden to the Company. Their effect on operations is to decrease efficiency and increase cost.

LET'S LOCK AT ABSENTEEISM

Time paid but not worked is not always an out-of-pocket cost, but it does frequently increase the company's operating costs. Because we're dealing with human beings who may be subject to a variety of ailments beyond their control, we know that some element of time paid, but not worked within reasonable limits is a cost of doing business that we have to accept. Are Mobil's sickness and absence disability payments reasonable? For the last three years these costs were as follows:

1967	$4,897,000
1968	5,949,000
1969	5,880,000

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We made a survey of MAD units in 1968 to determine whether more detailed reporting might serve as a control measure to reduce cost. We found that some MAD facilities had very good absence control programs and some did not. Those that had no formal program tended to suggest that none was needed. In conversations held in New York Headquarters, representatives of Systems and Controller's groups argued against any formal control efforts in New York.

I am not convinced that we are doing everything we can around the company to keep absenteeism at a minimum. I think this is a problem area in which you people can make more of a contribution. In the near future I mean to ask the Division Employee Relations Managers to review the problem of absenteeism in their respective portfolios again, and suggest ways in which they can control costs. I would like to invite you to study this problem again and recommend action plans that could be carried out by local management to keep absenteeism at a minimum.

NOW WHAT ABOUT ALCOHOLISM

According to the experts on alcoholism, 3% to 5% of industrial employees are problem drinkers. While it is not possible to determine accurately, the cost to business and industry of these ineffective employees, the lowest estimates are on the order of 2 ro 3 billion dollars per year. If we assume that Mobil has its proportionate share of alcoholics, this means we have:

-- Over 1,000 alcoholics in our 37,000 - employee domestic work force, and

-- Over 100 alcoholics in our 3,700 - employee New York Headquarters

These problem drinking employees may be costing the company anywhere from several hundred thousand dollars to several million dollars a year on account of:

-- Absenteeism and Lateness,
-- Lowered Productivity and increased waste,
-- Bad decisions, and
-- More accidents

Undoubtedly, drug addiction among employees will have some of the same bad results, if not more.

What are we doing to rehabilitate the problem drinking employee? We have had a Procedure Manual on Problem Drinking since January 1963. What is our batting average in respect to employee alcoholics? How many have we identified and rehabilitated since January 1963? Is Mobil any better off today that we were then in respect to problem drinkers? I don't know.

I do know that we are not going to lick the problems of alcoholism or drug addiction by simply issuing a Guide. The Medical Department is in a strategic position to make more of a contribution. In the Doctor-Patient relationship with employees, it is in a position to identify alcoholics and

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drug addicts and counsel them in respect to rehabilitation programs. In the advisory relationship with Managers, the Medical Department can continuously remind individual managers of their role and responsibilities in implementing Company policy. More important changes can be recommended in the work environment. The key to the problem is effective communication, to create understanding, to get both the employee and the manager to truly accept the principle that alcoholism is an illness, and that problem drinking employees who cooperate in their own rehabilitation should, and will receive the supportive treatment and financial assistance made possible under the Guide on Problem Drinking.

In the course of the present review of our present policy, you can help Mobil achieve its overall objectives by coming up with constructive suggestions on how we can get Mobil Managers to carry out the Company Policy designed to identify and rehabilitate employee alcoholics and drug addicts.

CONFLICTING FORCES

While we're striving to build a mutuality of interests between Mobil and its employees, we are aware that a number of forces are pushing the individual and the organization further apart.

Three factors stand out:

1. Most Americans are more affluent- They are not concerned about unemployment and move in and out of jobs freely.

2. Most Americans are more educated - They are no longer content with routine jobs and want challenging and socially significant work.

3. Most Americans want to be more equal - They are no longer willing to conform to rules and regulations they consider unjust or inequitable and want a bigger voice in rule making.

Minority members, young people, some women and even some managerial and professional employees are in revolt against the establishment - The establishment being any organization that appears to restrict their freedom -- government, the university, the corporation, the labor union. In seeking to achieve their objectives, some militant individuals and groups are showing a complete disregard for law, for authority, and for the rules of the game. They want freedom without responsibility.

However, many of the complaints made against the establishment are not without foundation. The old rules or ways of doing business are not all valid. The participatory democracy and the participative management desired or demanded by many individuals are not all bad.

WORK CLIMATE PROBLEMS

In Mobil, a recent study conducted by the Career Development Section found a number of problems in the overall work climate. A signficant number of individuals in the representative sample of upper, middle,and lower managers

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alcoholism, how do we plan to put these guides across; to audit the implementation of the guidelines set forth in these Management guides? What other guides should we issue bearing on safety?

POLLUTION AND TOXICOLOGY

Then there are the related problems of pollution and toxicology. Increasingly, governments at various levels are going to make demands and set standards for our manufacturing plants and for our products that are going to be difficult to meet. Although we do not expect the Medical Department to resolve the problems of pollution and toxicology singlehanded, obviously it can make a substantial contribution to the solution of problems in this area.

HEALTH CARE CRISIS

In closing, I would like to say a few words about medical economics in general. You are undoubtedly aware that the price tag for the health services provided Mobil employees is very high and that the trend is steadily upward.

In spite of the fact that the Company covers most of this cost through its insurance programs -- last year hospital, surgical, and all other medical insurance claims cost Mobil 8.6 million dollars -- The cost to the individual is still significant enough so that of all the benefit plans provided by Mobil, employees are least satisfied with the medical expense plans. Nevertheless, we can say that adequate health care is available to every Mobil employee.

We cannot say the same thing for every person in the United States. In a recent study of health care in our country, the U.S. Chamber of Commerce found that although U.S. health expenditures per person are among the highest in the world and our doctors and nurses are among the best trained in the world, America faces critical challenges stemming from:

-- Resentment of higher medical costs,
-- Inadequacies in all types of medical facilities,
-- Severe shortages of paramedical personnel,
-- Maldistribution of physicians both geographically and by field or type of practice,
-- Inadequate medical insurance coverage of the population, and
-- Inadequate health care for the disadvantaged.

Health care in the United States faces a "massive crisis," according to the Nixon Administration, unless we can streamline medical services and make them available to more people. The administration has already begun to take the initiative with a proposal for a pre-paid group practice program for Medicare and Medicaid. This proposal would establish group clinics that provide medical service on a fixed-price-per person basis, contracted for annually. The fixed-price feature is intended to serve as an incentive to practice medicine more efficiently. Is this the kind of solution we should support? What will be the effects of widespread pre-paid group practice? Can programs such as these be utilized by Mobil to cut the mounting cost of hospital, surgical, and other medical insurance claims?

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Unless the medical profession and the private sector face up to the situation and develop some practical solutions through voluntary action, the play will be taken away from us by government.

WHAT CAN THE MEDICAL DEPARTMENT DO

One of Mobil's objectives is to seek to shape the environment in which we have to do business so that the Company's freedom to operate is not unduly restricted. The Medical Department can contribute to the achievement of this objective by recommending courses of action that will help to resolve the problem of health, both physical and mental, and medical economics for Mobil and its employees.

To sum up, I would like to return to the three A's. The Medical Department can make a major contribution to the achievement of Mobil objectives by helping to overcome the problems of absenteeism, alcoholism, and alienation - all impediments in the maximizing of Mobil's human resources.

We next will have a Panel On Noise which will be chaired by Dr. Gil Meyers who is our Regional Medical Director for the Eastern Region. The members of the panel will include Dr. Wiley Harrison, Mr. E. K. Daniels, Pauline Melton and Mr. F. A. Johnson.

WILEY HARRISON, M. D.
NOISE IN THE EAR

The public, industry and government have recently become increasingly aware of noise pollution, a problem we as doctors have been aware of, but probably have not publicized enough. We can see from this film depicting the transmission of sound from the tympanic membrane to the inner ear fluid that the impulse can indeed be a strong physical thrust. We are interested in excessive noise levels that can traumatize the ear and lead to permanent damage. These levels will be shown by other speakers here assembled who are experts on noise in industry.

Damage to the ear from noise is confined to the middle ear conductive system and to the inner ear. A strong percussion wave can perforate the ear drum but this is fairly rare and the drum can be restored with treatment or by grafting. I have seen hemorrhage in the middle ear in rock and roll band members but this too is amenable to treatment. The inner ear can be saved only by prevention as there is no treatment which will restore the function of a noise damaged Organ of Corti. The hearing loss at first is confined to the area of 4000 Hz and recovery from mild insults can occur. However, with prolonged exposure of levels over 90 decibels in intensity approximately one half of people so exposed will suffer permanent damage and their audiograms will reveal a deepening and widening of the 4000 Hz notch to involve the speech frequencies. Decreased ability to understand speech can occur which makes rehabilitation even with hearing aid amplication much less effective.

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Anatomically the damage to the inner ear can be shown at the basal turn of the cochlea where the outer hair cells are literally destroyed when scund levels over 110 decibels are delivered to animals over an eight hour period. The few patients who have been followed through life and have donated their bones to the Temporal Bone Banks have given us the same pathologic change of outer hair cell damage from loud noise exposure.

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E. K. DANIELS

NOISE EVALUATION, PROTECTION, AND THE ISO AUDIOMETRIC ZERO

My part of this panel concerns noise evaluation, noise protection, and international organization for standarization, or as is commonly spoken of, the ISO. Actually, of the latter there are a series of standards covering different aspects of noise as it affects the general population, but we will consider only the one which covers audiometric zero. For the time that has been alloted to this portion of this morning's presentation, it will be necessary to consider only briefly the three facets set forth in the title, to completely cover the subject in depth could be expanded into several hours for each part.

NOISE EVALUATION

Noise has often been defined as unwanted sound. However, this is not really a good definition because some sounds may be music to some people and yet the same sounds, to others, can be bothersome. Also, the absence of pain, when a person is exposed to noise, should not be construed to mean that a person is not exposed to potentially harmful noise. Pain may be felt during exposure to noise levels of the order of 130 decibels; However, noise induced hearing loss can be produced at considerably lower levels.

In the evaluation of noise, the exposure must be analyzed in terms of:

A. Overall level (noise loudness)
B. Composition of the noise (broken into frequencies)
C. Duration and distribution of exposure during a typical working day.
D. And total exposure time during a work life.

Evaluation of each of these four factors is important in evaluating noise exposures for initiating a hearing conservation program. Even though two noises have the same overall levels, their compositions may differ considerably and to such an extent that one may cause hearing loss while the other won't.

There are two types of instruments that can be used to measure sound. These are:

1. Sound level meter.
2. Octave band analyzer

The sound level meter has built into its detecting ability three networks. There are indicated as "A", "B", and "C" networks. The "A" network utilizes filters which eliminate most of the low frequency sounds. The "C" scale has a flat response scale and does not discriminate or filter out any of the frequencies, its response is flat from 37.5 - 10,000 Hertz. The "B" has the greatest response to the lower and middle frequencies and discriminates or filters out the high frequency sounds.

To use the SLM or OBA it is necessary to have a numerical scale. This scale is referred to as a sound pressure level, which is measured in decibels in reference to a relative quantity. The decibel scale is logarithmic and is a term borrowed from electrical communication engineering. When it is used to

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express noise level, a reference quantity is implied. This reference value normally is 0.0002 microbars or 0.0002 dynes per CM^2.

The overall level of "C" scale reading of noise is the summation of all the frequencies that go into producing that particular noise which is being measured. Every noise has its own sound pattern or frequency variation. Overall sound levels can be measured by the sound level meter using the "C" or flat response scale or the octave band analyzer which also has a setting for overall sound level measurements. The OBA consists of a series of electronic filters that select for measurement each of several octave bands or center frequencies. Most standard analyzers are designed to filter eight octave bands: 37.5 - 75, 75-100, 150-300, 300-600, 600-1200, 1200-2400, 2400-4800, 4800-9600 CPS. For example, the standard tone "A" occurs when the pressure changes through a complete cycle 440 times per second. The frequency of that tone is said to be 440 cps or Hertz. "Hertz" and cycles per second are synonymous terms.

The following octave bands and center frequencies are preferred by the American Standards Association or as it is now know, American National Standards Institute and the ISO.

PREFERRED FREQUENCIES FOR ACOUSTICAL MEASUREMENT

Center Frequency	Octave Bands
31.5	22.1 - 44.2
63	44.2 - 88.4
125	88.4 - 177
250	177 - 354
500	354 - 707
1000	707 -1414
2000	1414 -2828
4000	2828 -5656
8000	5656 -11,310
Overall	All Pass (Overall)

Lets examine some examples of overall and center frequency analyses of several typical noise producing equipment.

CENTER FREQUENCY

	Overall	31.5	63	125	250	500	1000	2000	4000	8000
Crude Heater	113	90	94	98	110	108	102	97	92	89
FCC Air Comp	104	93	96	95	91	89	91	100	99	92
Gas Comp	95	87	83	84	83	90	88	93	83	77
H2 Comp	116	91	86	87	98	89	92	102	115	103

Each frequency, as will be noted, has its own particular noise level.

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We have one other factor to consider and that is the duration and distribution of exposure during the person's working day and work life. Noise exposure cannot be evaluated solely by noise measurements. The effects of continuous exposure to a given noise level differ from the effects of an exposure interrupted by periods of reduced noise level. Therefore, we must know how the exposure to noise is distributed throughout a representative of typical work day. This varies depending on the job of an individual from day to day. This complicates the evaluation of exposure and more often than not we assign a risk to certain exposures and limit the duration of an individual's exposure in the particular area.

When a person is exposed to noise levels that cause impairment to his hearing, there is produced what has been termed as a temporary threshold shift "TTS. However, when the person is removed from the noise insult the hearing acuity returns to essentially normal. The temporary loss of hearing produced by a noise insult is a good example of why we stress a waiting period before an audiogram is made. The longer the quiet period the more nearly the "TTS" will be eliminated. The more repetitive the insults and intensity of sound levels, the less the possibility for the "TTS" to return to normal. Several states have noise level codes which have established definite sound levels and when these decibel levels are exceeded, then hearing protection must be worn. More recently, the U.S. Department of Labor has put out a regulation governing noise levels that are tied to the dBA scale of the sound level meter. These are:

HOURS EXPOSURE	SOUND LEVEL IN dBA
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115

Some of the states are adopting these levels from the U.S. Department of Labor and making them a part of their safety regulations or occupational health regulations. Of course, the so called contract states have been told to conform to these limits or lose their contract status.

NOISE PROTECTION

After the noise has been measured, then it becomes necessary depending on the levels, exposure, time, etc. to control the noise. The most satisfactory method is a reduction in the amount of noise produced at the source. This may be accomplished by:

1. Careful acoustical design of new equipment.
2. Modification of design of machines presently in use.
3. Proper upkeep and repair of equipment.
4. Muffling exhausts
5. Changes in methods or processing.

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Another scheme is the reduction of noise that is transmitted through air or building structures. This may be accomplished by:

1. Constructing sound barriers.
2. Sound proofing work areas to reduce reverbrations.
3. Placing vibration mounts on equipment.

Sometimes revision of operational procedures may reduce noise exposure. These are:

1. Changing job schedules
2. Rotating personnel.
3. Enclosing stations or equipment with sound proofing covers.
4. Putting men in sound proof observation booths.

When control of noise levels is not feasible by engineering methods, which is the best way, it then becomes necessary to use personal protection. Ear protectors are of two types:

Ear Plugs
Ear Muffs

The ear plug literally plugs up the ear canal preventing noise from entering. From this standpoint, it is very important that the plug be properly fitted in the ear canal. Not all ear canals are the same size and shape. If the plug doesn't fit, the value of its use is lost because noise can filter around the plug and still cause hearing loss. The muff, on the other hand, covers the whole external ear. Different degrees of noise attenuation are obtained from plugs and muffs. Overall, the muff affords slightly greater attentuation than does the ear plug. Under some conditions of noise exposure it may be necessary to wear both plugs and muffs.

ATTENUATION FOR SIX DIFFERENT EAR PROTECTORS TESTED
(in dB re. 1951 ASA audiometer reference zero)

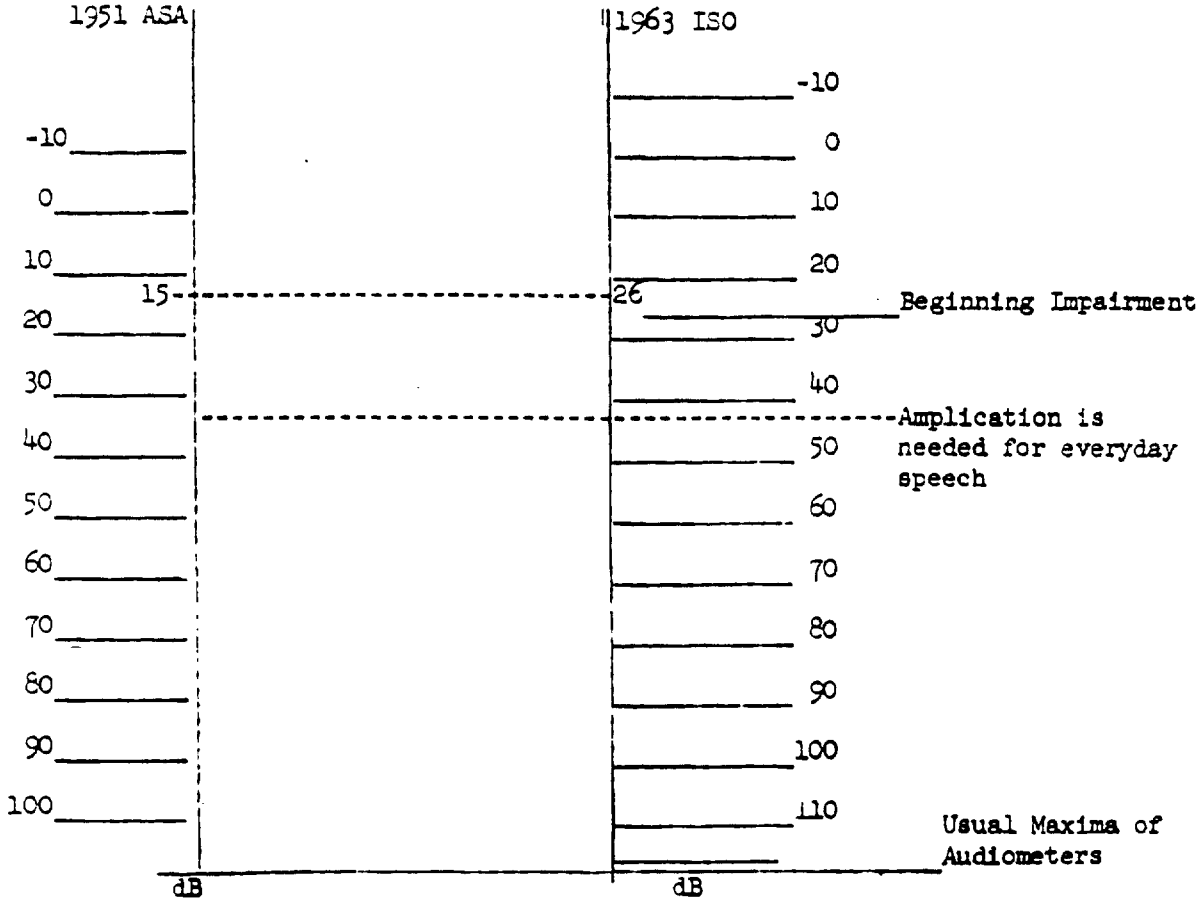
	Frequency								
TYPE	125	250	500	1000	2000	3000	4000	6000	8000
Ear Plugs									
A		21.9	25	25.9	33.4	38	41.2	33	37.5
B	15	15.9	16.2	21.3	28.8	33.7	33.7	32.9	39.1
C	8	16	16	19	23	29	27	34	40
Ear Muffs									
A	8	23	30	32	33	40	39	39	28
B	19	30	38	38	42	44	45	40	35
C	7	13	23	31	34	34	42	40	35
Cotton	5	6	8	9	13	15	13	14	16

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INTERNATIONAL STANDARDS ORGANIZATION (ISO STANDARD)

The "ISO" has developed zero reference levels for audiometers. The new levels are based on a series of studies of the thresholds of normal hearing in five different countries. These included children, adults, and even natives who had never been exposed to high noise levels. On the other hand, the ASA Standard, which is currently in use, was developed from audiograms made on working men at several Midwest fairs a number of years ago. It is felt by some renowned experts that the new standard will eliminate confusion and ambiguity. Personally, I cannot share this enthusiasm. One of the main reasons is the number of compensation laws that are tied into the ASA 1951 standard. These laws do not and are not changed overnight.



The relation between the two audiometric scales is shown in the above chart. The "ISO" scale is displaced upward relative to the "ASA" scale by 11 dB.

The following table gives the reference threshold values in terms of a standard earphone and coupler for the present ASA specifications against the proposed "ISO" reference levels with both referenced to 0.0002 microbar.

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Reference threshold levels in dB

FREQUENCY	1951 ASA	1963 ISO	Difference
125	54.5	45.5	9
250	39.5	24.5	15
500	25	11	14
1000	16.5	6.5	10
2000	17	8.5	8.5
3000	(16)	7.5	(8.5)
4000	15	9	6
6000	(17.5)	8	(9.5)
8000	21	9.5	11.5

( ) REPRESENT INTERPOLATIONS

Until all audiometers are calibrated to one scale of reference values, there will be some confusion and it is necessary to indicate which reference calibration is used, "ISO" 1963 or ASA 1951. This does not mean that an audiogram taken on an instrument calibrated in 1951 "ASA" cannot be converted to the 1963 "ISO" reference level. This is done by adding the appropriate "difference in dB" in each frequnecy. To convert readings taken on an audiometer calibrated to the 1963 "ISO" reference thresholds to readings based on the 1951 "ASA" thresholds, subtract the difference in dB.

Mobil has had an employee hearing protection policy since 1964. We are currently in the process of revising and bringing this policy up-to-date. It is generally felt that Mobil has had a satisfactory hearing conservation program. Noise levels in our various plants have been measured and management has been made aware. We do not believe we have a program that cannot be eliminated. Hopefully, through cooperation with our engineering department, we are attempting to have noise levels written into equipment specifications.

PAULINE MELTON, R. N.
AUDIOMETRIC TESTING

My first reaction when given the assignment to speak on "Audiometric Testing" was, what in the world can I say to those people about audiometric testing that they don't already know. I felt that the nurses had no doubt already attended a special certified course in audiometric testing and the doctors, though they probably are not able to turn the equipment on and off, only need the audiograms that we have prepared for their interpretations. But after giving it some thought I realized that we all likely had different instructors and, too, there is always something new we can learn even if it is only a review of what we have already had.

I won't attempt to discuss the mechanics of the equipment because we likely all use different types of instruments and, anyway, this is not of particular importance. The important point for the audiometric technician to

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remember is that no matter what type of instrument is used, the purpose is the same - to measure hearing acuity for certain required frequencies.

Ideally, the room used for hearing tests should be a soundproof booth which is prepared especially for this purpose. Since this is not always possible, the environment in which the tests are performed must be sufficiently quiet so as not to interfere with testing procedures. These test rooms should be located in as quiet a place as possible, preferably within practical access but away from outside walls, elevators, heating and plumbing noises, waiting rooms and busy hallways. Acoustical treatment of audiometric rooms may prove to be a difficult task, but nevertheless some acoustic materials are of great value and it can be added to present existing rooms.

The next thing is to see that all equipment is in exeellent working condition. The audiometer itself should be kept in perfect calibration and all parts checked regularly to be sure they are all working properly. It may be necessary to have it calibrated every six months, but certainly at least every year. The technician should check the audiometer for accuracy once each week by comparing with her own hearing for a number of frequencies for which she has learned her own decible threshold; then, at the beginning of each day, the audiometer should be turned on for the day and checked to assure proper operation. Each earphone should be checked at this time. Once the machine is turned on at the start of the day, it should be left on rather than turning it off after each examination. In this way, there is no warm-up period required and it is always ready to use even though I know that instructions on some of our newer machines state that they do not require any warm-up period.

Frequency of individual audiograms depends upon various situation. Pre-placement audiograms should test hearing threshold for both ears at frequencies of 500, 1000, 2000, 3000, 4000 and 6000 cps which are the only frequencies we are to be concerned with in our screening audiograms. The primary purpose of the pre-placement is to establish an auditory baseline. Frequencies of 500, 1000, and 2000 are speech frequencies. When beginning a test, we should start with 1000 cps, then 2000, 3000, 4000, etc.; then go back to 500 since this is the frequency hardest to hear. Start with 40 db. at 1000 cps for instructions, then decrease the decibels to the employee's threshold for recording. Subsequent audiograms utilizing the same frequencies should be obtained as deemed necessary by the physician. These are made to provide a record of possible changes in hearing due to accident, disease, age,noise exposure, etc. The frequency of follow-up audiograms will generally be related to the type and intensity of noise exposure or the medical code.

The final audiogram is never better than the care exercised by the technician in obtaining the audiogram; therefore, proper preparation of the subject is important. It is most important that the technician establish good communications with the individual being tested to make sure he understands the test and responds as he has been instructed. The headphones must be properly placed over the ears by the technician personally who can adjust them to fit each subject's ears properly. All obstructions such as ear rings, hair, eye glasses, etc. should be removed before the test. Audiometric earphones should never be held in place by the subject's hands because equal pressure should be maintained throughout the entire audiogram. Also, any movement of the hands on the earphones generates undue noise under the cushions. You could

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suggest that the employee might be able to concentrate on the various tones better if he closes his eyes or looks down at the floor. This eliminates distraction and promotes a more accurate threshold score.

The environment in which the test is made should be conducive to reassuring the employee. The technician needs to be relaxed, unhurried and instruct the employee in a calm, unhurried manner. The subject to be tested should be positioned away from and not facing the control panel. Watching the expression on his face often tells the technician if the employee is hearing and responding as instructed. Explain the test, tell him that he will hear tones of various degrees of loudness and pitch. It might be helpful to sweep the dial to different tones before starting the test to familiarize the employee with the frequencies. Using the hand signal on the audiometer, raising the finger or answering verbally for the response is a matter of preference, convenience or availability as long as the individual understands and responds as instructed. Personally, I like for the employee to signal by raising his finger when he hears the tone. In this way any question as to whether or not he is actually hearing the tone can be detected by the manner in which he holds up his finger. For instance, if he hesitates or raises his finger slowly, it is obvious that he is not sure he is hearing the tone.

The technician should obtain a good accurate history including previous and continuing noise exposures such as the use of firearms, driving tractors, racing cars, flying, or other noisy vehicles; personal history of ear infections, surgery, injuries, perforations of the tympanic membrane, medications or anything that could affect the employee's hearing, as well as a family history of deafness.

The record of final audiogram is very important and should be signed in ink by the technician the same as she signs other medical records. These audiograms should be regarded in the same manner as any medical record and the technician should understand their significance. No corrections or erasures should be made on the final audiogram as this is a permanent record. It is essential to record on the form whether or not the test was plotted by ISO or ASA Standards in order to make a correct interpretation of the audiogram. Most of our equipment is calibrated by ISO today and the American Standard is seldom used. Audiograms should be kept indefinitely as they may be needed for basis of fair settlement of claims. These are important factors in the audiogram records, particularly in case of a lawsuit. However, though it is important that the technician have a special certified course in audiometric technology, a physician's examination who is specialized in audiology would be required for compensation suits. The nurse technician would be questioned only on the type of examination given, what experience she had had in audiometric testing, what formal training she had had and who her instructor was.

From the audiogram and the history obtained by the technician, the physician interprets the degree of hearing impairment and the individual's susceptibility to noise exposures. He then makes his recommendations to the other persons concerned. These recommendations may be a job change for the employee, engineering changes to control noises, ear protectors, instructions to the employee or consultations with the supervisor. It is, therefore, evident that much of the success of a hearing conservation program depends on a well trained, knowledgeable audiometric technician.

F. A. JOHNSON

COMPENSATION FOR HEARING LOSS

When I told Dr. Sinclaire that I would be happy to discuss compensation for hearing loss with your group, I thought the subject would be one which would not be complex. My initial reaction was to take the New York Workmen's Compensation Law and discuss with you how hearing loss claims were adjudicated. When I began studying the New York Act, I found that it varied considerably with the California Act with which I was familiar. Only then did I realize that Mobil had not had a hearing loss claim in the four years that I had been in New York.

I am sure that you all know that workmen's compensation is a state administered program. It may be difficult for you to believe, but it is true that no two of our 50 great states treat workmen's compensation or occupational disease laws in precisely the same manner. While Mobil does have some operations in all states except Hawaii, time would not permit a discussion of the way hearing loss cases are decided in each jurisdiction. Therefore, I thought it would be more meaningful if I first gave you a brief history on the subject and then discuss in rather broad terms the highlights of hearing loss adjudication in a few of the states where we have large concentrations of employees.

I began handling workmen's compensation claims a little over 20 years ago. If I had been asked to discuss compensation for hearing loss in 1950, I could have covered the subject in a matter of a couple of minutes. At that time, compensation for loss of hearing or tinnitus was paid only where a specific trauma could be proven. Most commonly, there were explosions or blows to the head. By 1950, the medical journals reported very little information regarding hearing loss as a result of industrial exposure to noise. The few papers dealing with this subject written by leading otolaryngologists and environmental health officers were generally ignored by those in the industrial medicine field and certainly ignored by those of us who were handling claims, as well as by adjudicating officials of the various state agencies. Parenthetically, I might say that the then Socony-Vacuum Medical Staff were on top of this problem.

This was all changed in December 1953, when the Wisconsin Supreme Court upheld the state industrial commission decision which allowed compensation to a drop forge operator, Albert Wojcik, aged 60, who claimed that his work caused partial loss of hearing. Since 1919 the Wisconsin Occupational Disease Act provided coverage for ANY occupational disease. Not until 1950, however, did anyone try to collect for impairment of hearing which did not result in loss of time or wages, i.e., a specific trauma.

In 1950, a Milwaukee attorney filed 450 claims involving partial loss of hearing on behalf of employees who were members of Local 509 of the AFL Boilermakers Union. In 1952, the industrial commission chose the case of Wojcik to test the law. The commission awarded Wojcik $2,429 for a 13.5% loss of hearing caused by "excessive noise in his occupation".

Following the decision in the Wojcik case, other Wisconsin attorneys began filing similar claims on a wholesale basis. The Wisconsin commission realized

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that the claims they were receiving were being filed by members of certain labor unions who were still actively engaged in their normal occupation. Accordingly, the commission sought the advice of the Medical Subcommittee of the Advisory Committee on Workmen's Compensation Legislation. On April 5, 1954, that committee advised the commission that it subscribed in principle to the statement of policy of the Academy of Opthalmology and Otolaryngology which is as follows:

> "Hearing loss produced by prolonged exposure to loud noise may be considered permanent if it still persists after the individual has been removed from the noise environment for the period of six months."

The Wisconsin legislature in 1954 accordingly amended the act as it pertained to compensation for occupational deafness. The 1954 amendment provided that the maximum award not exceed $3,000 in the aggregate from all employers. This amount has subsequently been increased to $3,500. The amendment further provided that no benefits shall be payable for temporary total or temporary partial disability for loss of hearing due to prolonged exposure to noise. Further it provided that no claim shall be filed until six consecutive months of removal from noisy employment and that no payment shall be made to an employee unless he shall have worked in noisy employment for a total period of at least 90 days for the employer from whom he seeks compensation. Further, the act now provides that an employer shall become liable for the entire occupational deafness to which his employment has contributed; but if previous deafness is established by a hearing test or other competent evidence, whether or not the employee was exposed to noise within the six months preceeding such test, he shall not be liable for previous loss so established, nor shall he be liable for any loss for which compensation has been previously paid or awarded. In other words, if an employee had received an award for a hearing loss of 10 per cent from a previous employer and a claim were filed against a subsequent employer and it was found that the employee now had a 20 per cent loss of hearing, the subsequent employer would only be assessed for the remaining 10 per cent loss. Further, if an employer, as part of a pre-employment physical examination, took an accepted type of audiogram which disclosed a hearing loss, he would only be responsible for any further loss of hearing while the employee was in his employment. The legislation also provided for the claimant emjoining previous employers.

New York's Occupational Disease Law is patterned very much after that of Wisconsin and was enacted about the same time as the amendment to the Wisconsin act.

A unique factor in the New York act provides that a hiring employer, who at the time of pre-employment medical examination, finds upon taking an audiogram that the new hire has a hearing loss, he must notify the previous employer, as well as the employee, of the results of the pre-employment audiogram. Failure to do so makes the hiring employer completely responsible for the entire hearing loss should the employee file a claim against the new employer. I'll pass around a copy of the notice Mobil sends out, as well as one I took out of our files at random which happened to be from Eastern Airlines.

Most states permit the most recent employer to enjoin past employers. This takes time and delays action before the adjudicating body. Attorneys who

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represent claimants have become aware of this and file claims against all previous employers along with a request that the actions be joined.

A few years ago Mobil in California was joined along with 27 other employers by an applicant who was claiming loss of hearing. Our investigation revealed that the claimant had indeed worked for Mobil for a period of just over 6 years in the late 20's and early 30's as a boilermaker in a tool shop we used to operate in Vernon. Three or four employers were dismissed from the action on the grounds that the applicant's employment by them did not expose him to high noise levels. I don't recall all of the employers, but one was a service station owner and one was a slaughter house. I've wondered about this latter employer being dismissed. Anyone who has driven by a slaughter house and heard the pigs squeeling will know what I mean.

Well, obviously, Mobil was held in. In the 20's and 30's no one ever thought to take a noise survey of their plants and probably there wasn't the equipment to do it. We had to admit he was a boilermaker and that did it.

This particular claimant was 65½ years of age when he filed his action. He had commenced working as a boilermaker helper when he was 18 years of age. His employment in a high noise level type of work was computer at 44 years and Mobil's 6 plus years required us to pay 13% of his combined loss of hearing - which was not total. We paid the claimant $620. Most of the states follow the California pattern in that an employee claiming hearing loss due to excessive noise can file against all of his previous employers, or, should he not do so and bring an action against his most recent employer - that employer can enjoin the previous employers.

Presbycusis is treated differently by the various states. The New York act specifically states that presbycusis shall not be considered in evaluating hearing loss due to prolonged exposure to excessive noise. The Missouri act, on the other hand, provides that in determining the corrected average hearing level there shall be deducted from the average hearing level ½ decibel for each year of the employee's age over 40 at the time of his last exposure to industrial noise. The Maryland act was amended in 1967, its language being identical to that of Missouri. The Texas act states, "since there is no exact scientific test by which non-industrial hearing loss can be distinguished from induced impairment, the opinion as to the amount of loss due to such other causes shall be made by the examining medical specialist." Several states, California among them, have no such language in their law but nevertheless allow the principle of hearing loss due to presbycusis. At the moment the New Jersey legislature has under consideration a bill which would provide language almost identical to the Missouri act.

In reviewing the various workmen's compensation laws dealing with the subject of hearing loss, I find that in most of the states east of the Mississippi the use of a hearing aid cannot be taken into consideration in computing industrial hearing loss. The language of the New York act is typical: "The improvement resulting from the use of a hearing aid is too variable to warrant its consideration as a corrective factor and any benefit which might be obtained in an individual case from the use of a hearing aid should not be considered in arriving at a percentage of hearing loss or disability." The Pacific Coast states, on the other hand, allow credit for improvement in hearing loss due to

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use of a hearing aid.

Earlier, I mentioned that many of the states' laws followed the Wisconsin act which required that an employee be removed from industrial noise environment for a period of six months before a determination is made of his hearing loss. The three Pacific Coast states, however, do not have this requirement. An employee can claim and receive benefits for loss of hearing while still employed in a high noise level occupation. As a matter of fact, we now have a case pending in California - involving a compressor plant operator - who has a demonstrable hearing loss which the otolaryngologist attributes to his occupation. He can be given a permanent partial disability by the California Board. Should he, at some future time, have an additional loss of hearing - and assuming he is still performing the same work for Mobil - he could file another claim and receive the difference between the first rating and the amount later found to be attributable to his occupation. Fortunately, we have only a few hearing loss claims a year in the North American Division where we have nine field claim offices. Each field claim office has responsibilities for more than one state. Whenever these claims arise it is necessary for the field claim manager to review the latest changes in the law in the state where the claim is filed.

Only a few states publish workmen's compensation statistics or adjudicated claims. In January 1970 the New York Workmen's Compensation Board published their report on compensated cases closed in 1967. That report reflects that 90 cases involving hearing loss were closed during that year and that compensation totaling $206,076 was awarded. This averaged $2,290 per case. During the same period California reported 337 cases disposed of. They do not, however, publish the amount of compensation awarded. As these states have comparable benefits, it is estimated that approximately $770,000 was paid out for hearing loss claims in California during 1967.

I have often heard it said that Medicine is not an exact science. From my remarks, I am sure that you will agree that the same can be said of compensation for hearing loss.

Now that we have had our coffee, let us reconvene. We will now have a panel entitled FITNESS TO RETURN TO WORK. Its chairman is Dr. Robert J. Potts, who is Regional Medifal Director for the Western Region. Dr. Potts' panel speakers will include Dr. J. R. Meredith, Plant Physician, Paulsboro Refinery, R. A. Eskeaen, Clinician, New York Headquarters and Dr. James K. Stewart, Plant Physician, Beaumont Refinery.

J. R. MEREDITH, M. D.
ORTHOPEDIC FITNESS TO WORK

I INTRODUCTORY REMARKS

Some people say that the best way to understand a disease is to get it yourself. If I were to ask for a show of hands of those in this room who have had

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a low back problem, bursitis of the shoulder, a torn meniscus of their knee, a tennis elbow, or fractures, many of you might develop a sore shoulder now from raising your arm. Perhaps my only qualification for giving a talk on orthopedic problems this morning is that I happen to have had all of the aforementioned diseases.

Indeed, orthopedic problems are exceedingly common, understandably quite so in this country. A commentary on "Modern America" which impresses me is that we are OVERFED, OVERSTIMULATED, OVERPROTECTED, and (this last one is a big key to our orthopedic lives) UNDEREXERCISED. I'm sure I also bring this qualification to today's talk. Seriously, I am no expert in Orthopedics, but at Paulsboro, especially at the Refinery where the average age of the workers is over 50 and the work is physically demanding, we see our share of orthopedic problems.

As I go along you may wish to follow on the outline. Treatment I will skip over completely for reasons of time and pertinence.

II TYPES OF ORTHOPEDIC PROBLEMS

After touching briefly on the overall categorization of orthopedic disease we'll move on to the common industrial orthopedic problems and then concentrate a little on low backs.

A. General Categorization

Categorizing orthopedic problems could be done in two ways.

(1) Area involved. We could categorize by the area involved: shoulder problems, back problems - purely an anatomic sorting.

(2) Etiology. Or we could categorize by etiology and use the following five baskets: infectious, tumor, systemic, mechanical, congenital. Examples would be: of infectious - TB of the hip; of tumor - osteogenic sarcoma; of systemic - rickets; of mechanical - fractures, strains or sprains; of congenital - talipes equinovarus (alias club foot). Such an etiologic categorization is quite workable, but it has it drawbacks. For example, it fragments disease families like Arthritis; osteoarthritis would best be put in the mechanical basket, gouty arthritis in the systemic basket, and gonococcal arthritis in the infectious basket.

B. Common Orthopedic Problems

Let's procede, please, to an enumeration of some of the most common orthopedic problems we are now seeing in our industrial work. By far, most of them are in the mechanical category. I mention the following:

(1) Low back problems - I'll address myself in more detail in a minute to this universal problem.

(2) Bursitis of the shoulder - rather a collection of entities.

(3) Radiohumeral bursitis - a tough one to cure in many people, and

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understandably so, when you consider the instability of the radio-humeral joint: flexion - extension, pronation - supination.

(4) Internal derangement of the knee - this is usually a torn medical meniscus, torn at times by the most innocent trauma.

(5) Various arthritides.

(6) Fractures and sprains.

C. Decompensation of the Back

I hate to talk further about the low back problem because it is indeed a disquieting subject. But it is here to stay. And there is a concept that is useful for handling most low back trouble. I'm not referring to the back problem caused by TB or neoplasm, or by compression fracture of a vertebral body, or by severe degenerative change, or by herniated nucleus pulposus (alias ruptured disc). I am referring to the large number of low back strains to which numerous terms have been applied. Lumbosacral strain is a common one and easy to use.

The term or diagnosis I like is "Decompensation of the lower back." It's unwieldly but descriptive pathophysiologically. We must start with the concept that an organ or functional unit of the body has at any point in time a limited capacity. The peak demands on such a functional unit are usually considerably less than its capacity. We say in such a situation that the unit or organ is compensated. We call the difference between peak demand and capacity, that extra margin so to speak, the reserve. The heart, lungs, brain, liver, abdominal wall, and other parts of the body have in most people a high reserve. They are not readily decompensated during young and middle life. Many backs, however, have very little reserve. They are easily decompensated in the face of an extra demand.

The next step in this concept of decompensation is that the capacity of some parts of the body will increase with regular use and decrease with disuse. More vernacularly, a part or system of your body can be in shape or out of shape. So, in low back problems we often start with a human back that has very little reserve to start with (it is a mechanically inefficient part of the body); then we find that the reserve is lessened by disuse and poor posture. There may or may not be some congenital osseous defects which compound the problem of mechanical inefficiency.

We add to all this the precipitating factor of a peak demand and something's got to give. This is a pull or stretch or tear of the low back structures. Hence, pain from tissue edema and muscle spasm. This is strain or "Decompensation of the back." Before I close I'll refer briefly to its cure and prevention.

III EVALUATION OF ORTHOPEDIC PROBLEMS

Evaluating a presenting orthopedic problem can be very difficult.

A. History

A large piece of one's evaluation is based on history, and this

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is obtained from numerous sources:

(1) From reports from the treating physician, or other than the company doctor. The telephone is usually the most efficient pathway to additional information from this source.

(2) From employee's record - not at all infallible, however.

(3) From the employee directly. Here we are at times over the subjective barrel (especially in orthopedic cases), but we can find some pegs on which to hang solid judgment if we dig more deeply. In spite of space age technology more diagnoses can still be made by history alone than by examination alone or by tests alone.

The employee's psychologic needs usually must be understood to diagnose or to treat effectively. Sometimes, because of the pressure of time or because of our own emotional imperfections, we, the professionals, can see only what we want or need to see. We never have trouble, however, seeing some of the miraculous cures that sometimes occur when half-pay starts.

B. Physical Examination

History completed, now an examination. The following might be the instructions to a new doctor:

(1) Inspection - observe gait and stance and agility. In back cases look for kyphosis, lordosis, scoliosis, pelvic tilt, swelling, etc.
(2) Palpate for atrophy, tenderness, spasm, crepitus, etc.
(3) Measure leg length, extremity circumference, etc.
(4) Determine range of motion of joints; estimate pain; note catching.
(5) Test motor function.
(6) Test for sensory loss.
(7) Test certain reflexes.
(8) Observe specific functions which will be required on the job such as squatting, bending, gripping.
(9) Determine joint stability, such as in a knee joint which has torn collateral ligaments.
(10) Perform certain specific tests. For back problems there are a number, each with variations and with different proper names. For example, raising the leg straight up (the hip flexed and the knee extended) is straight leg raising on Kernig's sign. In the case of compression of a nerve root, as by a herniated disc, this can cause localized back pain. Lasegue's sign is basically Kernig's plus a dorsiflexion of the foot when leg is raised straight and then a comparison of the response to a flexion of the thigh without straightening the leg (the jack-knife position).

C. Radiograph

An x-ray is a diagnostic tool that is invaluable in many orthopedic problems, but it can be very misleading and very overrated in some situations. For example, in case of low back problems there is a high percentage of false positives and of false negatives, and there is a definite limit to the correlation between radiologic findings and either current or

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future clinical pathology. Why? Because such a large proportion of low back trouble is decompensation, involving soft tissues. All of this could be an argument for not routinely taking L-S spine x-rays at the time of pre-employment examinations..

D. Laboratory Tests

There are laboratory tests which might be helpful in certain evaluations; uric acid, to mention one.

E. Orthopedic Consultant

Since we are talking about cases with elements of chronicity and/or Workman's Compensation, we at Paulsboro make good use of the local Orthopedist for diagnosis and treatment.

So now we have the orthopedic problem evaluated. We have a diagnosis and an estimate of functional capacity. We may also have some anticipation of possible changes in functional capacity, maybe increased in the case of the employee who has room for further rehabilitation, maybe decreased in the case of a degenerative problem. We are ready to consider the employee's return to work. Let's look at his job.

IV PHYSICAL STRESS OF A JOB

Evaluation of the physical demands of an employee's job is nearly as important as evaluating his health. There are orthopedically stressful jobs and within a given job there are orthopedically stressful tasks. In our work population of 2500 at Paulsboro we have a wide assortment of jobs. In the Refinery there are jobs which call at times for high ladder climbing to inspect a unit, others which require working in a cramped space in a twisted position. There is heavy work to be done, also lots of squatting and bending. Background knowledge of these jobs comes from experience. One good course of this experience is a visit to the units, both while they are running and while they are on shut-down for maintenance. Another good source of experience is taking every opportunity in conversation with an employee to learn the details of his job. A call to or from the employee's foreman will fill in many details on the physical demands of a job.

V RETURN TO WORK CONSIDERATIONS

There are different hats a doctor or a nurse must wear at different times in the industrial field. They all get on our heads usually when we involve ourselves in an orthopedic problem. The following are occupational medical considerations when we return employees to work:

A. Immediate Productivity

Our number one goal is to return the employee to as much production as possible, for the sake of the company and of the individual's mental health. No one concerned is truly happy with a protracted inability to produce.

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B. Long-term Result

However, we must take the long look down the line to future productivity and function. Sometimes immediate productivity does well to take a back seat to the long-term result. Our long-term care often includes physiotherapy and psychotherapy.

C. We should give thought to the safety of the employee and his fellow workers, as well as to the safety of the company and the community. If a man has an impaired grip, for example, there are places he just should not be working.

D. Comfort

Comfort is a factor to be reckoned with, but some times there is no way to achieve increased orthopedic function without pushing through a period of discomfort.

E. Workman's Compensation

Workman's Compensation complicates some of our decisions and often flavors the attitude of the recovering employee.

F. Lost-time Record

Preservation of lost-time records can press too hard on our decisions at times, if we let it.

G. Morale of Work Force

Morale of the work force can be affected by some return to work decisions. Many employees are unhappy if a fellow-employee is not carrying his share of the load; others' attitudes are affected by seeing someone on the job who is in obvious distress.

H. Morale of Local Management

Last, but not least, the morale of local management can at times be affected by overprotection of health problems on our part.

VI RECOMMENDATIONS TO MANAGEMENT

So we understand the orthopedic problem, we understand the job requirements, we have considered the many ramifications of our recommendations to management. What can we recommend?

A. Not to Return to Work Yet

First, we might decide that the man should not yet return to work, in spite of his wishes or the opinion of an outside treating physician. Further evaluation or rehabilitation might be in order.

B. Job Change

Another course of action occasionally recommended is a job change. The possibilityof a change may be limited by these factors: lack of skill; local management's needs, and the union's position.

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C. Severance

A third course of action, even more infrequent, is severance. This might be under a disability plan, by early retirement, or by just plain severance.

D. Return to Work

Finally, and most commonly, we might recommend return to work. This could be to regular duty or it could be to restricted duty.

VII RESTRICTED DUTY

The problems attendant to work restrictions are by no means small for management.

A. Factors in Management Acceptance

The degree of cooperation with our recommendations on work restrictions depends on the job, the department, and local management's overall economic situation. For example, the Research and Development Corporation whom we service, can readily provide light duty for almost any of their employees. The Refinery, on the other hand, is extremely limited in the opportunities they can provide for light duty. Often a factor that determines managements's interest in taking a restricted-duty man back is the length of the restriction. When we can tell them that the man will be able to do more in a few weeks and that it is part of his rehabilitation to work gradually back to good productivity, they can invariably live with this.

B. Form CO-1873

Among the hand-outs you will see a copy of Form CO-1873 which we use at Paulsboro to make our recommendations on work restrictions. In orthopedic cases the blocks we check most commonly are Weight for Lifting, Bending, and Ladder Climbing. After the block "Other" we might write in something like Squatting. The restrictions are qualified and quantified as much as possible. They also are given time limits so that management has a basis for planning and so that we force ourselves to review the problem at appropriate intervals. The time interval for these reviews runs from one day to one year.

VIII REHABILITATION AND PREVENTION

Handling the immediate orthopedic problem is our main job, but achieving maximum orthopedic function and maintaining it is also a goal. Therefore, we address ourselves to further rehabilitation and to prevention. Instruction sheets and booklets, such as you have with your outline, can be very helpful, but some individualized verbal suggestions can go much further. In the case of decompensation of the back we might lay out a set of gradual progessive exercises which an employee should follow in order to achieve full function. Then we would encourage him to continue and to increase his exercises to avoid overcompensation. In this way the reserve can be increased, hopefully avoiding further incidents of decompensation in the face of a peak stress.

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Then, finally, we usually climb up on our soapbox, take the long look at the health horizon, and start preaching. We talk about things like weight control, regular vigorous exercise, and cigarette smoking.

In closing may I observe that the human body is a unique machine. In many ways, the more it is used, the better it works.

R. A. ESKESEN, M. D.
FITNESS TO RETURN TO WORK
CARDIAC DISEASES

I think it is best for me, first of all, to present some case histories of patients we have met in the New York office to best illustrate fitness to return to work and its problems with regard to cardiac diseases.

This first patient was hired by Mobil as an engineer in 1934 and his health remained satisfactory until he was seen in March of 1969 when he was 55 years of age. At that time, he complained of pain in the right upper chest, anteriorly which he believed first occurred while shoveling snow. The pain would recur if he walked briskly and also in cold air and was relieved by rest.

His blood pressure was 152/94, pulse 60. The physical examination was negative, as was a resting electrocardiogram and chest x-ray. However, an exercise ECG showed S-T segment depression, and was considered positive. The diganosis was angina pectoris, he refused any treatment by us and was referred out to his own doctor.

On April 20, 1969, he was in Amsterdam. He developed sharp pains in the right chest, continuing for two days. He was therefore seen by a physician who examined him, noted a pre-systolic gallop and premature beats on an otherwise negative examination, but the electrocardiogram showed an antero-septal infarction.

He was hospitalized and given anticoagulants. His convalescence was complicated by an atrial flutter, but this was controlled with quinidine. After about six weeks hospitalization, at the end of May, he was mobilized. He left the hospital on the 10th of June and returned to the United States by sea a week later.

He returned to work on July 14, 1969, just short of three months following the onset of his illness. At that time, he was continuing anticoagulants and was on a low-fat, low-carbohydrate diet. His electrocardiogram showed evidence of an antero-septal infarction, his sed. rate was 3, and his physical examination showed him to be doing well.

He was allowed to return to work from 10 A.M. to 1 P.M., but only for three days a week for two to three weeks. Several weeks later, his own doctor did an exercise electrocardiogram and advised him there was still some damage. He was not to resume any exercise as yet.

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any physical activity without discomfort and even having symptoms at rest. The therapeutic classifications are class A, who need no restrictions in physical activity; class B, who are advised against severe activity; class C, with moderate restriction in ordinary activity; class D, with marked restriction in ordinary activity; and class E, who are confined to complete rest in bed or chair.

A patient who returns to work following a cardiac ailment is put through a complete physical examination with routine blood counts, urinalysis, Alkaline Phosphatase, True Glucose, BUN, Total Cholesterol, T4 and Uric Acid as well as a chest x-ray and ECG. If it is advisable, the patient is returned to part-time work for a while and his progress determined. Fleetmen are not allowed to go to sea if they are on anticoagulants and cannot be returned to duty unless they are capable of full-time work as there is no place for limited duty in the fleet. Certain jobs can entail a fair to large amount of physical effort and it may be necessary that the patient be restricted in his activities or given an entirely different job.

The patient's progress is evaluated at regular intervals, but it is often several months before full-time duties are resumed, even in relatively sedentary work. Travel limitations have to be individualized with each case, but usually we like to have at least a year of good health before we allow such patients to go overseas.

Thus, in evaluating fitness in return to work, our problems are mainly those of disposition and progressive evaluation. It is necessary to determine the patient's status and know his limitations in the job to which he is assigned as well as the psychological status. The latter is quite important because many heart patients have a severe neurosis marked by loss of motivation, alcoholism, disability benefits and relative ease of getting early retirement.

Over twenty years ago, the employee benefit plans were devised to give an ill employee a maximum of 12 to 13 weeks total disability coverage. This time period was aimed particularly at the coronary patient who required that amount of time to recover. Despite modern improvements in therapy and reduction in mortality, that period of convalescence still is necessary today.

Part-time benefits can last up to one year, depending upon an employee's length of service with the company. The disposition of employees who are still ill at the end of that time will be discussed in a paper this afternoon.

J. K. STEWART, M. D.
FITNESS TO RETURN TO WORK
RESPIRATORY PROBLEMS

The evaluation of the ability to work with chronic respiratory disease - just as with any other body system - requires an evaluation of the total man.

This starts with a complete history and physical examination, with special attention to the respiratory system. As a reminder of the details required, I have included an outline for your review.

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The commonest subjective symptom of respiratory dysfunction and the most frequent cause of pulmonary disability is dyspnea.

There are, of course, considerations and symptoms other than dyspnea which may contribute to the impairment in patients with respiratory disease and such factors may modify the patient's ability to perform the activities of daily living, but these are often difficult to evaluate. They include, for example: Malaise, fatigability, wheezing, excessive cough.

Because the evaluation of dyspnea enters into any judgment of pulmonary disability, it is important that we have an understanding of what is meant by dyspnea.

Dyspnea, or shortness of breath, is defined as a consciousness of effort in breathing - at a level of exertion - which in the patient's opinion is less than he thinks it should be.

From a subjective standpoint, dyspnea varies from an awareness of breathing to the extremes of respiratory distress.

The evaluation of dyspnea begins with the careful inquiry into the patient's symptoms and activities, particularly his response to exercise.

If you will, now refer to the work sheet - Pulmonary Function Evaluation.

In order to evaluate to what degree a person is limited by his subjective complaints of shortness of breath, a grading system was standarized as follows:

Grade of Dyspnea -

I. Only on severe exertion.
II. Can keep pace with person of same age and body build on the level without breathlessness, but not on hills or stairs.
III. Can walk a mile at own pace without dyspnea, but cannot keep pace on the level with a normal person.

IV. Present after walking about 100 yeards or for a few minutes on the level.
V. Present on slight exertion such as: dressing, talking, at rest.

There are some very simple tests of overall ventilary function that can be carried out in any physician's office.

We have listed these tests on the work sheet and will discuss each one, and then, later, show how these tests help us in evaluating (total) impairment.

The measurement of VC without the estimation of the rate of expiratory air flow is not of much value.

Therefore, if one is limited to a single peice of laboratory equipment, it should provide a graphic, permanent record of both flow and volume.

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Slide #1 - Vitalor - Here is a picture of a simple apparatus that we are using which we like because it was inexpensive, very easy to operate and easy to measure and calculate the results.

All of the measurements that we need for rating of pulmonary impairment can be obtained from the Forced Vital Capacity (FVC).

Slide #2 - This slide represents a normal FVC.

The Total VC or FVC is recorded in liters and Timed in seconds.

From the FVC, we are able to measure the Forced Expiratory Volume (FEV). This is the maximal volume that can be exhaled per unit of time (in seconds), It is recorded as:

FEV_1 (in seconds), FEV_2, FEV_3
In Liters/sec

The Predicted FVC and FEV_1 are obtained from standard charts.

The % Predicted of each $= \frac{\text{obtained results}}{\text{Predicted values}} \times 100$

The third important calculation to make from the FVC is the 1 second Timed VC%. (FEV_T%)

1 second Timed VC% $= \frac{FEV_1}{VC} \times 100$

A normal person is able to exhale about 83% of his Total VC during the first second, 94% during the first 2 seconds, 97% in 3 seconds.

It should be kept in mind that there is a wide normal range and a reduction in VC from the normal of predicted value should be in excess of 20% to be considered abnormal.

So, you will note that on our work sheet that minimal impairment and early exertional dyspnea begins below 85% of predicted normal.

Repeated VC's should check within 100-200 cc.

Slide #3 - as shown on this record.

Physiologically restrictive lesions are characterized by a decrease in VC without evidence of obstruction to air flow, such as pulmonary fibrosis, rheumatoid spondylitis, and congestive failure.

These slides illustrate the reduction in FVC seen in

Slide #4 - Fibrosis
Slide #5 - Myocardial ischemia
Slide #6 - Obesity
Slide #7 - Undiagnosed, but complaints of dyspnea, vague chest pains, and just not feeling well in a man up until 1 year ago had worked 30 years without an absence. He probably doesn't feel like working.

Reduction in VC may occur in so many diseases that it is not pathognomic of any single disorder and, indeed, does not necessarily signify pulmonary disease at all. On the other hand, it is possible to have pulmonary disability even though the VC is normal or near normal. This is commonly observed in pulmonary emphysema and may also be seen in patients with impaired diffusion.

As we can see on these slides:

Slide #8 - A normal Total VC, but definite evidence of obstruction. FEV_1, and 1" Timed VC%.

Slide #9 - Perfectly respectable tracing (on top) several months ago, but has been disabled recurrently with severe bronchial asthma - just returned from 3 months' absence - Look now (botton tracing).

Slide #10 - Nearly normal VC - but totally disabled with cancer of lung with metastasis.

In the presence of diffuse obstructive emphysema, bronchial asthma and air way obstruction, the speed of expiration is reduced. The quantity of air expired may be reduced also, but it is often near normal even in the face of moderate impairment of expiratory flow.

Consequently, the measurement of obstructive ventilatory defects are by measures related to air way resistance which is an expression of the ratio between pressure and flow.

These tests are:

(1) 1 second Timed VC%
(2) Maximal mid-expiratory flow (MMF)
(3) Maximal expiratory flow rate (MFFR) or FEF

We have already discussed the 1" Timed VC%.

Maximal mid-expiratory flow (MMF) - This is the measurement of the mean expiratory flow rate during the middle 50% of the VC. The first 25% of the effort is eliminated because it is encumbered by the patient's hesitation and spirometer inertia. The last 25% is eliminated because this is not a useful portion of the VC.

Measured in cc or liters per second. And, also time may be recorded (MMFT) in seconds.

A better test is the:

Maximal Expiratory Flow Rate (MEFR) - now called Forced Expiratory Flow (FEF) is the flow rate during expiration between 200 and 1200 cc. Measured from the point to where the FVC crossed the 1200 cc. line (Measured in L/minute). Normal 300-500 L/min.

Slide #11 - How would you like to have an MEFR of 500+ when you're 64? The 1" Timed VC% is also 99.75%.

The MEFR (FEF) and the FEV_1 are very similar. They both measure flow from roughly the same part of the forced vital capacity in liters per unit of time.

Slide #12 - Here is a case of obstructive disease with a fairly normal FVC, 81%, but with moderate reduction of the FEV_1 and FEF. You will note also that the 1" Timed VC% is reduced.

It should be recognized that reduction in these measurements do not necessarily indicate that the patient has obstructive air-way disease. Patients with restrictive lung and chest wall diseases without air way obstruction, characteristically have reduced forced expired volumes and commonly have a reduced FEF; however, the Timed VC as a % of the Total VC is usually normal or even high in these patients.

Slide #13 - Note that this obvious restrictive disease is verified by the normal 1" Timed VC%.

In contrast, patients with primarily obstructive air way defects have both reduced Timed VC as % of the Total and reduced FEF.

Thus, one should hesitate to diagnose obstructive air way disease from measurements of FEV_1 or FEF unless the Timed VC as the % is also reduced.

Slide #14 - Re-emphasizing obstructive disease with decreased Total VC is proven to be obstructive by a reduction in the 1" Timed VC%.

An effort to correlate the Timed VC, MBC, and MEFR (FEF) with the exercise tolerance of patients with obstructive air way defects suggest that the MEFR (FEF) correlates best with the exercise tolerance history of these patients.

MEFR's (FEF) of less than 50 L/min. result in a seriously limited patient.

Slide #15 - As in this case of severe obstructive disease with an FEF of 40L/min. Not improved with bronchodilators.

While patients with an FEF around 20 L/min become dyspnic with any activity.

Slide #16 - As this case of total disability who worked for several years not much better than this.

A marked decrease in flow rate is particularly serious, because it decreases the patient's ability to cough and to remove secretions from his air way.

Maximum Minute Volume (MMV) or the Maximum Breathing Capacity (MBC) is the amount of air that can be exchanged per minute by maximum voluntary effort, or is a measure of air flow velocity and also a test of endurance. The subject does not use his entire VC, as in simple expiratory flow measurements, but, instead, selects a somewhat smaller volume and is exhorted to ventilate maximally for 10 seconds. Because a satisfactory result is so dependent upon comprehension, muscle power, coordination, and general physical well being, this particular test is no longer in wide-spread use. - Slide #16

Slide #17 - Normal MMV or MBC which should be 100-200 L/min.

Slide #18 - Very abnormal MMV.

It is more apt to be reduced in patients with obstructive disease of the lung, such as pulmonary emphysema than in those with restrictive disease such as pulmonary fibrosis.

These tests can be understood by patients after a short explanation and instruction period, but most patients need to be encouraged to put forth their best effort.

Slide #19 - Poor technique such as this is usually seen in the FEV_1, FEF, and $FEV_T\%$, rather than the Total VC.

The FEV_1 and FVC should each be administered three times, recording the best of the three tests.

The MVV is a fatiguing test - better of two attempts is acceptable. However, the degree of permanent impairment can usually be established without the MVV test.

If the FEV test is interpreted as showing air-flow obstruction, the test might be repeated 5-10 minutes after the patient has inhaled a nebulized bronchodilator. If there is at least 15% improvement in the performance test, the possible reversibility of the air way obstruction, and, incidentally, the presumed efficiency of bronchodilator therapy, is established.

Slide #20 - This person, although tested on different dates, does show a good response to bronchodilators.

However, the best results of tests before bronchodilation should be used in determining the degree of impairment.

Results of tests of ventilatory function should be expressed in terms of liters or liters/min. and also as a percentage of the predicted normal.

With much experience, the experts in this field have gotten together and correlated the Grade of Dyspnea with the Class of Impairment and have established a percentage of impairment of the patient as a whole.

In establishing this Class of Impairment, they have taken the results of tests of ventilatory function as a percentage of predicted normal and correlated to the Grade of Dyspnea for us to use as a guide. These are compared and listed by classes on the work sheet. The AMA has established three guidelines. You will probably note that Grades of Dyspnea 4 & 5 are combined into Class 4 impairment.

The estimated work capacity, (which I have also added to the sheet) in my opinion, is more related to the Grade of Dyspnea than the % of predicted normal of the test of ventilatory function.

I would like to illustrate:

Slide #21 - A 54 year old labor helper with chronic obstructive and restrictive disease works regularly but, obviously, with less incapacity than tests indicate. Certainly, not sedentary work.

Slide #22 - Nor this 55 year old blender with chronic obstructive and restrictive disease. Also works regularly.

Study of 681 cases

Slide #23 - This slide summarized the 681 employees we have tested in the past 1 year. By using the % of predicted normals of the FVC and FEV_1, about 59% were considered to have no respiratory impairment, 25% had minimal impairment,

16% or 109 employees have moderate to severe impairment.

I'm not sure what this tells me, but Dr. Benjamin Burrows of the University of Arizona College of Medicine told the last AMA clinical meeting that the FEV_1 is a good basis for predicting the survival of patients with chronic air-way obstruction. In his series, about 47% of patients with the FEV_1 below 60% of predicted normal, were dead in 5 years.

Thus, we can see that:

The evaluation of a patient with regard to his ability to do work is a complex problem. Physical work required adequate function of the dynamic processes of the body, as well as another important factor, the motivation of the subject.

I don't want to fail to mention another important evaluation of ability to work, the Preplacement examination.

Slide #24 - Example of preplacement at the critical employment age of 45. Fortunately, this man was healthy and had good pulmonary function.

Slide #25 - Here is a case that we had to reject because of restrictive pathology - age 48.

Slide #26 - Another rejection - obstructive disease - age 45. And these tests were essentially the only positive findings on physical examination.

In conclusion, I hope that I have explained, and rather hurriedly, how the classification of respiratory impairment is based primarily on:

1. The degree of dyspnea - the commonest subjective symptoms of respiratory dysfunction.

2. The degree of impairment of ventilatory function - the easiest aspect of pulmonary function tomeasure.

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SLIDES
1-26

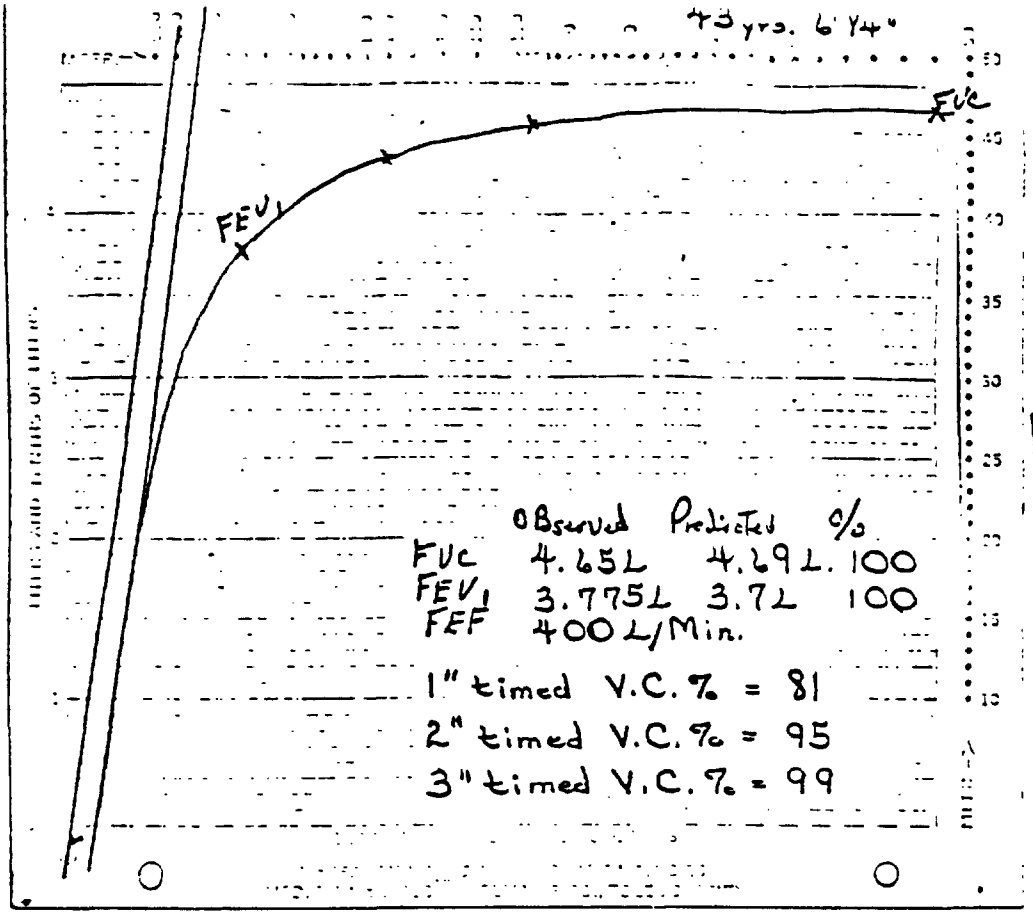
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Slide 1

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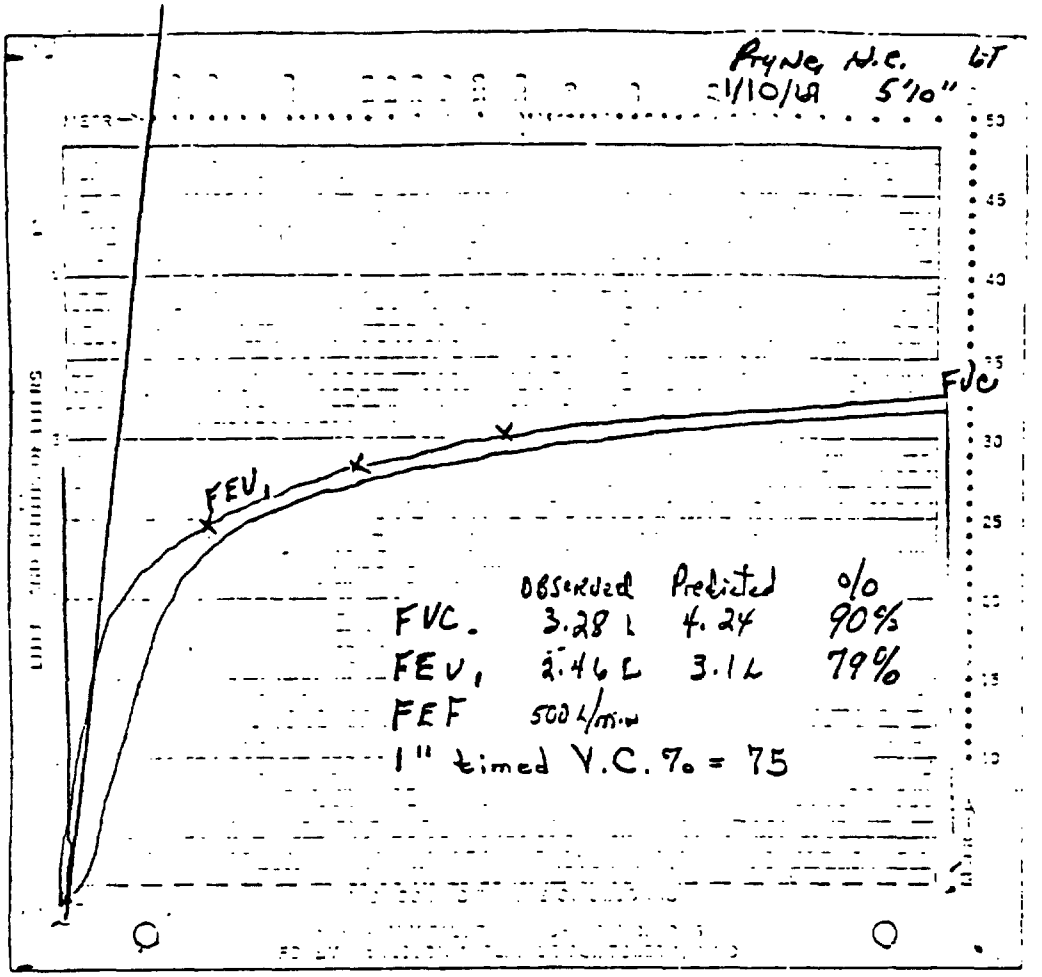


Non-smcki

Slide #2

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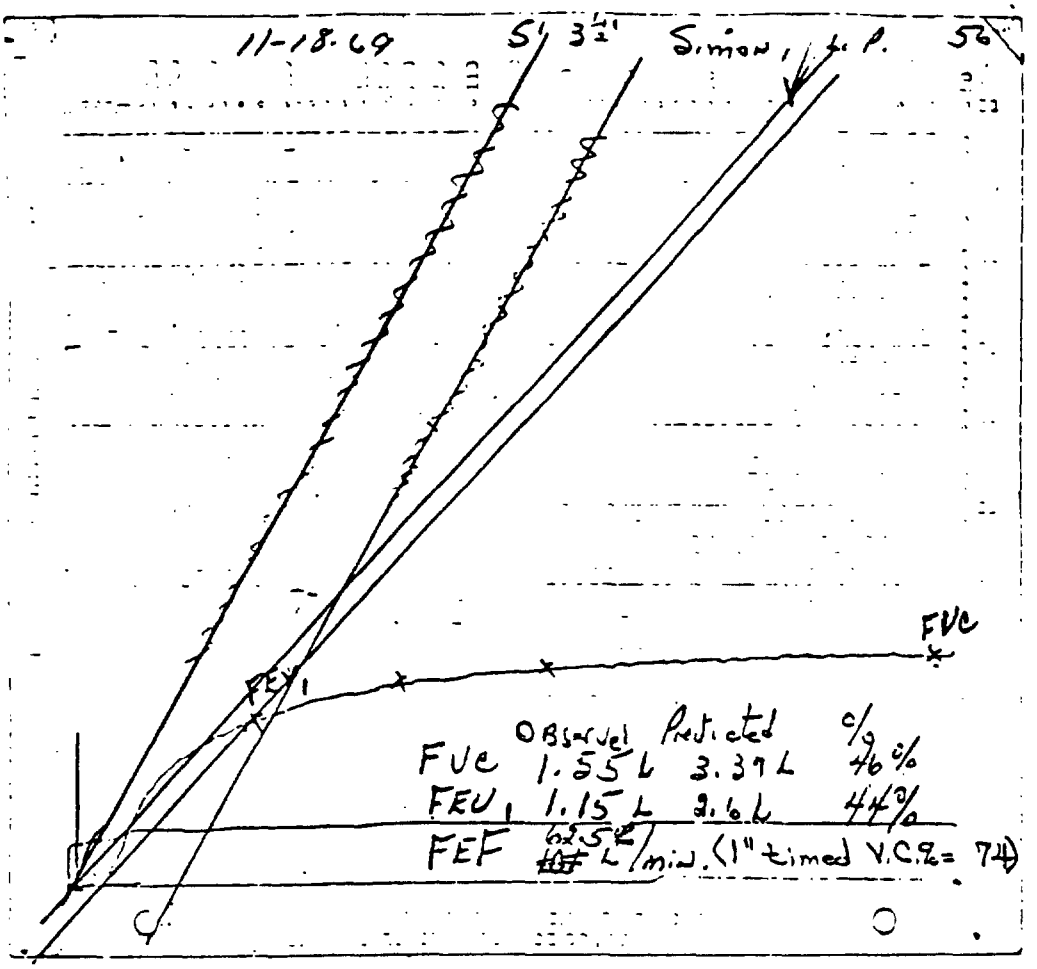


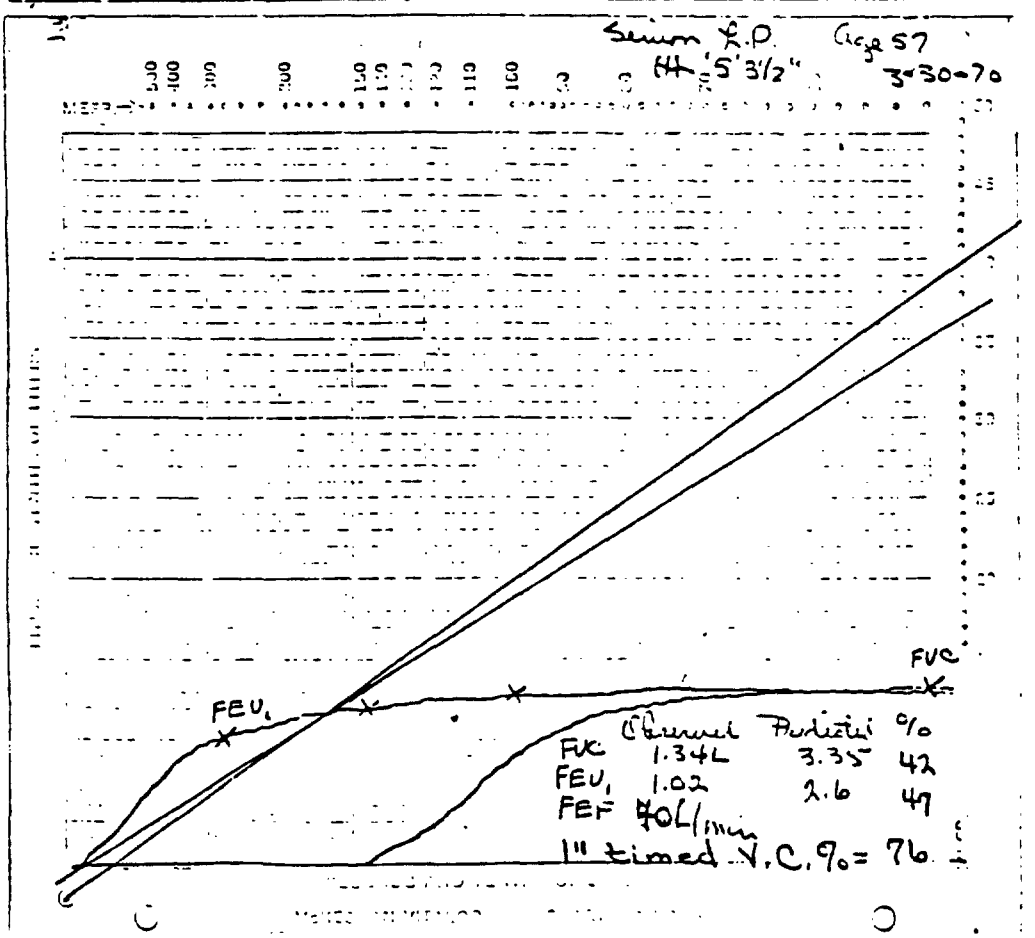
Smokes 2 pckgs. of cigs. / d.

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Slide #3

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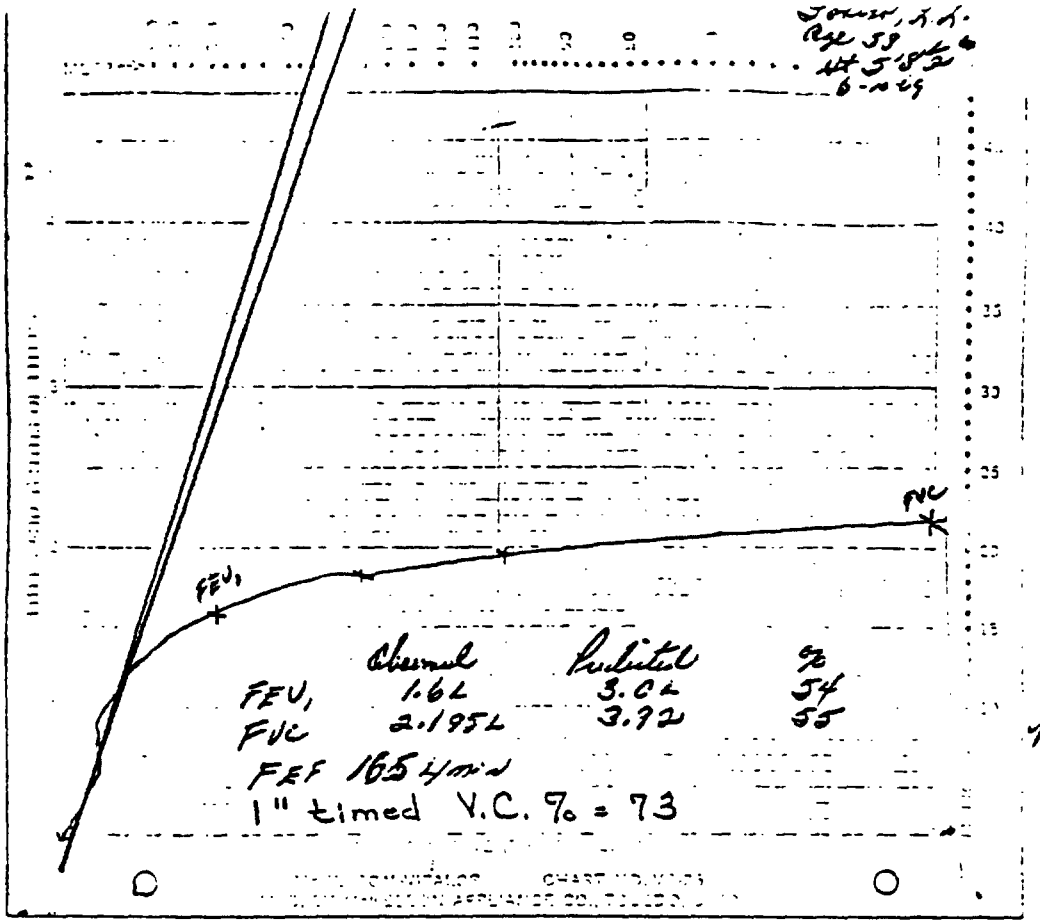
Smokes less than A package of cigarettes / day.

No tobacco since December 1969

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Slide #4

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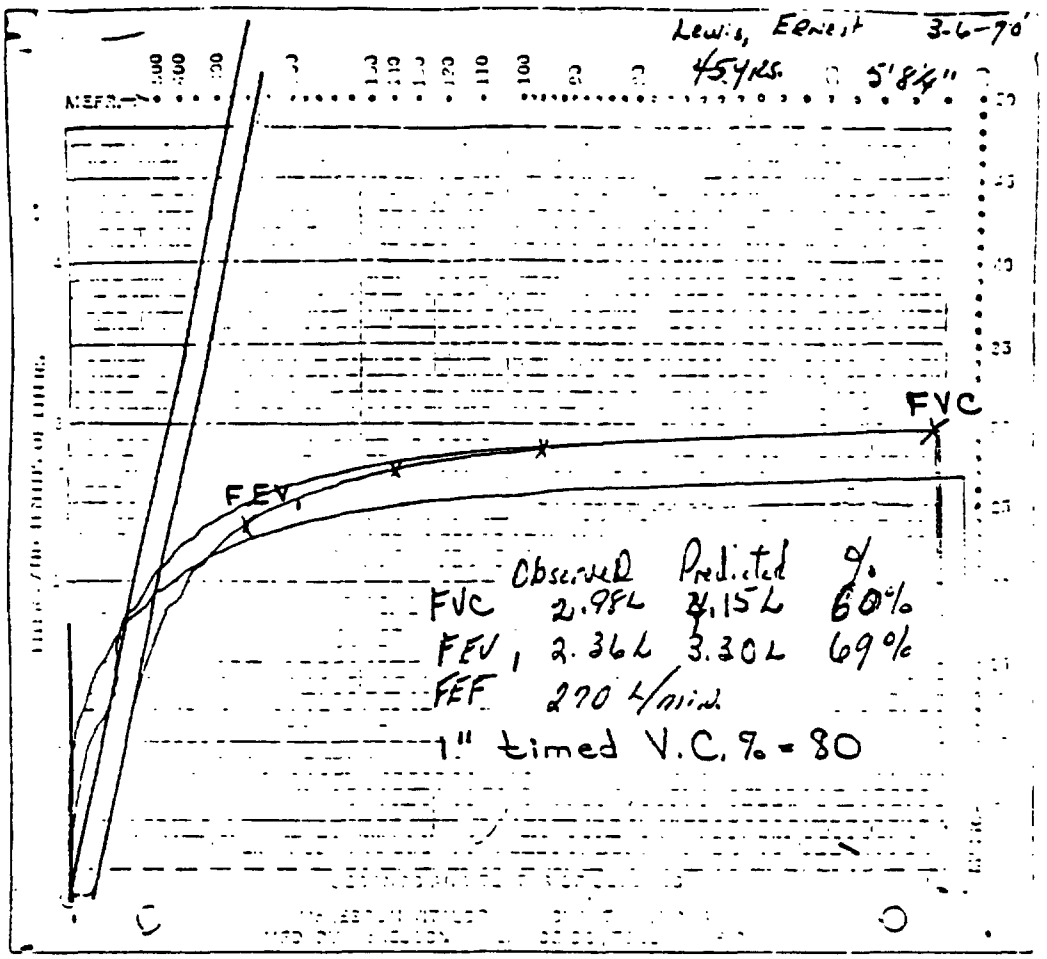


Non Smoker

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Slide #5

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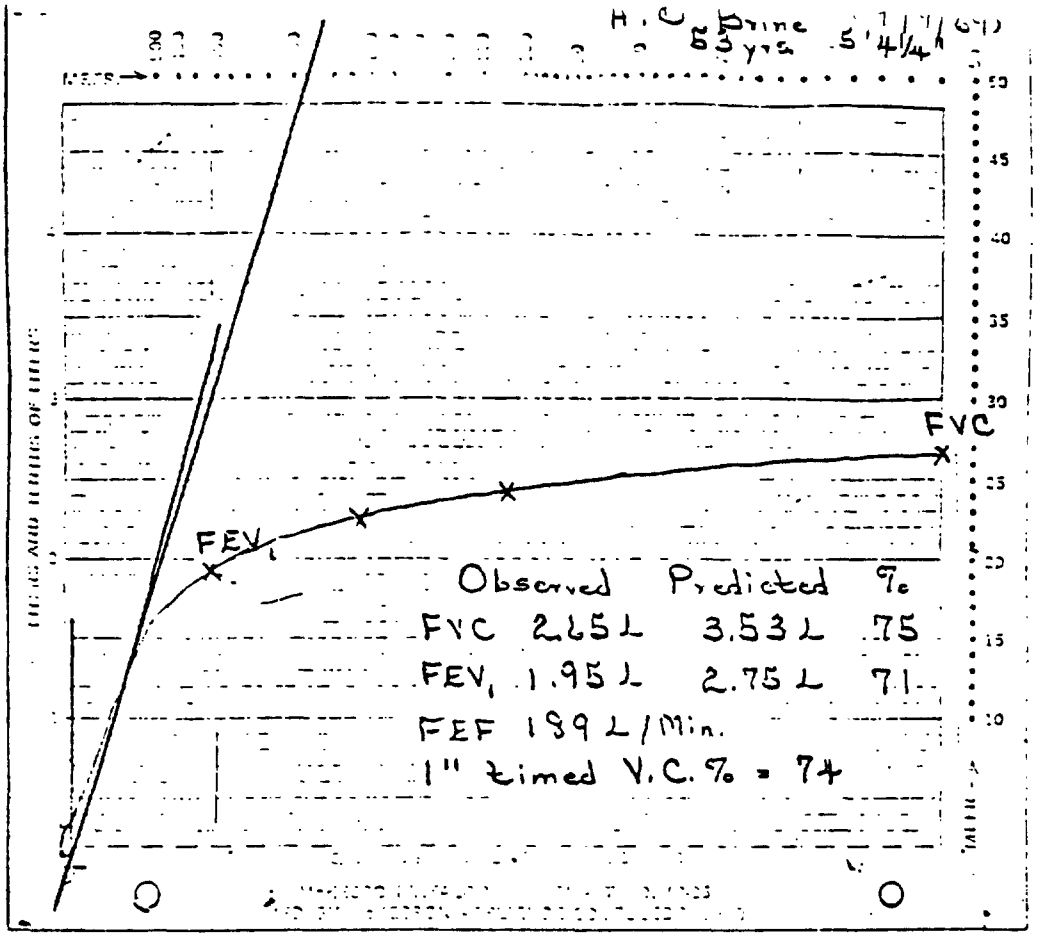


Smokes less than ½ pck. q. cig /da.

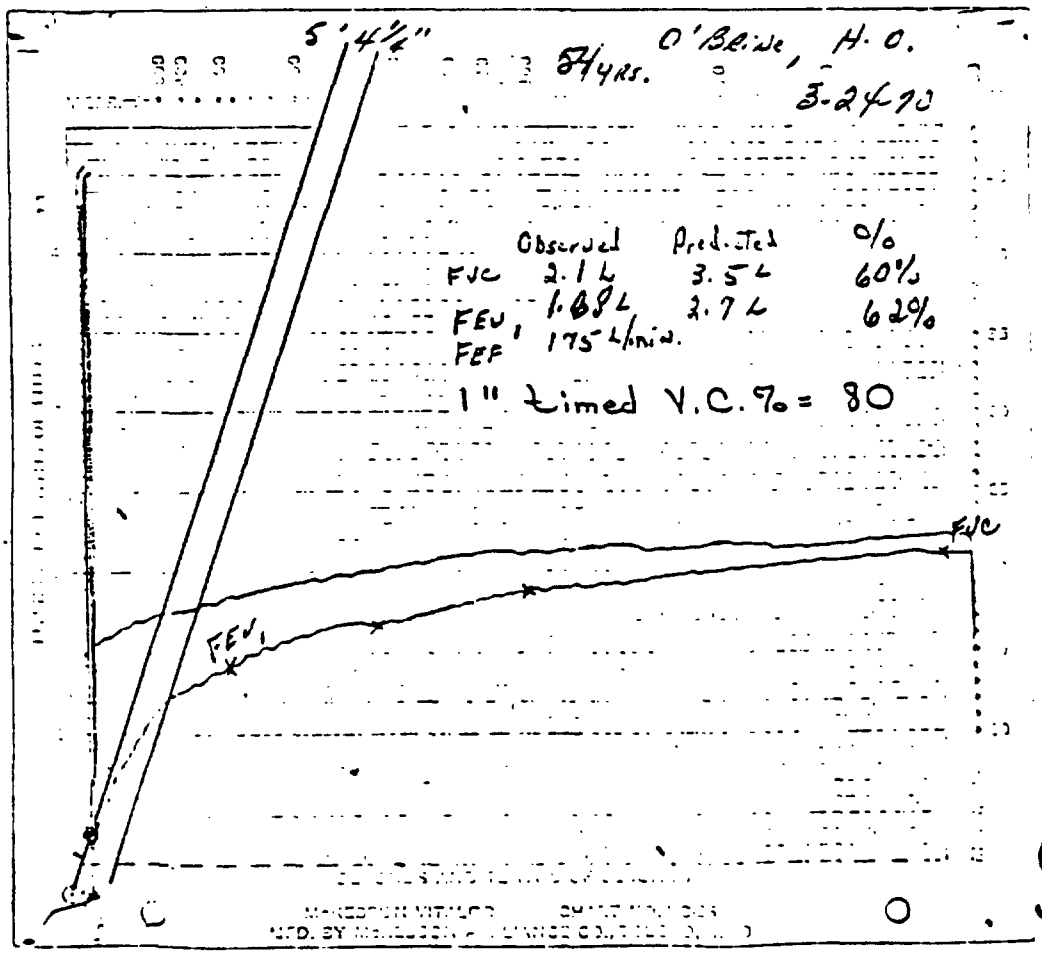
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Slide #6

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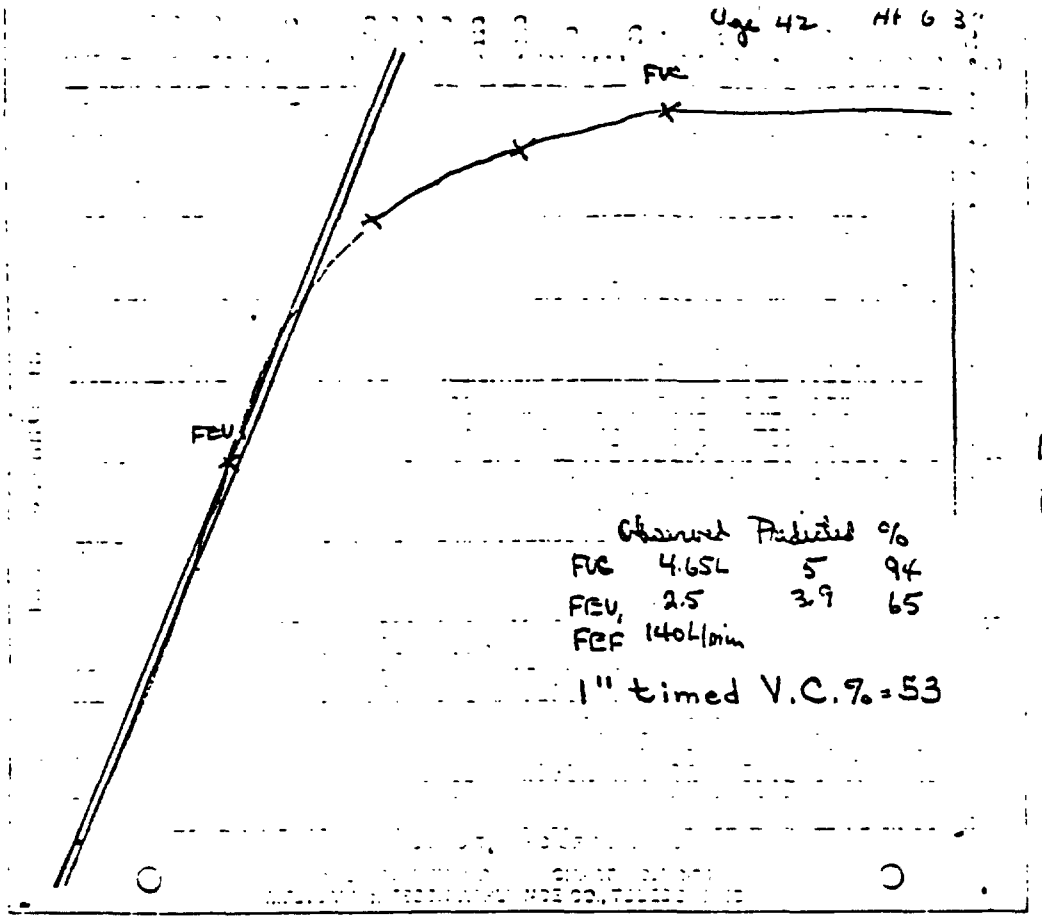
Smokes ½ pkg. cigarettes per day



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Slide #

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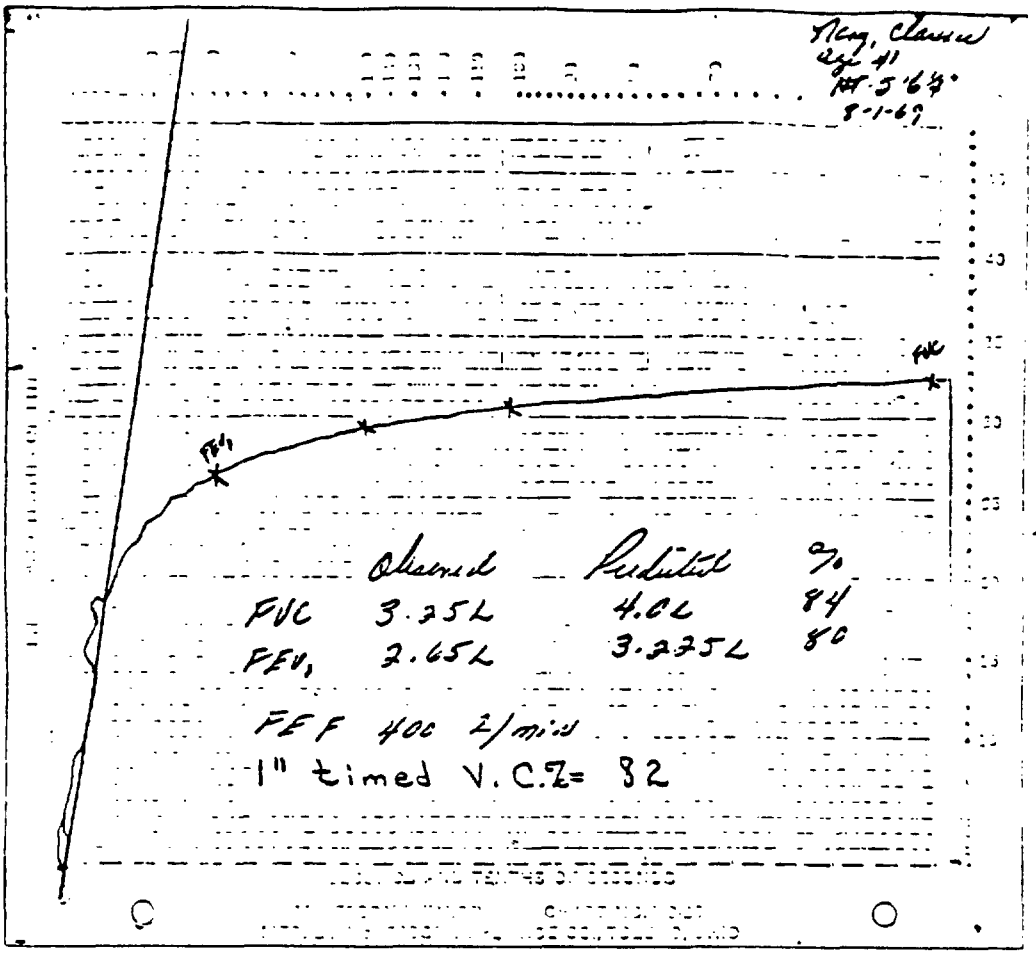


1 Pkg. cigarette per day.

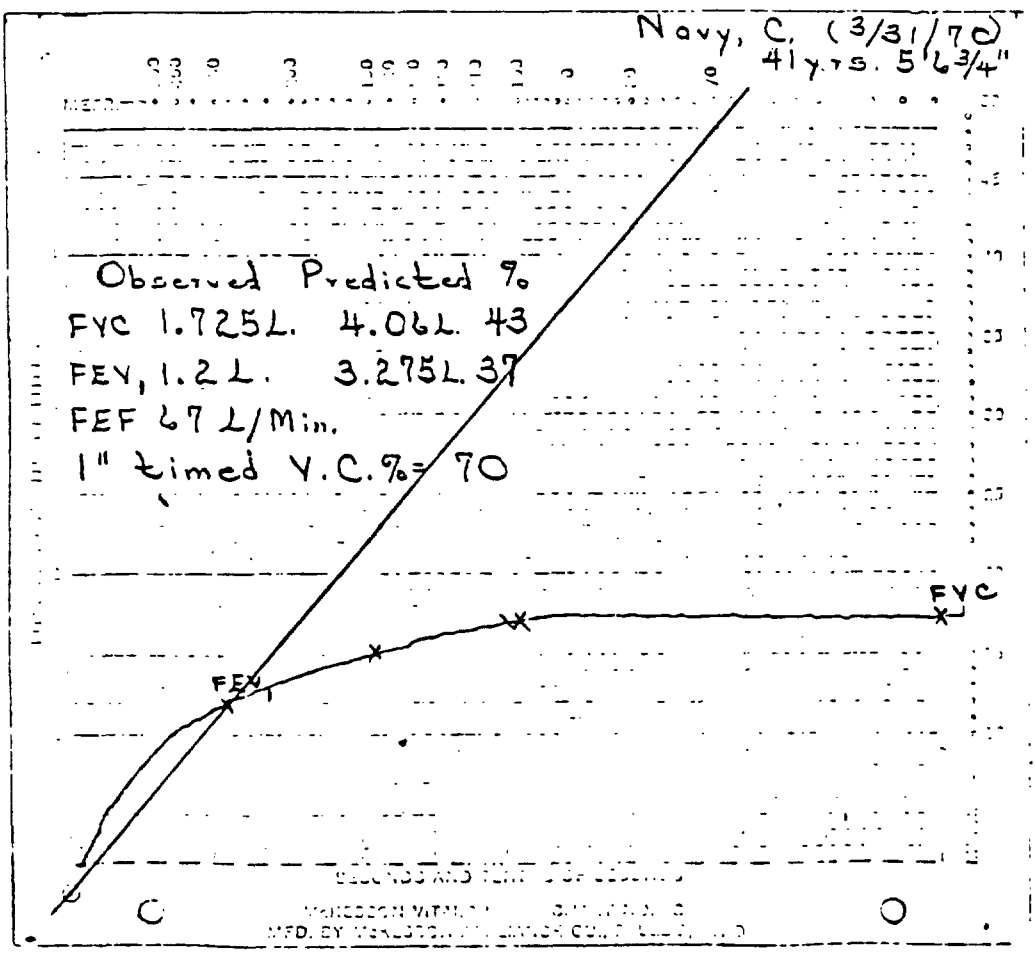
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Slide #8

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Smoke 1 pkg. cigarettes daily

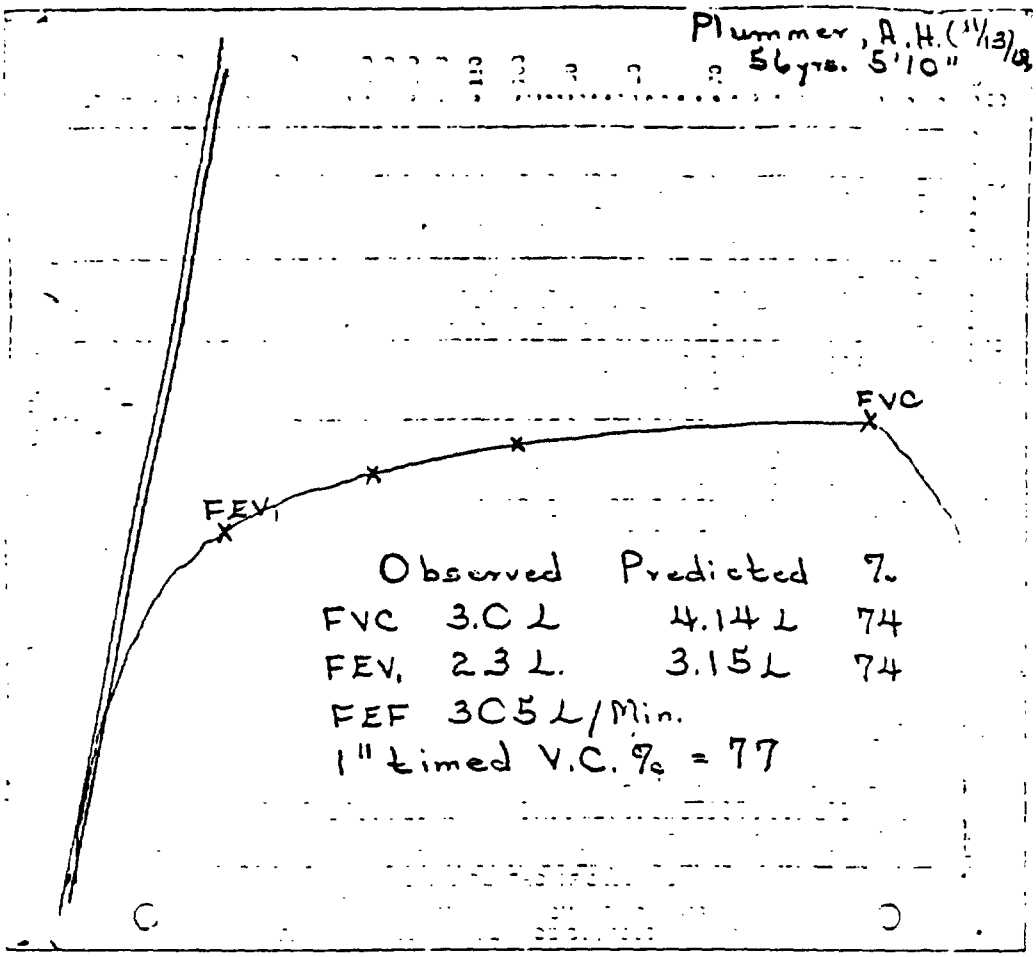


Non-smoker since Jan. prior to the pt. smoked one pkg. cigarettes per day X 15-20 yrs

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Slide #C

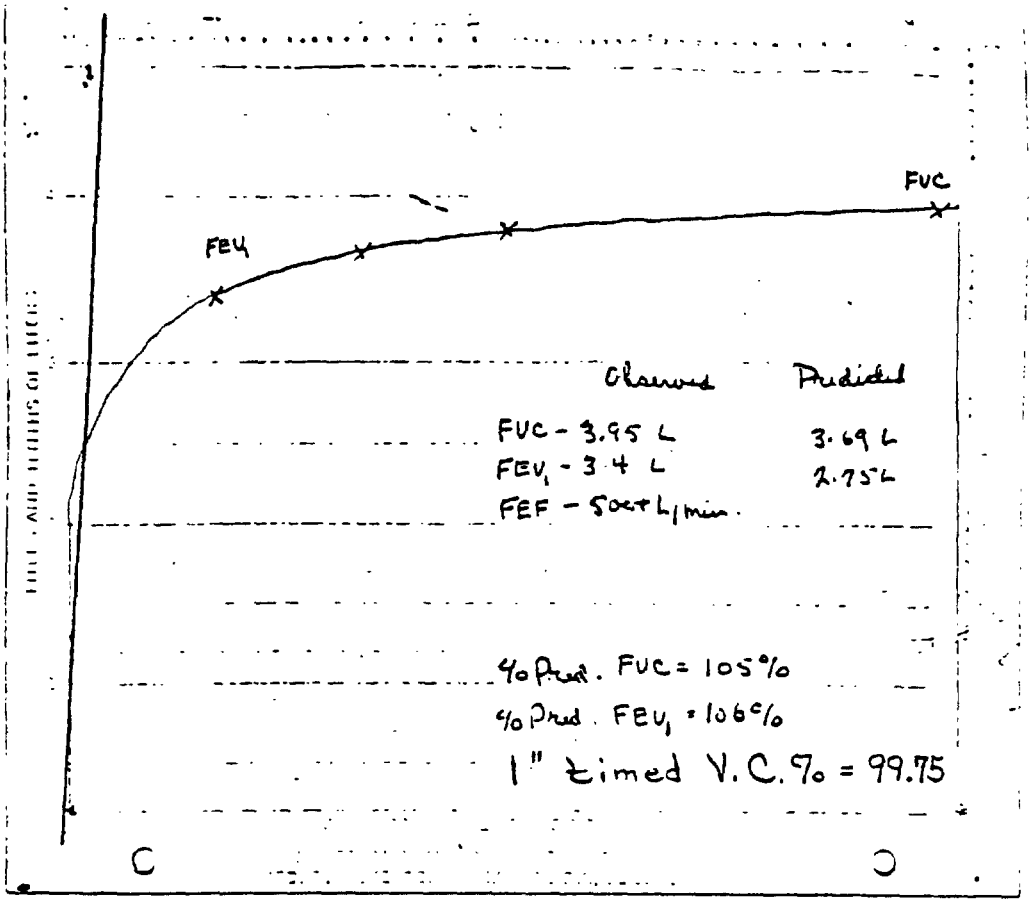
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Slide # 1(

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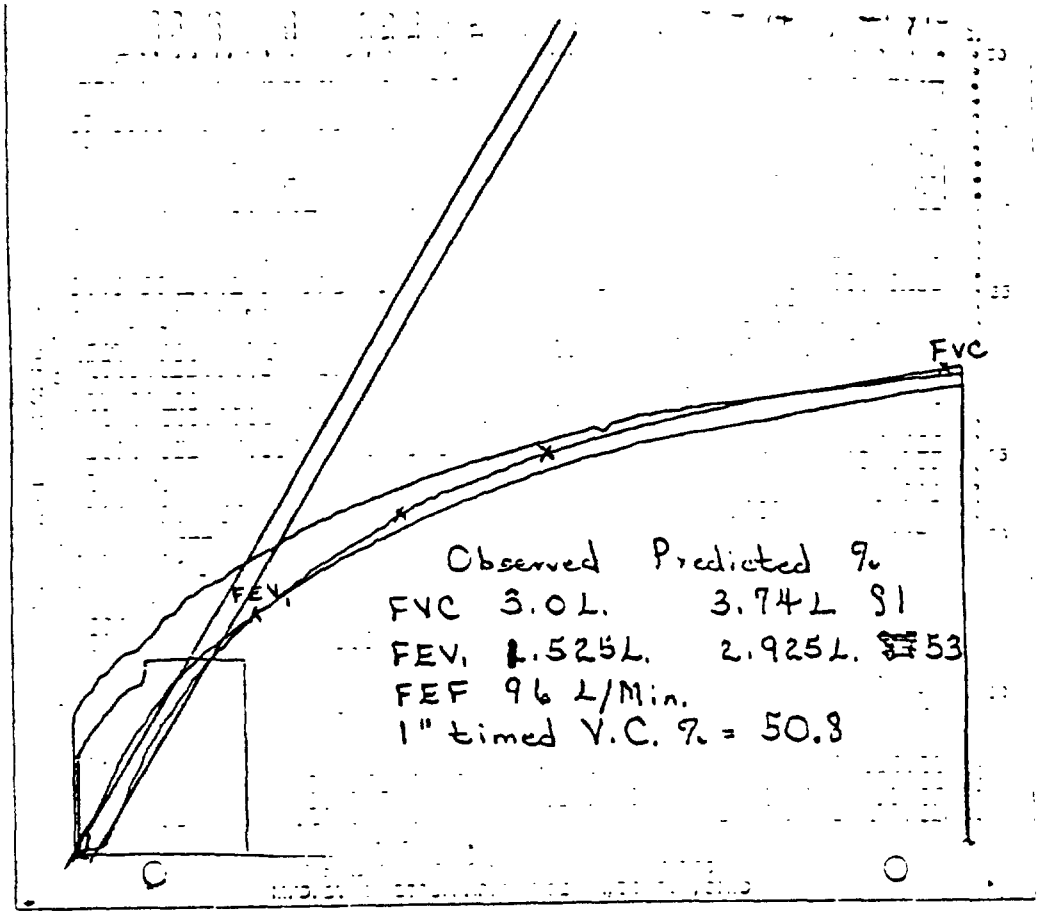


No tobacco

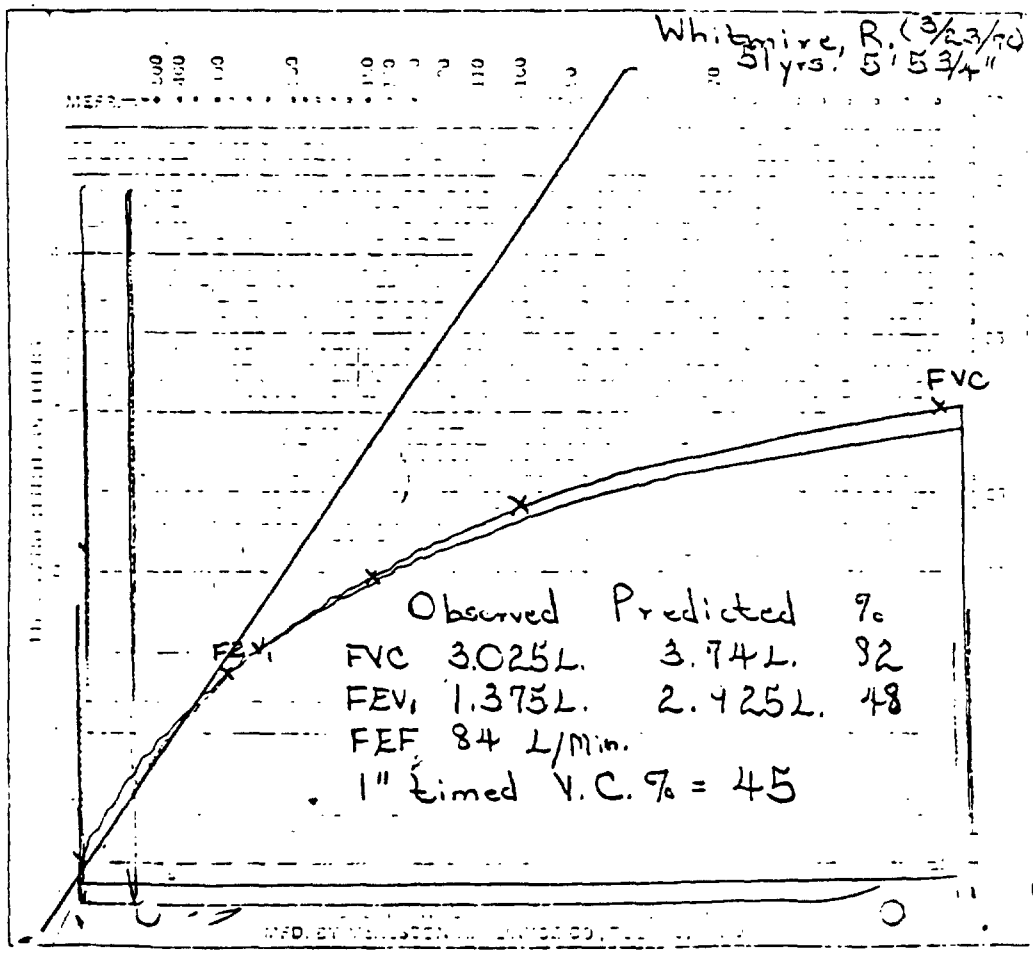
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Slide #11

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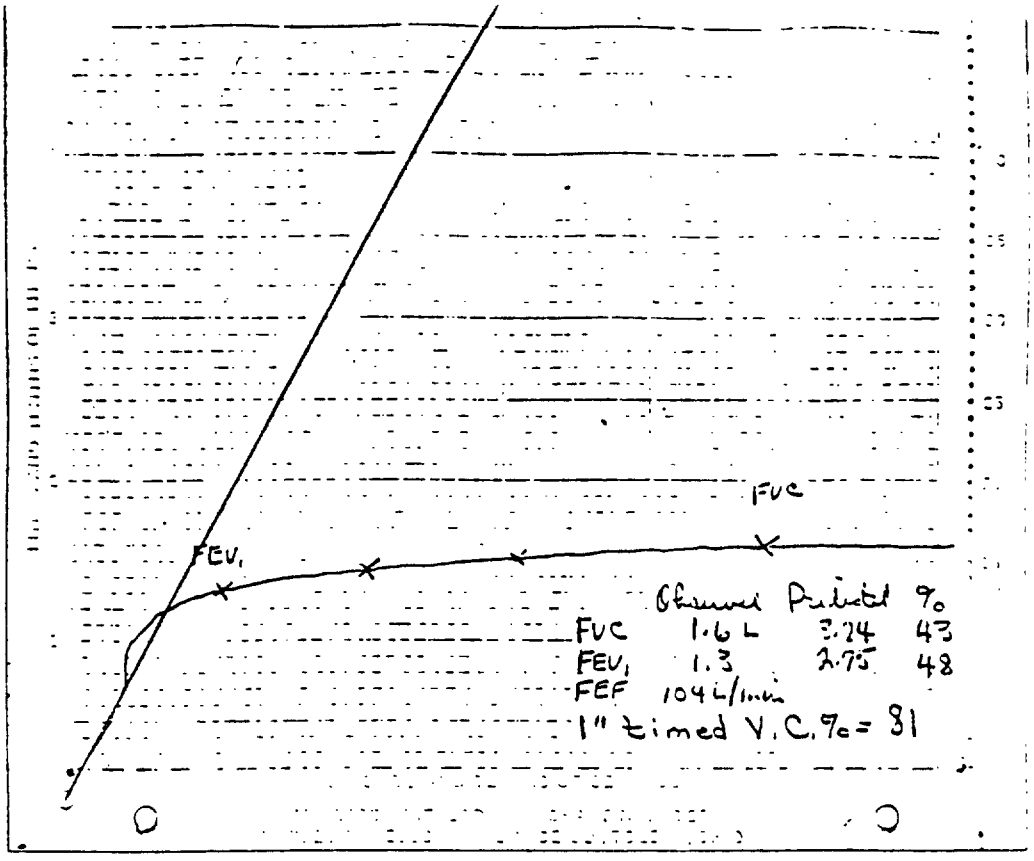
Non-smoke
x 1wk.
Prior to
then, pt
smoked or
pkg. cigs
per day



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Slide #1

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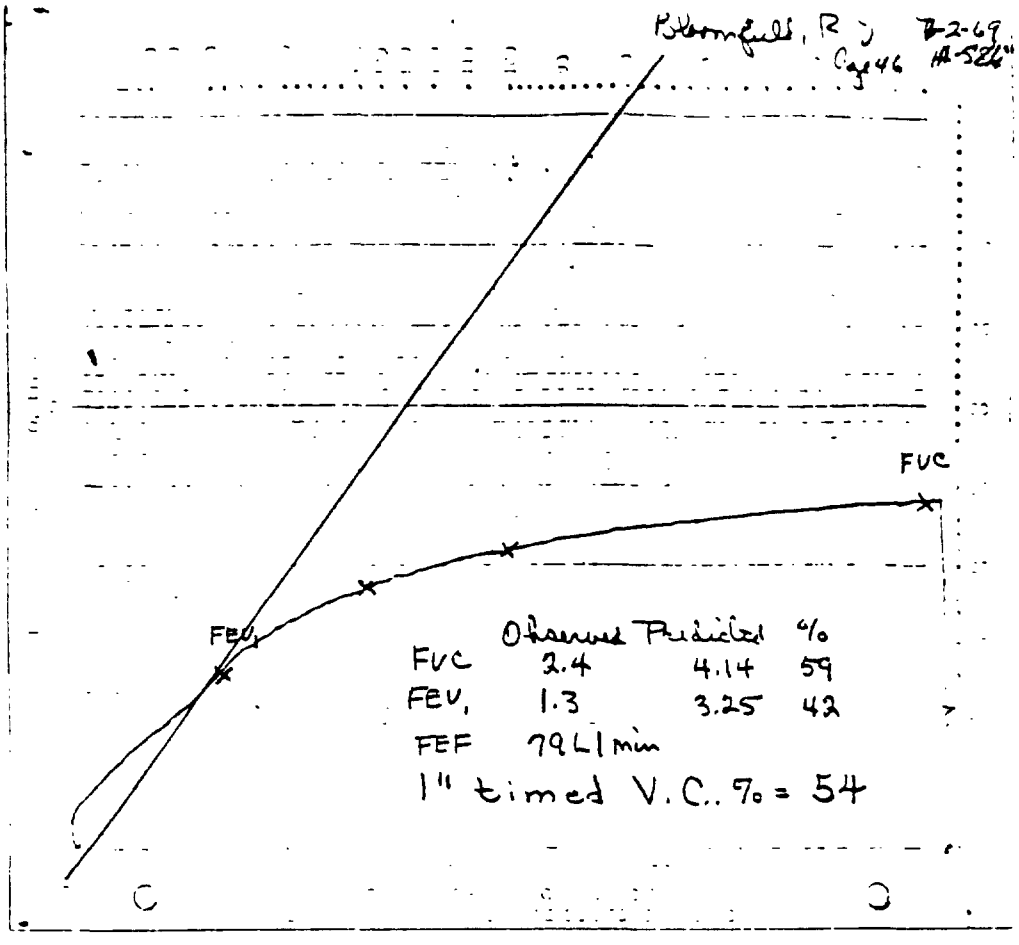


No tobacco

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Slide #13

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	Observed	Predicted	%
FVC	2.4	4.14	59
FEV1	1.3	3.25	42
FEF	79 L/min		

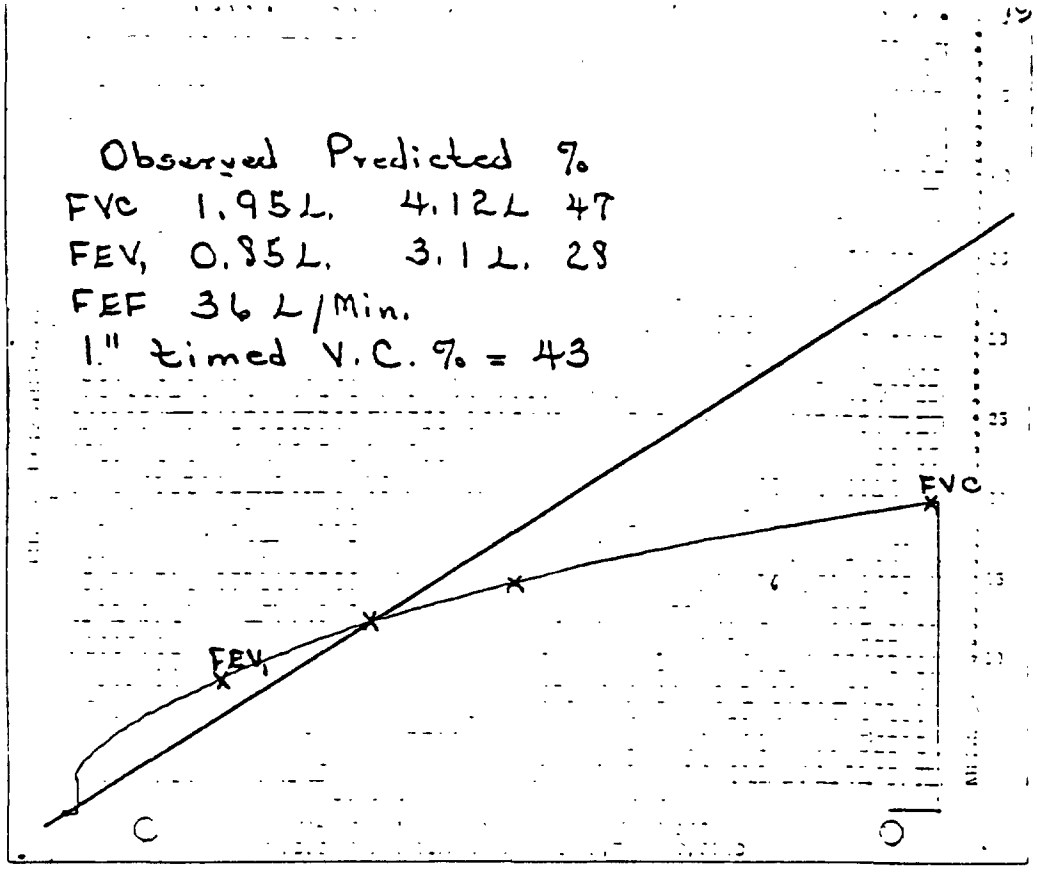
1" timed V.C. % = 54

1½ pkg cigarettes per day.

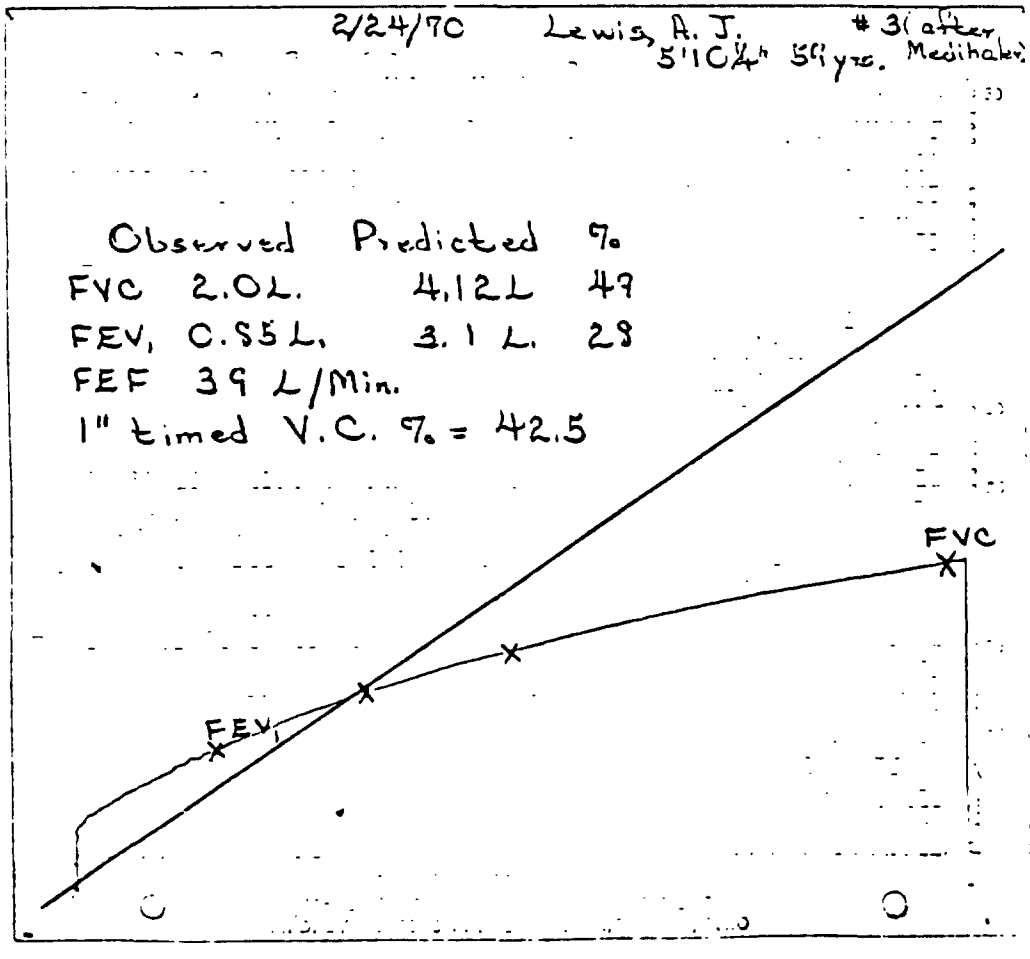
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Slide #14

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Non-smok

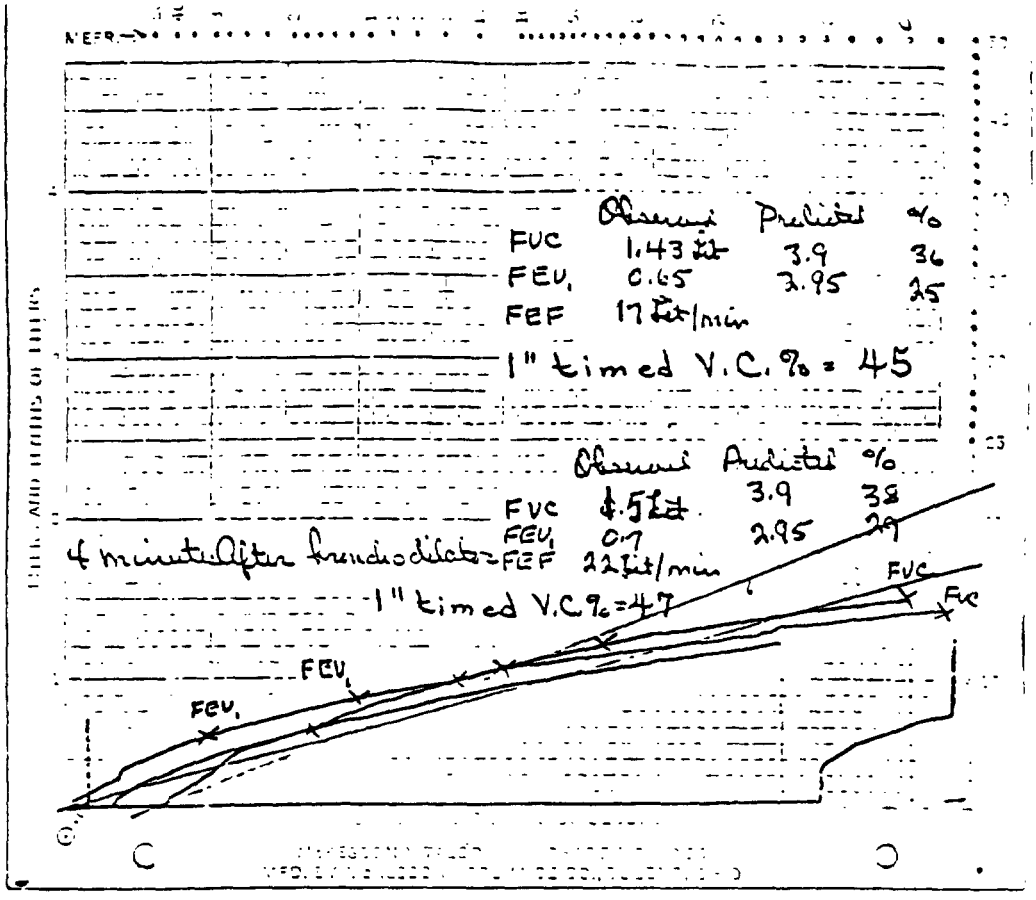


Non-smo
X 3-4 mos
prior to
that ti
smoked
approx. 1
cigarett
per day
for appro
20 yrs.

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Slide #1

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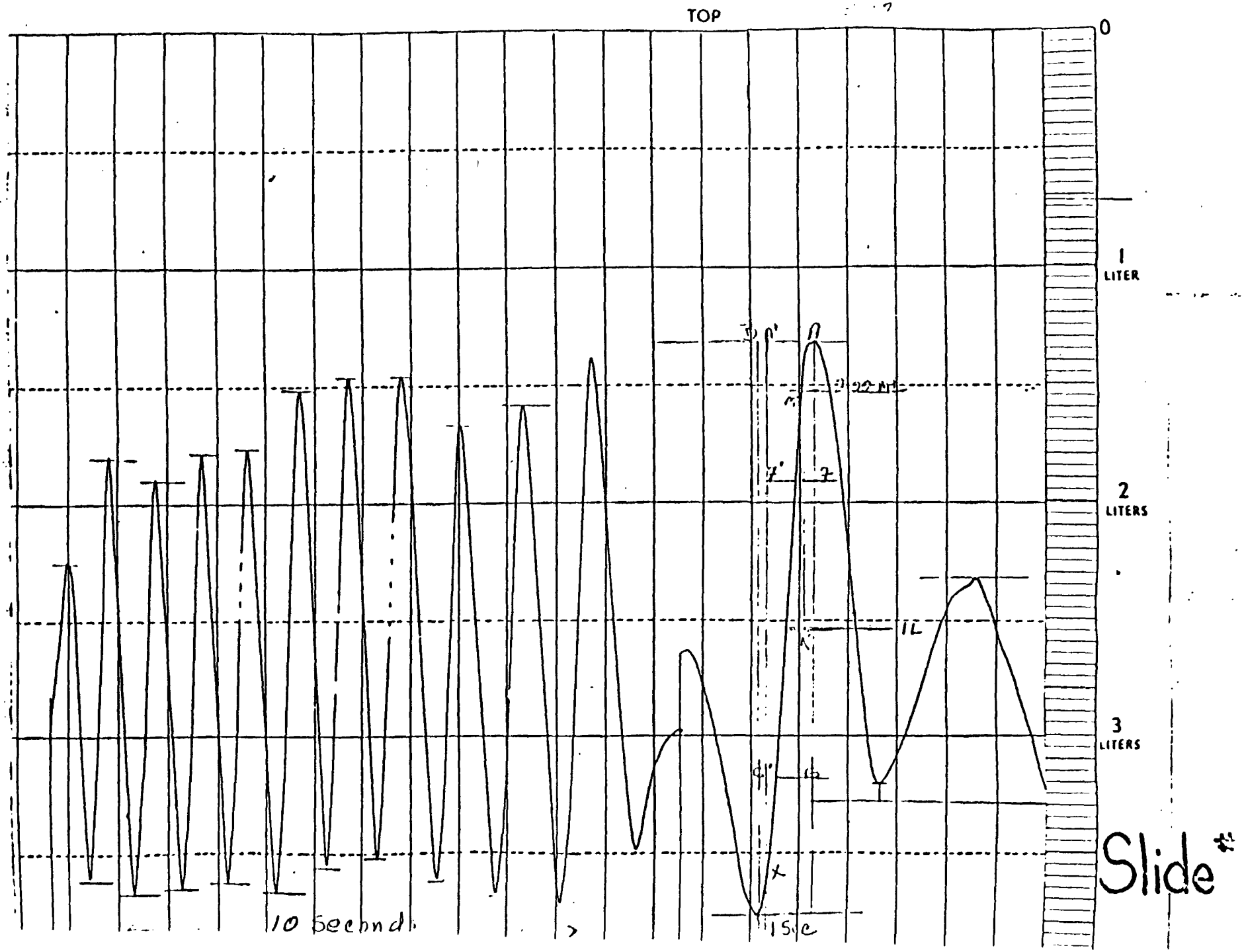


No tobacco

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Slide #16

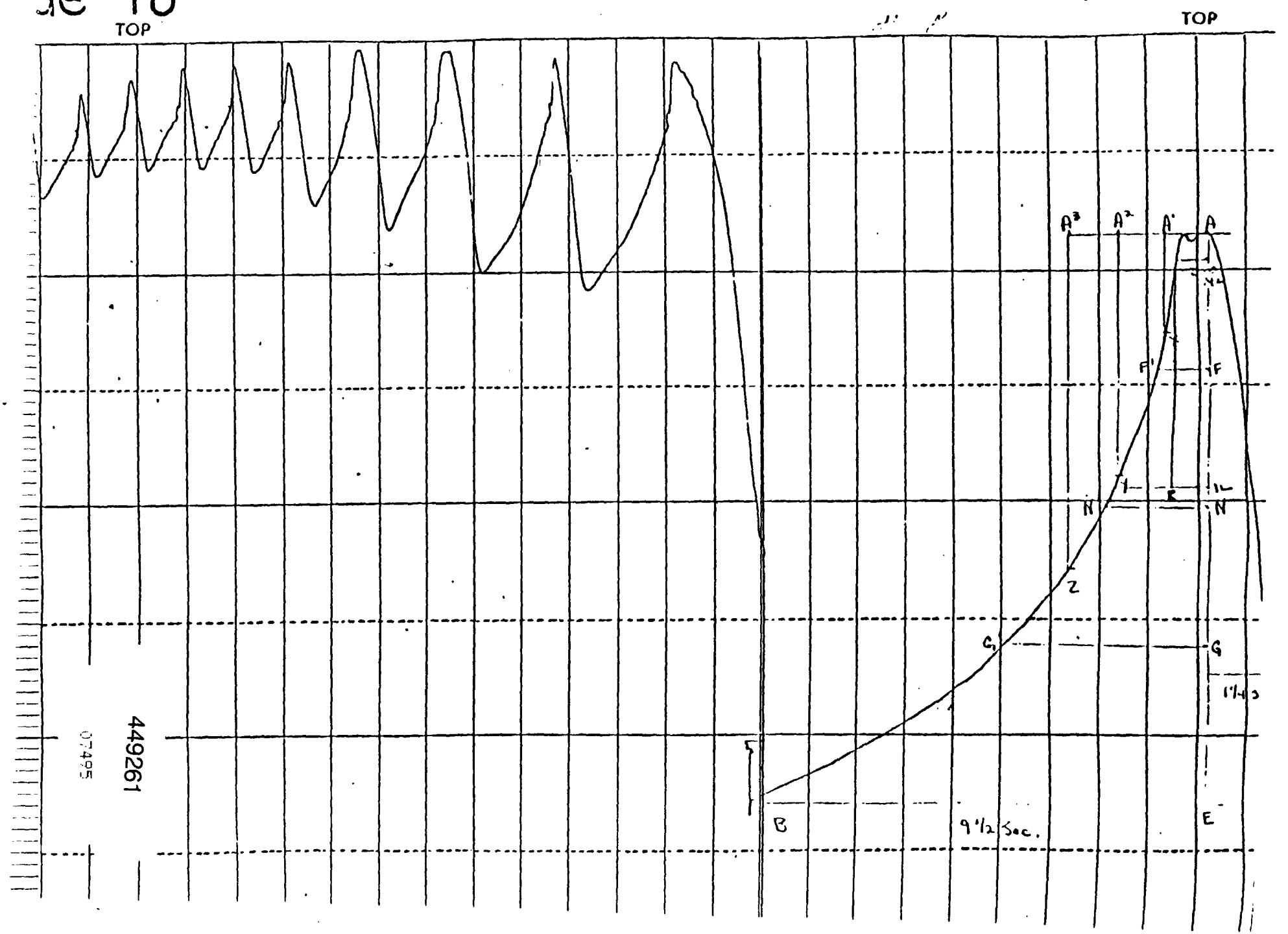
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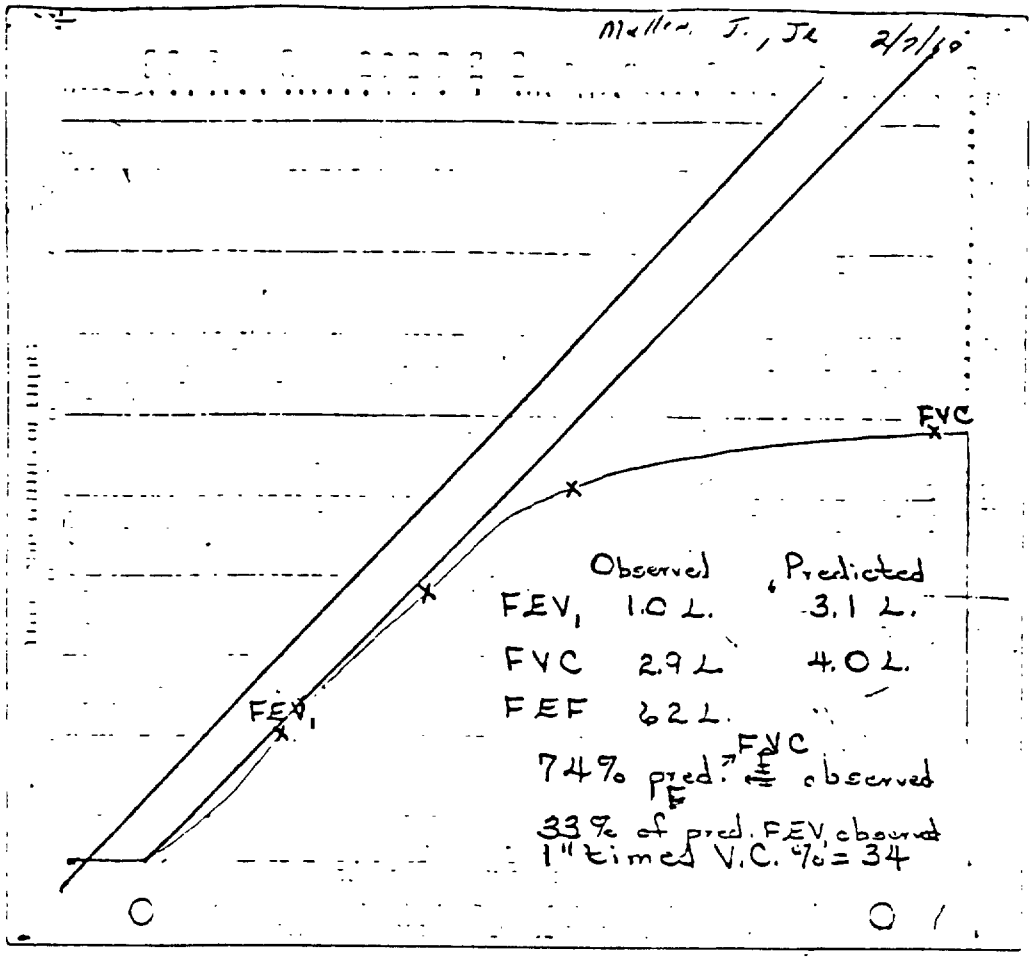


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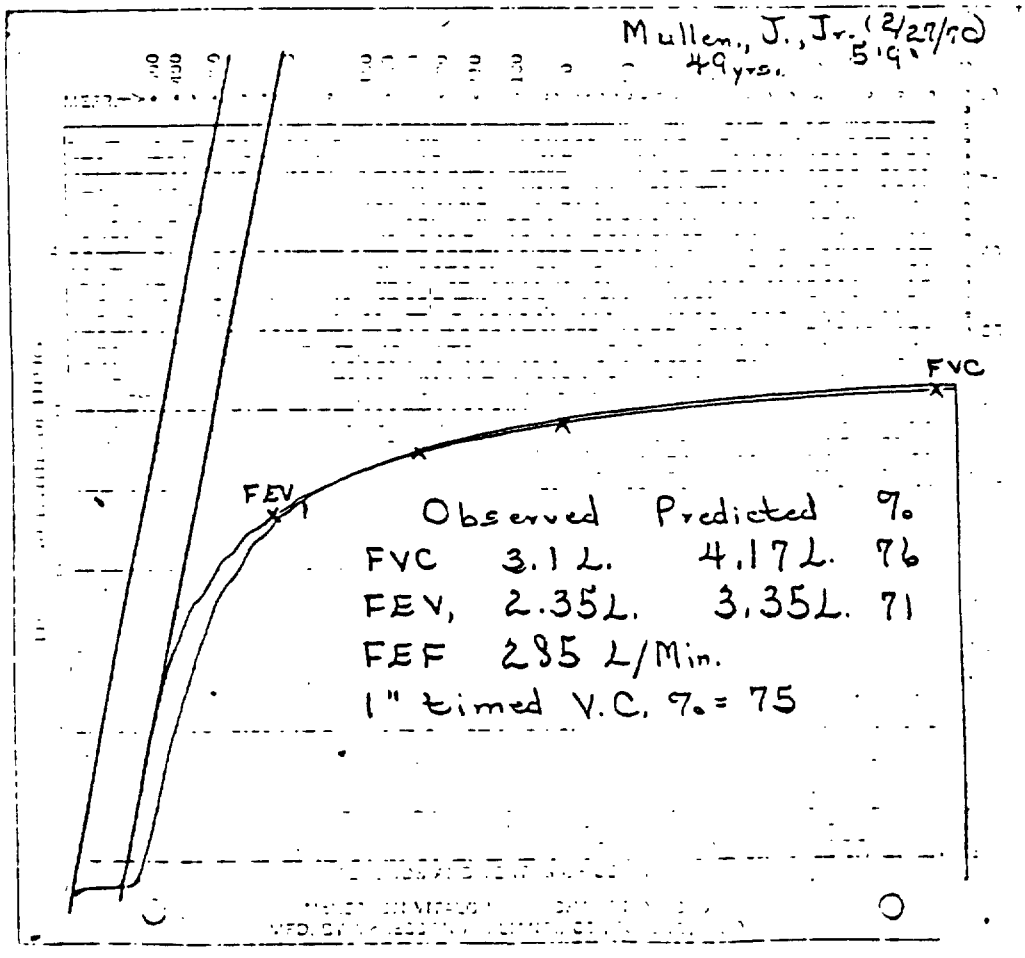
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de 10





1 pkg Cigarettes daily

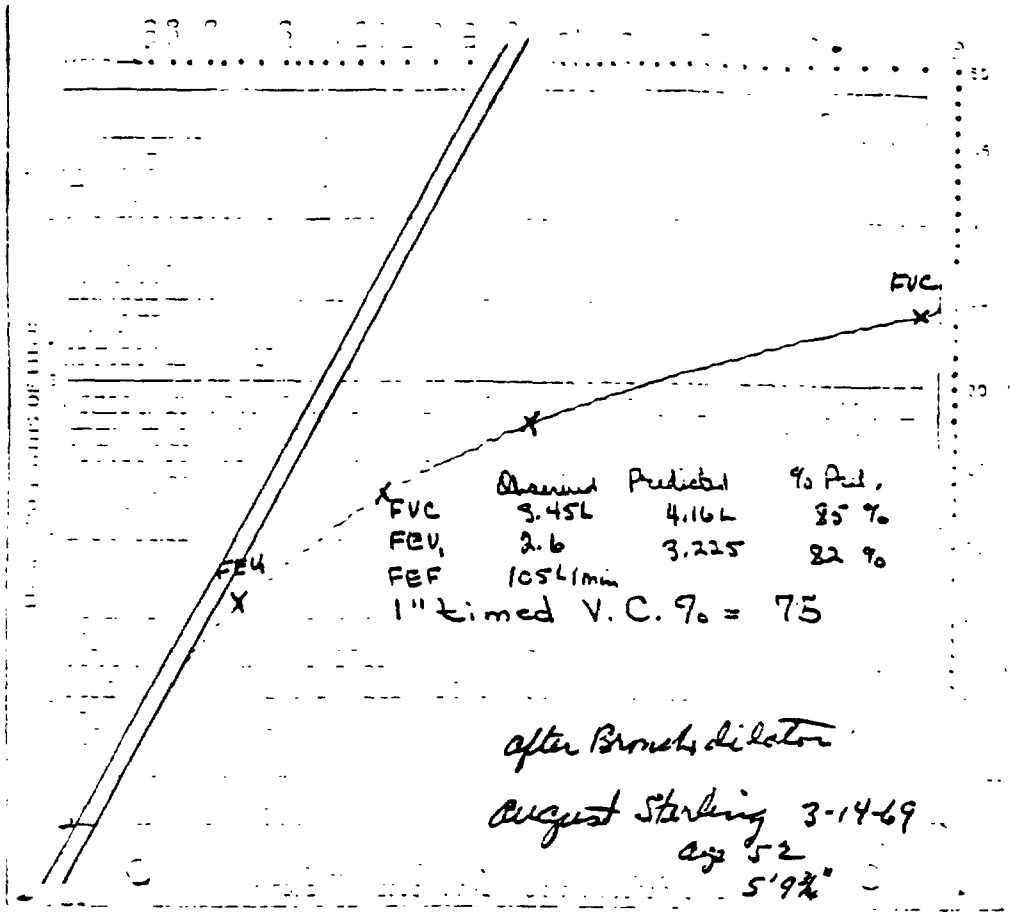


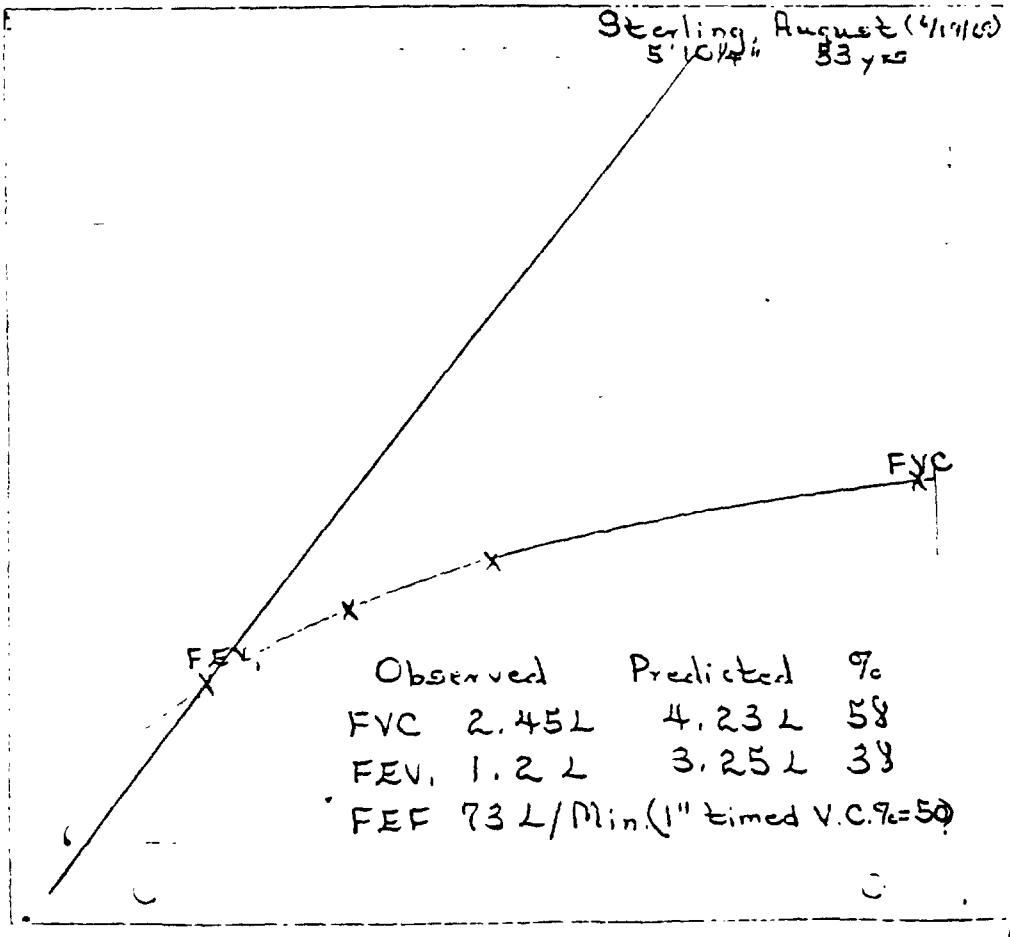
Smokes one pkg cigarettes per day

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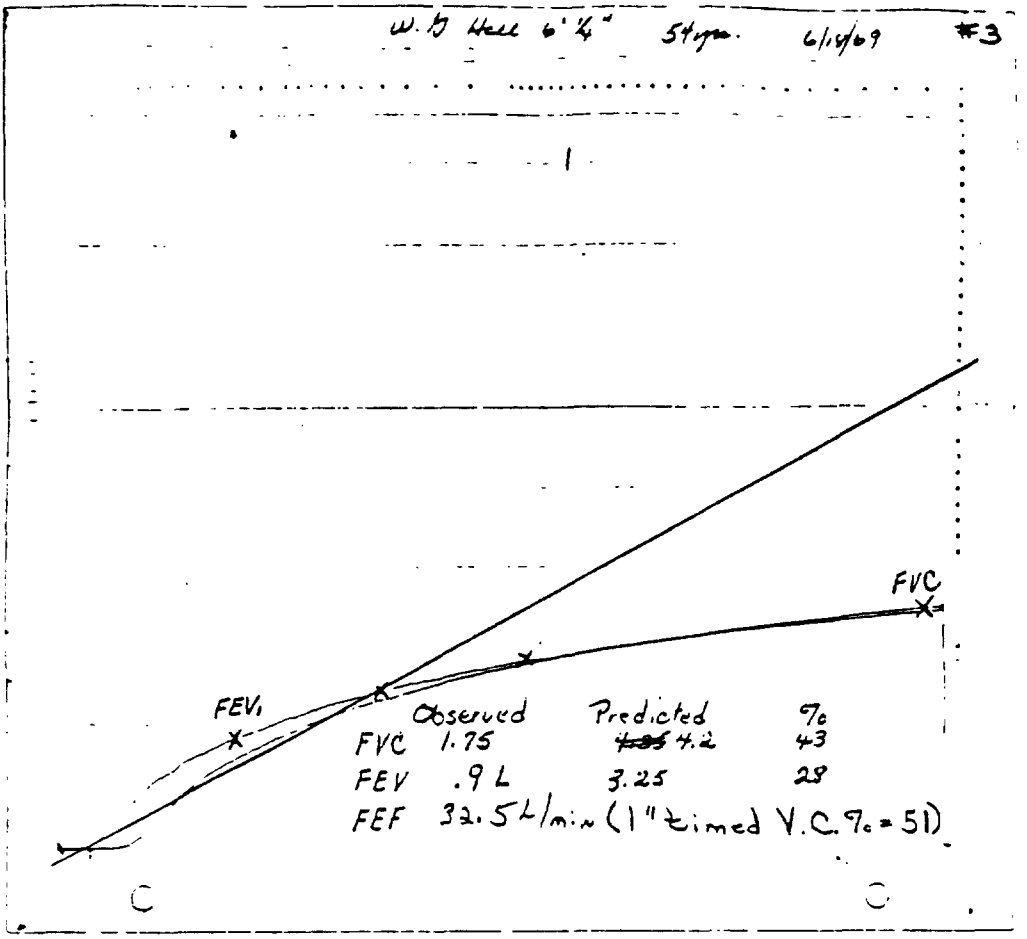
Smokes less than ½ pkg cigarettes per day

Had no broncho dilat on day of tracing

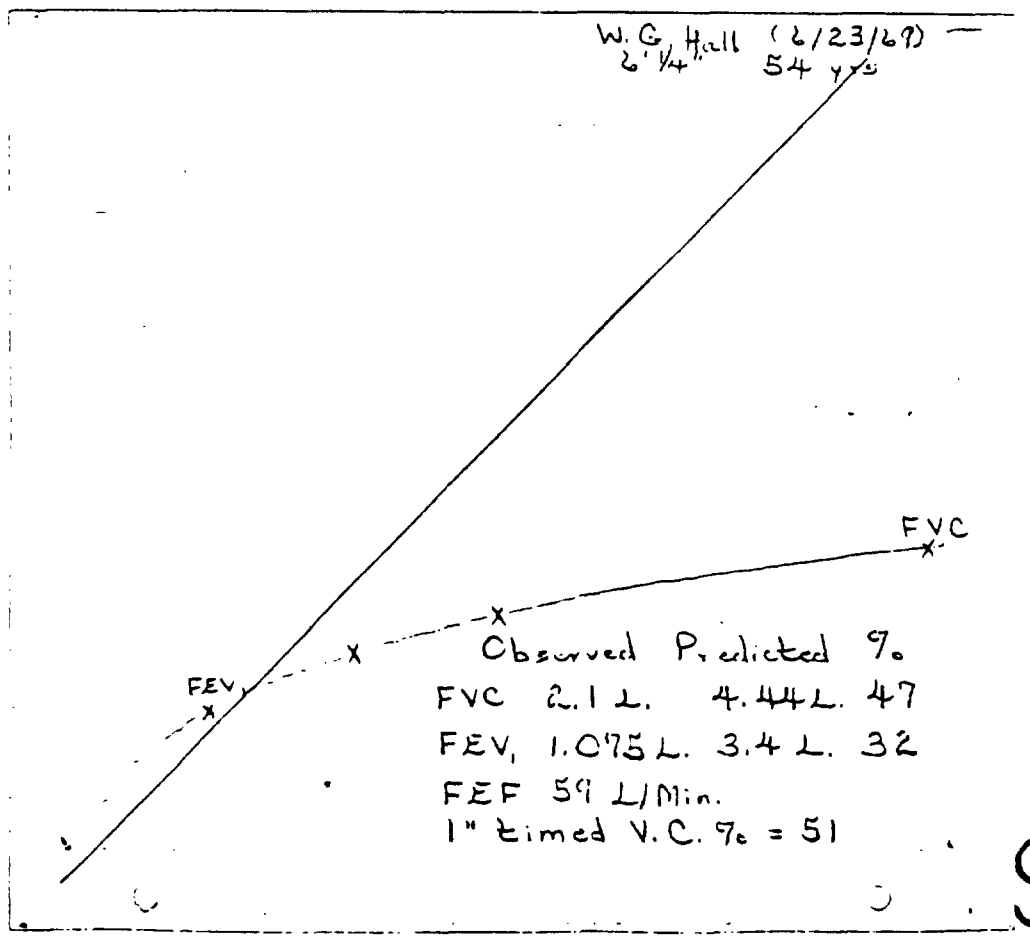
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Smokes 3/4 packs a day.

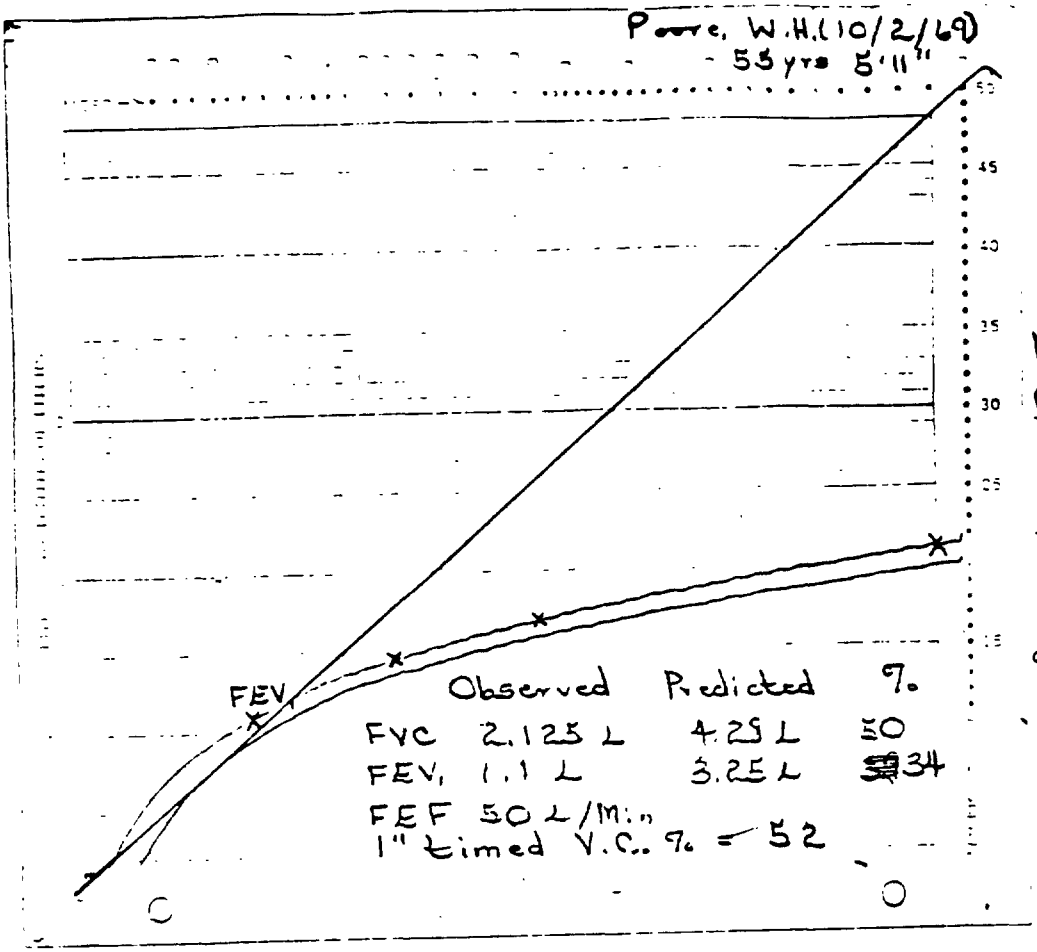


Tracing made jus after usi Medihale

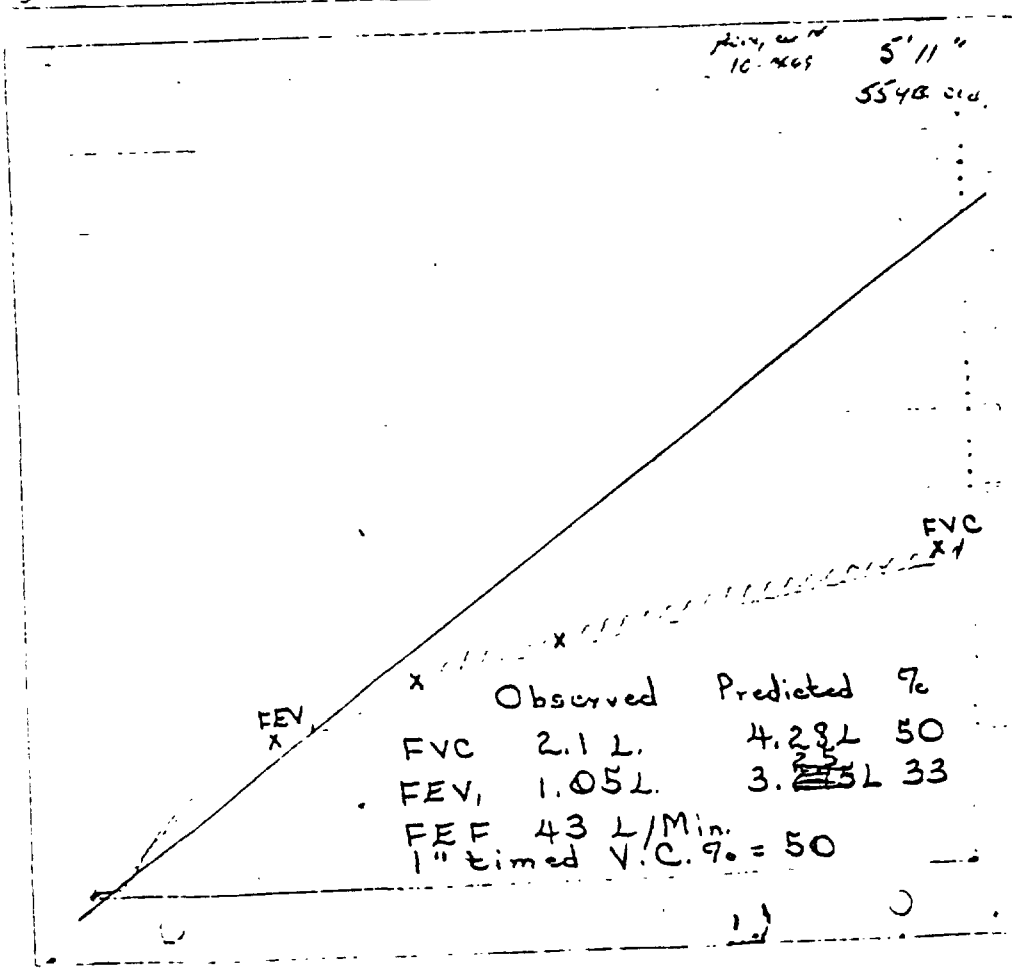
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Non-smoker for past 4 years; prior to that time smoked approx. 1 pk cigarettes per day for approx. 30



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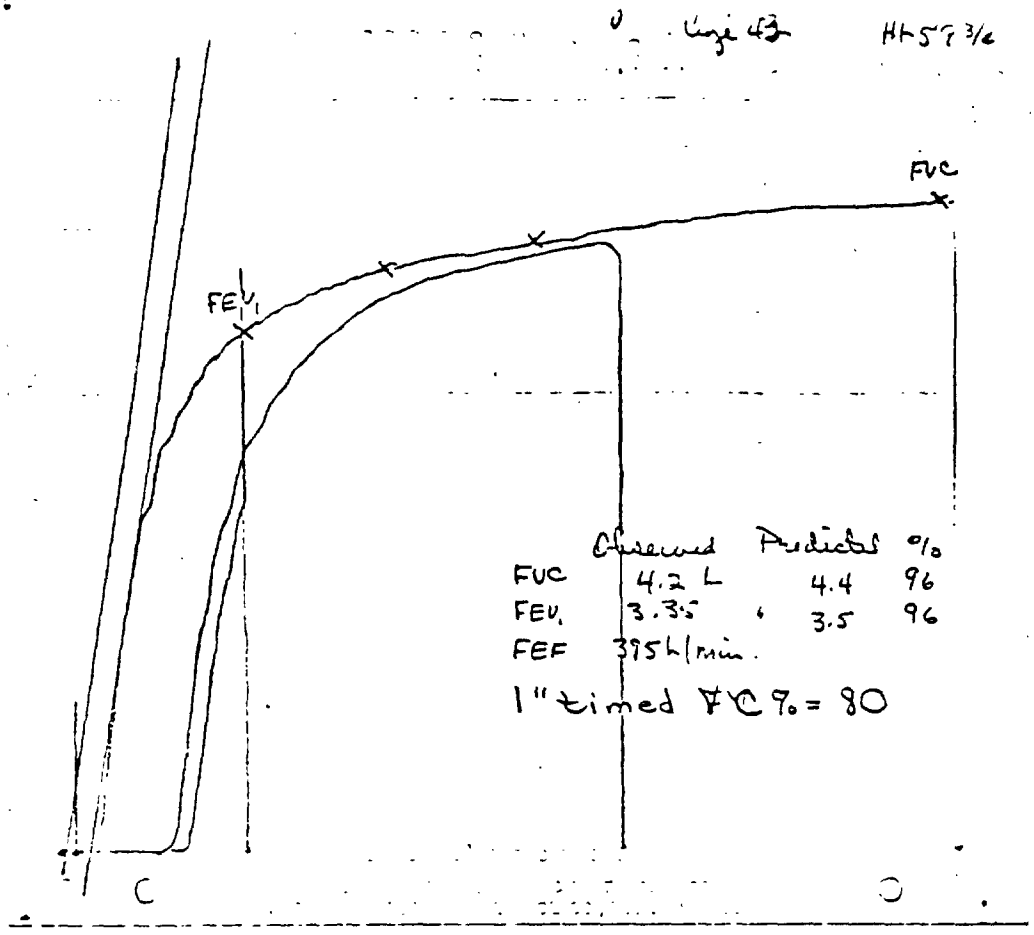
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RESULTS OF VITALOR TRACINGS ON MOBIL EMPLOYEES-BEAUMONT, TEX.
FEBRUARY, 1969 TO PRESENT

.irment of the patient . whole (estimate to nearest 5%)	None	Minimal 10% to 25%	Moderate 30% to 50%	Severe 55% to 75%	Very Sever 80% to 90%
pulmonary function ..: Use at least two the following three ts for rating purposes: ced Vital Capacity (FVC) second expiratory vol- ($FEV_{1.0}$) imum Voluntary Ventila- n (MVV)	Not less than 85% of pre-dicted	70% to 85% of predicted	55% to 69% of predicted	35% to 54% of predicted	Less than 3 of predicte
AGE RANGE:					
60-65 YRS.	59	35	15	7	1
55-59 YRS.	80	46	27	9	1
50-54 YRS.	86	31	14	4	0
45-49 YRS.	103	36	19	5	1
40-44 YRS.	62	24	4	0	0
BELOW 40 YRS.	9	1	2	0	0
TOTAL NO. IN SURVEY: 681	399	173	81	25	3
PERCENTAGE:	58.6	25.4	11.9	3.7	.4

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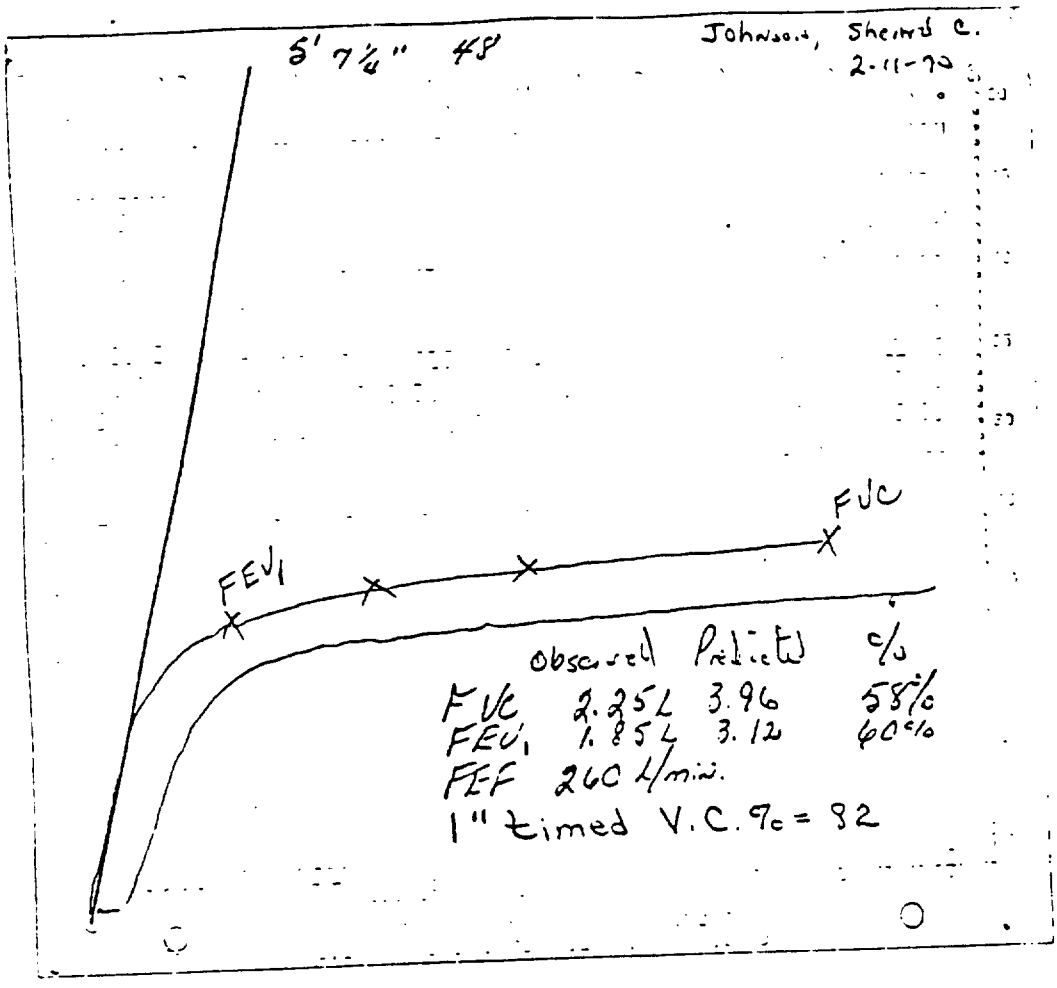


No tobacco

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NON Smoker

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Our first afternoon speaker is Mr. Bob Peters. Mr. Peters is Manager of Benefits in the Corporate Employee Relations Department, Compensation and Benefits Section. He was graduated from St. Benedict's College in 1956 with a B.S. degree in Mathematics. Mr. Peters joined Mobil in 1965 as Financial Representative in the Corporate Treasurer's Department. Formerly, he was an Assistant Actuary with Alexander and Alexander, Inc. He was Manager of Corporate Investments and Institutional Funding before assuming his present position in January. Mr. Peters will talk to us about "Long Term Disability-Coordination Between the Insurance Carrier and Mobil's Medical Department".

R. B. Peters
LONG TERM DISABILITY-
COORDINATION BETWEEN THE INSURANCE CARRIER AND MOBIL'S MEDICAL DEPARTMENT"

One of the problems addressing a professional group such as Mobil's Medical Department is in knowing when you say too much or too little.

The problem of saying too much is exemplified by a situation one of my prior actuarial associates got himself into while recruiting talent for the actuarial profession at a local college. He was telling the college students how interesting the field of actuarial science was and got so involved in the subject that he failed to notice that time was dragging on and the students were getting up and leaving. Finally there remained just one person sitting right in front of him. He realized suddenly that everyone else had left and said to the remaining individual, "I sure would like to express my thanks to you for your interest in my talk." Interest hell," he said, I'm the next recruiter who is supposed to make a speech."

A friend of mine was quite concerned about saying too little once when addressing a group of doctors and nurses on the subject of Sex. He wanted to be as brief as possible, and perhaps he was too brief because he got up in front of the audience and said, "Doctors and nurses, ladies and gentlemen, it gives me great pleasure, and then sat down.

LONG TERM DISABILITY

History

Along with the possibility of the loss of family income through the death of the breadwinner, today's working man and his family are also faced with the fear of crippling injury or protracted illness resulting in loss of income at a time of mounting debt and depletion of savings (i.e., when he becomes disabled).

The growth of disability income protection plans, however, has for the most part been restricted to plans providing benefit periods ranging up to the first 52 weeks of disability. Not until 1965 when the Steelworkers in the Can Industry became covered for maximum durations of up to 5 years did the longer period of disability protection cover a large group of wage earners.

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Long Term Disability Coordination Between the Insurance Carrier and Mobil's Medical Department

Past --

Mobil's Medical Department has been acclaimed as being "most helpful" in the past where Total and Permanent Disability claims were concerned. This the insurance carrier tells us is particularly true where a waiver of premium for Group Life Insurance is concerned. The waiver of premium provision is of concern to the insurance company because it produces a definite death benefit claim sometime in the future with no premiums. Approximately 12 thousand employees remain covered by the Total and Permanent Disability Plan. The annual benefits paid from that Plan are presently over $500,000. The Metropolitan has 373 Total and Permanent Disability cases that have elected the waiver of premium feature in our Life Insurance Plan, and have potential claim liability of over $5 million. Our carrier cites that Mobil's Medical Department, in addition to forwarding claims forms and editing employees' personal physicians' statements, frequently send copies of past medical history summaries. It would also assist the insurance carrier if this practice was continued in Long Term Disability cases.

Present --

The Medical Department can be of great help to the Insurance Administrator in the handling of specific claim and absentee problems as well as in the broader field of medical relations. The Plant Physician or Medical Director can assist in the following ways:

1. Consultation on absences where the extent or expected duration of disability is questionable. The Medical Director, because of his knowledge of working conditions and familiarity with the employee's previous attendance record and medical history, is sometimes in the best position to judge the extent of disability and ability to work. He may be able to save the Insurance Administrator much time and trouble by his recommendations.

2. Discuss controversial cases directly with the employee's physician and thereby arrive at a mutual understanding regarding the employee's physical condition and ability to work.

3. Determine in which instances it would be advisable to recommend that the employee be examined by an insurance company examiner or by a specialist.

4. Call the employee in for a physical examination in the Company's Medical Department. This is particularly effective if preliminary investigation by the Insurance Administrator or previous examination by an insurance company examiner has indicated recovery on the part of the employee.

5. Consultation on employees seeking to return to work upon drawing maximum insurance benefits. Often, such employees desire to return

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before having fully recovered. Sometimes this desire is influenced by the fact that return to work for a specified period will qualify the employee for a new claim. Whenever return to work is sought after maximum benefits have been drawn, arrangements should be made for an appropriately thorough reemployment examination to determine whether the employee can safely resume his normal duties without injury to his health and in the best interests of the Company.

6. Contact the employee's physician in cases where the medical report does not give a definite estimate of the duration of disability. The physician might be informed that this information is necessary not only for purposes of insurance, but also in order that the Company may schedule its work force properly.

Future --

I am told that many times the judgment of the validity of a Long Term Disability case may be clouded if an employee's attending physician is not as cooperative as we might wish. Apparently it is not unusual for a patient to tell his doctor "I can't work any more," and for the doctor to pass this on as an objective fact rather than the man's own subjective feelings. To avoid this kind of hang up and where you have reason to believe this might be the case, the Metropolitan invites you to ask their Claim Division to have the employee examined by a local Metropolitan consulting internist or specialist if needed on a particular diagnosis. This invitation also included the possibility of using the Metropolitan as an objective third party in medical matters.

Projection

Long Term Disability benefits will undoubtedly become more popular in the 1970's. Changes are imminent as the needs of disabled people become more known. Benefit programs will begin to blend Long Term Disability benefits with other long term benefits such as Retirement Plans. For instance, it appears that the accrual of pension credits while disabled and before normal retirement dates will become widespread. Probably the most important advent in the field of Long Term Disability during the 1970's will be the gain in emphasis on rehabilitation of the disabled. It is also quite possible that other forms of illness will be included in the existing definitions of disability, i.e., alcoholism. After last night that might not be a bad idea.

Next I would like to introduce Dr. Charles Thompson who is going to talk to us about The Significance of Multiple Blood Analyses and Detection of Early Coronary Disease", the results of his findings among several thousand executives he has followed for many years.

Dr. Thompson is a graduate of the University of Nebraska in 1929 and also from their medical school. In 1959 after his residency training in Omaha and service with the armed forces, Dr. Thompson entered private medical practice in Chicago and shortly thereafter founded the association he now

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heads which performs executive health examinations. He is on the staff of the Wesley Memorial Hospital and Northwestern University Medical School. It is a pleasure to have Dr. Thompson speak to us.

CHARLES THOMPSON, M. D.
SIGNIFICANCE OF MULTIPLE BLOOD ANALYSES IN DETECTION OF EARLY CORONARY DISEASE. EVALUATION OF THE CORONARY SUSPECT

For the past fifteen years many physicians have been studying coronary artery problems from diverse points of view, and, as a result, literally thousands of manuscripts have been presented in cardiac literature. The trend toward studying coronary risk factors has been an outstanding advance in the field of cardiac investigation. Such studies have established the existence of the "coronary prone" or coronary suspect" individual and have presented this person to each physician an opportunity to practice preventive medicine against the number one killer of civilized people.

The following study was performed on a population of 8,500 "well people," namely executives, examined periodically over a period of twelve years. The purpose of the examination was to look at the total individual; it was accomplished through comprehensive examination by certified internists. Included in this study were the following factors.

1. Evaluation of "coronary proneness" of each individual, as well as total diagnostic evaluation and disease incidence.

2. Study of 120 deaths known to occur in this group, including the evaluation of the risk factors of 44 coronary deaths.

3. Study of 905 consecutive examinees for the coronary risk factors done during the summer and fall months of 1966.

The results of the first factors have been reported elsewhere. Studies have verified that, in addition to the major recognized factors, a probable statistical relationship of elevated serum uric acid level and low thyroid states exists. A final evaluation will be made shortly on both of these factors as based on the study of 905 consecutive examinees.

All other considerations aside, death is the final evaluation of coronary disease. Of the 8,500 examinees studied, 44 deaths occurred caused by acute myocardial infarction. The relationship to Coronary Risk Factors, based on this group of 44 men, are as follows:

TABLE I

Average age of death	55.4 years
Elevation of serum cholesterol level (over 300 mgm%)	40
Elevation of blood pressure (greater than 140/90)	23
Obesity (Physician's evaluation of weight & height)	24
Evaluation of fasting blood sugar (over 110 mgs%)	22
Abnormal electrocardiographic findings	25

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TABLE II

Relationship of combinations of factors to total coronary deaths

Those having

1 factor	6
2 factors	11
3 factors	12
4 factors	13
5 factors	2

Average time span between first examination and death - 2 Yrs. 3 Mos.

Those having other factors not generally a factor in myocardial infarction death 4

Old RHD	2
Moenekeberg Sclerosis	1
Polycythemia	1

TABLE III

THOMPSON TRIOSORB STUDY
PERCENTAGE OF 905 PATIENTS WITH REGARD TO NORMAL PHYSICAL AND LABORATORY MEASUREMENTS

Variable	Values Not to Exceed	Percent of Patients Normal	Abnormal
Weight Normality	Med. Eval.	93.9	6.1
Systolic BP (mmHg)	139	73.0	27.0
Diastolic BP (mm Hg)	89	76.3	23.7
Glucose (mm/100 ml)	100	52.9	47.1
Cholesterol (mm/100 ml)	270	69.9	30.1
SED Rate (mm in 1 hr)	12	62.3	37.7
Uric Acid (mg/11 ml)	7.5	77.0	23.0
T3 (%): (Lower Limit)	38.0 (50.0)	71.6	11.1 (17.3)

It becomes apparent that most fatal cases of coronary disease have more than one factor in operation to produce the chain of events leading to the fatal heart attack. Certainly, elevated serum cholesterol is th. most frequent offender. The other factors occur in various combinations usually associated with serum cholesterol elevations.

Table III illustrates the abnormalities as seen in the consecutive series study of 905 examinees. This shows the percentage of normal and abnormal findings of examinees based on the established normal physical and laboratory measurements. It is readily seen as one studies the so-called healthy man, laboratory and physical abnormalities appear: such observations have

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been repeatedly made. In the above study, standards for the fasting blood sugar, 100 mgs% are not those accepted in other mass studies: 110mgs% is a more realistic figure.

On the other hand, the standard of 270 mgs% for cholesterol has given this group a 10 mgs% bulge over the accepted 260 mgs%. Long clinical experience by repeated study of periodic sampling and split sampling with other laboratories has shown that 260 mgs% is an accurate figure. Further samples seem to come up with the consistent 30% elevated blood serum cholesterol.

When a computer is used to analyze the statistical description and data by standard deviations, low, high and mean, a more realistic evaluation is evident. (Table IV) However, no matter which way the figures come out, it is still apparent that cholesterol is the number one offender. Other factors, as evidenced in this study are: blood pressure, disturbance of the sugar metabolism in varying degrees, and weight.

When one looks at the death patterns, and again at the examinees 10 years prior to the ultimate result (45.9 years to 55.4 years), there is a similarity of causative agents. This evidence then, leads to the conclusion that there is a true relationship that is well enough established to produce a "coronary suspect."

To discuss this matter a bit further, these factors are known and can easily be recognized. It is, then, the duty of physicians to study their patients in this regard. Ask yourself if each patient is a "coronary suspect." Examinations that are carefully done and that use the appropriate laboratory facilities make recognition easy. The hope that we have at the present time of reducing the mortality, the morbidity of the acute attack, rests with the recognition and proper treatment with currently available drugs, diet, and exercise to control or to use a surveillance technique, on the factors known to produce myocardial infarction. It is not enough to use such techniques after the patient has had his coronary. This is, of course, a wise and useful treatment. But why not attempt the prevention of the attack?

Reverting back to a comparison of death statistics, in our small study we find the ratio between cancer deaths to coronary deaths to be 1:1. Studies done by the U.S. government, insurance companies, and USPH studies using larger, general population figures show roughly a 3:1 ratio. In an attempt to evaluate these discrepancies, there have been several explanations including one recently done by the Standard Oil group. This, however, is only part of the answer. Much of the answer is in the knowledge of the patient's understanding of the hazard. Periodic testing and adequate treatment of the factors which make a person, male or female, a coronary suspect are the task of the physician; this is a Herculean task.

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TABLE IV
THOMPSON TRIOSCRB STUDY
STATISTICAL DESCRIPTION OF PATIENT CHARACTERISTIC.
AND LABORATORY MEASUREMENTS FOR 905 PATIENTS

Variable	Low	High	Mean	Std. Dev.
Age (yrs)	13	80	45.9	9.6
Sex	Males:832 (91.9%)		Females:73 (8. %)	
Height (in.)	56	79	69.4	3.1
Weight (lbs.)	104	284	176.3	25.2
Systolic BP (mmHg)	86	200	131.2	15.8
Diastolic BP (mmHg)	54	124	82.9	9.0
Glucose (mg/100 ml)	72	294	100.2	14.4
Cholesterol (mg/10C ml)	114	486	254.8	39.4
SED Rate (mm in 1 hr.)	10	49	12.0	8.0
Uric Acid (mg/100 ml)	2.3	12	6.7	1.2
T3 (%)	20.0	49	33.4	3.8

REFERENCES

1. J. Stamler, M. D. et al, Estrogens and Androgens in the Treatment of Hyperlipidemia, Cardiovascular Drug Therapy, 1965.

2. Thompson, Charles E, M.D. "What an Executive Should Know About His Health", (Dartnell, 1961)

3. Abbott Laboratories, Personal correspondence.

Mr. Abe Alfaro, who is a new member of our department, has a Masters Degree from New York University with a major in Exercise Physiology and Kinesiology. Prior to his present position as Supervisor of Mobil's Fitness Unit, he was an instructor at Hunter College and served as a Fitness Consultant. In the latter capacity he lectured on the value of exercise and developed fitness programs. Mr. Alfaro will speak to us on "Mobil Oil Corporation's Medical Fitness Unit: A Pilot Program".

ABE ALFARO
"MOBIL OIL CORPORATION'S MEDICAL FITNESS UNIT:
A PILOT PROGRAM"

Referring to the Medical Fitness Unit, an executive stated to one of our physicians, "This is the first time the Company is doing something for me." He held this belief in spite of his eligibility for the Executive Dining Room, incentive compensation, and possibly stock options.

What are we doing for this executive and his colleagues in the Medical Fitness Unit? A sign posted on our door one morning read, Executive Playpen." In a manner of speaking, it is. This is a time when the executives are relieved of their "intellectural responsibilities" to fulfill their need for regular exercixe which too often has been neglected since youth.

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As one client, after five months in the program stated, "I have a sense of recaptured youth". This is to be expected in light of a loss of two inches on his waist and 15.5 pounds. This is not an isolated incidence since many of our regulars boast of girth and weight reductions.

Many of the participants have commented that since exercising they find it easier to shovel snow, walk up the hill to their houses, or engage in any other physical task. In addition, they will comment that their pulse rate is lower now than in the past for the same work load. This points to an improved level of cardiovascular fitness which, in light of the literautre, appears to be a deterrent to ischemic heart disease.

During a noontime locker room conversation, one executive asked another if he exercises because he is a fitness bug or strives to work off the morning's anxieties. This program is a "tension reliever" stated another executive who finds himself relaxed and better equipped for work after exercising. These viewpoints appear to be in line with Dr. Paul Dudley White's when he prescribed for a patient two punching bags, "one at home and one in the office". In other words, exercise may provide immediate relief from emotional stress by enabling one to displace their aggressions. Over an extended time period, exercise tends to promote parasympathetic preponderance so that we are physiologically less sensitive to emotional crises.

Speaking broadly, we are seeking to enhance the work capacity of the participants and reduce morbidity and mortality rates by prolonging the onset of, if not preventing, degenerative diseases, especially hypoxic heart disease. In short, the medium is primarily exercise, and the message is life, quantitatively and qualitatively.

At present, administrative eligibility is restricted, because of the size of our facilities, to a limited number of the corporation's top executives. This population must then take a complete medical examination which includes a resting and a Master's two step ECG.

To better acquaint you with the Medical Fitness Unit, let us assume that you are an executive visiting us for the first time.

Presentation of Slides:

1. Sign In
2&3. Pick up a uniform.
4&5. In your locker keep your personal grooming items and sneakers. While exercising place your valuables in your locker and hang your clothing in the closet.
6. Take your pre-exercise pulse and note it on your record.
7. We employ a circuit or series of exercise stations commencing, in your case, with a treadmill.
8. How long and how fast should you exercise? This pacer is your guide. You will be exercising at a programmed rate and not competing with your colleagues who may be more or less fit than you. Set the time and goal assigned to you: the latter is relatively low since we wish to acclimate you to the stress. Start walking on the treadmill to trigger the time mechanism, and keep the red line on the green

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effort band in line with the red line on the blue time band. If the two lines are together at the end of the time period you will have done 100% of the effort.

9. Record the percentage of the effort and your post-exercise pulse rate. In preparation for the next activity note your time and goals. When you have adapted to the exercise, as indicated by your pulse and percentage of the work load completed, we will increase your goals.

We employ the concept of interval training, especially with beginners. In other words, we elevate your pulse by means of a systemic or total body activity such as rowing and then lower it by a localized exercise such as sit-ups. You are stressed and then given a chance to recover before being stressed again.

Successive activities, depending on your circuit, include the:

10. Knee-thigh machine
11. Rowing
12. Bench press, bicycle
13. Medicine ball, and
14. Jump rope
15. After exercising, and before going into the sauna, cool down for approximately five minutes so that your pulse rate returns to within twenty beats of the pre-exercise level.

16. During this time you can read the articles posted on the bulletin board which provide insights into the relationship between exercise and topics such as: weight control; relief from emotional stress; and cardio-vascular fitness.
17. Record your post-exercise pulse.
18. If you wish you may use the sauna for five minutes.

We recommend a minimum of three visits each week. Since the exercise program is about 25 to 30 minutes, you can expect to spend 40 to 60 minutes for each visit. We open the unit at 8:30 A.M. and the last person is admitted at 4:30 P.M.

What physiological and anatomical changes can the participants expect in the months to come? As previously stated, many of the regulars, those attending three and especially four or five times each week can boast of weight and girth reductions. The following cases demonstrate this:

Subject	Weight Loss	Abd. Girth Loss	Time (Mnts)	Average # Days Subject Exercises
A	15.5	2"	5	5
B	15	1 5/8"	2 3/4	5
C	20	2 1/8"	3	5
D	9		5	5
E	5	0	2	3
F	9	1"	3 1/3	3
G	8.5	5/8"	3	4-5

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As an indication of cardiovascular fitness, most of the men have demonstrated a drop in the pre and post exercise pulse rates. We are now instituting two evaluation techniques, a pulse ratio step test and blood pressure readings, which will provide insights into this parameter. It is with these and other standardized tests that we will provide statistical data on the fitness of the clients and subsequently the value of the medical fitness unit.

SUMMATION
H. A. SINCLAIRE, M. D.

I was so glad to have you all here today. I hope you enjoyed your day with Mobil. We are certainly indebted to our many speakers who have made the day most instructive and stimulating. For those of you who are remaining in Chicago for next week's conferences, I hope that you will enjoy your visit, as well as come away with some new ideas and techniques which can be practically used in your everyday work roles in Mobil's medical departments.

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